INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

THIRD MEETING OF AIG AUTHORITIES

AIG-SAM/3

DRAFT REPORT

LIMA, PERU, 7-9 MARCH 2016

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HISTORICAL

ii.1 Place and Date of the Meeting

The Third Meeting of AIG Authorities of South America (AIG-SAM/3) was held at the premises of the ICAO South American Regional Office, from 7 to 9 March 2016.

ii.2 Opening Ceremony

Mr. Oscar Quesada, Deputy Regional Director of the South American Office of the International Civil Aviation Organization (ICAO) and Mr. Marcus Costa, chief of the AIG Section of the Headquarters Office of the International Civil Aviation Organization (ICAO), welcomed the participants. Ms. Ana Pamela Suárez, Chairperson of the Junta Investigadora de Accidentes de Aviación Civil (JIAAC) from Argentina, provided opening remarks and officially opened the meeting.

ii.3 Officers of the Meeting

The AIG-SAM/3 Meeting was held with the participation of Mrs. Ana Pamela Suárez, Chairperson of the Junta Investigadora de Accidentes de Aviación Civil (JIAAC) from Argentina. Mr. Marcelo Ureña, Regional Officer Flight Safety of the South American Office of the International Civil Aviation Organization (ICAO), Mr. Marcio Abreu, AIG Specialist of the South American Office of the International Civil Aviation Organisation (ICAO) and Mr. Daniel Barafani, Chief of the Operative Investigation Department of the Junta Investigadora de Accidentes de Aviación Civil (JIAAC) from Argentina acted as Co-secretaries of the Meeting. Mr. Gustavo Adolfo Iriarte Navas, Chief AIG of the Unidad Administrativa Especial de Aeronáutica Civil, Colombia, was elected as chairperson of the Meeting.

ii.4 Working Languages

The working languages of the Meeting were English and Spanish, and it counted with simultaneous interpretation. The working papers, information papers and draft report of the meeting were available to participants in both languages.

ii.5 Schedule and Working Arrangements

It was agreed that the working hours for the sessions of the meeting would be from 09:00 to 17:30 hours daily with adequate breaks. The Meeting was held in plenary session. At the end of the sessions, the Secretariat prepared a draft report for consideration of the Meeting, where measures to be taken and agreements to be followed were specified.

ii.6 Agenda

Agenda Item 1: Approval of the Agenda and work programme

Agenda Item 2: Review and signature of the AIG Cooperation Agreement among the ARCM States

a) AIG Cooperation Agreement proposal among the ARCM States

Agenda Item 3: AIG regulations review

a) Proposals for the amendment of the AIG State regulation
b) Proposals for the amendment of LAR 113

Agenda Item 4: ARCM AIG procedures manual review

a) Proposals for the amendment of the accidents and incidents investigation procedures manual

Agenda Item 5: ARCM AIG training programme review

a) Proposal for the amendment of the ARCM AIG training programme

Agenda Item 6: ARCM Safety data collection and processing system (SDCPS) procedures review

a) Proposal on procedures for the implementation of the ARCM safety data collection and processing system (SDCPS).

Agenda Item 7: Investigation of non-serious incidents

a) Role of the organizations involved in the investigation of non-serious incidents

Agenda Item 8: 2016 ARCM activities programme approval

a) 2016 ARCM activities programme proposal

Agenda Item 9: South American ARCM multinational investigator certification

a) South American ARCM multinational investigator certification manual proposal

Agenda Item 10: Other issues

a) ARCM web page proposal review
b) ARCM logo proposal review
c) ARCM Executive Committee meetings venue proposal
d) ARCM organization and planning manual proposal review
e) ARCM accidents and incidents investigation policies and procedures manual proposal
f) 2016 ARCM activities programme progress
g) Proposal for the incorporacion of the BEA as ARCM member in condition of observer

ii.7 Attendance

The Meeting was attended by 11 States from the SAM Region and one Observer State, totalling 26 delegates as indicated in the list of participants.

ii.8 List of Conclusions

Number	Title	Page
*/1	***The list of conclusions/decisions will be included in the final version of the Report***	*-1
*/2		*-1
*/3		*-1

ii.9 List of Working and Information Papers

Refer to the Meeting web page:
http://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2016-AIGSAM03
and or http://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2016-AIGSAM03
The final list of documentation will be included in the final version of the Report.

LIST DE PARTICIPANTS

ARGENTINA

1. Ana Pamela Suárez
2. Oscar Daniel Barafani
3. Víctor Godoy

BOLIVIA

4. Franz Ronald Tamayo
5. Ernesto Saavedra

BRAZIL

6. Dilton José Schuck
7. Alexandre Prado Lima

CHILE

8. Alonso Lefno

COLOMBIA

9. Gustavo Adolfo Iriarte Navas
10. Julián Echeverri Valencia

ECUADOR

11. Armando Durán Nuñez

FRANCE

12. Thierry Loo

GUYANA

13. Paula McAdam

PANAMA

14. Robert Katz
15. Eunides Antonio Pérez

PERU

16. Fernando Melgar
17. Pedro Avila y Tello
18. Fredy Núñez Munarriz
19. Victor Arcaya
20. Renzo Gallegos Begazo

SURINAME

21. Cliffort Themen

URUGUAY

22. Miguel lAntes Russo
23. Rubén Villagra

ICAO

24. Marcus Costa
25. Marcelo Ureña
26. Marcio Abreu

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Agenda Item 1: Approval of the Agenda and work programme

1.1 The Secretariat presented WP/01 and invited the participants to approve the Agenda and tentative work programme for the Third Meeting of AIG Authorities of the South American Region (AIG-SAM/3). The participants approved the work programme as shown in the history of this report and the schedule as shown in **Attachment A** to this part of the report.

1.2 The Meeting had two presentations on the following topics:

- ✓ Improved protection of investigation records, by the head of the ICAO AIG Section; and
- ✓ Progress made in ARCM implementation, by the Secretariat.

THIRD AIG AUTHORITIES MEETING OF SOUTH AMERICA, LIMA, PERU, FROM 07 TO 09 MARCH 2016
AGENDA SCHEDULE

Time	Monday, 7 March	Time	Tuesday, 8 March	Time	Wednesday, 9 March
08:30 09:00	Registration	08:30 09:30	Agenda Item 6: Safety data collection and processing system (SDCPS) procedures review (WP/07)	08:30 09:00	For the use of the Secretariat
09:00 09:30	Welcome and opening words Mrs. Ana Pamela Suarez, ARCM Chairperson Mr. Marcus Costa, Chief AIG Section, ICAO Mr. Oscar Quesada, Deputy Director, SAM Office				
09:30 10:00	✓ Election of the meeting chairperson ✓ Approval of the agenda, schedule and proposed working methods (WP/01)	09:30 10:00	Agenda Item 7: Non-serious incidents investigation (WP/08)	09:00 10:00	Revision of the report by the participants
10:00 10:30	**Group picture and Coffee break**	10:00 10:30	**Coffee break**	10:00 10:30	**Coffee break**
10:30 11:15 11:15 11:30	✓ Presentation: Enhancing protection of investigation records. Mr. Marcus Costa ✓ Agenda Item 1: ARCM implementation progress. Mr. Marcelo Ureña	10:30 11:30	Agenda Item 8: 2016 ARCM activities programme approval (WP/09)	10:30 11:30	Plenary revision of the report
11:30 12:15	Agenda Item 2: Review of the AIG Cooperation Agreement proposal among the ARCM States (WP/02)	11:30 12:15	Agenda Item 9: South American ARCM multinational investigator certification (WP/10)	11:45 12:15	Closure words Mrs. Ana Pamela Suarez, Chairperson ARCM Mr. Marcus Costa, Chief AIG Section, ICAO Mr. Oscar Quesada, DD, SAM Office
12:15 14:00	**Lunch**	12:15 14:00	**Lunch**		
14:00 15:00	Agenda Item 3: AIG regulations review (WP/03, WP/04)	14:00 15:00	France BEA Presentation		
15:00 16:00	Agenda Item 4: ARCM AIG Procedures Manual review (WP/05)		**Agenda Item 10:** Other issues (WP/11, WP/12, WP/13, WP/14, WP/15, WP/16, WP/17)		
16:00 16:30	**Coffee break**		**Coffee break**		
16:30 17:30	Agenda Item 5: ARCM AIG instructions programme review (WP/06)		**Agenda Item 10:** Other issues (Continuation)		

Agenda Item 2 Review and signature of the AIG Cooperation Agreement among the ARCM States

2.1 Under this agenda item, the Chairperson of the ARCM Executive Committee presented WP/2 containing the proposal for the review and signing of the AIG Cooperation Agreement among ARCM States.

2.2 In this regard, the Meeting took note that the AIG-SAM/2 meeting had agreed on the creation of the ARCM to expedite mutual technical cooperation among the States of Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of), thus requiring a legal instrument to enable such cooperation in the area of aircraft accident and incident investigation.

2.3 The Meeting then took note that protocol question (PQ) AIG 6.115 allows any State that has insufficient or no duly qualified personnel of its own to make arrangements (*e.g.,* memoranda of agreement) with other States or regional organisations in order to quickly procure the necessary staff in case of an accident.

2.4 Likewise, PQ 6.122 requires States to establish a formal means, such as a letter of agreement, to clearly define the privileges and obligations of those participating in the investigation, such as the assigned experts, accredited representatives, advisors, observers, and experts.

2.5 The Meeting agreed that cooperation would be subject to a request being submitted by an AIG authority of a member State, the availability of the necessary means, and acceptance by the other AIG authorities of the other ARCM member States to expedite such cooperation.

2.6 Next, the Meeting was presented with the proposal of AIG Cooperation Agreement among ARCM States to enable regional cooperation making use of the following resources:

- ✓ investigators or other AIG-related experts, such as ADREP/ECCAIRS system experts;
- ✓ technical facilities;
- ✓ equipment related to the investigation of accidents and serious incidents;
- ✓ training, including on-the-job training (OJT) opportunities, either observing or participating in an investigation, and availability of instructors and/or training;
- ✓ readout of flight data recorders and cockpit voice recorders, excluding the analysis of retrieved data and sounds, for the purpose of investigating accidents and serious incidents;
- ✓ testing of materials and fluids; and
- ✓ drafting of documents and other publications, such as final reports, manuals, provisional statements, and other public documents

2.7 Regarding Article 9 – Financial aspects of the Agreement, the Meeting agreed on the need to replace “United Nations” with “ICAO” in terms of *per diems,* since it was the organisation that all States knew and thus it would be easier for AIG authorities to process those *per diems* before the

respective bodies of their State. In this regard, the Meeting entrusted the Secretariat with making the agreed modification.

2.8 Finally, the Meeting remarked that the scope of the ARCM should be expanded to other States that are not necessarily located in South America, as is the case of Panama, and thus agreed on looking for a name that would encompass other States of the Americas. In this regard, the Meeting had an extensive debate and agreed to keep the existing name, since Article 11 of the Agreement allows other AIG authorities from other ICAO contracting States that are not ARCM members to join, prior approval by the ARCM Executive Committee.

2.9 Upon discussing the working paper and agreeing on the amendments to the Agreement, the Chairperson of the Executive Committee invited the participating States to sign the ARCM multinational technical cooperation agreement. Accordingly, the Meeting agreed on the following conclusion:

CONCLUSION AIG-SAM/3-01 Approval of the amendment and signature of the Multinational technical cooperation agreement among aircraft accident and incident investigation authorities of ARCM member States of South America

a) Approve the amendment to Article 9 of the Agreement – Financial aspects, replacing United Nations with ICAO in the *per diem* regime.

b) Deposit the Agreement signed by the AIG authorities of Argentina, Bolivia, Ecuador, Guyana, Panama, Peru, and Uruguay before the ARCM Technical Committee.

c) Request the AIG authorities of the States of Brazil, Chile, Colombia, Paraguay, Suriname, and Venezuela to sign the Agreement as soon as possible.

- ✓ The States of Brazil and Chile expressed that they needed more time to sign the Agreement, since it was being analysed by the legal areas of each State for its approval.

- ✓ The States of Paraguay and Venezuela offered their apologies for not attending the Meeting, but expressed their intention to sign the Agreement. To that end, the Chairperson of the ARCM Executive Committee undertook to circulate the Agreement for the respective signatures.

- ✓ The representative of Suriname stated that he was not empowered to sign the Agreement, but would inform the ARCM when that State was ready to sign the aforementioned.

- ✓ The representative of Colombia stated that the Agreement would be signed by the Director General of UAEAC.

d) **Attachment A** to this part of the report contains the Agreement signed by Argentina, Bolivia, Ecuador, Guyana, Panama, Peru, and Uruguay. It also includes the signature of the representative of BEA, which will participate as special observer.

MULTINATIONAL TECHNICAL COOPERATION AGREEMENT AMONG AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION AUTHORITIES OF MEMBER STATES OF THE AIG REGIONAL COOPERATION MECHANISM (ARCM) OF SOUTH AMERICA

ACUERDO DE COOPERACIÓN TÉCNICA MULTINACIONAL ENTRE LAS AUTORIDADES DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN DE LOS ESTADOS MIEMBROS DEL MECANISMO REGIONAL DE COOPERACIÓN AIG (ARCM) DE SUDAMÉRICA

MULTINATIONAL TECHNICAL COOPERATION AGREEMENT AMONG AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION AUTHORITIES OF MEMBER STATES OF THE AIG REGIONAL COOPERATION MECHANISM (ARCM) OF SOUTH AMERICA

PREAMBLE

The parties to this Agreement are the aircraft accident and incident investigation authorities of the South American States.

Whereas the International Civil Aviation Organization (ICAO) is the international body created by the 1944 Convention on International Civil Aviation (Chicago Convention) having as its main objectives the safe and orderly development of international civil aviation, the implementation and adoption of the principles and provisions of the Chicago Convention, including standards and recommended practices concerning accident and incident investigation and other matters connected with the safety and efficiency of air navigation;

Whereas Article 26 of the Convention provides that a State in which an accident occurs "will institute an inquiry into the circumstances of the accident in accordance, so far as its laws permit, with the procedure which may be recommended by the International Civil Aviation Organization";

Whereas Annex 13 to the Convention specifies standards and recommended practices (SARPs) for the conduct of aircraft accident and incident investigations on the part of States to meet their obligations under Article 26 of the Convention;

Recognising that ICAO audits and coordinated validation missions (ICVM) conducted within the framework of the Universal safety oversight audit programme continuous monitoring approach (USOAP-CMA) have shown that many Contracting States have not established and/or managed effective accident and incident investigation organisations, primarily because of difficulties in the allocation of more resources to their organisations to meet their obligations under the Convention and Annex 13 to the Convention;

Taking into account the recommendations of the Accident Investigation and Prevention (AIG) Divisional Meeting (2008) (AIG/08) held in Montreal, Canada, from 13 to 18 October 2008, and in particular Recommendation 6/3 a), urging Contracting States to conduct safety investigations pursuant to Article 26 of the Chicago Convention and Annex 13 when an accident occurs in their territory, and to obtain regional support if the required capabilities or resources are not available;

Taking into account that Chapter 5 of Annex 13 includes the possibility for the State of occurrence to delegate the whole or any part of the conducting of an investigation in another State to a regional accident and incident investigation organisation by mutual arrangement and consent;

Considering that the 38th Session of the ICAO Assembly resolved, in Appendix N – Cooperation among member States concerning aircraft accident investigations, to recommend member States to cooperate in the investigation of aircraft accidents, especially accidents in which the investigation requires highly-specialised experts and facilities, and that to this end, Member States and regional accident and incident investigation organisations (RAIOs), to the extent possible, *inter alia*:

a) provide, on request by other Member States, expert assistance and facilities for the investigation of major aircraft accidents; and

b) afford opportunity to Member States seeking investigation experience to attend the investigation of aircraft accidents, in the interest of developing and furthering investigation expertise.

Recalling that the First AIG Meeting of the SAM Region (AIG/SAM-1), held from 18 to 20 March 2014 at the ICAO South American Regional Office, agreed on the strategy for moving towards the creation of a Regional AIG Cooperation Mechanism (ARCM) in the SAM Region, as one of the forms of a RAIO, that would allow Member States facing difficulties to meet their international obligations in terms of accident investigation, to meet those obligations by pooling efforts and sharing resources that they would otherwise not be able to obtain.

Considering that AIG authorities of the South American States agreed at the Second AIG Meeting of the SAM Region (AIG/SAM-2), held in Buenos Aires, Argentina, from 9 to 11 June 2015, to establish a Regional AIG Cooperation Mechanism (ARCM) and approved its regulations, procedural handbooks, training programme, and the regional database.

Considering the need to further an agreement among AIG authorities of the South American ARCM Member States with a view to formalising and increasing cooperation and collaboration in accident and incident investigation.

Considering that one of the objectives of the ARCM is to support and assist the AIG authorities of the States that so request it in aspects related to aircraft accident and incident investigation within a context of regional cooperation that contributes to improve effective implementation in the AIG area.

Considering that an aspiration of the States is to ensure that AIG authorities of the South American Region apply the highest standards in aircraft accident and incident investigation processes.

Therefore, the AIG authorities of the States of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela.

HAVE AGREED TO THE FOLLOWING:

ARTICLE 1
Application of the Agreement

The Agreement will govern cooperation in aircraft accident and incident investigation among aircraft accident and incident investigation authorities of States that are party to the Regional AIG Cooperation Mechanism (ARCM) of South America.

ARTICLE 2
Objective

The objective of this Agreement is to facilitate multinational technical cooperation in aircraft accident and incident investigation, including technical assistance by investigators in the investigation of aircraft accidents and serious incidents, training of investigation personnel, and

mainly material and equipment testing, whenever requested by an AIG authority of a member State, the required means are available, and the other AIG authorities of the other ARCM Member States agree to facilitate the requested cooperation. Resources to be provided under this agreement include:

a) investigators or other specialists related to the AIG field, for example, experts in the ADREP/ECCAIRS system;
b) technical facilities;
c) equipment related to the investigation of accidents and serious incidents;
d) training, including on-the-job training (OJT) opportunities, either observing or participating in an investigation, and availability of instructors and/or training materials;
e) flight data recorder and cockpit voice recorder readings, excluding the analysis of recovered data and noise, for the purpose of investigating accidents and serious incidents;
f) material and fluid testing; and
g) drafting of documents and other publications, such as final reports, bulletins, manuals, provisional statements, and other public documents.

ARTICLE 3
Cooperation among AIG authorities of ARCM States

1. Under this Agreement, AIG authorities of ARCM Member States may provide technical assistance in the resources mentioned in Article 2 of this Agreement, when so requested by an AIG authority of another Member State, and the terms of the required cooperation are agreed upon, and they have the capacity to do so.

2. The AIG authorities in charge of the investigation may request technical assistance from other AIG authorities of ARCM States to cooperate in the investigation of accidents and serious incidents. However, the AIG authorities in charge of the investigation will be responsible for the investigation as a whole, in accordance with the provisions of Annex 13 to the Chicago Convention.

3. The AIG authority of the State providing the required services will determine if the circumstances allow for assistance to be provided to the petitioner, in which case the terms governing such assistance will be determined by common agreement among the Parties.

4. The request for cooperation will be submitted to the Chairperson of the Executive Committee of the ARCM.

5. The assistance provided under this agreement will be offered in accordance with national AIG documentation harmonised with ARCM AIG documentation.

ARTICLE 4

Training cooperation methods

When an investigation in one of the ARCM States is in a particular area of interest of the AIG authority of another State, or in an area in which the latter does not have resources or technical expertise, said authority may request that an AIG specialist participate in the investigation as an observer, who will be under the control and direction of the investigator in charge, for purposes of on-the-job training (OJT). Participation as an observer will imply compliance with all

information protection measures resulting from the application of applicable regulations of the State conducting the investigation, as well as signing current confidentiality agreements to preserve the confidential nature of the information.

ARTICLE 5

Methods for participating as investigator or specialist in an investigation

When an AIG authority of the ARCM States requests the participation of an investigator or specialist in the investigation of an accident or serious incident as an investigator or advisor, the latter will be under the control and direction of the investigator in charge of the investigation. Participation as an investigator or advisor implies compliance with all information protection measures derived from the applicable regulations of the State conducting the investigation, as well as signing current confidentiality agreements to preserve the confidential nature of the information.

ARTICLE 6

Method of operation for testing materials

When an AIG authority of the ARCM States requests from another AIG authority the conduction of a material test of a part corresponding to an aircraft involved in an accident, the former will be responsible for delivering the element to the laboratory where such testing will take place, and also for its retrieval. It will also be responsible for all administrative and export formalities required for the delivery of the element.

ARTICLE 7

Method for reading the FDR or CVR

When an AIG authority of the ARCM States requests another AIG authority to obtain data from an FDR or CVR corresponding to an aircraft involved in an accident, it will be responsible for the delivery of the element to the laboratory where such testing will take place, as well as of its retrieval. It will also be responsible for all administrative and export formalities required for the delivery of the element.

ARTICLE 8

Confidentiality and information protection

The data, records, recordings, statements, communications, and reports to which one of the parties might have access as a result of its collaboration with the other will be subject to the confidentiality and information protection measures of the State of the party that provides them, and their dissemination or assignment to third parties will be subject to the conditions and obligations contained in such regulatory provisions.

ARTICLE 9

Financial aspects

The AIG authority of the State requesting the cooperation of another AIG authority of another ARCM State will cover air travel expenses and *per diems* resulting from such cooperation, in accordance with ICAO *per diem* rates.

ARTICLE 10

Entry into force, duration, and withdrawal

1. This Agreement shall be signed and deposited by the AIG authorities of the respective States with the ARCM Technical Committee, through the Chairperson of the Executive Committee.

2. This Agreement will enter into force immediately upon signature by at least three AIG authorities of ARCM States. Thereafter, it will come into force for the other AIG authorities of ARCM States immediately after at least three AIG authorities of ARCM States have signed this Agreement.

3. The AIG authorities of the States agree that the Chairperson of the ARCM Executive Committee shall notify the entry into force of this Agreement to them, as well as the signatures and deposits received after the entry into force of this Agreement.

4. Any Party that elects to withdraw from this Agreement will forward an official notification of its intent to withdraw to the Chairperson of the ARCM Executive Committee. The withdrawal will take effect one year after the date of the receipt by the Chairperson. The withdrawal will be without prejudice to any obligation incurred by the withdrawing party under this Agreement prior to such withdrawal. This Agreement will continue to be in force thereafter with respect to the other Parties.

ARTICLE 11
Accession

1. This Agreement, once in force, will remain open to accession by other AIG authorities of other Contracting States of the Convention on International Civil Aviation that are not ARCM members, upon approval by the ARCM Executive Committee. The ARCM Technical Committee will be the depository of the Agreement and accession requests will be submitted to the Chairperson of the ARCM Executive Committee.

2. Requests by entities or other bodies interested in becoming a party to the ARCM as special observers shall be submitted to the Chairperson of the ARCM Executive Committee, who will initiate the corresponding administrative process. Accession will be granted to entities or other interested bodies upon approval by the ARCM Executive Committee.

3. Any other AIG authority of another State that wishes to become a party to this Agreement shall submit an accession request to the Chairperson of the ARCM Executive Committee, and may do so upon approval by the other AIG authorities of ARCM Member States and upon signature of the Agreement.

4. In case of accession, this Agreement will enter into force for the party acceding, thirty days after the date of signature.

ARTICLE 12

Dissolution

The Agreement may be dissolved by the AIG Authorities of Member States.

ARTICLE 13
Amendment of the Agreement

1. This Agreement may be amended by the agreement of the AIG authorities of the ARCM member States.

2. The AIG authorities of the member States may submit proposals for the amendment of this Agreement.

3. Any proposal for amendment will be submitted in writing to the Chairperson of the ARCM Executive Committee who will, within thirty (30) days of its receipt, communicate the proposed amendment to the AIG authorities of ARCM member States.

4. The AIG authorities of ARCM member States that wish to make comments concerning the proposal may do so within ninety (90) days from the date of its delivery by the Chairperson of the ARCM Executive Committee.

5. Proposals and comments received in this regard from AIG authorities of the ARCM Member States will be submitted at the following meeting of the ARCM Executive Committee for approval.

6. Any amendment to this Agreement will be valid only when adopted by the AIG authorities of the ARCM member States, and will enter into force once approved by all the AIG authorities of ARCM member States.

IN WITNESS WHEREOF, the AIG authorities sign this Agreement on this seventh day of March in the year two thousand and sixteen

ACUERDO DE COOPERACIÓN TÉCNICA MULTINACIONAL ENTRE LAS AUTORIDADES DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES DE AVIACIÓN DE LOS ESTADOS MIEMBROS DEL MECANISMO REGIONAL DE COOPERACIÓN AIG (ARCM) DE SUDAMÉRICA

PREÁMBULO

Las partes en el presente Acuerdo son las autoridades de investigación de accidentes e incidentes de aviación de los Estados de Sudamérica.

Considerando que la Organización de Aviación Civil Internacional (OACI) es el organismo internacional creado por el Convenio sobre Aviación Civil Internacional de 1944 (el Convenio de Chicago) que tiene como sus principales objetivos el desarrollo seguro y ordenado de la aviación civil internacional, la aplicación y adopción de los principios y disposiciones del Convenio de Chicago, incluyendo las normas y métodos recomendados relativos a la investigación de accidentes e incidentes y otros asuntos relacionados con la seguridad operacional y la eficiencia de la navegación aérea;

Considerando que el Artículo 26 del Convenio dispone que todo Estado en donde ocurra un accidente "abrirá una encuesta sobre las circunstancias del mismo, ajustándose, en la medida que lo permitan sus leyes a los procedimientos que pueda recomendar la Organización de Aviación Civil Internacional";

Considerando que el Anexo 13 al Convenio especifica las normas y métodos recomendados (SARPS) para la realización de investigaciones de accidentes e incidentes de aviación que han de seguir los Estados para cumplir con sus obligaciones en virtud del Artículo 26 del Convenio;

Reconociendo que los resultados de las auditorías y de las misiones de validación coordinadas de la OACI (ICVM) realizadas en el marco del enfoque de observación continua del Programa universal de auditoría de la vigilancia de la seguridad operacional (USOAP-CMA) indican que muchos Estados contratantes no han establecido y/o gestionado organizaciones eficaces de investigación de accidentes e incidentes, debido principalmente a las dificultades que tienen para asignar mayores recursos a sus organizaciones y cumplir sus obligaciones en virtud del Convenio y del Anexo 13 al Convenio;

Teniendo en cuenta las recomendaciones formuladas por la Reunión departamental de investigación y prevención de accidentes (AIG) (2008) (AIG/08) celebrada en Montreal, Canadá, del 13 al 18 de octubre de 2008, y en particular la Recomendación 6/3 a), en la que se insta a los Estados contratantes a que realicen investigaciones de seguridad operacional con arreglo al Artículo 26 del Convenio de Chicago y el Anexo 13 cuando ocurra un accidente en su territorio y a que procuren apoyo regional si no se dispone de capacidades o recursos;

Teniendo en cuenta que el Capítulo 5 del Anexo 13 incluye la posibilidad que el Estado del suceso pueda delegar total o parcialmente, la realización de la investigación en otro Estado u organización regional de investigación de accidentes e incidentes, por acuerdo y consentimiento mutuos;

Considerando que el 38° período de sesiones de la Asamblea de la OACI resolvió, mediante el Apéndice N - Cooperación entre los Estados miembros en las investigaciones de accidentes de aviación, recomendar a los Estados miembros que cooperen en la investigación de accidentes de aviación, especialmente accidentes en los que la investigación requiere expertos e instalaciones altamente especializados, y que para este fin los Estados miembros y las organizaciones regionales de investigación de accidentes e incidentes (RAIO), en la medida de lo posible, entre otras cosas:

c) proporcionen, a solicitud de otros Estados miembros, ayuda e instalaciones especializadas para la investigación de accidentes de aviación de gran magnitud; y

d) brinden la oportunidad a los Estados miembros que desean adquirir experiencia en investigaciones, para que asistan a las investigaciones de accidentes de aviación, en interés del desarrollo y fomento de la investigación especializada.

Recordando que en la Primera Reunión AIG de la Región SAM (AIG/SAM-1), celebrada del 18 al 20 de marzo de 2014 en la Oficina Regional Sudamericana de la OACI, en Lima, Perú, se acordó la estrategia para avanzar hacia la formación de un Mecanismo Regional de Cooperación AIG (ARCM) en la Región SAM, como una de las formas de una RAIO, que permita que sus Estados miembros que tengan dificultades en atender sus obligaciones internacionales en materia de investigación de accidentes puedan cumplir dichas obligaciones uniendo esfuerzos y compartiendo recursos que de otra manera no podrían obtener.

Considerando que en la Segunda Reunión AIG de la Región SAM (AIG/SAM-2), celebrada en Buenos Aires, Argentina, del 09 al 11 de junio de 2015, las autoridades AIG de los Estados de Sudamérica, acordaron el establecimiento del Mecanismo Regional de Cooperación AIG (ARCM) y la aprobación de sus reglamentos, manuales de procedimientos, programa de instrucción y de la base de datos regional.

Considerando que es necesario propiciar un Acuerdo entre las autoridades AIG de los Estados miembros del ARCM de Sudamérica, con el objeto de formalizar y acrecentar la cooperación y colaboración respecto a la investigación de accidentes e incidentes.

Considerando que entre los objetivos del ARCM se encuentra el apoyar y asistir a las autoridades AIG de los Estados que lo soliciten en los aspectos relacionados con la investigación de accidentes e incidentes de aviación en un ambiente de cooperación regional que permita mejorar la aplicación eficaz en el área AIG.

Considerando que es una aspiración de los Estados asegurar los más altos estándares en los procesos de investigación de accidentes e incidentes de aviación de las autoridades AIG de la Región Sudamericana.

Por consiguiente, las autoridades AIG de los Estados de Argentina, Estado Plurinacional de Bolivia, Brasil, Chile, Colombia, Ecuador, Guyana, Panamá, Paraguay, Perú, Surinam, Uruguay y República Bolivariana de Venezuela.

HAN ACORDADO LO SIGUIENTE:

ARTÍCULO 1
Aplicación del Acuerdo

El Acuerdo regirá la cooperación entre las autoridades de investigación de accidentes e incidentes de aviación de los Estados miembros del Mecanismo Regional de Cooperación AIG (ARCM) de Sudamérica en el marco de la investigación de accidentes e incidentes de aviación.

ARTÍCULO 2
Objetivo

El objetivo de este Acuerdo es facilitar la cooperación técnica multinacional en el ámbito de la investigación de accidentes e incidentes de aviación que incluirá asistencia técnica con investigadores en la investigación de accidentes e incidentes graves de aviación, en la formación del personal de investigadores y en los ensayos de materiales y equipos principalmente, siempre que una autoridad AIG de un Estado miembro lo solicite y existan los medios necesarios y la aceptación por parte de las otras autoridades AIG de los otros Estados miembros del ARCM para facilitar la cooperación solicitada. Los recursos a ser cubiertos por este acuerdo incluyen:

h) investigadores u otros especialistas afines al campo AIG, por ejemplo, especialistas en el sistema ADREP/ECCAIRS;
i) instalaciones técnicas;
j) equipos relacionados con la investigación de accidentes e incidentes graves;
k) instrucción, incluyendo oportunidades para instrucción práctica en el puesto de trabajo (OJT), ya sea observando o participando en una investigación, y la disponibilidad de instructores y/o de materiales de instrucción;
l) lecturas de registradores de datos de vuelo y registradores de voz de cabina, excluyendo el análisis de los datos y sonidos recuperados, con fines de investigación de accidentes e incidentes graves;
m) ensayos de material y fluidos; y
n) elaboración de documentos y otras publicaciones, tales como informes finales, boletines, manuales, declaraciones provisionales y otros documentos públicos.

ARTÍCULO 3
Cooperación entre las autoridades AIG de los Estados del ARCM

6. Las autoridades AIG de los Estados miembros del ARCM, al amparo de este Acuerdo, podrán proveer asistencia técnica en los recursos mencionados en el Artículo 2 de esta Acuerdo, cuando una autoridad AIG de otro Estado miembro lo solicite y estén de acuerdo con los términos de la cooperación requerida y tengan capacidad para ello.

7. Las autoridades AIG encargadas de la investigación podrán solicitar asistencia técnica de otras autoridades AIG de los Estados del ARCM para que colaboren en la investigación de accidentes e incidentes graves, no obstante, las autoridades AIG encargadas de la investigación serán responsables de la investigación en su totalidad, de acuerdo con las disposiciones del Anexo 13 al Convenio de Chicago.

8. La Autoridad AIG del Estado prestador de los servicios requeridos determinará si las circunstancias hacen posible que se preste la asistencia al solicitante, en cuyo caso se establecerán los términos por los cuales se regirá la misma, de común acuerdo entre las Partes.

9. La solicitud de cooperación será tramitada a través del/la Presidente del Comité Ejecutivo del ARCM.

10. La asistencia brindada conforme a este acuerdo será ofrecida en base a la documentación nacional AIG, armonizada con la documentación AIG del ARCM.

ARTÍCULO 4

Métodos de cooperación en cuanto a capacitación

Cuando una investigación en uno de los Estados del ARCM es en un área de particular interés de una autoridad AIG de otro Estado, o en un área donde este último no cuenta con recursos o experiencia técnica especializada, dicha autoridad podrá solicitar la participación de un especialista AIG en la investigación, en calidad de observador, quien estará bajo el control y dirección del investigador encargado para los fines de instrucción práctica en el puesto de trabajo (OJT). La participación como observador implicará el cumplimiento de toda medida de protección de la información que resultase de la aplicación de la reglamentación aplicable del Estado que realiza la investigación, así como la firma de compromisos de confidencialidad vigentes que preserven el carácter reservado de la información.

ARTÍCULO 5

Métodos para participar como investigador o especialista en una investigación

Cuando una autoridad AIG de los Estados del ARCM solicite la participación de un investigador o especialista en la investigación de un accidente o incidente grave, en calidad de investigador o asesor, éste estará bajo el control y dirección del investigador encargado de la investigación. La participación como investigador o asesor implica la observación de toda medida de protección de la información que resultase de la aplicación de la reglamentación aplicable del Estado que realiza la investigación, así como la firma de compromisos de confidencialidad vigentes que preserven el carácter reservado de la información.

ARTÍCULO 6

Método de actuación para realizar un ensayo de material

Cuando una autoridad AIG de los Estados del ARCM solicite a otra, la realización de un ensayo de material a una parte correspondiente a una aeronave accidentada, esta se hará cargo del envío del elemento hasta el laboratorio donde se realizará dicho ensayo, como así también de su recuperación. Además se encargará de realizar todos los trámites administrativos y de exportación necesarios para el envío del elemento.

ARTÍCULO 7

Método de actuación para realizar la lectura de FDR o CVR

Cuando una Autoridad AIG de los Estados del ARCM solicite a otra Autoridad AIG, la obtención de datos de un equipo FDR o CVR correspondiente a una aeronave accidentada, ésta se hará cargo del envío del elemento hasta el laboratorio donde se realizará dicho ensayo, como así también de su recuperación. Además se encargará de realizar todos los trámites administrativos y de exportación necesarios para el envío del elemento.

ARTÍCULO 8

Confidencialidad y protección de la información

Los datos, registros, grabaciones, declaraciones, comunicaciones, e informes a los que pudiera tener acceso una de las partes como consecuencia de su colaboración con la otra estarán sujetas a las medidas de confidencialidad y protección de la información del Estado de la parte que los proporciona y su divulgación o cesión a terceros estará sujeta a los condicionantes y obligaciones contenidas en dichas disposiciones reglamentarias.

ARTÍCULO 9
Aspectos financieros

La autoridad AIG del Estado que solicite la cooperación de otra autoridad AIG de otro Estado del ARCM, sufragará los gastos de pasajes aéreos y viáticos que dicha cooperación ocasione, de acuerdo con el régimen de viáticos de OACI.

ARTÍCULO 10
Entrada en vigor, duración y retiro

5. El presente Acuerdo deberá ser firmado y depositado por las autoridades AIG de los Estados respectivos en el Comité Técnico del ARCM a través del/la Presidente del Comité Ejecutivo.

6. El presente Acuerdo entrará en vigor inmediatamente después que al menos tres autoridades AIG de los Estados del ARCM hayan firmado y depositado el presente Acuerdo. De allí en adelante, entrará en vigor para las otras autoridades AIG de los Estados del ARCM que firmen posteriormente el presente Acuerdo.

7. Las autoridades AIG de los Estados acuerdan que el/la Presidente del Comité Ejecutivo del ARCM, les notifique la entrada en vigor del presente Acuerdo, así como las firmas y depósitos que se reciban con posterioridad a la entrada en vigor del presente Acuerdo.

8. Toda Parte que opte por retirarse del presente Acuerdo enviará una notificación oficial de su intención de retirarse al Presidente del Comité Ejecutivo del ARCM. Tal retiro surtirá efecto un año después de la fecha en que el/la Presidente del Comité Ejecutivo del ARCM reciba la mencionada notificación. El retiro será sin prejuicio de las obligaciones contraídas por la Parte que se retira en virtud de este Acuerdo antes de retirarse. El presente Acuerdo continuará en vigor de allí en adelante con respecto a las demás Partes.

ARTÍCULO 11
Adhesión

5. El presente Acuerdo, una vez vigente, quedará abierto a la adhesión de otras autoridades AIG de otros Estados contratantes del Convenio sobre Aviación Civil Internacional que no sean miembros del ARCM, previa aprobación del Comité Ejecutivo del ARCM. El Comité Técnico del ARCM será la depositaria del Acuerdo y las solicitudes de adhesión serán cursadas al Presidente del Comité Ejecutivo del ARCM.

6. Las solicitudes de entidades u otros organismos interesados en ser admitidos en el ARCM en la condición de observadores especiales, deberán ser cursadas al Presidente del Comité Ejecutivo del ARCM, para que dé inicio al proceso administrativo correspondiente. La

adhesión de entidades u otros organismos interesados será otorgada previa aprobación del Comité Ejecutivo del ARCM.

7. Toda otra autoridad AIG de otro Estado que desee ser Parte del presente Acuerdo deberá presentar al Presidente del Comité Ejecutivo del ARCM una solicitud de adhesión, dicha autoridad AIG podrá serla tras la aprobación de las otras autoridades AIG de los Estados miembros del ARCM y la firma del Acuerdo.

8. En caso de adhesión, este Acuerdo entrará en vigor para la Parte que se adhiere al mismo, treinta días después de la fecha de la firma.

ARTÍCULO 12

Disolución

El Acuerdo puede ser disuelto por las Autoridades AIG de los Estados miembros.

ARTÍCULO 13
Enmienda del Acuerdo

7. El presente Acuerdo puede ser enmendado por acuerdo de las autoridades AIG de los Estados miembros del ARCM.

8. Las autoridades AIG de los Estados miembros pueden presentar propuestas de enmienda al presente Acuerdo.

9. Toda propuesta de enmienda se presentará por escrito al Presidente del Comité Ejecutivo del ARCM, quien en el plazo de treinta (30) días de su recepción, comunicará la enmienda propuesta a las autoridades AIG de los Estados miembros del ARCM.

10. Las autoridades AIG de los Estados miembros del ARCM que deseen formular comentarios con respecto a la propuesta, pueden hacerlo dentro de un plazo de noventa (90) días a partir de la fecha de envío de la propuesta por el/la Presidente del Comité Ejecutivo del ARCM.

11. Las propuestas y comentarios que se reciban al respecto de las autoridades AIG de los Estados miembros del ARCM, serán presentados en la próxima reunión del Comité Ejecutivo del ARCM para aprobación.

12. Toda enmienda al presente Acuerdo será válida únicamente cuando las autoridades AIG de los Estados miembros del ARCM la hayan adoptado y entrará en vigor cuando haya sido aprobada por todas las autoridades AIG de los Estados miembros del ARCM.

EN FE DE LO CUAL, las autoridades AIG que suscriben firman el presente Acuerdo el día séptimo del mes de marzo en el año dos mil dieciséis.

Autoridad AIG del Estado miembro del ARCM
Nombre y título del representante
firma/fecha

JIAAC, Argentina

Sra. Ana Pamela Suárez
Presidenta de la JIAAC

DGAC, Estado Plurinacional de Bolivia

Gral. Brig. Aé. Edgar Pereira Quiroga
Director Ejecutivo (a.i.), DGAC

CENIPA, Brasil

Brig. Dilton José Schuck
Jefe de CENIPA

DGAC, Chile

_____

General de Brigada Aérea (A) Víctor O. Villalobos,
Director General, DGAC

UAEAC, Colombia

_____

Dr. Gustavo Alberto Lenis Steffens
Director General UAEAC

DGAC, Ecuador

_____

Capt. Roberto Yerovi de la Calle
Director General, DGAC

Aircraft Accident and Incident Investigation Authority of Guyana

Mrs. Paula McAdam
Aircraft Accident Investigator

AAC, Panamá

Ing. Alfredo Fonseca Mora
Director General, AAC

DINAC, Paraguay

Dr. Luis Manuel Aguirre
Presidente de la DINAC

CIAA, Perú

Sr. Fernando Melgar, Presidente
CIAA, MTC

The Aircraft Accident and Incident Investigation Authorities of Suriname

Mr. Roy Baidjnath Panday
Attorney General of the Republic of Suriname

CIAIA, Uruguay

Cnel. (Av.) Rubén Villagra
Director de la CIAIA

DGPIAA, República Bolivariana de Venezuela

Gral. Khyumell Ponte Soteldo
Director, DGPIAA, Ministerio del Poder Popular para Transporte Acuático y Aéreo

Agenda Item 3 Review of AIG regulations

Proposals of amendment to State AIG regulations

3.1 Continuing with the agenda items, the Meeting took note of the proposals of amendment to the following regulations:

- ✓ State AIG regulations; and
- ✓ Latin American Aeronautical Regulation (LAR) 113.

3.2 In this regard, the Meeting noted that, according to the latest results obtained within the framework of the ICAO Universal safety oversight audit programme (USOAP) continuous monitoring approach (CMA) activities, one of the areas with the lowest effective implementation (EI) related to safety oversight capabilities in SAM States continued to be the area of accident and incident investigation (AIG).

3.3 In this area, it was noted that one of the subgroups with the lowest effective implementation among SAM States corresponded to legislation and regulations.

3.4 The Meeting considered that the implementation of harmonised AIG regulations within the ARCM would facilitate the investigation process, giving a significant boost to safety oversight capabilities of SAM States and promoting compliance with Annex 13 and other related Annexes, as well as USOAP CMA protocol questions (PQs) in the AIG area.

3.5 The Meeting took note that based on the above the First edition of the State AIG Regulations had been circulated among ARCM States for comments. In this regard, six (6) States had sent comments on this regulation. Such comments were analysed by the ARCM Technical Committee.

3.6 The Meeting agreed that each ARCM member State should do its utmost to harmonise its national AIG regulations with the ARCM AIG Regulations.

3.7 The ARCM member States were reminded of their obligation under Article 38 of the Convention, whereby States are requested to notify the Organization of any different between their national regulations and methods and the international standards contained in Annex 13 and its amendments.

3.8 The Meeting agreed that ARCM member States should notify any difference between their national regulations with respect to the State AIG Regulations to the ARCM, specifying the period of time within which such difference would be resolved, or their decision to maintain such difference.

3.9 The Meeting concluded that the AIG reality of the SAM Region posed the need and the challenge of working towards the strengthening of the AIG Regional Cooperation Mechanism (ARCM), in order to establish a legal and technological relationship that would benefit the SAM Region in the investigation of aircraft accidents and incidents.

3.10 This activity, in addition to being aligned with ICAO GASP objectives, represents an excellent opportunity to work in a collaborative environment, allowing the SAM Region to improve its effective implementation (EI) levels in AIG, which currently reach 70%.

3.11 It would also strengthen AIG capabilities, improve the use of limited State resources, and reduce the accident rate in all civil aviation segments.

3.12 Regarding Paragraph 5.1.2 of the State AIG Regulations, the Meeting considered improving the text in order to clarify the responsibility for investigating the circumstances of a serious incident as follows:

5.1.2 The AIG Authority will initiate an investigation to determine the circumstances of a serious incident ~~and incidents~~ and shall be responsible for its conduction and for notifying ICAO when the aircraft has a maximum weight (mass) that exceeds 2 250 kg. For purposes of the ARCM, the AIG Authority will investigate and notify any serious incident involving aircraft of 2 250 kg or less, up to 1kg~~, where appropriate~~. This authority may delegate, in whole or in part, the conduction of such investigation to another State, to the ARCM, or to a RAIO, by mutual agreement and consent. In any case, the AIG Authority will use all the means at its disposal to facilitate the investigation.

3.13 Regarding Chapter 1 – Definitions, all changes were accepted as follows:

ARCM Executive Committee.- designates the Executive Committee established by virtue of Article 9 of the ARCM organisation and functional manual, made up by the AIG Authorities of the ARCM member States.

State of registry.- The State on whose register the aircraft is entered.

Note.- In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport (Doc 9587).

Member State.- ~~designates an ARCM member State that is party to this Agreement~~.

Corresponds to a State that is part of the AIG Regional Cooperation Mechanism (ARCM) of South America.

~~*ARCM General Board*. designates the General Board established by virtue of Article 9 of this Agreement, which is made up by the AIG Authorities of the ARCM member States.~~

3.14 Regarding Chapter 6 – Final report, all change were accepted as follows:

The AIG Authority will send a copy of the draft final report to the following States, inviting them to formulate, as soon as possible, their relevant and substantiated comments on the report:

a) the State that initiated the investigation;

b) the State of Registry;

c) the State of the Operator;

d) the State of Design;

e) the State of Manufacture;

f) any other State that participated in the investigation, in accordance with Chapter 5; and

g) the ARCM ~~where applicable~~.

3.15 Regarding Chapter 7 - ADREP reporting, all changes were accepted as follows:

7.1 *When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the AIG Authority will send the preliminary report to:*

a) the State of Registry or the State of Occurrence, as appropriate;

b) the State of the Operator;

c) the State of Design;

d) the State of Manufacture;

e) any State that provided relevant information, significant facilities or experts;

f) the International Civil Aviation Organization; and

g) the ARCM~~, as appropriate~~.

7.2 *When an aircraft, not covered by 7.1, is involved in an accident and when airworthiness or matters considered to be of interest to other States are involved, the AIG Authority will forward the preliminary report to:*

a) the State of Registry or the State of Occurrence, as appropriate;

b) the State of the Operator;

c) the State of Design;

d) the State of Manufacture;

e) any other State that provided relevant information, significant facilities or experts; and

f) the ARCM~~, as appropriate~~.

7.3 *When the AIG Authority conducts an investigation of an accident involving an aircraft of a maximum weight (mass) of over 2 250 kg, this authority will forward, as soon as possible after the investigation, the accident data report to the International Civil Aviation Organization and the ARCM~~, as appropriate~~.*

Additional report

7.4 *Reserved*

Incidents to aircraft over 5 700 kg

When the AIG Authority conducts an investigation into an incident to an aircraft of a maximum mass of over 5 700 kg, this authority will send, as soon as possible after the investigation, the incident report data to the International Civil Aviation Organization and the ARCM. ~~as applicable~~.

3.16 Regarding Attachment B – Notification and reporting checklist, all changes were accepted as followed:

1. NOTIFICATION OF ACCIDENTS AND SERIOUS INCIDENTS

From	*For*	*Send to*	*~~Annex 13~~ State AIG Regulations reference*
State of Occurrence	International occurrences: All aircraft	State of Registry State of the Operator State of Design State of Manufacture ~~ICAO (when aircraft over 2 250 kg or turbojet)~~ International Civil Aviation Organization in case the corresponding aircraft is of a maximum mass over 2 250 kg or is a turbojet, and to the ARCM all occurrences regardless of aircraft mass.	4.1
State of Registry	Domestic and other occurrences: All aircraft	State of the Operator State of Design State of Manufacture ~~ICAO (when the aircraft is over 2 250 kg or is a turbojet)~~ International Civil Aviation Organization in case the corresponding aircraft is of a maximum mass over 2 250 kg or is a turbojet, and to the ARCM all occurrences regardless of aircraft mass.	4.8

Proposal of amendment to LAR 113

3.17 The Meeting took note that the mission of the ARCM is to support investigation organisations that so require on aircraft accident and incident investigation aspects, in order to improve effective implementation in the AIG area, and to contribute to the reduction of aircraft accident and incident rates in the SAM Region below the global rate in all aviation segments.

3.18 The ARCM considers that each State must have regulations that are consistent with the other Latin American Aeronautical Regulations (LARs), transposing the provisions of Annex 13 – Aircraft accident and incident investigation, and which:

- ✓ establish the obligations and requirements to be met by aircraft operators and service providers of the aeronautical system upon occurrence of an **aircraft accident, serious incident or incident involving aircraft of a mass over 5 700 kg**.

- ✓ contain the same obligations and requirements for air service operators and service providers, regardless of the State of Occurrence, upon occurrence of an **accident, serious incident or incident involving aircraft of a mass over 5 700 kg**.

3.19 The discussion of this agenda item included a review of Annex 13 requirements and protocol questions (PQs) related to the notification and preservation of evidence by service providers and air service operators upon the occurrence of an event. It was also noted that these requirements and obligations were the reason why these Latin American regulations were developed.

3.20 Note was also taken of the observations made to this regulation by six (6) States. Next, the Meeting was presented with the proposal of amendment to LAR 113, explaining the substantial modifications made in relation to the first edition of this regulation:

- ✓ Clarification in several sections of the regulation where the following terms are included: *accidents, serious incidents and incidents involving aircraft of a mass over 5700 kg.*
- ✓ In this same regard, a note has been included stating that in case of incidents involving *aircraft of a mass below 5700 kg, the AIG organisation will proceed in accordance with the legislation and/or regulations of its State*.

- ✓ The figure of *operations staff* was included in several parts of the regulation.

- ✓ The definition of Authority to conduct an investigation was included under Investigative Authorities, in accordance with the definition proposed in Amendment 15 to Annex 13.

3.21 When discussing the working paper, the Meeting made some clarifications when it was proposed that AIG organisations should establish coordination workshops with other aeronautical authorities to articulate interventions upon the occurrence of an incident involving aircraft of a mass below 5700 kg.

3.22 Finally, the Meeting proposed that a study should be made of the possibility of including in LAR 113 a text requiring the service provider and/or air service operator to give the investigators of the AIG organisations immediate access to the aircraft involved in an occurrence and to its records.

3.23 After discussing the proposals of amendment to the regulations, the Meeting formulated the following conclusion:

CONCLUSION AIG-SAM/03-02 Approval of AIG Regulations

a) Approve the First amendment to the First edition of the following AIG regulations:

- ✓ State AIG Regulations; and
- ✓ LAR 113.

b) That the States and the ARCM conduct workshops with the other aeronautical authorities to define responsibilities in case of incidents involving aircraft of 5 700 kg or below.

c) That the ARCM Technical Committee includes in LAR 113 the obligation of service providers and air service operators to provide immediate access to an aircraft involved in an occurrence and to its records.

d) **Attachment A** to the report of this agenda item contains the approved First amendment to the First edition of the State AIG Regulations.

e) **Attachment B** to the report of this agenda item contains the approved First amendment to the First edition of LAR 113.

South American AIG Regional Cooperation Mechanism (ARCM)

AIG State Regulation

Aviation accident and incident investigation

~~**Original**~~ **First edition**
June 2015

AIG State Regulation

Aviation accident and incident investigation

AIG State Regulation amendment records			
Amendment No.	**Date applicable**	**Date entered**	**Entered by:**

AIG State Regulation

Aviation accident and incident investigation

Amendment of AIG State Regulation			
Amendment	**Origin**	**Subjects**	**Approved by the ARCM Executive Committee**
First edition	Second Meeting of AIG Authorities of South America (AIG-SAM/2), Buenos Aires, Argentina, 09 to 11 June 2015	Incorporates Annex 13; Tenth Edition, July 2010; Amendment 14, applicable from 14 November 2013	11 June 2015 AIG-SAM/02

AIG State Regulation

Aviation accident and incident investigation

List of effective pages

List of effective pages			
Detail	**Pages**	**Amendment**	**Dates**
Foreword	vii to viii	Original	June 2015
Chapter 1 Definitions		Original	June 2015
Chapter 2 Applicability		Original	June 2015
Chapter 3 General		Original	June 2015
Chapter 4 Notification		Original	June 2015
Chapter 5 Investigation		Original	June 2015
Chapter 6 Final report		Original	June 2015
Chapter 7 ADREP reporting		Original	June 2015
Chapter 8 Accident prevention measures		Original	June 2015
Chapter 9 Training		Original	June 2015
Appendix 1 Format of the Final Report		Original	June 2015

Attachment A Rights and obligations of the State of the operator in respect of accidents and incidents involving leased, chartered or interchanged aircraft		Original	June 2015
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AIG STATE REGULATION

FOREWORD

This Regulation has been designed to guarantee a high level of civil aviation safety and to spare no effort to reduce the number of accidents and incidents, thus enhancing public confidence in air transport.

The expeditious holding of investigations into civil aviation accidents and incidents improves safety and helps prevent accidents and incidents.

Information, analysis and release of the results of accidents and incidents relating to safety are important, principally to improve aviation safety.

It should be noted that the Convention on International Civil Aviation, signed in Chicago on December 7, 1944 (the Chicago Convention), that provides for the application of actions necessary to guarantee the safe operation of aircraft. Particular account should be taken of Annex 13 to the Chicago Convention and its subsequent amendments, which establish international standards and recommended practices for the Aviation accident and incident investigation, and also the definitions of the terms State of Registry, State of the Operator, State of Design or State of Manufacture and State of Occurrence used in said Convention.

In accordance with the international standards and recommended practices established in Annex 13 to the Chicago Convention, accidents and serious incidents investigations should be carried out under the responsibility of the State where the accident or serious incident happened or the State of Registry whenever it is impossible to establish definitively that the place where the accident or serious incident happened is located in the territory of a State. An ARCM member State can delegate to another State the task of carrying out the investigation or ask for its help. The accidents and incidents investigations in the **AIG regional cooperation mechanism (ARCM)** should be carried out analogously.

In order to increase the safety rates of civil aviation among ARCM member States of the SAM region, they must have a good knowledge of the existing investigation requirements and its applicability. Maintaining this capability will come down to acceptable risk, in a global context, provided that contributing factors are identified, which will allow the making of safety recommendations, necessary for preventing future accidents.

Although some member States face restrictions in their legal frameworks which impede the fulfilment of certain rules from Annex 13, it is important that the States try to seek, at the highest decision-making level, the importance of adopting the appropriate civil aviation safety actions, and if necessary, to modify the legal structures so as to provide investigators with the capacity and autonomy to carry out the investigations, according to what is highly advisable in any investigation process.

Consequently, it is important to consider that it is not the ARCM cooperation mechanism's intention to interfere neither with the States autonomy, nor with the management of their investigation processes. However, it is important that all processes described in these Regulations are observed during the investigation, so that there is a better performance in its application, and that the investigation cycle is completed in all its phases following the necessary and corresponding safety recommendations for the prevention of future accidents.

The main objective of these Regulations is to harmonize the AIG requirements within the ARCM member States and the observance of the standards and recommended practices deriving from Annex 13. This will improve ARCM States AIG effective implementation, and contribute to reducing the accidents and incidents rates in the SAM Region.

The scope of an investigation will depend on the lessons that can be derived from them to improve safety, especially considering the need of a wise use of the investigation resources available in the ARCM.

The investigation of accidents and incidents occurred in civil aviation is to be conducted by an independent authority in charge of the investigations, or under its control, to avoid any interest conflicts or any possible exterior interference in the determination of the causes of the events under investigation.

AIG Authorities play a key role in the aviation accident and incident investigation process. Their work is of utmost importance for the determination of an accident or incident causes. Therefore, it is essential that they carry out their investigations completely independently and that they have the financial, material and human resources necessary to conduct the investigation efficiently and effectively.

AIG national authorities' capabilities should be reinforced; cooperation among them is necessary to improve the efficiency of the investigation and prevention of civil aviation accidents and incidents in the SAM Region.

AIG Authorities' coordination role has to be recognized and reinforced in a South American context, so as to generate a real added value in safety, based on the existing cooperation between these authorities and the investigation resources available in the ARCM member States, which should be used in the most cost-effective way and in economies of scale.

Since assuring clear rights for aviation accidents and incidents investigations is essential, the member States, respecting its existing legislations on the competence of the authorities responsible for legal investigation and, where appropriate, in close cooperation with them, must ensure that the authorities in charge of the investigations are able to do their mission in the best of conditions, for the benefit of aviation safety. AIG Authorities must have, therefore, immediate and unrestricted access to the scene of the accident and be provided with all the necessary elements to fulfill the requirements of an investigation, without undermining the legal investigation's objectives.

An efficient investigation is possible only if important pieces of evidence are duly preserved.

One of the civil aviation safety management methods is based on the relations and lessons drawn from the accidents and incidents, which requires a strict application of the provisions on confidentiality to guarantee the future availability of valuable information sources. In this context, sensitive safety data should be adequately protected.

An accident raises a whole range of different public interests, such as the prevention of future accidents and the sound administration of justice. Those interests extend beyond the single interests of parties concerned and the specific occurrence. In order to guarantee the general public interest, a fair balance between the interests is necessary.

The civil aviation sector must also promote a non-punitive environment that facilitates the spontaneous notification of occurrences, thus taking forward the principle of *culture of equity.*

The information provided by a person within the framework of investigations should not be used against such person, in accordance with the constitutional principles and the national law.

ARCM member States will be able to limit the instances in which a decision of disclosure concerning the information obtained during an investigation without affecting the proper function of the judicial system.

It is important for accidents and incidents prevention that relevant information is

communicated as soon as possible, particularly including reports and recommendations concerning safety drawn from the investigations.

Recommendations concerning safety drawn from an accident or serious incident investigation, or of any other nature, such as studies concerning safety, should always be considered by the competent authority and, in the circumstances, be implemented to guarantee the correct civil aviation accidents and incidents prevention.

In order to improve the means that the investigators have to determine the accidents and incidents causes and to increase the recurrent incidents prevention capacity, investigation progress should be promoted, in relation to both the real-time positioning of aircraft and the possibility of access to the information from the flight recorder in its physical absence. Such progress would constitute an important advance regarding safety.

Experience has shown that on some occasions it is difficult to rapidly obtain the list of persons on board the aircraft, but it is also important to fix a deadline within which said lists could be requested to an operator. Furthermore, the data in those lists should be protected against unauthorized use and disclosure. Likewise, in order to minimize the risks to the investigators in charge of the investigations in the scene of the accident, it is necessary to have information related to dangerous goods on board the aircraft which has suffered an accident.

Assistance to the victims of aviation accidents and to their families should be adequately specified.

The way in which Member States and the airlines face an accident and its consequences is of crucial importance. In this regard, Member States should have emergency plans that, in particular, provide for emergency services at the airport, as well as assistance to the victims of civil aviation accidents and to their families. Airlines should also have a plan of assistance to the victims of civil aviation accidents and to their families. Particular attention is to be paid to the support to the victims, their families and associations, as well as the communication among them.

Since the objective of these Regulations is the establishment of common requisites in the field of investigation, at times, this objective could not be achieved efficiently by the ARCM member States without a true commitment in the area of aviation accidents and incidents investigation.

Chapter 1

Definitions

The terms and expressions shown below are used in the standards and recommended practices for aviation accidents and incidents investigation, they have the following meanings:

Accident.- Any occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- direct exposure to jet blast,
- except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,
- except for engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

c) the aircraft is missing or is completely inaccessible.

Accredited representative.- A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State. Where the State has established an accident investigation authority, the designated accredited representative would normally be from that authority.

Adviser.- A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

AIG Authority.- The organization in charge of the accidents and incidents investigation in the State.

AIG Specialist / Expert.- The specialist or expert person in a specific area related to aviation accidents and incidents investigation, who is available for the allocation of specific action (e.g. development of AIG requirements and procedures), upon request of a member State.

Aircraft.- Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

ARCM Executive Committee.- designates the Executive Committee established by virtue of Article 9 of ARCM organization and functions manual, consisting of the AIG Authorities of ARCM member States.

ARCM Focal Points.- AIG specialists, appointed by AIG Authorities from ARCM member States, to maintain an agile communication link with the AIG Technical Committee and promote and coordinate ARCM activities within its Authority.

~~*ARCM General Board*.- The General Board established by the Article 9 of this Agreement, which shall be composed of the AIG Authorities of the ARCM member States.~~

ARCM Investigator.- The aviation accidents and incidents investigator available for the appointment of an accident or incident investigation, whenever a member State requires it.

ARCM Investigator-in-charge.- A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

ARCM Regulations.- AIG Regional Cooperation Mechanism (ARCM) Regulations, which describes the objectives, functions, organizational structure, and other provisions for the ARCM operation.

Causes.- Actions, omissions, events, conditions, or a combination thereof, which led to the accident or incident. The identification of causes does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

Chicago Convention.- The Convention on International Civil Aviation signed in Chicago on 7 December 1944.

Contributing factors.- Actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

Flight recorder.- Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

GASP.- The global ICAO plan for aviation safety

GASR.- The route map for aviation safety on a worldwide scale, prepared by the safety strategy Group and approved by the ICAO Council on 15 June 2006.

Incident.- An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Investigation.- A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and/or contributing factors and, when appropriate, the making of safety recommendations.

Investigator-in-charge.- A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Nothing in the above definition is intended to preclude the functions of an investigator-in-charge being assigned to a commission or other body.

Maximum mass.- Maximum certificated take-off mass.

Maximum weight (mass).- Maximum certificated take-off weight (mass).

Member State.- An ARCM member state which is part of the Regional Cooperation Mechanism (ARCM) of South America.

Operator.- A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Preliminary Report.- The communication used for the prompt dissemination of data obtained during the early stages of the investigation.

President of the General Board.- President of the General Board conformed by the ARCM AIG Authorities, who shall be elected among its members for a one year term and may be re-elected for equal and successive terms.

Safety recommendation.- A proposal of the accident investigation authority, based on information derived from the investigation, made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident. In addition to the safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies.

Serious incident.- An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

The difference between an accident and a serious incident lies only in the result.

Examples of serious incidents can be found in Attachment C.

Serious injury.- An injury which is sustained by a person in an accident and which:

a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or
d) involves injury to any internal organ; or
e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
f) involves verified exposure to infectious substances or injurious radiation.

State of Design.- The State having jurisdiction over the organization responsible for the type design.

State of Manufacture.- The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

State of Occurrence.- The State in the territory of which an accident or incident occurs.

State of the Operator.- The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

State of Registry.- The State on whose register the aircraft is entered.

Note.- In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport *(Doc 9587).*

State safety programme (SSP). An integrated set of regulations and activities aimed at improving safety.

Chapter 2

Applicability

2.1 Unless otherwise stated, the specifications in this Regulation apply to activities following accidents and incidents wherever they occurred.

2.2 In this Regulation the specifications concerning the State of the Operator apply only when an aircraft is leased, chartered or interchanged and when that State is not the State of Registry and if it discharges, in respect of this Regulation, in part or in whole, the functions and obligations of the State of Registry.

Chapter 3

General

Objective of the investigation

3.1 The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

Protection of evidence, custody and removal of aircraft

Responsibility of the State of occurrence

General

3.2 The AIG Authority as State of occurrence shall take all reasonable measures to protect the evidence and to maintain safe custody of the aircraft and its contents for such a period as may be necessary for the purposes of an investigation. Protection of evidence shall include the preservation, by photographic or other means, of any evidence which might be removed, effaced, lost or destroyed. Safe custody shall include protection against further damage, access by unauthorized persons, pilfering and deterioration.

Request from State of registry, State of the operator, State of design or State of manufacture

3.3 If a request is received from the State of registry, the State of the operator, the State of design or the State of manufacture that the aircraft, its contents, and any other evidence remain undisturbed pending inspection by an accredited representative of the requesting State, the AIG Authority shall take all necessary steps to comply with such request, so far as this is reasonably practicable and compatible with the proper conduct of the investigation; provided that the aircraft may be moved to the extent necessary to extricate persons, animals, mail and valuables, to prevent destruction by fire or other causes, or to eliminate any danger or obstruction to air navigation, to other transport or to the public, and provided that it does not result in undue delay in returning the aircraft to service where this is practicable.

Release from custody

3.4 Subject to the provisions of 3.2 and 3.3, the AIG Authority shall release custody of the aircraft, its contents or any parts thereof as soon as they are no longer required in the investigation, to any person or persons from the AIG Authority duly designated by the State of registry or the State of the operator, as applicable. For this purpose the AIG Authority shall facilitate access to the aircraft, its contents or any parts thereof, provided that, if the aircraft, its contents, or any parts thereof lie in an area within which the AIG Authority finds it impracticable to grant such access, it shall itself effect removal to a point where access can be given.

Chapter 4

Notification

Accidents or serious incidents in the national territory to aircraft of another contracting State

Responsibility of the AIG Authority

Forwarding

4.1 The AIG Authority, as the State of occurrence shall forward a notification of accident or serious incident, with a minimum of delay and by the most suitable and quickest means available, to:

a) the State of registry;

b) the State of the operator;

c) the State of design

d) the State of manufacture; and

e) the International Civil Aviation Organization, when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, and to the ARCM, all events regardless of weight (mass) of the aircraft.

However, when the AIG Authority, as the State of occurrence, is not aware of a serious incident, the State of registry or the State of the operator, as appropriate, shall forward a notification of such an incident to the State of design, the State of manufacture and the State of occurrence.

Format and content

4.2 The notification shall be in plain language and contain as much of the following information as is readily available, but its dispatch shall not be delayed due to lack of complete information:

a) for accidents the identification abbreviation ACCID, for serious incidents INCID;

b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;

c) name of owner, operator and hirer, if any, of the aircraft;

d) qualification of the pilot in command, and nationality of crew and passengers;

e) date and time (local time or UTC) of the accident or serious incident;

f) last point of departure and point of intended landing of the aircraft;

g) position of the aircraft with reference to an easily defined geographical point and latitude and longitude;

h) number of crew and passengers; on board, killed and seriously injured; others, killed and

seriously injured;

i) description of the accident or serious incident and the extent of damage to the aircraft so far as is known;

j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;

k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;

l) identification of the originating authority and means to contact the investigator in charge and the accident AIG Authority of the State of occurrence at any time; and

m) presence and description of dangerous goods on board the aircraft.

Language

4.3 The notification shall be prepared in one of the working languages of ICAO, taking into account the language of the recipient(s), whenever it is possible to do so without causing undue delay.

Additional information

4.4 As soon as it is possible to do so, the AIG Authority shall dispatch the details omitted from the notification as well as other known relevant information.

Responsibility of as State of registry, State of the operator, State of design and State of manufacture

Information - Participation

4.5 Reserved

4.6 Upon receipt of the notification, The AIG Authority as the State of registry, the State of the operator, the State of design and the State of manufacture shall, as soon as possible, provide the State of occurrence with any relevant information available to them regarding the aircraft and flight crew involved in the accident or serious incident. Each State shall also inform the State of occurrence whether it intends to appoint an accredited representative and if such an accredited representative is appointed the name and contact details; as well as the expected date of arrival if the accredited representative will travel to the State of occurrence.

4.7 Upon receipt of the notification, as State of the Operator, the AIG Authority shall, with a minimum of delay and by the most suitable and quickest means available, provide the State of occurrence with details of dangerous goods on board the aircraft

Accidents or serious incidents in the territory of the State of registry, in a non-contracting State or outside the territory of any State

Responsibility of as State of Registry

Forwarding

4.8 When the State of registry institutes the investigation of an accident or serious incident, the AIG Authority shall forward a notification, in accordance with 4.2 and 4.3 above, with a minimum of delay and by the most suitable and quickest means available, to:

a) the State of the operator;

b) the State of design;

c) the State of manufacture; and

d) the International Civil Aviation Organization, when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, and to the ARCM all the occurrences regardless of the aircraft weight (mass).

Responsibility of as State of the operator, State of design and State of manufacture

Information — Participation

4.9 Reserved

4.10 Upon receipt of the notification, as State of the operator, State of design, and Sate of manufacture, the AIG Authority shall, upon request, provide the State of registry with any relevant information available to them regarding the flight crew and the aircraft involved in the accident or serious incident. The AIG Authority shall also inform the State of registry and occurrence whether it intends to appoint an accredited representative, and if such an accredited representative is appointed, the name and contact details; as well as the expected date of arrival if the accredited representative will be present at the investigation.

4.11 Upon receipt of the notification, as State of the operator, State of design, and Sate of manufacture, the AIG Authority shall, with a minimum of delay and by the most suitable and quickest means available, provide the State of registry with details of dangerous goods on board the aircraft.

Chapter 5

Investigation

Responsibility for instituting and conducting the investigation

Accidents or incidents in the national territory

State of occurrence

5.1 The AIG Authority shall institute an investigation into the circumstances of the accident and be responsible for the conduct of the investigation, but it may delegate the whole or any part of the conducting of such investigation to another State, in ARCM, or a Regional accident Investigation Organization (RAIO) by mutual arrangement and consent. In any event, the AIG Authority shall use every means to facilitate the investigation.

5.1.1 The AIG Authority shall institute an investigation into the circumstances of a serious incident and be responsible for the conduct of the investigation, but it may delegate the whole or any part of the conducting of such investigation to another State, in an ARCM, or a RAIO by mutual arrangement and consent. In any event, State of Occurrence shall use every means to facilitate the investigation.

5.1.2 The AIG Authority shall institute an investigation into the circumstances of a serious incident and be responsible for the conduct of the investigation when the aircraft is of a maximum weight (mass) of over 2 250 kg, of 2 250 kg and less ~~when appropriate~~. Such a State may delegate the whole or any part of the conducting of such investigation to another State, in the ARCM, or a RAIO by mutual arrangement and consent. In any event the AIG Authority shall use every means to facilitate the investigation.

Accidents or Incidents in the territory of a non-contracting State

State of registry

5.2 Reserved

Accidents or incidents outside the territory of any State

State of registry

5.3 When the location of the accident or the serious incident cannot definitely be established as being in the territory of any State, the AIG Authority, as State of registry, shall institute and conduct any necessary investigation of the accident or serious incident. However, it may delegate the whole or any part of the investigation to another State by mutual arrangement and consent.

5.3.1 States nearest the scene of an accident in international waters shall provide such assistance as they are able and shall, likewise, respond to requests by the State of Registry.

5.3.2 Reserved

Organization and conduct of the investigation

Responsibility of the AIG Authority

Note.- Nothing in the following provisions is intended to preclude the State conducting the investigation from calling upon the best technical expertise from any source.

General

5.4 The AIG authority in charge of the investigation shall have independence in the conduct of the investigation and have unrestricted authority over its conduct, consistent with the provisions of this Regulation. The investigation shall normally include:

a) the gathering, recording and analysis of all available relevant information on that accident or incident;

b) if appropriate, the issuance of safety recommendations;

c) if possible, the determination of the causes, contributing factors and/or latent conditions; and

d) the completion of the final report.

When possible, the scene of the accident shall be visited, the wreckage examined and statements taken from witnesses. The extent of the investigation and the procedure to be followed in carrying out such an investigation shall be determined by the AIG authority, depending on the lessons it expects to draw from the investigation for the improvement of safety.

5.4.1 Any investigation conducted in accordance with the provisions of this regulation shall be separate from any judicial or administrative proceedings to apportion blame or liability.

5.4.2 The AIG Authority shall develop documented policies and procedures detailing its accident duties. These shall include: organization and planning; investigation; and reporting.

5.4.3 The AIG Authority shall ensure that any investigations conducted under the provisions of this Regulation and Annex 13, have unrestricted access to all evidentiary material without delay and are not impeded by administrative or judicial investigation or proceedings.

Investigator-in-charge — Designation

5.5 The AIG Authority shall designate the investigator-in-charge of the investigation and shall initiate the investigation immediately.

Investigator-in-charge — Access and control

5.6 The investigator-in-charge shall have unhampered access to the wreckage and all relevant material, including flight recorders and ATS records, and shall have unrestricted control over it to ensure that a detailed examination can be made without delay by authorized personnel participating in the investigation.

Flight recorders — Accidents and incidents

5.7 Effective use shall be made of flight recorders in the investigation of an accident or an incident. The AIG Authority shall arrange for the read-out of the flight recorders without delay.

5.8 In the event that the AIG Authority does not have adequate facilities to read out the flight recorders, it shall use the facilities made available to it by other States, giving consideration to the following:

a) the capabilities of the read-out facility;

b) the timeliness of the read-out; and

c) the location of the read-out facility.

Autopsy examinations

5.9 The AIG Authority conducting the investigation into a fatal accident shall arrange for complete autopsy examination of fatally injured flight crew and, subject to the particular circumstances, of fatally injured passengers and cabin attendants, by a pathologist, preferably experienced in accident investigation. These examinations shall be expeditious and complete.

Medical examinations

5.9.1 When appropriate, the AIG Authority conducting the investigation shall arrange for medical examination of the crew, passengers and involved aviation personnel, by a physician, preferably experienced in accident investigation. These examinations shall be expeditious.

Coordination — Judicial authorities

5.10 The AIG Authority shall recognize the need for coordination between the investigator-in-charge and the judicial authorities. Particular attention shall be given to evidence which requires prompt recording and analysis for the investigation to be successful, such as the examination and identification of victims and read-outs of flight recorder recordings.

Informing aviation security authorities

5.11 If, in the course of an investigation it becomes known, or it is suspected, that an act of unlawful interference was involved, the investigator-in-charge shall immediately initiate action to ensure that the aviation security authorities of the State(s) concerned are so informed.

Non-disclosure of records

5.12 The AIG Authority shall not make the following records available for purposes other than accident or incident investigation, unless the appropriate authority for the administration of justice in that State determines that their disclosure outweighs the adverse domestic and international impact such action may have on that or any future investigations:

a) all statements taken from persons by the investigation authorities in the course of their investigation;

b) all communications between persons having been involved in the operation of the aircraft;

c) medical or private information regarding persons involved in the accident or incident;

d) cockpit voice recordings and transcripts from such recordings;

e) recordings and transcriptions of recordings from air traffic control units;

f) cockpit airborne image recordings and any part or transcripts from such recordings; and

g) opinions expressed in the analysis of information, including flight recorder information.

5.12.1 These records shall be included in the final report or its appendices only when pertinent to the analysis of the accident or incident. Parts of the records not relevant to the analysis shall not be disclosed.

5.12.2 The names of the persons involved in the accident or incident shall not be disclosed to the public by the AIG Authority.

Reopening of investigation

5.13 If, after the investigation has been closed, new and significant evidence becomes available, the AIG Authority shall reopen it. However, when the State which conducted the investigation did not institute it, that State shall first obtain the consent of the State which instituted the investigation.

Responsibility of the State

Information — Accidents and incidents

5.14 The AIG Authority shall, on request from the State conducting the investigation of an accident or an incident, provide that State with all the relevant information available to it.

5.15 Any State, the facilities or services of which have been, or would normally have been, used by an aircraft prior to an accident or an incident, and which has information pertinent to the investigation, shall provide such information to the AIG Authority.

Responsibility of the State of registry and the State of the operator

Flight recorders — Accidents and serious incidents

5.16 When an aircraft involved in an accident or a serious incident lands in a State other than the State of occurrence, the State of registry or the State of the operator shall, on request from the AIG Authority, furnish the latter State with the flight recorder records and, if necessary, the associated flight recorders.

Organizational information

5.17 The State of registry and the State of the operator, on request from the AIG Authority, shall provide pertinent information on any organization whose activities may have directly or indirectly influenced the operation of the aircraft.

Participation in the investigation

Participation of the State of registry, the State of the operator, the State of design and the State of manufacture

Rights

5.18 The AIG Authority shall entitle the State of registry, the State of the operator, the State of design and the State of manufacture to appoint an accredited representative to participate in the investigation.

5.19 The State of registry or the State of the operator shall appoint one or more advisers, proposed by the operator, to assist its accredited representative.

5.19.1 When neither the State of registry, nor the State of the operator appoints an accredited representative, the AIG Authority shall invite the operator to participate, subject to the procedures of the State conducting the investigation.

5.20 The State of design and the State of manufacture shall be entitled to appoint one or more advisers, proposed by the organizations responsible for the type design and the final assembly of the aircraft, to assist their accredited representatives.

5.21 When neither the State of design nor the State of manufacture appoint an accredited representative, the AIG Authority shall invite the organizations responsible for the type design and the final assembly of the aircraft to participate, subject to the procedures of the AIG Authority.

Obligations

5.22 When the AIG Authority conducting an investigation of an accident to an aircraft of a maximum mass of over 2 250 kg specifically requests participation by the State of registry, the State of the operator, the State of design or the State of manufacture, the State(s) concerned shall each appoint an accredited representative.

Participation of other States

Rights

5.23 Any State which on request provides information, facilities or experts to the AIG Authority shall be entitled to appoint an accredited representative to participate in the investigation.

Entitlement of accredited representatives

Advisers

5.24 A State entitled to appoint an accredited representative shall also be entitled to appoint on or more advisers to assist the accredited representative in the investigation.

5.24.1 Advisers assisting accredited representatives shall be permitted, under the accredited representatives' supervision, to participate in the investigation to the extent necessary to enable the accredited representatives to make their participation effective.

Participation

5.25 Participation in the investigation shall confer entitlement to participate in all aspects of the investigation, under the control of the investigator-in-charge, in particular to:

a) visit the scene of the accident;

b) examine the wreckage;

c) obtain witness information and suggest areas of questioning;

d) have full access to all relevant evidence as soon as possible;

e) receive copies of all pertinent documents;

f) participate in read-outs of recorded media;

g) participate in off-scene investigative activities such as component examinations, technical briefings, tests and simulations;

h) participate in investigation progress meetings including deliberations related to analysis, findings, causes, contributing factors and safety recommendations; and

i) make submissions in respect of the various elements of the investigation.

However, participation of States other than the State of registry, the State of the operator, the State of design and the State of manufacture may be limited to those matters which entitled such States to participation under 5.23.

Obligations

5.26 Accredited representatives and their advisers:

a) shall provide the AIG Authority conducting the investigation with all relevant information available to them; and

b) shall not divulge information on the progress and the findings of the investigation without the express consent of the AIG Authority conducting the investigation.

Participation of States having suffered fatalities or serious injuries to its citizens

Rights and entitlement

5.27 A State which has a special interest in an accident by virtue of fatalities or serious injuries to

its citizens shall be entitled to appoint an expert who shall be entitled to:

a) visit the scene of the accident;

b) have access to the relevant factual information which is approved for public release by the AIG Authority, and information on the progress of the investigation; and

c) receive a copy of the Final Report.

This will not preclude the State from also assisting in the identification of victims and in meetings with survivors from that State.

5.28 The AIG Authority shall release, at least during the first year of the investigation, established factual information and indicate the progress of the investigation in a timely manner.

Chapter 6

Final Report

6.1 The format of the final report in the Manual on aircraft accidents and incidents investigation reporting shall be used by the AIG Authority. However, it may be adapted to the circumstances of the accident or incident.

Responsibility of any State

Release of information – Consent

6.2 The AIG Authority shall not circulate, publish or give access to a draft report or any part thereof, or any documents obtained during an investigation of an accident or incident, without the express consent of the authority which conducted the investigation, unless such reports or documents have already been published or released by that latter State.

Responsibility of the State conducting the investigation

Consultation

6.3 The AIG Authority conducting the investigation shall send a copy of the draft final report to the following States inviting their significant and substantiated comments on the report as soon as possible:

a) the State that instituted the investigation;

b) the State of registry;

c) the State of the operator;

d) the State of design;

e) the State of manufacture;

f) any State that participated in the investigation as per Chapter 5; and

g) the ARCM ~~when appropriate~~.

If the AIG Authority receives comments within sixty days of the date of the transmittal letter, it shall either amend the draft final report to include the substance of the comments received or, if desired by the State that provided comments, append the comments to the final report. If the AIG Authority receives no comments within sixty days of the date of the first transmittal letter, it shall issue the final report in accordance with 6.4, unless an extension of that period has been agreed by the States concerned.

6.3.1 The AIG Authority shall send, through the State of the operator, a copy of the draft final report to the operator to enable the operator to submit comments on the draft final report

6.3.2 The AIG Authority shall send, through the State of design and the State of manufacture, a copy of the draft final report to the organizations responsible for the type design and the final assembly of the aircraft to enable them to submit comments on the draft final report.

Recipient States

6.4 The final report of the investigation of an accident shall be sent with a minimum of delay by the AIG Authority to:

a) the State that instituted the investigation;

b) the State of registry;

c) the State of the operator;

d) the State of design;

e) the State of manufacture;

f) any State that participated in the investigation;

g) any State having suffered fatalities or serious injuries to its citizens; and

h) any State that provided relevant information, significant facilities and services or experts.

Release of the final report

6.5 In the interest of accident prevention, the AIG Authority shall make the final report publicly available as soon as possible and, if possible, within twelve months.

6.6 If the report cannot be made publicly available within twelve months, the AIG Authority shall make an interim statement publicly available on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised.

6.7 When the AIG Authority that has conducted an investigation into an accident or an incident involving an aircraft of a maximum mass of over 5 700 kg has released a final report, that authority shall send to the International Civil Aviation Organization a copy of the final report..

Safety recomendations

6.8 At any stage of the investigation of an accident or incident, the accident or incident investigation authority of the State conducting the investigation shall recommend in a dated transmittal correspondence to the appropriate authorities, including those in other States, any preventive action that it considers necessary to be taken promptly to enhance aviation safety

6.9 The AIG Authority shall address, when appropriate, any safety recommendations arising out of its investigations in a dated transmittal correspondence to the accident investigation authorities of other State(s) concerned and, when ICAO documents are involved, to ICAO.

Responsibility of a State receiving or issuing safety recommendations

Action on safety recommendations

6.10 The AIG Authority that receives safety recommendations shall inform the proposing State, within ninety days of the date of the transmittal correspondence, of the preventive action taken or under consideration, or the reasons why no action will be taken.

6.11 The AIG Authority issuing a safety recommendation shall implement procedures to record the responses to the safety recommendation issued.

6.12 When the AIG Authority receives a safety recommendation shall implement procedures to monitor the progress of the action taken in response to that safety recommendation.

Chapter 7

ADREP Reporting

Preliminary report

Responsibilities of the AIG Authority

Accidents to aircraft over 2 250 kg

7.1 When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the AIG Authority shall send the preliminary report to:

a) the State of registry or the State of occurrence, as appropriate;

b) the State of the operator;

c) the State of design;

d) the State of manufacture;

e) any State that provided relevant information, significant facilities and services or experts;

f) the International Civil Aviation Organization; and

g) the ARCM~~, when appropriate~~.

Accidents to aircraft of 2 250 kg or less

7.2 When an aircraft, not covered by 7.1, is involved in an accident and when airworthiness or matters considered to be of interest to other States are involved, the AIG Authority shall forward the preliminary report to:

a) the State of registry or the State of occurrence, as appropriate;

b) the State of the operator;

c) the State of design;

d) the State of manufacture;

e) any State that provided relevant information, significant facilities and services or experts; and

f) the ARCM~~, when appropriate~~.

Language

7.3 The preliminary report shall be submitted to appropriate States and to the International Civil Aviation Organization in one of the working languages of ICAO.

Dispatch

7.4 The preliminary report shall be sent by facsimile, e-mail, or airmail within thirty days of the date of the accident unless the accident/incident data report has been sent by that time. When matters directly affecting safety are involved, it shall be sent as soon as the information is available and by the most suitable and quickest means available.

Accident/Incident data report

Responsibilities of the AIG Authority

Accidents to aircraft over 2 250 kg

7.5 When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the AIG Authority shall send, as soon as practicable after the investigation, the accident data report to the International Civil Aviation Organization and the ARCM~~, when appropriate~~.

Additional information

7.6 Reserved

Incidents to aircraft over 5 700 kg

7.7 If the AIG Authority conducts an investigation into an incident to an aircraft of a maximum mass of over 5 700 kg, that authority shall send, as soon as is practicable after the investigation, the incident data report to the International Civil Aviation Organization and the ARCM~~, when appropriate~~

Data reporting to the ARCM

Accidents to aircraft of 2 250 kg or less

7.8 If the AIG Authority conducts an investigation into an accident to an aircraft of a maximum mass of over 2 250 kg or less, that authority shall send, as soon as is practicable after the investigation, the accident data report to the ARCM.

Incidents to aircraft of 5 700 kg or less

7.9 If the AIG Authority conducts an investigation into an incident to an aircraft of a maximum mass of over 5 700 kg, that authority shall send, as soon as is practicable after the investigation, the incident data report to the ARCM.

Chapter 8

Accident Prevention Measures

Database and preventive actions

8.1 The AIG Authority shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine any preventive actions required.

8.2 Reserved

8.3 In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies. If safety recommendations are addressed to an organization in another State, they shall also be transmitted to that organization by the AIG Authority through that State's investigation authority.

Chapter 9

Training

9.1 The AIG Authority shall establish and keep valid a training programme where the type of training that must be provided for investigators is detailed. The training programme shall include basic training, practical on-the-job training (OJT), regular training, and specialized training, with indication of the duration, when appropriate. The training programme shall include basic and regular training in on-the-scene safety for investigators.

9.2 The AIG Authority shall establish a regular training plan where the type of training to be provided for the established period is detailed in order of priority. The type and frequency of the training shall be enough for the investigators to acquire and have a level of knowledge, skills, competence and qualifications in accordance with the rights and obligations assigned.

9.3 The AIG Authority shall establish and introduce a system to keep the training records of the investigators, including OJT.

APPENDIX 1

FORMAT OF THE FINAL REPORT

(See Chapter 6)

PURPOSE

The purpose of this format is to present the final report in a convenient and uniform manner.

Detailed guidance on completing each section of the final report is found in the *Manual of aircraft accident and incident investigation*.

FORMAT

Título. The final report begins with a title comprising:

name of the operator; manufacturer, model, nationality and registration marks of the aircraft; place and date of the accident or incident.

Synopsis. Following the title is a synopsis describing briefly all relevant information regarding:

notification of accident to national and foreign authorities; identification of the accident investigation authority and accredited representation; organization of the investigation; authority releasing the report and date of publication;

and concluding with a brief résumé of the circumstances leading to the accident.

Body. The body of the Final Report comprises the following main headings:

1. Factual information
2. Analysis
3. Conclusions
4. Safety recommendations

each heading consisting of a number of subheadings as outlined in the following:

Appendices. Include as appropriate.

Note.- In preparing a Final Report, using this format, ensure that:

a) all information relevant to an understanding of the factual information, analysis and conclusions is included under each appropriate heading;

b) where information in respect of any of the items in 1.— Factual information is not available, or is irrelevant to the circumstances leading to the accident, a note to this effect is included under the appropriate subheadings.

1. FACTUAL INFORMATION

1.1 ***History of the flight.*** A brief narrative giving the following information:

- ✓ Flight number, type of operation, last point of departure, time of departure (local time or UTC), point of intended landing.

- ✓ Flight preparation, description of the flight and events leading to the accident, including reconstruction of the significant portion of the flight path, if appropriate.

- ✓ Location (latitude, longitude, elevation), time of the accident (local time or UTC), whether day or night.

1.2 ***Injuries to persons.*** Completion of the following, (in numbers):

Injuries	*Crew*	*Pasengers*	*Others*
Fatal			
Serious			
Minor/None			

Note.- Fatal injuries include all deaths determined to be a direct result of injuries sustained in the accident. Serious
injury is defined in Chapter 1 of the AIG Regulation of the State.

1.3 ***Damage to aircraft.*** Brief statement of the damage sustained by aircraft in the accident (destroyed, substantially damaged, slightly damaged, no damage).

1.4 ***Other damage.*** Brief description of damage sustained by objects other than the aircraft.

1.5 ***Personnel information:***

a) Pertinent information concerning each of the flight crew members including: age, validity of licences, ratings, mandatory checks, flying experience (total and on type) and relevant information on duty time.

b) Brief statement of qualifications and experience of other crew members.

c) Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant.

1.6 ***Aircraft information:***

a) Brief statement on airworthiness and maintenance of the aircraft (indication of deficiencies known prior to and during the flight to be included, if having any bearing on the accident).

b) Brief statement on performance, if relevant, and whether the mass and centre of gravity were within the prescribed limits during the phase of operation related to the accident. (If not and if of any bearing on the accident give details.)

c) Type of fuel used.

1.7 ***Meteorological information:***

a) Brief statement on the meteorological conditions appropriate to the circumstances including both forecast and actual conditions, and the availability of meteorological information to the crew.

b) Natural light conditions at the time of the accident (sunlight, moonlight, twilight, etc.).

1.8 ***Aids to navigation.*** Pertinent information on navigation aids available, including landing aids such as ILS, MLS, NDB, PAR, VOR, visual ground aids, etc., and their effectiveness at the time.

1.9 ***Communications.*** Pertinent information on aeronautical mobile and fixed service communications and their effectiveness.

1.10 ***Aerodrome information.*** Pertinent information associated with the aerodrome, its facilities and condition, or with the take-off or landing area if other than an aerodrome.

1.11 ***Flight recorders.*** Location of the flight recorder installations in the aircraft, their condition on recovery and pertinent data available therefrom.

1.12 ***Wreckage and impact information.*** General information on the site of the accident and the distribution pattern of the wreckage; detected material failures or component malfunctions. Details concerning the location and state of the different pieces of the wreckage are not normally required unless it is necessary to indicate a break-up of the aircraft prior to impact. Diagrams, charts and photographs may be included in this section or attached in the Appendices.

1.13 ***Medical and pathological information.*** Brief description of the results of the investigation undertaken and pertinent data available therefrom..

Note.— Medical information related to flight crew licences should be included in 1.5 — Personnel information.

1.14 ***Fire.*** If fire occurred, information on the nature of the occurrence, and of the fire fighting equipment used and its effectiveness.

1.15 ***Survival aspects.*** Brief description of search, evacuation and rescue, location of crew and passengers in relation to injuries sustained, failure of structures such as seats and seat-belt attachments.

1.16 ***Tests and research.*** Brief statements regarding the results of tests and research.

1.17 ***Organizational and management information****.* Pertinent information concerning the organizations and their management involved in influencing the operation of the aircraft. The organizations include, for example, the operator, the air traffic services, airway, aerodrome and weather service agencies, and the regulatory authority. The information could include, but not be limited to, organizational structure and functions, resources, economic status, management policies and practices, and regulatory framework.

1.18 ***Additional information.*** Relevant information not already included in 1.1 to 1.17.

1.19 ***Useful or effective investigation techniques.*** When useful or effective investigation techniques have been used during the investigation, briefly indicate the reason for using these techniques and refer here to the main features as well as describing the results under the appropriate subheadings 1.1 to 1.18.

2. ANALYSIS

Analyse, as appropriate, only the information documented in 1. — Factual information and which is relevant to the determination of conclusions and causes and/or contributing factors.

3. CONCLUSIONS

List the findings, causes and/or contributing factors established in the investigation. The list of causes and/or contributing factors should include both the immediate and the deeper systemic causes and/or contributing factors.

Note.- As stated in 6.1, the final report format presented in this Appendix 1 may be adapted to the circumstances of the accident or incident. Thus, the AIG Authority may use either "causes" or "contributing factors", or both, in the Conclusions.

4. SAFETY RECOMMENDATIONS

As appropriate, briefly state any recommendations made for the purpose of accident prevention and identify safety actions already implemented.

APPENDICES

Include, as appropriate, any other pertinent information considered necessary for the understanding of the report.

ATTACHMENT A

RIGHTS AND OBLIGATIONS OF THE STATE OF THE OPERATOR IN RESPECT OF ACCIDENTS AND INCIDENTS INVOLVING LEASED, CHARTERED OR INTERCHANGED AIRCRAFT

The standards and recommended practices of Annex 13 — *Aircraft accident and incident investigation* were developed when the State of registry and the State of the operator normally were the same. In recent years, however, international aircraft leasing and interchanging arrangements have developed so that in many instances the State of the operator is different from the State of registry.

Leasing or interchange arrangements sometimes include the provision of flight crews from the State of registry. However, more often, flight crews are provided by the State of the operator and the aircraft operated under national legislation of the State of the operator. Similarly, a variety of arrangements for airworthiness can emerge from these arrangements. Airworthiness responsibility may rest, wholly or partly, with the State of the operator or State of registry. Sometimes the operator, in conformity with an airworthiness control system specified by the State of registry, carries out maintenance and keeps records.

In the event of an accident or an incident, it is important that any State which has assumed responsibility for the safety of an aircraft has the right to participate in an investigation, at least in respect of that responsibility. It is also important that the State conducting the investigation should have speedy access to all documents and other information relevant to that investigation.

When the location of an accident or an incident cannot definitely be established as being in the territory of another State, the State of the operator, after consultation with the State of registry, should accept full or partial responsibility for the conduct of the investigation.

ATTACHMENT B
NOTIFICATION AND REPORTING CHECKLIST

Note.— In this checklist, the following terms have the meaning indicated below:

- ✓ International occurrences: *accidents and serious incidents occurring in the territory of a contracting State to aircraft registered in another contracting State.*
- ✓ Domestic occurrences: *accidents and serious incidents occurring in the territory of the State of registry.*
- ✓ Other occurrences: *accidents and serious incidents occurring in the territory of a non-contracting State, or outside the territory of any State.*

1. NOTIFICATION OF ACCIDENTS AND SERIOUS INCIDENTS

From	*For*	*Send to*	*State AIG Regulation~~Annex 13~~ reference*
State of occurrence	International occurrences: All aircraft	State of registry State of the operator State of design State of manufacture ~~ICAO (when aircraft over 2 250 kg or is a turbojet-powered aeroplane)~~ the International Civil Aviation Organization, when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, and to the ARCM, all events regardless of weight (mass) of the aircraft.	4.1
State of registry	Domestic and other occurrences: All aircraft	State of the operator State of design State of manufacture ~~ICAO (when aircraft over 2 250 kg or is a turbojet-powered aeroplane)~~ the International Civil Aviation Organization, when the aircraft involved is of a maximum mass of over 2 250 kg or is a turbojet-powered aeroplane, and to the ARCM all the occurrences regardless of the aircraft weight (mass).	4.8

2. FINAL REPORT

Accidents and incidents wherever they occurred

From	*Type of report*	*Concerning*	*Send to*	*Annex 13 reference*
State conducting the investigation	FINAL REPORT	All aircraft	State instituting the investigation State of registry State of the operator State of design State of manufacture State having interest because of fatalities	6.4

		State providing information, significant facilities and services or experts	
	Aircraft over 5 700 kg	ICAO	6.7

3. ADREP REPORT

Accidents and incidents wherever they occurred

From	*Type of report*	*Concerning*	*Send to*	*Annex 13 reference*
State conducting the investigation	PRELIMINARY REPORT	Accidents to aircraft over 2 250 kg	State of registry or State of occurrence State of the operator State of design State of manufacture State providing information, significant facilities and services or experts ICAO	7.1
		Accidents to aircraft of 2 250 kg or less if airworthiness or matters of interest are involved	Same as above, *except* ICAO	7.2
	ACCIDENT DATA REPORT	Accidents to aircraft over 2 250 kg	ICAO	7.5
	INCIDENT DATA REPORT	Incidents to aircraft over 5 700 kg	ICAO	7.7

4. ACCIDENT PREVENTION MEASURES

Safety matters of interest to other States

From	*Type of report*	*Concerning*	*Send to*	*Annex 13 reference*
States making safety recommendations	Safety recommendations	Recommendations made to another State	Accident investigation authority in that State	6.8 8.3
		ICAO documents	ICAO	6.9

ATTACHMENT C

LIST OF EXAMPLES OF SERIOUS INCIDENTS

1. The term “serious incident” is defined in Chapter 1 as follows:

Serious incident. An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

2. The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

a) Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.

b) Collisions not classified as accidents.

c) Controlled flight into terrain only marginally avoided.

d) Aborted take-offs on a closed or engaged runway, on a taxiway[1] or unassigned runway.

e) Take-offs from a closed or engaged runway, from a taxiway[1] or unassigned runway.

f) Landings or attempted landings on a closed or engaged runway, on a taxiway[1] or unassigned runway.

g) Gross failures to achieve predicted performance during take-off or initial climb.

h) Fires and/or smoke in the cockpit, in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.

i) Events requiring the emergency use of oxygen by the flight crew.

j) Aircraft structural failures or engine disintegrations, including uncontained turbine engine failures, not classified as an accident.

k) Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.

l) Flight crew incapacitation in flight.

m) Fuel quantity level or distribution situations requiring the declaration of an emergency by the pilot, such as insufficient fuel, fuel exhaustion, fuel starvation, or inability to use all usable fuel on board.

n) Runway incursions classified with severity A. The Manual on the prevention of runway incursions (Doc 9870) contains information on the severity classifications.

o) Take-off or landing incidents. Incidents such as under-shooting, overrunning or running off the side of runways.

p) System failures, weather phenomena, operations outside the approved flight envelope or other occurrences which caused or could have caused difficulties controlling the aircraft.

q) Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.

r) The unintentional or, as an emergency measure, the intentional release of a slung load or any other load carried external to the aircraft.

ATTACHMENT D

GUIDELINES FOR FLIGHT RECORDER READ-OUT AND ANALYSIS

Initial response

1. The aftermath of a major accident is a demanding time for any State's investigation authority. One of the immediate items requiring a decision is where to have the flight recorders read out and analysed. It is essential that the flight recorders be read out as early as possible after an accident. Early identification of problem areas can affect the investigation at the accident site where evidence is sometimes transient. Early identification of problem areas may also result in urgent safety recommendations which may be necessary to prevent a similar occurrence.

2. Many States do not have their own facilities for the playback and analysis of flight recorder information (both voice and data) and consequently request assistance from other States. It is essential, therefore, that the accident investigation authority of the State conducting the investigation make timely arrangements to read out the flight recorders at a suitable read-out facility.

Choice of facility

3. The investigating State may request assistance from any State that, in its opinion, can best serve the investigation. The manufacturer's standard replay equipment and playback software, which are typically used by airlines and maintenance facilities, are not considered adequate for investigation purposes. Special recovery and analysis techniques are usually required if the recorders have been damaged.

4. Facilities for the read-out of flight recorders should have the following capabilities:

a) the ability to disassemble and read out recorders that have sustained substantial damage;

b) the ability to play back the original recording/memory module without the need for the use of a manufacturer's copy device or the recorder housing that was involved in the accident or incident;

c) the ability to manually analyse the raw binary waveform from digital tape flight data recorders;

d) the ability to enhance and filter voice recordings digitally by means of suitable software; and

e) the capability to graphically analyse data, to derive additional parameters not explicitly recorded, to validate the data by cross-checking and other analytical methods to determine data accuracy and limitations.

Participation by the State of manufacture (or design) and the State of the operator

5. The State of manufacture (or design) has airworthiness responsibilities and the expertise normally required to read out and analyse flight recorder information. Since flight recorder information can often reveal airworthiness problems, the State of manufacture (or Design) should have a representative present when the flight recorder read-out and analysis are being conducted in a State other than the State of manufacture (or design).

6. The State of the operator has regulatory responsibilities regarding the flight operation and can provide insights into operational issues which may be specific to the operator. Since flight recorder information can reveal operational problems, the State of the operator should also have a representative present when the flight recorder read-out and analysis are being conducted..

Recommended procedures

7. The flight data recorder and the cockpit voice recorder should be read out by the same facility, because they contain complementary data which can help validate each recording and aid in determining timing and synchronization.

8. Flight recorders should not be opened or powered up and original recordings should not be copied (particularly not by high-speed copy devices) prior to the read-out because of the risk of damage to the recordings.

9. The facility at which the flight recorders are read out for another State should be given an opportunity to comment on the final report in order to ensure that the characteristics of the flight recorder analysis have been taken into account.

10. The facility at which the flight recorders are read out may require the expertise of the aircraft manufacturer and the operator in order to verify the calibration data and validate the recorded information.

11. The State conducting the investigation may leave the original recordings, or a copy of them, with the read-out facility until the investigation is completed, in order to facilitate the timely resolution of additional requests or clarifications, providing that the facility has adequate security procedures to safeguard the recordings.

ATTACHMENT E

LEGAL GUIDANCE FOR THE PROTECTION OF INFORMATION FROM SAFETY DATA COLLECTION AND PROCESSING SYSTEMS

1. INTRODUCTION

1.1 The protection of safety information from inappropriate use is essential to ensure its continued availability, since the use of safety information for other than safety-related purposes may inhibit the future availability of such information, with an adverse effect on safety. This fact was recognized by the 35th Session of the ICAO Assembly, which noted that existing national laws and regulations in many States may not adequately address the manner in which safety information is protected from inappropriate use.

1.2 The guidance contained in this Attachment is therefore aimed at assisting States enact national laws and regulations to protect information gathered from safety data collection and processing systems (SDCPS), while allowing for the proper administration of justice. The objective is to prevent the inappropriate use of information collected solely for the purpose of improving aviation safety.

1.3 Because of the different legal systems in States, the legal guidance must allow States the flexibility to draft their laws and regulations in accordance with their national policies and practices.

1.4 The guidance contained in this Attachment, therefore, takes the form of a series of principles that have been distilled from examples of national laws and regulations provided by States. The concepts described in these principles could be adapted or modified to meet the particular needs of the State enacting laws and regulations to protect safety information.

1.5 Throughout this Attachment:

a) *safety information* refers to information contained in SDCPS established for the sole purpose of improving aviation safety, and qualified for protection under specified conditions in accordance with 3.1 below;

b) *operational personnel* refers to personnel involved in aviation operations who are in a position to report safety information to SDCPS. Such personnel include, but are not limited to, flight crews, air traffic controllers, aeronautical station operators, maintenance technicians, cabin crews, flight dispatchers and apron personnel;

c) *inappropriate use* refers to the use of safety information for purposes different from the purposes for which it was collected, namely, use of the information for disciplinary, civil, administrative and criminal proceedings against operational personnel, and/or disclosure of the information to the public;

d) SDCPS refers to processing and reporting systems, databases, schemes for exchange of information, and recorded information and include:

1) records pertaining to accident and incident investigations, as described in Chapter 5 of this Annex;

2) mandatory incident reporting systems, as described in Annex 19, Chapter 5;

3) voluntary incident reporting systems, as described in Annex 19, Chapter 5; and

4) self-disclosure reporting systems, including automatic data capture systems, as described in Annex 6, Part I, Chapter 3, as well as manual data capture systems.

Note.— Information on safety data collection and processing systems can be found in the Safety Management Manual (SMM) (Doc 9859)..

2. GENERAL PRINCIPLES

2.1 The sole purpose of protecting safety information from inappropriate use is to ensure its continued availability so that proper and timely preventive actions can be taken and aviation safety improved.

2.2 It is not the purpose of protecting safety information to interfere with the proper administration of justice in States.

2.3 National laws and regulations protecting safety information should ensure that a balance is struck between the need for the protection of safety information in order to improve aviation safety, and the need for the proper administration of justice.

2.4 National laws and regulations protecting safety information should prevent its inappropriate use.

2.5 Providing protection to qualified safety information under specified conditions is part of a State's safety responsibilities.

3. PRINCIPLES OF PROTECTION

3.1 Safety information should qualify for protection from inappropriate use according to specified conditions that should include, but not necessarily be limited to: the collection of information was for explicit safety purposes and the disclosure of the information would inhibit its continued availability.

3.2 The protection should be specific for each SDCPS, based upon the nature of the safety information it contains.

3.3 A formal procedure should be established to provide protection to qualified safety information, in accordance with specified conditions.

3.4 Safety information should not be used in a way different from the purposes for which it was collected.

3.5 The use of safety information in disciplinary, civil, administrative and criminal proceedings should be carried out only under suitable safeguards provided by national law.

4. PRINCIPLES OF EXCEPTION

Exceptions to the protection of safety information should only be granted by national laws and regulations when:

a) there is evidence that the occurrence was caused by an act considered, in accordance with the law, to be conduct with intent to cause damage, or conduct with knowledge that damage would probably result, equivalent to reckless conduct, gross negligence or willful misconduct;

b) an appropriate authority considers that circumstances reasonably indicate that the occurrence may have been caused by conduct with intent to cause damage, or conduct with knowledge that damage would probably result, equivalent to reckless conduct, gross negligence or willful misconduct; or

c) a review by an appropriate authority determines that the release of the safety information is necessary for the proper administration of justice, and that its release outweighs the adverse domestic and international impact such release may have on the future availability of safety information.

5. PUBLIC DISCLOSURE

5.1 Subject to the principles of protection and exception outlined above, any person seeking disclosure of safety information should justify its release.

5.2 Formal criteria for disclosure of safety information should be established and should include, but not necessarily be limited to, the following:

a) disclosure of the safety information is necessary to correct conditions that compromise safety and/or to change policies and regulations;

b) disclosure of the safety information does not inhibit its future availability in order to improve safety;

c) disclosure of relevant personal information included in the safety information complies with applicable privacy laws; and

d) disclosure of the safety information is made in a de-identified, summarized or aggregate form.

6. RESPONSIBILITY OF THE CUSTODIAN OF SAFETY INFORMATION

Each SDCPS should have a designated custodian. It is the responsibility of the custodian of safety information to apply all possible protection regarding the disclosure of the information, unless:

a) the custodian of the safety information has the consent of the originator of the information for disclosure; or

b) the custodian of the safety information is satisfied that the release of the safety information is in accordance with the principles of exception.

7. PROTECTION OF RECORDED INFORMATION

Considering that ambient workplace recordings required by legislation, such as cockpit voice recorders (CVRs), may be perceived as constituting an invasion of privacy for operational personnel that other professions are not exposed to:

a) subject to the principles of protection and exception above, national laws and regulations should consider ambient workplace recordings required by legislation as privileged protected information, i.e. information deserving enhanced protection; and

b) national laws and regulations should provide specific measures of protection to such recordings as to their confidentiality and access by the public. Such specific measures of protection of workplace recordings required by legislation may include the issuance of orders of non-public disclosure.

ATTACHMENT F

GUIDANCE FOR THE DETERMINATION OF AIRCRAFT DAMAGE

1. If an engine separates from an aircraft, the event is categorized as an accident even if damage is confined to the engine.

2. A loss of engine cowls (fan or core) or reverser components which does not result in further damage to the aircraft is not considered an accident.

3. Occurrences where compressor or turbine blades or other engine internal components are ejected through the engine tail pipe are not considered an accident.

4. A collapsed or missing radome is not considered an accident unless there is related substantial damage in other structures or systems.

5. Missing flap, slat and other lift augmenting devices, winglets, etc., that are permitted for dispatch under the configuration deviation list (CDL) are not considered to be an accident.

6. Retraction of a landing gear leg, or wheels-up landing, resulting in skin abrasion only. If the aircraft can be safely dispatched after minor repairs, or patching, and subsequently undergoes more extensive work to effect a permanent repair, then the occurrence would not be classified as an accident.

7. If the structural damage is such that the aircraft depressurizes, or cannot be pressurized, the occurrence is categorized as an accident.

8. The removal of components for inspection following an occurrence, such as the precautionary removal of an undercarriage leg following a low-speed runway excursion, while involving considerable work, is not considered an accident unless significant damage is found.

9. Occurrences that involve an emergency evacuation are not counted as an accident unless someone receives serious injuries or the aircraft has otherwise sustained significant damage.

Note 1.- Regarding aircraft damage which adversely affects the structural strength, performance or flight characteristics, the aircraft may have landed safely, but cannot be safely dispatched on a further sector without repair.

Note 2.- If the aircraft can be safely dispatched after minor repairs and subsequently undergoes more extensive work to effect a permanent repair, then the occurrence would not be classified as an accident. Likewise, if the aircraft can be dispatched under the CDL with the affected component removed, missing or inoperative, the repair would not be considered as a major repair and consequently the occurrence would not be considered an accident.

Note 3.- The cost of repairs, or estimated loss, such as provided by insurance companies may provide an indication of the damage sustained but should not be used as the sole guide as to whether the damage is sufficient to count the occurrence as an accident. Likewise, an aircraft may be considered a "hull loss" because it is uneconomic to repair, without it having incurred sufficient damage to be classified as an accident.

International Civil Aviation Organization
South American AIG Regional Cooperation Mechanism (ARCM)

Latin American Aeronautical Regulation

LAR 113

Aviation accidents and incidents report and notification requirements

~~Original~~ First edition
June 2015

LAR – 113
Aviation accidents and incidents report and notification requirements

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LAR 113

Aviation accidents and incidents report and notification requirements

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First edition	Second Meeting of AIG Authorities of South America (AIG-SAM/2), Buenos Aires, Argentina, Lima, Peru, 09 to 11 June 2015	LAR 113 Aviation accidents and incidents report and notification requirements This regulation includes Annex 13 Amendment 14 – Ten edition, July 201013	11 June 2015 AIG-SAM/02

LAR 113

Aviation accidents and incidents report and notification requirements

List of effective pages

List of effective pages			
Detail	**Pages**	**Amendment**	**Dates**
Foreword	vii to viii	Original	June 2015
Chapter A General	113-A-1 to 113-A-5	Original	June 2015
Chapter B Occurrences report and notification	113-B-1 to 113-B-2	Original	June 2015
Chapter C Preservation of the aircraft, its contents and records	113-C-1	Original	June 2015
Appendix 1 Required information for initial notification of incidents	113- AP-1-1 to 113- AP-1-3	Original	June 2015
Attachment A List of examples of serious incidents	113- AD-A-1	Original	June 2015

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LAR 113

FOREWORD

Historical background

The ICAO Assembly, through Resolution A29-3 – *Global Rule Harmonization,* urges States and groups of States that still have not done it, to take positive action to promote global harmonization of national rules for application of standards of Annexes to the Convention on International Civil Aviation.

On the other hand, Article 26 of the Convention on International Civil Aviation states that it is incumbent on the State in which an aircraft accident occurs to institute an inquiry into the circumstances of the accident. This obligation can only be complied with when an appropriate organization for the aviation accident investigation exists. In Annex 13 to the Convention, standards and recommended practices (SARPS) for the States to conduct aviation accidents and incidents investigations are specified to comply with their obligations in accordance with the provisions of the referred Article 26 of the Convention.

The results of the audits conducted under the comprehensive systems approach (CSA) valid until 2011 and the activities under the new ICAO Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) indicate that several States have not been able to develop an effective system for aviation activities including aircraft accident and incident investigation. The results have been related, in general, to the lack of resources (human and financial) and, specifically, to the lack of appropriate legislation and regulations; accident and incident investigation organization; personnel training system; equipment to conduct the investigations; and policies, procedures and guidelines for the accident and incident investigation.

Through an AIG regional cooperation mechanism, economies of scale can be obtained since the necessary resources will be allowed to be shared. Besides, working together, the Contracting States of a region or sub region can more effectively exert their influence over the global context and can contribute to the creation of more favourable conditions in order to achieve an operationally safe and effective international air transport system.

The Civil Aviation Authorities of the SAM Region in their thirteenth meeting held in Bogota, Colombia, from 4 to 6 December 2013, convened by the ICAO South American Regional Office, and counting with the participation of high level officials representing 13 States and 8 international organizations and industry agreed on, through **the Declaration of Bogota**, their compromise on achieving the following regional goals related to safety in 2016:

- ✓ ***Accidents:*** *Reduce the GAP of the accident rate of the SAM Region in 50% in relation to the global accident rate.*

- ✓ ***Runway Excursions:*** *Reduce runway excursions rate in 20% in relation to the average rate of the Region (2007 – 2012).*

In the South American Region, according to the last outcomes achieved under the framework of the activities of the USOAP, one of the audit areas with less effective implementation (EI) in relation to the safety oversight capabilities of the SAM States is still aircraft accident and incident investigation (AIG).

In this area, it is mainly observed that the subgroups of investigation policies and procedures; development, completion and release of the final report; organization, staffing and training of the accident investigation authority; development, issuance, and recording of safety recommendations and forwarding of Accident/Incident Data Reports (ADREP) procedures are the ones that have the highest number of unsatisfactory Protocol Questions (PQ) as the SAM States general average.

In order to analyse the AIG situation and agree on a strategic plan with the aim of making the first steps in the creation of one of the forms of a Regional Accident and Incident Investigation Organization (RAIO), the SAM Region held the First Meeting of AIG Authorities (AIG-SAM/1) in Lima, Peru, from 18 to 20 March 2014.

In this meeting was discussed the concept of a RAIO and the fact that it can be implemented in different ways: in a very simple one such as the training of a regional group of investigators as well as a more complex one such as a

completely implemented, independent and institutionalized RAIO. In this regard, the meeting was invited to perform an analysis of the regional needs to be able to determine what form of a RAIO could be implemented in the SAM Region.

Following, the guidelines for the development of an AIG regional cooperation strategic plan were introduced and three groups of work among the States representatives and the industry for the development of a strategic plan of the SAM Region were formed. These three groups presented their proposals for the strategic plan; the adoption of an implementation process in phases was agreed upon and concrete objectives for these phases were identified.

To begin with the first phase of the project, the Civil Aviation Accident Investigation Board (JIAAC) of Argentina transferred the services of an AIG specialist to the ICAO South American Regional Office for the month of November 2014 to work in this phase.

During this month, two virtual meetings were carried out: the first, on Friday 7 November 2014, to present the assigned specialist's work programme, and the second, on Thursday 27 November 2014, to present the AIG diagnosis of the SAM Region with the aim of making the first steps in the establishment of an AIG regional cooperation mechanism (ARCM). In the Second virtual meeting five (5) tasks were agreed to be developed, whose proposals will be presented through working papers (WP) in the Second meeting of AIG authorities of the SAM Region (AIG-SAM/2) that will be held in Buenos Aires, Argentina, from 09 to 11 June 2015.

To support the AIG Project in the SAM Region, Brazil, in the month of February 2015, transferred the services of an AIG specialist to work as a secondment at ICAO South American Regional Office. Such specialist, together with the specialist from JIAAC Argentina, that conducted his second mission in the months of April and May 2015 and under the Safety Officer's management of the ICAO SAM Office, prepared the corresponding tasks for AIG-SAM/2.

The Second Meeting of AIG Authorities (AIG/SAM-2) held in Buenos Aires, Argentina, from 9 to 11 June 2015, integrated by Argentina, Brazil, Bolivia, Colombia, Ecuador, Guyana, Panama, Paraguay, Suriname, Uruguay and Venezuela, unanimously agreed the establishment of the AIG Regional Cooperation Mechanism (ARCM) of South America. Also, the documentation governing this mechanism was approved by the participating States of this meeting.

The LAR 113 developed has taken into account the provisions of the Annexes 6, 12, 13 and 18, as well as the national rules of the South American States and the New Zealand rules.

The LAR 113, that prescribes the aviation accident and incident report and notification requirements, contains the following chapters:

- *Chapter A – General*: includes the applicability of LAR 113 Regulation, the definitions used in that LAR and the authority to investigate.

- *Chapter B – Notification of reports and occurrences:* establishes the requirements to notify an accident and incident; and

- *Chapter C – Preservation of the aircraft, its contents and records:* prescribes the requirements for the access to an aircraft involved in an accident, the preservation of records and the retention of defective products and components.

- The LAR 113 also include Appendix 1 related to the information required for the initial notification of incidents and Attachment A that contains the list of examples of serious incidents.

Bibliography

ICAO

Doc 7300 – Convention on International Civil Aviation

Annex 6 – Operation of Aircraft, Part I – International Commercial Air Transport – Airplanes

Annex 6 – Operation of Aircraft, Part II – International General Aviation - Airplanes

Annex 6 – Operation of Aircraft, Part III – International Operations – Helicopters

Annex 11 – Air Transit Services

Annex 12 – Search and Rescue

Annex 13 – Aviation accident and incident investigation

Annex 18 – The Safe Transport of Dangerous Goods by Air

Doc 9756 – Manual of Aircraft Accident and Incident Investigation

Protocol of the AIG area of the USOAP CMA - 2014

States regulations

Part 12 – CAA, New Zealand.

Chapter A: General

113.001 Applicability

(a) This regulation prescribes rules for the:

(1) notification and reporting of accidents, serious incidents and incidents to aircraft over 5 700 kg;

(2) preservation of aircraft, aircraft contents, and aircraft records following an accident, serious incident and incident to aircraft over 5 700 kg; and

(3) preservation of records relating to an accident, serious incident and incident of facility malfunction ~~incident~~, ~~an~~ airspace ~~incident~~, or ~~a~~ promulgated information ~~incident~~.

Note.- *For incidents to aircraft of 5 700 kg or less, the State shall proceed in accordance with its legislation and regulations.*

For aircraft incidents of 5 700 kg or less, the State shall proceed in accordance with its laws and regulations

(b) This part does not apply to:

(1) gyrogliders;

(2) parasails,

(3) captive unmanned free balloons;

(4) kites;

(5) unmanned rockets;

(6) parachutes; and

(7) hang gliders.

113.005 Definitions

(a) The following definitions apply to this regulation:

(1) Accident.- An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

(i) a person is fatally or seriously injured as a result of:

A. being in the aircraft, or

B. direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or

C. direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew: or

(ii) the aircraft sustains damage or structural failure which:

A. adversely affects the structural strength, performance or flight characteristics of the aircraft; and

B. would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories); to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome) or

(iii) the aircraft is missing or is completely inaccessible.

(2) Human performance.- Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

(3) Aerodrome. - A defined area on land

or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

(4) Aircraft. - Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

(5) Flight data analysis.- A process of analysing recorded flight data in order to improve the safety of flight operations.

(6) Adviser.- A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

(7) Plane (aeroplane).- A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

(8) Large aeroplane.- An aeroplane of a maximum certificated take-off mass of over 5 700 kg.

(9) Small aeroplane.- An aeroplane of a maximum certificated take-off mass of 5 700 kg or less.

(10) AIG authority.- Describes the organization responsible for the accident and incident investigation in the State.

(11) Causes.- Actions, omissions, events, conditions, or a combination thereof, which led to the accident or incident. The identification of causes does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

(12) State of Design.- The State having jurisdiction over the organization responsible for the type design.

(13) State of Manufacture.- The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

(14) State of Registry.- The State on whose register the aircraft is entered.

(15) State of the Operator.- The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

(16) State of Occurrence.- The State in the territory of which an accident or incident occurs.

(17) Operator.- A person, organization or enterprise engaged in or offering to engage in aircraft operation.

(18) Contributing factors.- Actions, omissions, events, conditions, factors or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident. The identification of the contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

(19) Distress phase.- A situation wherein there is a reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

(20) Incident.- An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

~~(21) Cargo security incident.- Means an incident involving cargo or mail that is carried, or has been accepted by an air cargo agent or an air operator for carriage, by air on an aircraft conducting a regular air transport operation passenger service, and~~

~~(i) there is evidence of tampering or suspected tampering with the cargo or mail which could be an act or an attempted act of unlawful interference; or~~

~~(ii) a weapon, explosive, or other dangerous device, article or substance, that may be used to commit an act of unlawful inter-~~

~~ference is detected in the cargo or mail.~~

(22) Airspace incident.- Means an incident involving deviation from, or shortcomings of, the procedures or rules for:

(i) Avoiding a collision between aircraft; or

(ii) Avoiding a collision between aircraft and other obstacles when an aircraft is being provided with an Air Traffic Service.

(23) Bird incident.- Means an incident where:

(i) there is a collision between an aircraft and one or more birds; or

(ii) when one or more birds pass sufficiently close to an aircraft in flight to cause alarm to the pilot.

(24) Defect incident. - Means an incident that involves failure or malfunction of an aircraft or aircraft component, whether found in flight or on the ground.

(25) Facility malfunction incident. - Means an incident that involves an aeronautical facility.

(26) Promulgated information incident- Means an incident that involves significantly incorrect, inadequate, or misleading information or aeronautical data promulgated in an aeronautical information publication (AIP), map, chart, or otherwise provided for the operation of an aircraft.

(27) Serious incident.- An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down. In Attachment A of this regulation are formulated examples of serious incidents.

~~(28) Security incident. - Means an incident that involves unlawful interference.~~

(29) Operational personnel.- Refers to personnel involved in aviation operations who are in a position to report accidents, serious incidents and incidents related to the operation of an aircraft which affects or may affect safety through regulated reporting systems. Such personnel include, but are not limited to, flight crews, air traffic controllers, aeronautical station operators, maintenance technicians, cabin crews, flight dispatchers and apron personnel

(30) Preliminary report. - The communication used for the prompt dissemination of data obtained during the early stages of the investigation.

(31) Investigation. - A process conducted for the purpose of accident prevention which includes the gathering and analysis of the information, the drawing of conclusions, including the determination of causes and/or contributing factors and, when appropriate, the making of safety recommendations.

(32) Investigator-in-charge. - A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Note.- *Nothing in the above definition is intended to preclude the functions of an investigator-in-charge being assigned to a commission or other body.*

(33) Serious injury.- An injury which is sustained by a person in an accident and which:

(i) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or

(ii) results in a fracture of any bone (except simple fractures of fin-

gers, toes, or nose); or

(iii) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or

(iv) involves injury to any internal organ; or

(v) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or

(vi) involves verified exposure to infectious substances or injurious radiation.

(34) Maximum mass. - Maximum certificated take-off mass.

(35) Dangerous goods.- Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions, or which are classified according to those Instructions.

(36) Maximum weight (mass).- Maximum certificated take-off weight (mass).

(37) State safety program (SSP). - An integrated set of regulations and activities aimed at improving safety.

(38) Safety recommendation.- A proposal of an accident investigation authority based on information derived from an investigation, made with the intention of preventing accidents or incidents and which, in no case has the purpose of creating a presumption of blame or liability for an accident or incident. In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies.

(39) Flight recorder.- Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

(40) Accredited representative.- A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State. Where the State has established an accident investigation authority, the designated accredited representative would normally be from that authority.

113.010 Authority to investigate

(a) In accordance with the provisions of Annex 13 to the Convention on International Civil Aviation and AIG regulation of the State, the AIG Authority shall establish investigations to determine the circumstances of the accidents, serious incidents and incidents to aircraft over 5 700 kg.

Note.- *For incidents notification and investigation to aircraft of 5 700 kg or less, the State shall proceed in accordance with its legislation and regulations.*

(b) The State of Occurrence can partially or totally delegate the making of such investigation in another State, or in the AIG Regional Cooperation Mechanism (ARCM) of South America or in a Regional Accident Investigation Organization (RAIO), by mutual agreement and consent.

(c) The AIG authority in charge of the investigation shall have independence in the conduct of the investigation and have unrestricted authority over its conduct, consistent with the provisions of Annex 13 and State regulations. The investigation shall include the following:

(1) the gathering, recording and analysis of all available relevant information on that accident or incident;

(2) if appropriate, the issuance of safety recommendations;

(3) if possible, the determination of the causes, contributing factors and/or latent conditions; and

(4) the completion of the final report.

(d) The authority in charge of the investigation can request to any Sate all relevant information related to the investigation.

(e) When possible, the scene of the accident shall be visited, the wreckage examined and statements taken from witnesses. The AIG authority shall determine the reach of the investigation and the procedure to be

followed for its conduct, according to the lessons expected to be obtained from the investigation to improve safety.

Chapter B: Notification and reporting of occurrences

113.105 Notification of accidents and serious incidents

(a) Each pilot-in-command of an aircraft that is involved in an accident or serious incident or, if that person is fatally or seriously injured, or if the aircraft is missing, the operator or owner or the operational personnel shall immediate and directly notify the AIG Authority of the accident or serious incident.

(a) The notification under Paragraph (a) shall be in a manner acceptable to the AIG Authority and contain, where ascertainable, the:

(1) date and time of the accident or serious incident;

(2) nature of the accident or serious incident;

(3) type, nationality, and registration marks of the aircraft;

(4) names of the aircraft owner and operator;

(5) position or last known position of the aircraft with reference to an easily defined geographical point;

(6) name of the pilot-in-command of the aircraft;

(7) type of operation;

(8) last point of departure of the aircraft;

(9) next point of intended landing of the aircraft;

(10) description of the sky condition precipitation, wind velocity, and visibility;

(11) number of persons on board the aircraft;

(12) number of crew and passengers killed or seriously injured as a result of the accident;

(13) number of persons killed or seriously injured as a result of the accident that were not crew or passengers;

(14) presence of dangerous goods on board the aircraft and description thereof; and

(15) details of damage to the aircraft.

113.110 Notification in the distress phase

Upon the occurrence of a distress phase, the rescue coordination centre shall notify the AIG Authority of the distress situation.

113.115 Notification of incidents to aircraft over 5 700 kg

(b) The pilot-in-command or the operational personnel ~~of an aircraft~~ involved in ~~a serious incident or in~~ an incident to aircraft over 5 700 kg ~~that poses an immediate hazard to the safety of an aircraft operation~~ that affect or can affect safety, shall immediately notify to the AIG Authority of the incident.

(c) If required by the AIG Authority of the State where ~~the~~ an incident to an aircraft over 5 700 kg occurs ~~requires~~, the pilot-in-command or the operational personnel involved ~~of the aircraft,~~ shall submit, as soon as possible, a report on the incident. In this case, the pilot-in-command shall also submit a copy of the report to the AIG Authority of the State of the operator. Such reports shall be submitted as soon as possible and generally within 10 days.

(d) If a person that operates, carries out maintenance and services or does any other act in respect of an aircraft, aeronautical product, or aviation related service, is involved in an incident ~~that is a serious incident or poses an immediate hazard to the safety~~ to an aircraft over 5 700 kg, must notify the AIG Authority of the incident as soon as practicable.

(e) A pilot-in-command of an aircraft over 5 700 kg or the operational personnel ~~that is~~ involved in an airspace incident or a bird incident must notify the AIG Authority of the incident as soon as practicable. ~~if the incident is a serious incident or an immediate hazard to the safety of an aircraft operation.~~

(f) The notification of an incident required by Paragraphs (a), (b), (c) and (d) must be conveyed by a means acceptable to the AIG Authority and contain, where ascertainable, information in accordance with the following:

(1) for an airspace incident, Appendix 1 (a);

(2) for a defect incident, Appendix 1 (b);

(3) for a facility malfunction incident, Appendix 1 (c);

(4) for an aircraft incident, Appendix 1 (d);

(5) for a security incident, Appendix 1 (e);

(6) for a promulgated information incident, Appendix 1 (f) (e);

(7) for an aerodrome incident, Appendix 1 (g) (f);

(8) for a cargo security incident, Appendix 1 (h);

(9) for a dangerous goods incident, bird incident, or any other incident, Appendix 1 (i) (g);

(g) Despite Paragraph (a) of this section, an operator:

(1) certified according to LAR 119, must notify the AIG Authority of an aircraft incident or defect incident within 72 hours of the incident occurring if the incident is associated with an aircraft that is performing or is used to perform an extended diversion time operations (EDTO) and the incident involves:

(i) an in-flight shutdown of a propulsion system; or

(ii) a diversion or a turn back; or

(iii) an in-flight, inadvertent fuel loss or unavailability of fuel or an uncorrectable fuel imbalance; or

(iv) a malfunction of an EDTO significant system; or

(v) any other occurrence which affects the safety of an EDTO; and

(1) an aircraft maintenance organization certificate under the LAR 145 must notify the AIG Authority of a defect incident within 72 hours of the accident occurring if the incident is associated with an aircraft that is used to perform an EDTO; and

(i) the incident involves a malfunction of an EDTO significant system; or

(ii) any other defect that could affect the safety of an aircraft performing an EDTO.

Chapter C: Preservation of aircraft, its contents, and records

113.205 Access to aircraft involved in an accident

(h) In order to protect the aircraft and its contents after an accident, no person shall access, interfere with, or remove, an aircraft or its contents that is involved in an accident unless authorized to do so by the AIG Authority.

(i) For the purpose of the investigation, the AIG Authority may access, inspect, secure, or remove, an aircraft or its contents that is involved in an accident.

(j) A person may, subject to Paragraph (d):

(2) remove persons or livestock from the aircraft or wreckage; or

(3) protect the aircraft, wreckage, or contents, including mail or cargo, from further damage; or

(4) disconnect or deactivate any cockpit voice recorder (CVR), flight data recorder (FDR), or emergency location transmitter (ELT); or

(5) prevent obstruction to the public or to air navigation where no practical alternative is available;

(k) Any aircraft wreckage, mail, or cargo removed under Paragraph (c) shall:

(1) be moved only so far as necessary to ensure its safety;

(2) be kept in separate distinct areas to indicate from which part in the aircraft it has been taken; and

(3) where possible, have sketches, descriptive notes, and photographs made of their original position and any significant impact marks.

113.210 Preservation of records

(a) The operator of an aircraft that is involved in an accident, serious incident or incident must preserve all records, including all recording media maintained for the operation and maintenance of the aircraft, for at least 14 days after the accident, serious incident or incident unless otherwise ~~notified to~~ required by the ~~AIG~~ competent Authority.

(b) ~~An operator~~ A service provider that is involved in an accident, serious incident and incident of:

(1) a facility malfunction ~~incident or an accident~~; or

(2) an airspace ~~incident or an accident~~; or

(3) a promulgated information ~~incident or an accident~~;

(c) must preserve all records, including log entries, electronic recordings, technical and other relevant data relating to the accident, serious incident or incident ~~or accident~~ for at least 14 days after the accident, serious incident or incident ~~or accident~~ unless otherwise ~~notified to~~ required by the ~~AIG~~ competent Authority.

(d) All person who is involved in a promulgated information accident, serious incident, or incident ~~an accident~~ involving responsibilities with the instrumental flight procedures must preserve all records, including log entries, electronic recordings, technical and other relevant data relating to the accident, serious incident or incident ~~or accident~~ for at least 14 days after the accident, serious incident or incident ~~or accident~~ unless otherwise ~~notified to~~ required by the ~~AIG~~ competent Authority.

Note.- *The records of accidents, serious incidents and incidents of aircraft over 5 700 kg, shall be required by the AIG Authority.*

113.215 Retention of defective products and components

The holder of a certificate of an approval of aircraft maintenance organization, design organization, or manufacture organization must submit a defect incident report to the ~~AIG~~ competent Authority and retain the defective product for a period of at least 14 days after

submitting the report unless otherwise ~~notified~~ ~~to~~ required by the ~~AIG~~ competent Authority.

Appendix 1

Information required for initial notification of incidents

(a) **Airspace incident**.- The following information is required for notification of an airspace incident:

(1) date and time of the incident;

(2) brief description of events;

(3) aircraft nationality, registration, radio call sign, flight number and type;

(4) name of the aircraft operator;

(5) aircraft position and altitude;

(6) name of the pilot-in-command;

(7) phase of flight;

(8) effect on flight;

(9) flight rules under which the aircraft was operating;

(10) aircraft point of departure and destination;

(11) location, type, and class of airspace, and the ATS unit involved;

(12) any other relevant information submitted by the pilot concerned.

(b) **Defect incident**.- The following information is required for the notification of a defect incident:

(1) date and time the incident was detected;

(2) brief description of events;

(3) aircraft nationality, registration, and type;

(4) name of the aircraft operator and owner;

(5) location of the aircraft, part, or equipment at the time of the incident;

(6) phase of flight;

(7) effect on flight;

(8) aircraft point of departure and destination;

(9) name of the manufacturer of the aircraft, part, or equipment, and where appropriate, the part number, its modification standard, and its location on the aircraft;

(10) description of the incident, its effects, and any other relevant information;

(11) whether the person or organization making the notification has instituted an investigation into the defect and expected time of completion;

(12) name, organization, and contact details of the person notifying the incident.

(c) **Facility malfunction incident**.- The following information is required for notification of a facility malfunction incident:

(1) date and time of the incident;

(2) brief description of events;

(3) aircraft nationality, registration, radio call sign, flight number and type;

(4) name of the aircraft operator;

(5) aircraft position and altitude;

(6) name of aerodrome and runway used;

(7) name of the pilot-in-command;

(8) phase of flight;

(9) effect on flight;

(10) identification, type, name, frequency, and provider of the aeronautical telecommunication facility involved;

(11) whether the person or organization making the notification has instituted an investigation into the defect and expected time of completion;

(12) name, organization, and contact details of the person notifying the incident.

(d) **Aircraft incident**.- The following information is required for notification of an aircraft incident:

(1) date and time of the incident;

(2) brief description of events;

(3) aircraft nationality, registration, radio call sign, flight number and type;

(4) name of the aircraft operator and owner;

(5) aircraft position and altitude;

(6) phase of flight;

(7) if applicable, name of aerodrome and runway used;

(8) effect on flight;

(9) name of the pilot-in-command;

(10) type of operation being conducted;

(11) number of persons on board the aircraft;

(12) name, organization, and contact details of the person notifying the incident.

~~(e) **Security incident**.- The following information is required for notification of a security incident:~~

~~(1) date and time of the incident;~~

~~(2) brief description of events;~~

~~(3) aircraft nationality, registration, radio call sign, flight number and type;~~

~~(4) name of the aircraft operator and owner;~~

~~(5) aircraft position and altitude or place of incident;~~

~~(6) name of aerodrome or aeronautical telecommunication facility if applicable;~~

~~(7) name of the pilot-in-command;~~

~~(8) phase of flight;~~

~~(9) effect on flight;~~

~~(10) type of operation being conducted;~~

~~(11) name, organization, and contact details of the person notifying the incident.~~

(f) **Promulgated information incident**.- The following information is required for notification of a promulgated information incident:

(1) date and time the incident was discovered;

(2) brief description of events;

(3) details to identify the publication, map, chart, or other means by which the information or aeronautical data was promulgated;

(4) details relating to the information or aeronautical data that gave rise to the incident;

(5) name, organization, and contact details of the person notifying the incident.

(g) **Aerodrome incident**.- The following information is required for notification of an aerodrome incident:

(1) date and time of the incident;

(2) brief description of events;

(3) name of the aerodrome;

(4) description and the location of the reported defect or obstruction;

(5) name, organization, and contact details of the person notifying the incident.

~~(h) **Cargo security incident**.- The following information is required for notification of a cargo security incident:~~

~~(1) date and time of the incident ;~~

~~(2) brief description of the nature of the incident;~~

~~(3) details, if known, of where the incident may have occurred;~~

~~(4) name, organization, and contact details of the person notifying the incident.~~

(i) **Dangerous goods, bird, or other incident**.- The following information is required for notification of a dangerous goods, bird, or any other incident:

(1) date and time of the incident;

(2) brief description of events;

(3) name, organization, and contact details of the person notifying the incident.

Attachment A

List of examples of serious incidents

1. The term “serious incident” is defined in Chapter A as follows:

Serious incident. An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

2. The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

a) Near collisions requiring an avoidance maneuver to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate

b) Collisions not classified as accidents.

c) Controlled flight into terrain only marginally avoided.

d) Aborted take-offs on a closed or engaged runway, on a taxiway or unassigned runway.

e) Take-offs from a closed or engaged runway, from a taxiway or unassigned runway.

f) Gross failures to achieve predicted performance during take-off or initial climb.

g) Fires and/or smoke in the cockpit, in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.

h) Events requiring the emergency use of oxygen by the flight crew.

i) Aircraft structural failures or engine disintegrations, including uncontained turbine engine failures, not classified as an accident.

j) Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.

k) Flight crew incapacitation in flight.

Agenda Item 4; ARCM AIG procedures manual review

Proposals for the amendment to the accident and incident investigation procedures manual

4.1 Regarding this agenda item, the Secretariat presented a proposal of amendment to the ARCM accident and incident investigation procedural handbook.

4.2 In this regard, the Meeting took note that any ICAO contracting State could delegate the investigation to another State or request its assistance. It could also request the participation of investigators from ARCM member States. To that end, the States must have common requirements and procedures to facilitate the required cooperation and assistance.

4.3 The existence of harmonised procedures under the same scheme is vital for the proper operation of any regional AIG mechanism. There can be no effective exchange of knowledge and skills among the States of the Region without a set of standard regulations and procedures, and without investigators trained and qualified on the basis of the same scheme and standards.

4.4 The Meeting took note that the Second Meeting of AIG Authorities (AIG-SAM/2) had approved the First edition of the ARCM accident and incident investigation procedural handbook, and that the Secretariat had circulated such handbook among ARCM States for comments and reporting of differences. It also requested the ARCM Technical Committee to analyse the relevance of including the comments submitted by the States.

4.5 After receiving the comments by the States, the ARCM Technical Committee made the following amendments to the ARCM accident and incident investigation procedural handbook:

Regarding the table of contents, all changes were accepted as follows:

Regarding Chapter 1 – Investigation mandate, all changes were accepted as follows:

1.5.3 The immediate response of the investigative authority to the notifications will facilitate the immediate response of local authorities (judiciary, fire and police departments), as well as the quick arrival of investigators to the site of occurrence. The following tasks shall be carried out promptly in coordination with the Authority that has jurisdiction over the site of the accident so that all the necessary measures may be taken in order to:

4.6 Regarding Chapter 3 – Responsibility over the investigation, all changes were accepted as follows:

3.2 INVESTIGATOR IN CHARGE

3.2.1 The investigator in charge is responsible for the direction and daily conduction ~~day-to-day~~ of the investigation. Prior to travelling to the site of occurrence, the investigator in charge must determine what human, technical, and financial resources are needed for the investigation, and must establish the investigation team that will work on the accident. In the field, the investigator in charge is responsible for the conduction and control of the investigation, including the definition of the scope of the concrete information to be collected. During the phases following the investigation, when the importance of the established facts is being considered, the investigator in charge must consolidate the reports of the groups, analyse the information, and draft the final report.

4.7 After analysing the proposals of amendment to the ARCM accident and incident investigation procedural manual, the Meeting adopted the following conclusion:

CONCLUSION AIG-SAM/3-03 Approval of Amendment No. 1 to the First edition of the ARCM accident and incident investigation procedural manual

a) Approve the First amendment to the First edition of the ARCM accident and incident investigation procedural manual.

b) **Attachment A** to this part of the report contains the approved First amendment to the First edition of the accident and incident investigation procedures manual.

South American AIG Regional Cooperation Mechanism (ARCM)

Procedures for aircraft accidents and incidents investigation

Approved by South American ARCM General Coordinator and published under his responsibility

First edition
July 2015

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AMENDMENTS

Amendments are published on the ARCM website www.arcm-sam.org. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

FOREWORD

The purpose of this manual is to encourage the uniform application of the Standards and Recommended Practices contained in Annex 13 to the Convention on International Civil Aviation and to provide information and guidance to members States of the AIG Regional Cooperation Mechanism (ARCM) of South America on the procedures, practices and techniques that can be used in aircraft accident and incident investigations. Since accident investigations vary in complexity, a document of this kind cannot cover all eventualities. The more common techniques and processes, however, have been included. Although this manual will be of use to experienced and inexperienced investigators alike, it is **not** a substitute for investigation training and experience.

Because this manual deals with both accident and incident investigations and, for reasons of brevity, the term "accident investigation", as used herein, applies equally to "incident investigation".

The following ICAO documents provide additional information and guidance material on related subjects:

- Annex 13 - *Aircraft Accident and Incident Investigation*;
- Manual of aircraft accident and incident investigation (Doc 9756)
- *Manual on Regional Accident and Incident Investigation Organization* (Doc 9946);
- *Manual on Accident and Incident Investigation Policies and Procedures* (Doc 9962);
- *Manual of Civil Aviation Medicine* (Doc 8984);
- *Hazards at Aircraft Accident Sites* (Cir 315);
- *Human Factors Training Manual* (Doc 9683);
- Human Factors Digest No. 7- *Investigation of Human Factors in Accidents and Incidents* (Circ. 240); and
- *Training Guidelines for Aircraft Accident Investigators* (Circ 298).

This manual will be amended periodically as new investigation techniques are developed and updated information becomes available.

Throughout this manual, the use of the male gender should be understood to include male and female persons.

Readers are invited to submit material for possible inclusion in subsequent editions of this manual. This material should be addressed to:

General Coordinator
International Civil Aviation Organization
Av. Víctor Andrés Belaúnde N° 147
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Chapter 1

INVESTIGATION MANDATE

1.1 GENERAL

1.1.1 In accordance with the provisions of Annex 13 and the AIG State regulation, the State of Occurrence shall institute investigations and be responsible for investigating the circumstances of accidents and of serious incidents when the aircraft is of a maximum mass of over 2 250 kg. Annex 13 also recommends that the State of Occurrence should institute an investigation into the circumstances of serious incidents involving smaller aircraft. The State of Occurrence may delegate the whole or any part of the conduct of an investigation to another State member or not of the ARCM or in a regional accident investigation organization (RAIO) by mutual arrangement and consent.

1.1.2 The sole objective of the investigation of an accident or incident conducted under the provisions of Annex 13 and AIG State regulation shall be the prevention of accidents and incidents. The accident investigation authority responsible for the investigation shall have independence in the conduct of the investigation and have unrestricted authority over its conduct, consistent with the provisions of this Annex and the AIG State regulation. The investigation shall normally include:

a) the gathering, recording and analysis of all relevant information on that accident or incident;

b) if appropriate, the issuance of safety recommendations;

c) if possible, the determination of the causes, contributing factors and system latent conditions; and

d) the completion of the final report.

1.1.3 The extent of the investigation and the procedures to be followed in carrying out such an investigation shall be determined by the accident investigation authority, depending on the lessons it expects to draw from the investigation for the improvement of the State and SAM region safety. The scope and complexity of the investigation and the size and composition of the investigation team would be influenced by the following factors, among others:

a) injuries, deaths and damage to equipment, third parties and the environment;

b) identified and potential safety issues underlying the accident/incident;

c) the likelihood of recurrence, the probability of adverse consequences, and the severity of adverse consequences;

d) accident and incident history related to the type of operation, size and type of aircraft, the operator, manufacturer, and regulator; and

e) actual and potential deviations from industry safety and operational regulations, standards, procedures and practices.

1.2 DEFINITIONS

In addition to the definitions contained in Chapter 1 of Annex 13 and the AIG State regulation, the following definitions apply to this manual:

Investigator-in-charge. A charged, on the basis on his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Note.- Nothing in the above definition is intended to preclude the functions of an investigator-in-charge being assigned to a commission or to other body.

Occurrence. Any accident or incident associated with the operation of an aircraft.

Major Accident Investigation. An investigation into an accident involving a large aircraft and usually involving fatalities.

Smaller Investigation. An investigation into an incident involving any aircraft or into an accident involving a small aircraft.

1.3 ORGANIZATIONAL READINESS

In this manual, in part, provides that the investigation authority should have:

a) appropriate legislation that defines the rights and responsibilities of the aircraft accident investigation authority;

b) ready access to sufficient funds;

c) investigators who have the appropriate experience, training, clothing and equipment;

d) State regulations that provide for the accident investigation authority to be immediately notified of any accident or incident in its territory;

e) policies, plans, procedures and checklists required for investigations; and

f) an organization that ensures that accident and incident notifications are received and acted upon on a twenty-four-hour basis.

1.4 PLANNING FOR RESPONSES TO NOTIFICATIONS

1.4.1 Even though an investigation authority may have sufficient personnel, equipment and financial resources to properly handle a normal number of small accidents and incidents, a higher number of occurrences or even one large accident could result in a situation wherein the financial, equipment and personnel expertise resources required to conduct a thorough investigation may exceed those of the authority. In this regard, the authority should have provisions for acquiring supplementary funding and utilizes the ARCM for filling investigation expertise gaps.

1.4.2 The investigation authority shall have a documented process for assessing individual occurrences in order to determine the scope and depth of its investigations and the assignment of available resources. Factors that would influence such decision-making would include the potential for the investigation to result in safety improvements, the available investigative resources, national interests, national and international obligations and commitments, and media and public expectations.

1.5 RESPONDING TO NOTIFICATIONS

1.5.1 The investigation authority must respond immediately to notifications of accidents and incidents. The authority should maintain response plans and a ready posture, and have the capability to act upon these notifications on a twenty-four-hour basis.

1.5.2 The investigation authority's plans for responding to notifications should consider the following:

a) an immediate review of the information in the notification to ensure that all the required information has been provided;

b) the collection of missing or additional information, as soon as possible;

c) the validation of the information collected, to the degree possible;

d) an assessment of the information received and the circumstances of the occurrence to determine the classification of the occurrence (accident, serious incident or incident) and the scope and size of the investigation to be conducted;

e) the appointment of an Investigator-in-charge;

f) the notification of national authorities, local authorities, States and other organizations that may be involved in or have an interest in the occurrence; and

g) the allotment of resources (financial, equipment and personnel) to the investigation.

1.5.3 The investigation authority's immediate response to notifications will facilitate the immediate response of local authorities (judicial power, fire and police departments) and the prompt arrival on site of investigators. The following tasks should be accomplished without delay, in coordination with the Authority that has the jurisdiction of the place of the accident in order to be able to proceed with the necessary measures for:

a) securing the occurrence site, aircraft, wreckage, and other equipment involved to ensure their preservation, including protection against further damage, and the deterioration or disappearance of essential evidence due to theft, displacement or improper handling of the wreckage;

b) taking steps to preserve, through photography or other appropriate means, any evidence of a transitory nature, such as ice or soot deposits, corrosion of the wreckage, obliteration of ground scars, or contamination;

c) obtaining the names and addresses of all witnesses whose testimony may aid in the investigation – obtaining early statements from these witnesses could limit the risks that their accounts of the occurrence will become contaminated over time;

d) initiating the collection and securing of all records associated with the occurrence flight (for example crew, aircraft, and air traffic services); and

e) forming of the investigation team and dispatching the members of the team to the occurrence site.

f) In case that the investigation organism needs to count with the participation of an ARCM investigator, this should coordinate and take primary action until the ARCM investigator presents in the place of the occurrence.

Chapter 2

SIZE AND SCOPE OF THE INVESTIGATION

2.1 GENERAL

2.1.1 It is essential that the magnitude of the tasks and the scope of the investigation be assessed at an early stage so that the size of the investigation team can be planned, and the appropriate expertise can be acquired for the investigation. To achieve its purpose, the investigation should be properly organized, carried out, coordinated and supervised by qualified technical personnel.

2.1.2 Based on its assessment of the information contained in the notification and any other information available, the investigation authority must first decide on the type and scope of investigation and appoint the Investigator-in-charge. The Investigator-in-charge then becomes directly responsible for organizing the investigation team and for assigning responsibilities to its members.

2.1.3 Throughout the investigation, the Investigator-in-charge will manage the progress of the investigation. Specifically, the Investigator-in-charge must review the evidence as it is developed and make decisions that will direct the extent and depth of the investigation. It should be recognized that the precise extent and depth will be contingent upon the nature of the occurrence and, possibly, upon the availability of investigative resources.

2.1.4 Similarities between occurrences may tempt the unwary to arrive at premature conclusions. It is imperative that each investigation be approached individually based on the circumstances of the occurrence. Based on the evidence uncovered by the on-site investigation, it may be possible to eliminate certain areas from possible causal consideration at a fairly early stage during the investigation. As the investigation progresses, however, the need for extensive studies in one or more particular fields might become evident. It should be noted that this later statement or the various sections of this manual that follow are not intended to convey the impression that extensive technical studies need to be performed in every investigation or that every investigation needs to cover every aspect of the aircraft and its operation.

2.2 MAJOR ACCIDENT INVESTIGATION

2.2.1 In a major accident investigation, a substantial team of investigators is usually necessary to cover all aspects of the occurrence. The Investigator-in-charge should establish working groups, as required, to cover various functional areas of the investigation. Normally, investigators from the State conducting the investigation will head the various working groups. The membership of such groups may include, as appropriate, other investigators from the investigation authority conducting the investigation, from the investigation authorities of the States involved in the occurrence, from the ARCM when requested, as well as experts from the operator and the manufacturers of the aircraft, powerplant and accessories, who can contribute their technical knowledge and experience to the investigation. The number of groups, and the number of personnel assigned to each group, will depend on the type and complexity of the accident.

2.2.2 Nothing precludes using the major accident investigation procedures for the investigation of serious incidents or accidents involving a small aircraft.

2.2.3 In some investigations, the apparent causes/contributing factors may become evident early in the

investigation. In such situations, the subsequent prime investigative effort may then be channelled to good effect into a relatively narrow but specialized area. Nevertheless, it will still be necessary to investigate all factors that might have contributed to the accident and to eliminate those factors that did not. Whenever possible, system latent conditions should be identified for the respective assessment, and recommend mitigation actions. In situations wherein the causes are not readily apparent, the investigator must progress steadily through all aspects of the occurrence, and this type of situation may require substantive effort of many groups of investigators working in a balanced and coordinated manner.

Note.- Chapter 4 of this manual provides more specific guidance on the investigation of major accidents.

2.3 SMALLER INVESTIGATIONS OF INCIDENTS AND ACCIDENTS

2.3.1 In the case of incidents and non-major accidents, the investigative effort required in terms of manpower and resources may be proportionately smaller than that required for a major accident. In such situations, the smaller investigation might be handled by one or two investigators. One group of investigators can be assigned responsibilities normally assigned to two or more groups, or alternatively, one trained investigator can conduct the investigation assisted by one or more subject-matter experts.

2.3.2 Most investigations into serious incidents may be conducted by a small investigation team. Notwithstanding, this does not preclude investigating a serious incident using a larger investigation team and following the guidance for major investigations contained in section 2.2 and in Chapter 4 of this manual.

2.3.3 Even in small investigations, the degree of individual effort and diligence in accurately recording the facts and developing the analysis and conclusions must be of the same high standards as for major accident investigations.

Note.- Chapter 5 of this manual provides more specific guidance on the investigation of incidents involving any aircraft, or into accidents involving a small aircraft.

Chapter 3

INVESTIGATION RESPONSIBILITIES

3.1 GENERAL

3.1.1 The investigation authority has overall responsibility for the investigation and the investigation final report, including those investigations that have been delegated to other States or to the ARCM, therefore ensuring the necessary funds for the investigation. In practice, the authority delegates the day-to-day conduct of the investigation to the appointed Investigator-in-charge, who will be in every case an investigator from the AIG authority in charge of the investigation.

3.1.2 The Investigator-in-charge must keep the authority apprised of any major shift in the size and scope of the investigation and of any other situations that may result in a significant change to the resources required for the investigation.

3.1.3 The following sections provide an overview of the typical responsibilities of investigation team members of a major investigation. The Major Accident Investigation Guide (MAIG) in Appendix 6 of this manual provides more information on these responsibilities.

3.1.4 For smaller investigations, the Investigator-in-charge should be responsible for the managerial, administrative and support responsibilities. The remaining responsibilities listed in section 3.3 “Group Responsibilities”, if pertinent to the investigation, should be divided amongst the Investigator-in-charge and the other available investigators.

3.2 INVESTIGATOR-IN-CHARGE

3.2.1 The Investigator-in-charge is responsible for the day-to-day management and conduct of the investigation. During the pre-field phase, the Investigator-in-charge must determine the human, technical and financial resources needed for the investigation and must establish the investigation team that will work in the accident. During the field phase, the Investigator-in-charge is responsible for the conduct and control of the investigation, including defining the scope of factual information to be gathered. During the later phases of the investigation, when the significance of the established facts is under consideration, the Investigator-in-charge must consolidate the group reports, analyse the information, and draft the Final Report.

3.2.2 The Investigator-in-charge should liaise and coordinate investigation activities with other organizations, agencies and parties; enter into necessary informal agreements to facilitate the coordination; recognize and authorize observer/participant status; act as the investigation spokesperson; and, in the absence of established standards, procedures or instructions, take appropriate action, as necessary.

3.2.3 The Investigator-in-charge should have authority over all the members of the investigation team during the field phase of the investigation while they are away from their usual place of work. As such, the Investigator-in-charge should have the power to take administrative action, which includes authorizing travel expenses and overtime, approving. leave, and authorizing the issuance of equipment. The Investigator-in-charge should also have the authority to give out contracts and to engage in other necessary financial commitments.

3.3 SUPPORT COORDINATORS

3.3.1 Support coordinators are usually individuals belonging to the investigation authority of the State conducting the investigation. The coordinators support the Investigator-in-charge in all endeavours, act in direct support of the investigation process, and liaise with different groups, organizations and States. Coordinators who could be involved in a major investigation include: the deputy Investigator-in-charge, head office coordinator, administration coordinator, public relations coordinator, and site safety coordinator.

3.3.2 The **Deputy Investigator-in-charge** assists the Investigator-in-charge in the organization, conduct and control of the investigation. He also provides continuity in the investigation process when the Investigator-in-charge is absent.

3.3.3 The **Head Office Coordinator** assists the Investigator-in-charge in coordinating internal and external support for investigators in the field and in keeping the States, ARCM and various agencies involved in the occurrence informed as to the progress of the investigation.

3.3.4 The **Administration Coordinator** provides administrative support to the investigation team, including the establishment of a secure on-site office for the collection, retention and distribution of material collected during the on-site investigation.

3.3.5 The **Public Relations Coordinator** provides expertise and advice to the Investigator-in-charge concerning the handling of the media and their requests, arranges media events, provides advice on community relations, assures that media requests and community queries are followed up, and promotes a positive public image for the accident investigation authority. On occasion, the public relations coordinator may be appointed as the spokesperson on the following: the investigation authority's mandate, its investigation process, and on previously released investigation information.

3.3.6 The **Site Safety Coordinator** ensures that all the activities at the accident site are properly coordinated with specific emphasis on site and investigation team security and safety. This role should include, but not necessarily be limited to, the following:

a) reviewing the cargo manifest and working with local safety officials as necessary;

b) conducting an initial assessment of the circumstances of the accident site(s), the geography and condition of the site(s), and the hazards that exist, including biohazards;

c) defining the boundary(ies) of the site(s) required for the investigation, and the hazardous zones within the site(s);

d) on behalf of the investigation authority coordinate with the competent police authority for the custody of the site(s);

e) taking action to mitigate the risks within the site(s), to the degree possible;

f) determining the safety equipment and safety procedures for investigators operating on the site; and

g) establishing and maintaining the safety of operations and of personnel at the accident site(s).

3.4 INVESTIGATION GROUPS

3.4.1 General

3.4.1.1 The investigation groups can typically be divided into two categories: the operational category and the technical category. The operational category may include the following groups: Operations; Aircraft Performance; Medical/Human Factors; Witness; Flight Recorders[1]; Meteorology; Air Traffic Services/Airport; Survivability; and Cabin Safety. The technical category may include the following groups: Maintenance and Records; Systems; Structures; Powerplants; Site Survey; Crashworthiness; and Photo/Video.

3.4.1.2 Depending on the circumstances of the occurrence and the number of qualified personnel available to carry out the investigation, it may be impractical to approach each investigation with a full investigation team; therefore, some groups may be combined and/or some groups may be eliminated altogether. The Investigator-in-charge will ultimately determine the investigation team composition. A group chief will be responsible for all the activities of his group for the whole period of the investigation. Normally, the activities of the various groups cease when their group reports are completed and submitted to the Investigator-in-charge.

3.4.2 Operations Group

3.4.2.1 The Operations Group is responsible for collecting the facts concerning the history of the flight and the flight crew activities before, during and after the accident/incident. This includes the man-machine relationship and the actions or inactions present in the events surrounding the accident. It also includes flight planning, dispatch, mass and balance, weather and weather briefing, radio communications, air traffic services, navigation facilities, en-route stops, refuelling, flight experience, flight checks and general information concerning the flight crew. It also includes all aspects of training received and an assessment of the adequacy of this training; the level of supervision, including orders, regulations and manuals; and, the performance of supervisors, instructors and company management. The medical history of the flight crew, including any recent illnesses, psychological factors, rest periods, and activities, particularly during the seventy-two hours prior to the accident, should be determined. This latter aspect of the investigation should be coordinated with the Medical/Human and Organizational Factors Group. The Operations Group should also determine the flight path prior to the accident or incident. In this effort, it is essential to coordinate with the Witness Group, the Flight Recorder Group, and the Site Survey Group.

3.4.2.2 There are occasions when it is desirable to form additional groups to take over some of the functions of the Operations Group.

3.4.3 Aircraft Performance Group

An Aircraft Performance Group may be formed when there is a need for an in-depth examination of the aircraft performance characteristics that may have been causal to the accident. This group will gather the information on aircraft performance for the particular phases of flight and complete a scientific/mathematical analysis. This group will coordinate with most of the operational and technical groups to gather the basic information and will determine if there is a need to conduct performance-related flight tests or simulator tests.

1. Depending on the circumstances of the occurrence, it may be appropriate to establish the Flight Recorders Group as a technical group.

3.4.4 Medical/Human and Organizational Factors Group

3.4.4.1 Support regarding the investigation of medical and human and organizations factors issues would be achieved by assigning the subject-matter experts to the investigation group(s) requiring such assistance. A separate Medical/Human Factors Group would only be formed when there is a requirement to conduct an in-depth examination of the aero medical, crash injury, and/or human performance issues.

3.4.4.2 For human factors issues, this group would be responsible for gathering and analysing evidence on the general physical, physiological and psychological conditions, the environmental factors, and the organizational and management factors that might have adversely affected the crew or other individuals in the performance of their duties. The investigation of human factors should be conducted always, which would include the performance of, among others, cabin crew, air traffic controllers, maintenance crew, engineers, regulatory officials, decision-makers and the organization.

3.4.4.3 For medical issues, this group would be responsible for gathering and analysing evidence associated with the pathological, aviation-medical and crash-injury aspects of the investigation, including the identification of the crew, their location at the time of the accident, and by reviewing their injuries, their position and their activity in the cockpit at the time of the impact. This group will cover matters involving autopsies of crew and passengers, as appropriate, not only to identify the victims and to assist in legally determining the cause of death, but also to obtain all possible medical evidence which may be of assistance in the investigation. The group will also investigate the design factors related to human engineering that may have contributed to the causes of the accident, the survival aspects, and the crashworthiness of the aircraft contributing to the injury or death of the occupants.

3.4.4.4 The functions of the Medical/Human and Organizational Factors group must be closely coordinated with the Operations Group, Air Traffic Services/Airports Group, Witness Group, Recorders Group, Maintenance and Records Group, Structures Group and Crashworthiness Group.

3.4.5 Witness Group

The Witness Group is responsible for contacting and interviewing all survivors of the flight, and all persons who may have seen or heard some portion of the flight, or who may have knowledge concerning the flight or of the weather conditions at the time of the accident. The group's activity can range from questioning relatively few witnesses to a door-to-door activity covering great distances along the flight path in which hundreds of possible witnesses are interviewed. Information concerning observed positions, heights, altitudes, sounds, aircraft behaviour and in-flight disintegration can be gathered in this manner. The location of witnesses at the time of the accident should be plotted on a suitable map of the area. Whilst interviewing witnesses, close coordination must be maintained with the Operations Group, the Flight Recorder Group and the Site Survey Group in determining the flight path. In some instances, interpretation and translation facilities have to be provided for the interview of witnesses.

3.4.6 Flight Recorders Group

3.4.6.1 The Flight Recorders Group is responsible for examining and analysing the on-board and ground-based flight recorders, including the flight data recorders, cockpit voice recorder(s), and cockpit airborne image recorders. The Group will arrange through the Investigator-in-charge for their read-out. The calibration of the parameters in the flight data recorder must be taken into consideration in the interpretation of such read-outs; this work will often require coordination with manufacturers, vendors, or the operator(s) to ensure proper conversion of the parameters. The results of the read-outs must be closely coordinated with the Operations Group and such other groups as the circumstances indicate.

3.4.6.2 Due to the importance of flight recordings, extreme care must be taken in handling the recorders to prevent damage. Only fully qualified personnel should be assigned to recover and handle the recorders. Handling and transportation of the flight recorders from the accident site to the read-out facilities should be carried out by a member of the investigation authority.

3.4.6.3 The Flight Recorders Group may also be responsible for recovery and analysis of information contained on other aircraft computers (for example, flight management systems, traffic collision avoidance system, and terrain awareness and warning system), on memory units containing satellite navigation information, and on other portable electronic recording devices that can store some data related to the accident. The group may also be responsible for collecting and synchronizing flight data, audio and video information stored on ground-based devices.

3.4.7 Meteorology Group

When the weather is an important factor in an accident, a separate Meteorology Group, composed of meteorology and operations specialists, can best serve the investigation. The Meteorology Group is responsible for the collection and compilation of meteorological data pertinent to the accident, including both surface and upper air reports of actual conditions, pilot reports, recorded meteorological data, as well as forecasts of anticipated conditions prepared and issued by the agencies involved. This group is also responsible for investigating the systems, sensors, equipment and processes used to generate and provide weather information. Of necessity, the Meteorology Group must maintain close coordination with other groups, particularly the Operations Group, the Air Traffic Services/Airports Group and the Witness Group.

3.4.8 Air Traffic Services and Airport Group

3.4.8.1 When air traffic services or navigation aids are involved in the occurrence, the Air Traffic Services and Airport Group, which should include air traffic services specialists, should be established. This group is responsible for the review of the records of the air traffic services units concerned, including radar screen recordings, the radio communication and telephone line voice recordings; and, for the verification that written transcripts of voice communications are consistent with the recordings. This group should provide, when appropriate, a reconstruction of the history of the flight based on air traffic services information. In addition, the Group should determine the operating status of pertinent navigation aids, communications equipment, radar, transponder equipment, computers, and other equipment; and, should provide technical data on all such equipment and its operation, whenever it is deemed necessary.

3.4.8.2 When applicable, this group should investigate the operational status of the airport, pertinent navigational aids, communications equipment, radar, transponder equipment, and computers, and provide technical data on all such equipment and its operation.

3.4.9 Survivability Group

When required, the Survivability Group will be established to investigate the evacuation, the crash response, the firefighting, the survival and the rescue issues. The activities of this group include an examination of the respective equipment and of the manner in which it was used. Close coordination with the Human Factors Group, Operations Group and Cabin Safety Group will be required. This group could also logically be a sub-group of the Medical/Human and Organizational Factors Group.

3.4.10 Cabin Safety Group

The Cabin Safety Group is responsible for thoroughly exploring all the aspects of the accident related to the actions of the passengers and cabin crew members. This will normally include the following aspects:

passenger/crew member survivability factors; company policies and procedures as they relate to passenger/crew member safety; industry policies, procedures and regulations; and flight attendant training with respect to operational safety issues.

3.4.11 Maintenance and Records Group

The Maintenance and Records Group is responsible for reviewing the maintenance records to ascertain the maintenance history of the aircraft regarding adequacy of inspection, malfunctions that might be related to the occurrence, flight time on the aircraft, engines and components, and the flight time since overhaul. These activities are normally performed at the maintenance base of the operator. The function of this group involves close coordination with the other technical investigation groups, the State of Registry and the operator. This group is also responsible for reviewing recovered technical flight documents. Close coordination with the Operations Group will be required.

3.4.12 Systems Group

The Systems Group is responsible for the detailed examination of all systems and components, among others hydraulics, pneumatics, electrical and electronics, radio communication and navigation equipment, air conditioning and pressurization, ice and rain protection, cabin fire extinguishers, and oxygen. The examinations will include determination of the condition and operational capabilities of components. It is important that all system components be accounted for, within reason. The examination includes determination of the positions of associated controls and switches, as well as the identification and downloading of data contained in built-in test equipment. This group must coordinate its activities with the Flight Recorders, Operations, Site Survey, Maintenance and Records, Structures and Powerplants groups.

3.4.13 Structures Group

3.4.13.1 The Structures Group is responsible for collecting and analysing the facts and evidence related to the airframe and flight controls. If the wreckage is scattered, the Group's first concern is to locate and identify as many sections, components and parts as possible and to plot their positions on a wreckage distribution chart.

3.4.13.2 A reconstruction of the aircraft structure may be necessary, and this task could vary from laying out various pieces of wreckage on a flat area to the more complicated re-assembly of all available pieces in position on a framework. This procedure is most often used for in-flight break-up, in-flight fire and explosion type accidents. The main purpose of such a reconstruction is to identify the point of initial failure and to establish the progression of the break-up pattern. Close cooperation with the Site Survey Group is usually required.

3.4.14 Powerplants Group

The Powerplants Group is responsible for collecting and analysing the evidence related to the engine(s), including fuel and oil systems, propeller(s) and powerplant controls. The initial work of this group may be carried out in conjunction with the Structures Group and the Site Survey Group in the locating and plotting of wreckage. All powerplant fires should be investigated. This group is also responsible for determining the type of fuel used, the possibility of fuel contamination, and the effectiveness of the powerplant fire extinguisher system. The functions of this group must be coordinated with the Site Survey, Structures, Systems, Flight Recorders and Operations Groups.

3.4.15 Site Survey Group

The Site Survey Group is responsible for producing, in pictorial and graphic format, a description of the accident site, showing the location and distribution of the wreckage, human remains and other associated items, such as impact marks. This group must establish a probable flight path, an impact angle and impact speed. The activities of this group are linked to the Aircraft Performance Group, Structures Group and Recorders Group.

3.4.16 Crashworthiness Group

The Crashworthiness Group is responsible for determining the survivability issues for all aircraft occupants. The activities of this group will overlap with those of the Structures Group, Site Survey Group, Survivability Group, Flight Recorders Group and Witness Group. This group is often a sub-group of the Structures Group.

3.4.17 Photo/Video Group

The Photo/Video Group is responsible for ensuring that a systematic photographic/video record of the accident is created. This group would also provide photo/video support to the other groups during the field phase and post-field phase, including the documentation of teardowns, examinations and testing of components, and the analysis of photo/video records. This group is often a sub-group of the Site Survey Group.

3.5 ARCM INVESTIGATOR/EXPERT

3.5.1 An ARCM investigator/expert is that designated by the ARCM General Board Chairman through the ARCM General Coordinator to participate in an accident investigation upon request of the State of the occurrence, member of the ARCM. The investigator/expert would have the same prerogatives that those of a local investigator for carrying out the accident investigation or participating of o group of experts of a determined area.

3.5.2 The ARCM investigator/expert should depend of the investigator in charge of the investigation, and could provide the necessary advisory to proceed in an effective way.

3.5.3 In case that the investigating authority does not count with qualified personnel to assume as investigator in charge, the ARCM should be request that the investigator assigned to the investigation should have the necessary qualifications and experience to perform this function. In this case, the ARCM investigator should be in charge of the investigation, but the investigating authority will continue having the responsibility of the investigation.

3.6 ACCREDITED REPRESENTATIVES

3.6.1 Each accredited representative is the official representative of his State and, as such, is responsible for ensuring the safety interests of his State in the investigation. Accredited representatives are the essential links between the State conducting the investigation and the States that have a direct interest in the occurrence. The State of Registry, the State of the Operator, the State of Design, the State of Manufacture and any other State that, on request, provides information, facilities or experts are usually represented by an accredited representative. Chapter 5 to Annex 13 specifies the conditions under which these States are entitled to appoint an accredited representative, including the accredited representative's obligations and rights of access to, among others, the scene of the accident, the relevant evidence, and all pertinent documents. The essential guide in the conduct of investigations, in which accredited representatives participate, is comprised of a spirit of cooperation, participation, access to all relevant information, mutual trust and consultation.

3.6.2 Ideally, the accredited representative(s) should arrive at the accident site with the least possible delay. For this purpose, ICAO Annex 9 relating to Facilitation, provides for the temporary entry into a contracting State for the purpose of participation in an accident investigation. In normal circumstances, the accredited representative should be well advised to proceed directly to the accident site and to make contact with the Investigator-in-charge. Upon the arrival of the accredited representative, the State conducting the investigation should have already received a communication indicating the nomination of the accredited representative and the date of his arrival. During the investigation, the accredited representative should maintain close contact with the Investigator-in-charge rather than participate in a particular group. In this way, he should have an overall appreciation of all the facts relating to the accident and can be most responsive to the needs of the investigation. He should be considered free to communicate investigation information to his own government authorities; however, he must not divulge information on the progress and the findings of the investigation without the express consent of the Investigator-in-charge, exercising considerable care to ensure the preservation of the confidential nature of any information. To this end, the accredited representative should take appropriate precautions to ensure the proper transmission and handling of sensitive investigative information. In some situations, the accredited representative should be well advised to use the communications facilities that might be available at the nearest diplomatic or consular establishment of his government, since the security of communications by email, facsimile or other public services cannot be guaranteed.

3.6.3 Upon the arrival of an accredited representative, the Investigator-in-charge should provide him with a thorough update on the investigation and provide copies of all relevant information and pertinent documents. The Investigator-in-charge should also ensure that the investigation personnel, particularly the Group chiefs are introduced to the accredited representatives and their advisers, and are made aware of their rights and responsibilities.

3.6.4 On those occasions when the Investigator-in-charge requires documents or information, or requires aircraft component examinations to be carried out in the State of Registry, the State of the Operator, the State of Design, the State of Manufacture, or in any other State, it is the responsibility of the accredited representative to endeavour to comply with the request and to use his authority in his own State to ensure that the request is met in so far as it is compatible with the policies of his government.

3.6.5 During the later stages of the investigation, in which the significance of the established facts are under examination, it is desirable that the accredited representative be kept fully informed and invited to express his views, in particular when conclusions are being developed which bear upon persons, organizations, or activities within his State.

3.7 ADVISERS TO ACCREDITED REPRESENTATIVES

3.7.1 An adviser to the accredited representative is a person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation. A State that is entitled to appoint an accredited representative shall also be entitled to appoint one or more advisers to assist the accredited representative in the investigation. Normally, advisers will be representatives of the aircraft operator, aircraft manufacturer, and the Civil Aviation Administration (CAA).

3.7.2 Advisers assisting accredited representatives shall be permitted, under the accredited representatives' supervision, to participate in the investigation to the extent necessary to enable the accredited representatives to make their participation effective. In addition, advisers may be invited by the Investigator-in-charge to provide their expert knowledge to one or more groups of the investigation.

3.8 OBSERVERS/PARTICIPANTS

3.8.1 Observer[2] or participant[3] status is a privilege granted by the State conducting the investigation to a person having a direct interest in the investigation and who has the expertise to contribute to achieving the objective of the investigation. Among others, the following persons may be granted observer/participant status: persons representing a State department or agency, the aircraft owner and operator, union or employee associations, the flight crew involved in the accident.

3.8.2 The Investigator-in-charge should advise all the observers/participants in writing of their rights and responsibilities. In this regard, the investigation authority should have a letter of appointment that stipulates the terms and conditions of being granted observer/participant status. The letter of appointment should be signed by both the observer/participant and the Investigator-in-charge.

2. An observer would be a representative of an involved government department who is authorized by the authority to attend an investigation as an observer.
3. A participant would be a person authorized by the authority to participate in an investigation because in the opinion of the authority that person has a direct interest in the subject matter of the investigation and has the expertise to contribute to achieving the authority's objective.

Chapter 4

MAJOR ACCIDENT INVESTIGATIONS

4.1 GENERAL

4.1.1 The investigation into a major accident routinely requires a substantial team of investigators to cover all aspects of the occurrence. This team should be led by an Investigator-in-charge who has a thorough understanding of applicable national legislation and regulations; a sound understanding of the international standards, recommended practices, requirements, guidelines and protocols; and, experience in the conduct of investigations into accidents involving large aircraft.

4.1.2 The Investigator-in-charge should normally be a senior investigator of the investigation authority of the State responsible for the investigation, or an investigator designated by the ARCM and approved by the State in charge of the investigation. The Investigator-in-charge is responsible for the management and conduct of all aspects of the investigation from the start of the investigation to the time the Final Report is submitted for approval to the State investigation authority.

4.1.3 The size and scope of the investigation and the size and organization of the investigation team should be based on the circumstances of the accident. In this regard, the Investigator-in-charge should consider establishing working groups, as required, to cover various functional areas of the investigation. The number of groups and the number of personnel assigned to each group will depend on the type and complexity of the accident. Normally, investigators from the State conducting the investigation or from the ARCM, when these are requested, will head the various working groups. The members of such groups may include, as appropriate, other investigators from the investigation authority conducting the investigation and from the investigation authorities of the States involved in the occurrence, as well as experts from the operator and the manufacturers of the aircraft, powerplant and accessories, who can contribute their technical knowledge and experience to the investigation. It is preferable that accredited representatives not be assigned to a particular group because such an involvement may adversely affect the accredited representatives' availability and primary responsibilities to their States and to the Investigator-in-charge.

4.1.4 Chapter 5 of Annex 13 details the responsibilities and entitlements of the States involved in an investigation. National legislation and regulations of the State conducting the investigation should contain similar information. In summary and in part, members of an investigation group should have access to all relevant information uncovered in the course of the investigation and should be required to continue in the investigation until the group report is completed. Supporting experts should normally have access to the information necessary for them to advise in their area of expertise.

4.1.5 A major accident is always a significant event that may challenge the competency of the State investigation authority. The credibility of the State investigation authority, its investigation and its Final Report and recommendations will hinge on the independence of its investigation and on its ability to communicate investigation information in timely fashion to those entities having an interest in the investigation, including entities external to the investigation such as survivors, families of victims, and the media. No investigation information should be released without the express approval of the State responsible for the investigation. In most situations, the Investigator-in-charge is delegated this authority, or in the public relations coordinator.

4.2 RESPONDING TO A NOTIFICATION

4.2.1 Immediate notification of accidents to the accident investigation authority is essential because the proper conduct of an investigation requires the prompt arrival of investigators at the accident site. Any delay in their arrival may result in the deterioration or disappearance of essential evidence, displacement or improper

handling of the wreckage, corrosion of the wreckage, and obliteration of ground scars. (Section 1.5 of this manual provides a list of the factors that should be considered by the Investigator-in-charge when responding to notifications.)

4.2.2 For the case of a major accident, communication difficulties and significant travel times may delay the arrival of accredited representatives, advisors, operators and manufacturers at the accident location. In addition, loss of contact with entities while travelling may unnecessarily delay the formation of the investigation team and the initiation of the field phase of the investigation. In this regard, an accredited representative should provide the Investigator-in-charge with his enroute contact information, and with the contact information of an alternate point-of-contact for the travel period.

4.3 SECURING DOCUMENTATION

4.3.1 From the early stage in the investigation, it is important to secure the operational and maintenance documents of the accident aircraft and all other documents relevant to the occurrence. What documents will be required for the investigation depends on the nature of the accident. The Investigator-in-charge, as soon as possible, must decide what documents need to be obtained and must ensure that the relevant organizations are contacted and requested to collect the documents.

4.3.2 The operator, maintenance facility, air traffic services and airport service providers, civil aviation authorities, and meteorological services are examples of organizations that should be contacted as soon as possible to collect and secure documents necessary to the investigation. Typically the Investigator-in-charge or a person delegated by him will contact the applicable organizations preferably by telephone, or by e-mail or any other suitable means, to request that required documents and recordings be secured. For more guidance as to the typical documentation to collect, refer to the applicable sections of the *Investigations Management System Event Checklist* and the *Major Accident Investigation Guide* – both documents are appendices to this manual.

4.3.3 The Investigator-in-charge should remind the accredited representatives, the air operator and the manufacturers that the requested documents are needed urgently. These documents either could be provided electronically via email or, alternatively, could be transported to the accident location as personal baggage on board aircraft.

4.4 FIELD PHASE OF THE INVESTIGATION

4.4.1 When arriving at the site of the occurrence, investigators should meet leaders of firefighting and rescue teams, police, and other officials to determine the accident site situation regarding who has control, what has been done, and what has not been done. Before taking control of the site, the Site Safety Coordinator on behalf of the Investigator-in-charge, should assess the circumstances of the occurrence, the geography and condition and boundaries of the site, the hazards that exist, and the coordination requirements for ensuring the security and safety of the site. When ready to take control of the site, the Site Safety Coordinator should establish site boundaries, security, and access control procedures, and should request the competent police authority to apply them.

4.4.2 The size and organization of the investigation team should be based on the circumstances of the accident, the complexity of the investigation and the areas that will require significant investigation resources. The Investigator-in-charge must determine, first, the expertise requirements for the investigation; second, the expertise available within the authority; third, the expertise shortfalls; and fourth, how to fill the expertise gaps. Most of these expertise gaps should normally be filled using investigators from the State investigation authorities involved in the occurrence, the ARCM, and subject-matter experts from the involved operator and manufactures. The number of groups and the number of personnel assigned to each group will depend upon the type and complexity of the accident. The Investigator-in-charge should appoint a chief to head each

investigation group.

4.4.3 The investigation groups in a major investigation may include the following: Operations, Maintenance and Records, Site Survey, Aircraft Performance, Survivability, Cabin Safety, Crashworthiness, Photo/Video, Medical/Human and Organizational Factors, Structures, Systems, Powerplants, Flight Recorders, Witnesses, Meteorology, and Air Traffic Services/Airport. Examples of typical group structures can be found in Appendix 1 to this manual.

4.4.4 To manage the investigation effectively, the Investigator-in-charge must be kept informed as to the progress of the investigation. In this regard, open communications between all members of the team is paramount. To achieve this objective the Investigator-in-charge should consider the following:

a) As soon as possible after arriving at the accident location, he should hold an organizational meeting. During this meeting the Investigator-in-charge will assign responsibilities to the investigation groups.

b) On a daily basis, hold end-of-day investigation team meetings. The purpose of these meetings should be to determine the progress and status of the investigation, to identify strategic issues affecting the investigation, and to identify any significant safety issues.

c) At the end-of-day meetings, the chief of each investigation group should report on the significant work completed, important factual information determined, important work not completed, important information that is missing, any safety issues uncovered, the next day's planned investigation activities, and the group's revised investigation plan.

d) At the end-of-day meeting, the Investigator-in-charge should adjust the investigation plan according to actual circumstances.

4.4.5 For more guidance on assigning responsibilities (tasks) to investigation groups, on tracking the progress of the investigation, and on the typical documentation to collect during the field phase of the investigation, refer to the *Investigations Management System* and the *Major Accident Investigation Guide*. More detail on these investigation tools can be found in sections 4.7 and 4.8 of this chapter.

4.4.6 Prior to leaving the occurrence site, the Investigator-in-charge should consider the following:

a) chiefs of each investigation group should collect copies of any photos and reports prepared by team members; prepare a group field report of work completed and the work that still needs to be done; identify all potential safety issues, including the plans to validate them; and, coordinate the collation and archiving of all documents, recordings and components;

b) review group field-phase reports and review the status of group checklists and of the post-field-phase investigation plans, including the required tasks and deadlines;

c) update the investigation plan, including investigation tasks completed, investigation work remaining;

d) hold a final team meeting during which tasks and deadlines should be assigned to the chief of the investigation groups;

e) ensure that all required wreckage of interest has been removed from the site; that all wreckage no longer required for the investigation has been returned to the rightful owners; and, that the responsibility for the accident site has been passed to the appropriate local authority or the owner of the aircraft.

4.5 POST-FIELD PHASE OF THE INVESTIGATION

4.5.1 Subsequent to the field phase, significant investigation work remains, and the Investigator-in-charge must work diligently to maintain and manage the progress of the investigation. In general, the post-field phase involves the continued collection and validation of evidence; the examination of all pertinent personnel, company, aircraft, facility, government and other records; the examination of selected wreckage in the laboratory; the testing of selected components and systems; the reading and analysis of recordings; the conduct of further interviews; the determination of the sequence of events; the analysis of all investigation information; and completion of technical and group reports, if any. The post-field phase can take many months, depending on the size and complexity of the investigation.

4.5.2 It is always a challenge to ensure that the investigation continues to progress following the field phase, for the most part because the members of the investigation team are no longer centrally located, and subject matter expertise is no longer readily available. As a result, the group chiefs and the Investigator-in-charge will have to increase their efforts to maintain communication with team members and to ensure that investigation tasks are completed on time. In this regard, the Investigator-in-charge should have frequent, regularly scheduled, decision-oriented team meetings, and have additional meetings for significant issues or for issues that will require a change to the investigation plan. Specifically, it is prudent for the Investigator-in-charge to convene an investigation planning meeting soon after the team returns from the accident scene. The meeting should be attended by the group chiefs and senior management and should provide for a discussion of the scope of the investigation, the primary issue areas, and the scheduling of future investigative tasks. All team members should understand that they do not have to wait for a meeting to communicate significant, new information.

4.5.3 To ensure the continued progress of the investigation, the Investigator-in-charge should ensure that all team members regularly refer to the *Investigations Management System Event Flow Chart* and the applicable sections of the *Investigations Management System Event Checklist*.

4.6 INVESTIGATION REPORTING

Reporting — General

4.6.1 Timely and effective release of investigation information, including preliminary and other reports, interim statements, final reports and safety recommendations, is important to ensure that those involved and/or implicated in the occurrence are kept informed of the progress of the investigation and of the safety deficiencies uncovered.

Safety recommendations

4.6.2 Annex 13 requires that at any stage of the investigation of an accident, the accident investigation authority of the State conducting the investigation shall recommend to the appropriate authorities, including those in other States and the ARCM, any preventive action that is considered necessary to be taken promptly to enhance aviation safety in the region. Consequently, safety recommendations can be made any time during the investigation or be made in the safety recommendations part of the Final Report.

4.6.3 Safety recommendations should describe the safety problems and provide justification for the recommended safety actions. A safety recommendation should identify what actions to take, but leave scope for the authorities responsible for the matters in question to determine how to accomplish the objective of the recommendation. (More information on safety recommendations is contained in the ARCM . Manual on

aircrafts accidents and incidents investigation reporting)

4.6.4 The safety recommendations made during the investigation, as well as the preventive actions taken in response to these recommendations, should be presented in the safety recommendations part of the Final Report. Publishing the preventive actions taken has significant value for accident prevention for other authorities involved in similar operations; therefore these publications will be shared by the ARCM with its State members.

Final Report

4.6.5 The Final Report of an investigation, including its recommendations, is the catalyst for preventing further occurrences. Therefore, the Final Report must establish in detail what happened, how it happened and why it happened. For reporting on small investigations, abbreviated report formats have created, which only contain the history of flight, information on the deficiencies discovered by the investigation, analysis of the factors contributing to the occurrence, and findings related to the deficiencies. The findings and the causes/contributing factors of Final Reports should usually lead to safety recommendations so that appropriate preventive actions can be implemented, and disseminated similarly to major investigations..

4.6.6 The Investigator-in-charge and the group chiefs should refer to the following documents related to the production of the Final Report:

a) Annex 13, Chapter 6 contains the Standards and Recommended Practices on the consultation process and the release of the investigation Final Report;

b) the Appendix to Annex 13 details the format of the Final Report; and

c) the ARCM Manual on aircrafts accidents and incidents investigation reporting , provides detailed guidance on completing each section of the Final Report.

4.7 INVESTIGATION MANAGEMENT SYSTEM (IMS)

4.7.1 In the case of an accident investigation involving a large or complex aircraft (major investigation), a large team of investigators is usually required to conduct the investigation in the most effective and expeditious way. The effective management of a major investigation requires a management system based on a comprehensive plan, checklists, and a method and flow charts to track the progress of the investigation. In effect, a major investigation is a project that must managed. This section of the manual presents one such project management system, called the “Investigation Management System.” This system divides the investigation activities into functional events. Each event is numbered with a corresponding descriptive phrase. The list of Investigations Management System (IMS) events is contained in Appendix 2 to this manual.

4.7.2 To assist in the management of the investigation and the monitoring of the workload, each event should be assigned to a group within the investigation team. These assignments should be documented. An example Investigation Event Task-Assignment Chart is contained in Appendix 3 to this manual.

4.7.3 The Investigation Management System flow chart, which consists of a set of events, should be completed sequentially in the course of an investigation. The flow chart allows the investigators to ensure that the essential sequence of events is followed, and it provides an up-to-date picture of what has been completed to date. An example of the Investigations Management System — Event Flow Chart is contained in Appendix 4 to this manual.

4.7.4 A checklist is provided for each Investigation Management System event. The checklists should be reviewed to ensure that the tasks are appropriate to the organizing and conducting of accident investigations and are in line with the procedures of the State and the respective AIG authority. The breakdown

of activities and tasks into checklists allows the Investigator-in-charge to indicate clearly what is to be accomplished by the investigators and by the groups during an investigation.

4.7.5 Use of the task-assignment flow chart, the event flow chart, and checklists also allows the Investigator-in-charge to provide direction and guidance to persons who are participating in an investigation for the first time and who may require specific advice. The checklists, aside from being part of the Investigation Management System, provide some order in what is sometimes a confusing situation. The Investigations Management System Event Checklist is contained in Appendix 5 to this manual.

4.7.6 The investigation team members should be familiar with the IMS. The group chiefs must be knowledgeable about this system and the tasks that their groups will be required to carry out. Group chairpersons should be well aware that the tasks listed for each event may not be complete and that particular circumstances may require additional tasks. When using the checklists, investigators should note the completion date for each task, any further action that is required, and any significant issues associated with a particular task Regardless of how much planning goes into the provision of this type of checklist, there will be cases in which the outlined tasks have to be adapted to the special circumstances of the investigation.

4.7.7 The event flow chart and the checklists provide tools for the group chiefs to organize the work of their groups. The flow chart also provides the Investigator-in-charge with a tool to monitor investigation progress. At the daily progress meetings, the investigators should report the particular tasks in their checklists that have been completed since their last report, and the Investigator-in-charge should note the progress on the event flow chart. Another advantage of using this chart is the ease with which progress of the investigation can be reported to the headquarters office from the investigation site.

4.7.8 The Investigation Management System is one of the tools that an investigator should be called upon to use. The effectiveness of the Investigation Management System is directly related to the adherence to the flow chart and the checklists. An investigator likely to be appointed Investigator-in-charge or group chief in a major investigation should be familiar with this system prior to attempting to use it in the field.

4.8 MAJOR ACCIDENT INVESTIGATION GUIDE (MAIG)

4.8.1 In order to discharge his duties effectively, it is essential that the Investigator-in-charge of a major accident investigation have appropriate directing principles for the conduct of the investigation. The Major Accident Investigation Guide, Appendix 6 to this manual, complements the Investigation Management System and provides the Investigator-in-charge, group chiefs and other investigation team members with basic major investigation guidelines. These guidelines are not exhaustive. The Investigator-in-charge and members of the team are expected to exercise common sense and initiative, dependent on the circumstances of the accident.

4.8.2 The Major Accident Investigation Guide has proven to be an excellent method of conducting a thorough investigation of a major accident. It may prove to be impractical, however, to approach each investigation with a full investigation team; consequently, some investigation groups may be combined or eliminated altogether. The final determination of the team composition rests with the Investigator-in-charge. All personnel assigned to an investigation should remain responsible to the Investigator-in-charge until released by him.

4.8.3 One of the pitfalls of major accident investigations is the potential for the breakdown of effective communications between the various groups. This guide is aimed at eliminating that possibility.

Chapter 5

SMALLER INVESTIGATIONS OF INCIDENTS AND ACCIDENTS

5.1 GENERAL

5.1.1 The investigation of incidents and non-major accidents may be conducted by one investigator, sometimes assisted by one or a few other investigators. In such situations, the Investigator-in-charge will have the responsibility for the organization, conduct and reporting of the investigation, and will also be active in the investigation work appropriate to his expertise and background. If, for example, the Investigator-in-charge has a pilot background, then another team member could have different technical expertise and background. Depending on the circumstances of the occurrence, other subject-matter experts (such as air traffic services, aircraft performance, recorders, and human factors) could be assigned to the investigation team. Appendix 1 contains sample organization charts for smaller investigation teams.

5.1.2 Smaller investigations will vary from occurrence to occurrence. For example, the investigation could be a field investigation for which some or all of the investigators would deploy to the occurrence site, the location of the aircraft, the airline's offices, and/or the air traffic facility; or, it could be an office investigation where all or most of the investigation is conducted from the investigation authority's offices.

5.1.3 Where a non-major accident occurs on an airfield, there will likely be significant pressure to remove the wreckage so that normal operations can resume. In the same vein, for incidents that occur in flight or on the airport manoeuvring area, there might be significant pressure to move the aircraft and to return it to normal operations. In both these situations, the primary concern for the investigation should be the potential for loss of evidence. In this regard, the investigator may have to put a priority on properly documenting the wreckage site and/or the aircraft prior to its removal.

5.1.4 For incidents wherein there has been little or no damage, there will likely be significant pressure to return the aircraft to normal operations. Removing a recorder may delay the dispatch of an otherwise serviceable aircraft. In this regard, the investigator may have to put a priority on: first, ensuring that flight recordings are protected properly; second, determining if the recordings are required for the investigations; third, downloading the recordings; and fourth, releasing the aircraft for operations. (See section 5.3 for additional guidance on downloading recordings.)

5.1.5 For incidents and non-major accidents, it may be difficult to get on-site support from all entities having an interest in the investigation, such as from foreign States, airlines and aircraft and component manufacturers. As a result, extra effort will have to be taken to ensure good communications between the authority's investigators and these other entities throughout the investigation.

5.2 RESPONDING TO A NOTIFICATION

5.2.1 Although immediate notification of accidents and incidents to the accident investigation authority is essential, the uncertainty regarding the circumstances of incidents and non-major accidents, and a perception that such occurrences may be low-risk events, frequently lead to delayed and incomplete notifications. Such time delays usually lead to the loss of perishable evidence. (Section 1.5 of this manual provides a list of the factors that should be considered by the Investigator-in-charge when responding to

notifications.) 5.2.2 The following are important considerations associated with incidents and non-major accidents:

a) Immediately contact the reporting source to ensure that all the required information has been provided, to determine who and what organizations may have been involved in the occurrence, to determine who else has been informed of the occurrence, and to determine what actions have already been taken in response to the occurrence.

b) Notify national and local authorities, air traffic services, and other organizations who may be involved in or who have an interest in the occurrence regarding:

— the type of investigation that will be conducted;

— the requirement to secure the occurrence site, aircraft, wreckage, and other involved equipment to ensure their preservation, and the requirement to preserve and to photograph any evidence of a transitory nature;

— the requirement to secure all documentation and recordings associated with the occurrence; and

— the urgency to obtain the names and contact information of all those who may have been involved in the occurrence flight and of all eyewitnesses.

5.3 SECURING DOCUMENTATION

5.3.1 From the early stage in the investigation, it is important to secure the operational and maintenance documents of the occurrence aircraft, as well as all other documents relevant to the occurrence. What documents will be required for the investigation also depends on the nature of the occurrence. The Investigator-in-charge should decide, as soon as possible, what documents need to be obtained. He should contact the relevant organizations to collect the documents.

5.3.2 The operator, maintenance organization, air traffic services and airport service providers, the civil aviation authority, and meteorological services are examples of organizations that should be contacted as soon as possible to collect and secure documents necessary for the investigation. Typically the Investigator-in-charge or a person delegated by him should contact the applicable organizations preferably by telephone, by e-mail or any other suitable means, to request that required documents and recordings be secured. For more guidance as to the typical documentation to collect, refer to the applicable sections of the *Investigations Management System Event Checklist* and the *Major Accident Investigation Guide*. Both documents are appendices to this manual.

5.3.3 Flight recorders are an important source of factual information for investigations; consequently, recorder data should be recovered as a matter of course when the decision is made to investigate. An aircraft involved in an incident (and its flight recorders) may have moved a considerable distance from where the occurrence took place. Some operators have the equipment to copy the flight data recorder (FDR) and cockpit voice recorder (CVR) recordings without removing the unit from the aircraft.

5.3.4 Before demanding that a FDR or CVR be removed from an aircraft, the following should be carefully considered:

a) Is the recorded data vital to or useful to the investigation?

b) Can the data be obtained from other sources?

c) Can a suitable copy of the data be made without the recorder being removed from the aircraft?

d) If a copy of the recordings cannot be made at the location of the aircraft, what is the length of time that the aircraft can operate before the desired data is overwritten?

Note.— Removing CVRs for incidents: ICAO Annex 6 states that "Flight recorders shall not be switched off during flight time". In addition, the aircraft minimum equipment list normally does not allow an aircraft to be flown with a "purposely" removed or disabled flight recorder. The investigation authority might be taking an unacceptable risk if the CVR is pulled and the operator continues to fly without a replacement installed since, if the aircraft subsequently sustains another occurrence, there would be no CVR recording.

5.4 FIELD PHASE OF THE INVESTIGATION

5.4.1 When arriving at the site of the occurrence, investigators should meet leaders of firefighting and rescue teams, police, and other officials to determine the accident site situation, which has control, what has been done, and what has not been done. Before taking control of the site, the investigator should assess the circumstances of the occurrence, the geography and condition and boundaries of the site, the hazards that exist, and the requirements for ensuring the security and safety of the site. When ready to take control of the site, the investigator should establish site boundaries, security, and access control procedures, and request the local police authority to secure and protect the accident or incident site. This would relieve the investigators from this task and allow them to concentrate on other investigation matters.

5.4.2 The detailed on-site examination requires an orderly approach both to the examination and the recording of the information. The following is a partial list of actions required at the occurrence site:

a) locate the flight recorders;

b) initiate photo and video recording, in particular of perishable and important parts;

c) collect perishable evidence and flight recorders;

d) mark and photograph components in their original places;

e) construct a wreckage distribution plot;

f) locate major components and initiate searches for missing components;

g) assess general failure patterns (wings, fuselage and empennage);

h) document the initial ground impact and the subsequent path of the aircraft.

5.4.3 The Investigator-in-charge should also consider the following activities:

a) initiating an event flow chart to track the progress of the investigation. To assist in this regard, investigators should use, and adapt as necessary, the *Investigations Management System Event Flow Chart* located in Appendix 4 of this manual.

b) interviewing aircraft crew members;

c) interviewing eyewitnesses, including local authorities and first responders;

d) conducting preliminary examinations of systems, structures, engine(s), and propeller(s);

e) sending flight recorders to a readout facility, and conducting an immediate initial assessment of the recordings; and

f) sending aircraft parts and components for laboratory testing and analysis.

5.4.4 Prior to leaving the occurrence site, the Investigator-in-charge should ensure that:

a) all required wreckage of interest has been removed from the site and is secured elsewhere;

b) all wreckage not required for the investigation has been returned to the rightful owners; and

c) responsibility for the accident site has been passed to the appropriate local authority or the owner of the aircraft.

5.4.5 To avoid leaving the accident/incident site with information undetected or unrecorded, the Investigator-in-charge should consider referring to the applicable sections of the *Investigations Management System Event Checklist* and the *Major Accident Investigation Guide* — both documents are appendices to this manual.

5.5 POST-FIELD PHASE OF THE INVESTIGATION

5.5.1 Subsequent to the field phase, significant investigation work remains, and the Investigator-in-charge must work diligently to maintain and manage the progress of the investigation. In general, the post-field phase involves the continued collection and validation of evidence; the examination of all pertinent personnel, company, aircraft, facility, government and other records; the examination of selected wreckage in the laboratory; the testing of selected components and systems; the reading and analysis of recordings; the conduct of further interviews; the determination of the sequence of events; the analysis of all investigation information; and completion of technical and group reports, if any. The post-field phase can take many months, depending on the size and complexity of the investigation.

5.5.2 To ensure that all pertinent information is considered, the Investigator-in-charge should refer to the applicable sections of the *Investigations Management System Event Checklist* and the *Major Accident Investigation Guide,* and should maintain an *Investigations Management System Event Flow Chart*. All these documents are appendices to this manual.

5.6 INVESTIGATION REPORTING

Reporting — General

5.6.1 Timely and effective release of investigation information, including preliminary and other reports, interim reports, final reports and safety recommendations, is important to ensure that those involved and/or implicated in the occurrence are kept informed of the progress of the investigation and of the safety deficiencies uncovered.

Safety recommendations

5.6.2 Annex 13 and States AIG regulations require that at any stage of the investigation of an accident, the accident investigation authority of the State conducting the investigation shall recommend to the appropriate authorities, including those in other States and in the ARCM, any preventive action to be taken promptly to enhance aviation safety. Consequently, safety recommendations can be made any time during the investigation or be made in the safety recommendations part of the Final Report.

5.6.3 Safety recommendations should describe the safety problems and provide justification for the recommended safety actions. Safety recommendations should identify what actions to take, but leave scope for the authorities responsible for the matters in question to determine how to accomplish the objective of recommendations. (More information on safety recommendations is contained in theManual on aircraft accidents and incidents investigation reporting.)

5.6.4 The safety recommendations made during the investigation as well as the preventive actions taken in response to these recommendations should be presented in the safety recommendations part of the Final Report. Publishing the preventive actions taken has significant value for accident prevention for other authorities involved in similar operations, as well as for the ARCM States.

Final Reports

5.6.5 The Final Report of an investigation, including its recommendations, is the catalyst for preventing further occurrences. Therefore, the Final Report must establish in detail what happened, how it happened and why it happened. For reporting on small investigations, abbreviated report formats have been created, which only contain the history of flight, information on the deficiencies discovered by the investigation, analysis of the factors contributing to the occurrence, and findings related to the deficiencies. The findings and the causes/contributing factors of Final Reports should usually lead to safety recommendations so that appropriate preventive actions can be implemented. The dissemination of this report is similar to that of an important investigation.

5.6.6 In some cases, report forms have been created that contain narrative sections, wherein the sequence of events is described; point-form sections, wherein free text can be entered; and, check-off boxes for certain parameters that will facilitate data storage and extraction for statistical programmes. A well-designed form could serve as an investigation checklist and/or as the investigation Final Report.

5.6.7 The investigator in charge and the group chiefs should refer to the following documents for the production of the final report:

a) Annex 13, Chapter 6 and State AIG Regulation. These documents contain the dispositions about the consultation process and the dissemination of the investigation final report;

b) Appendix to Annex 13 – Final report format. This appendix presents detailed information about this format; and

c) ARCM *Manual on aircraft accidents and incidents investigation reporting.* This manual includes detailed guidelines about the way in which each section of the final report should be completed.

Appendix 1

SAMPLE INVESTIGATION ORGANIZATION CHARTS

Depending on the circumstances of the occurrence, it may be appropriate to establish the Flight Recorders Group as a technical group under the airworthiness group chief.

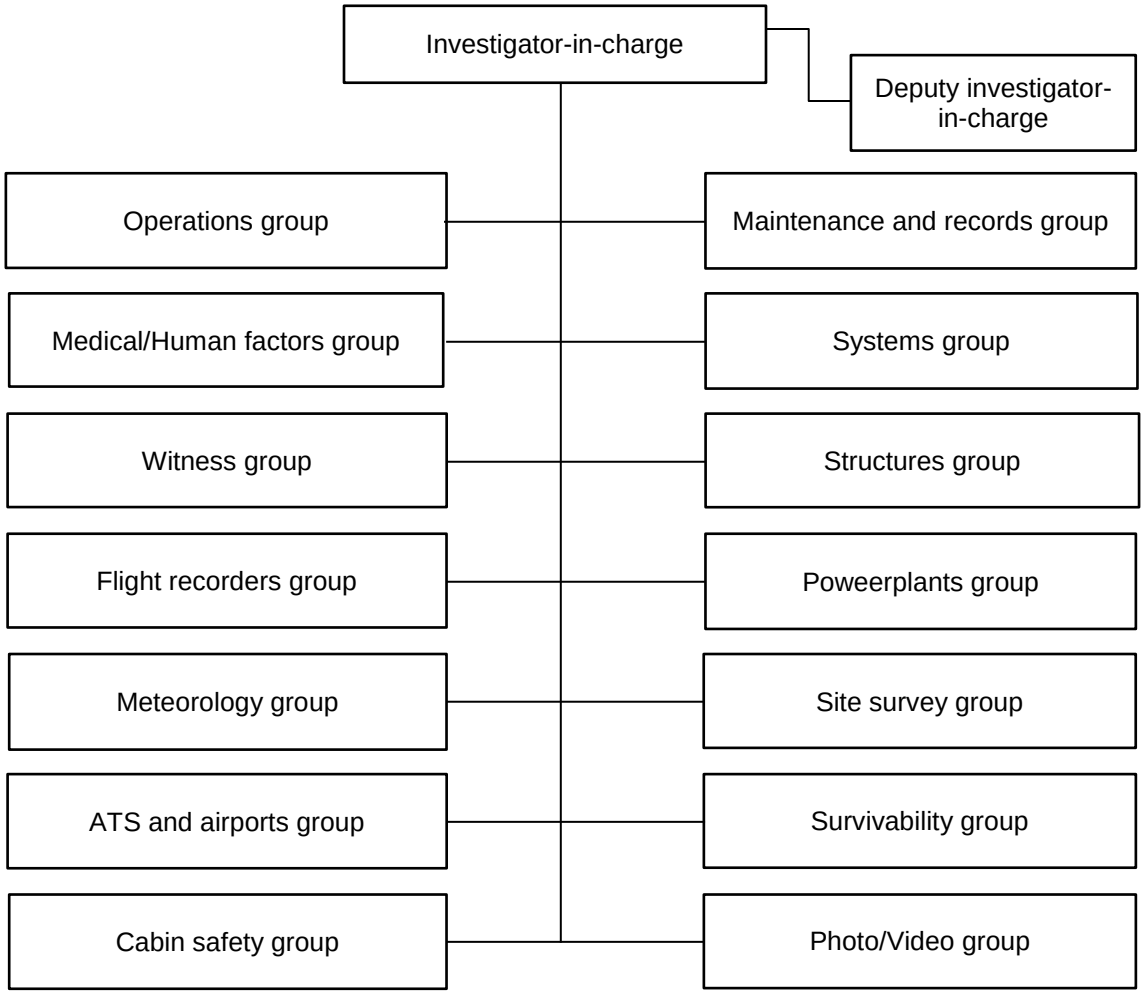
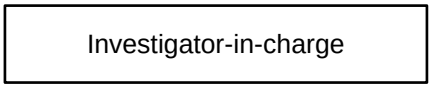


Figure A1-1. Major accident investigation team organization - A



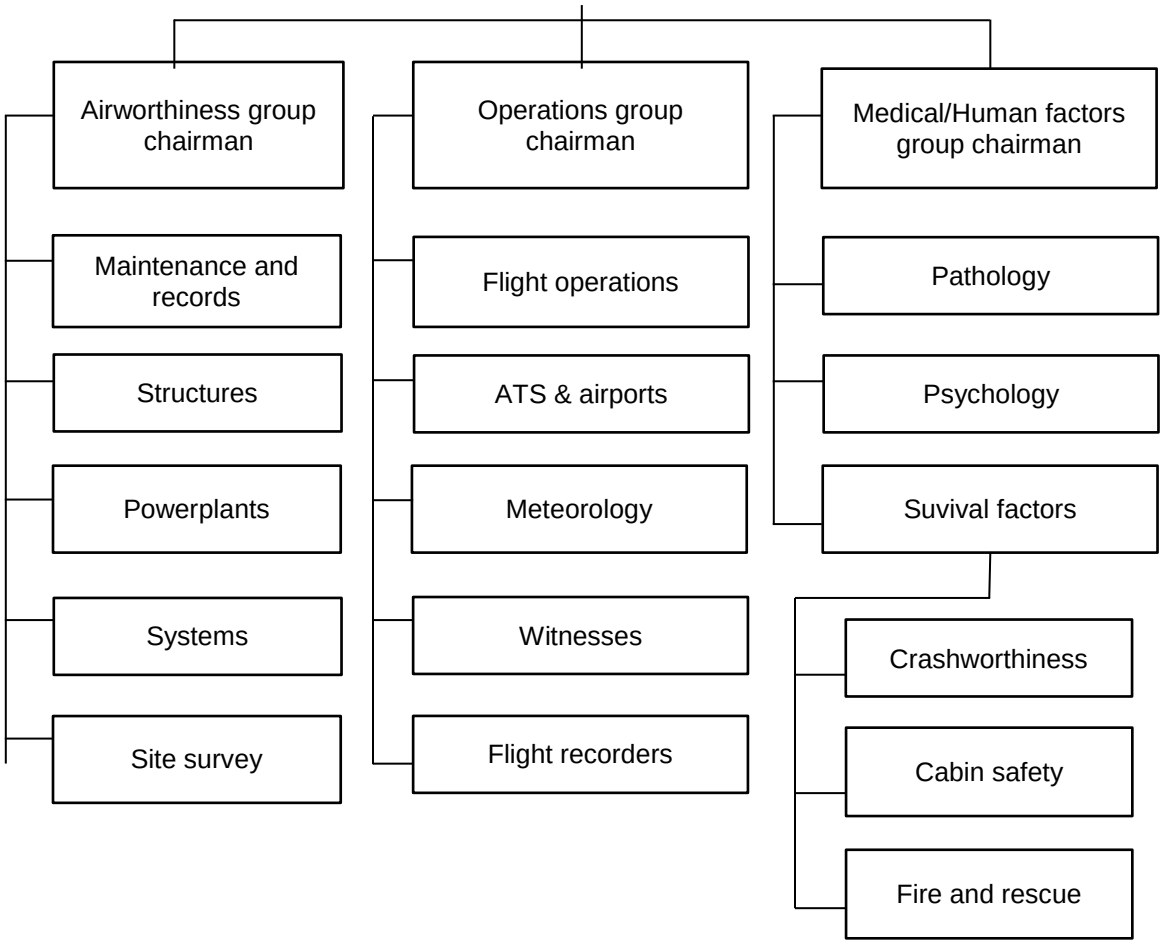


Figure A1-2. Major accident investigation team organization - B

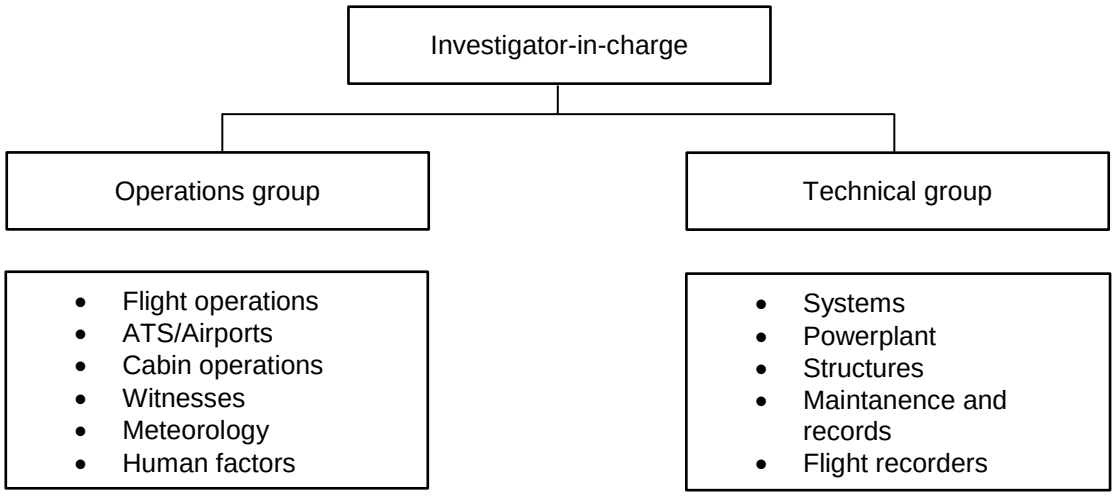
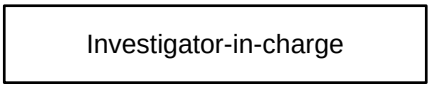


Figure A1-2. Smaller accident investigation team organization - A



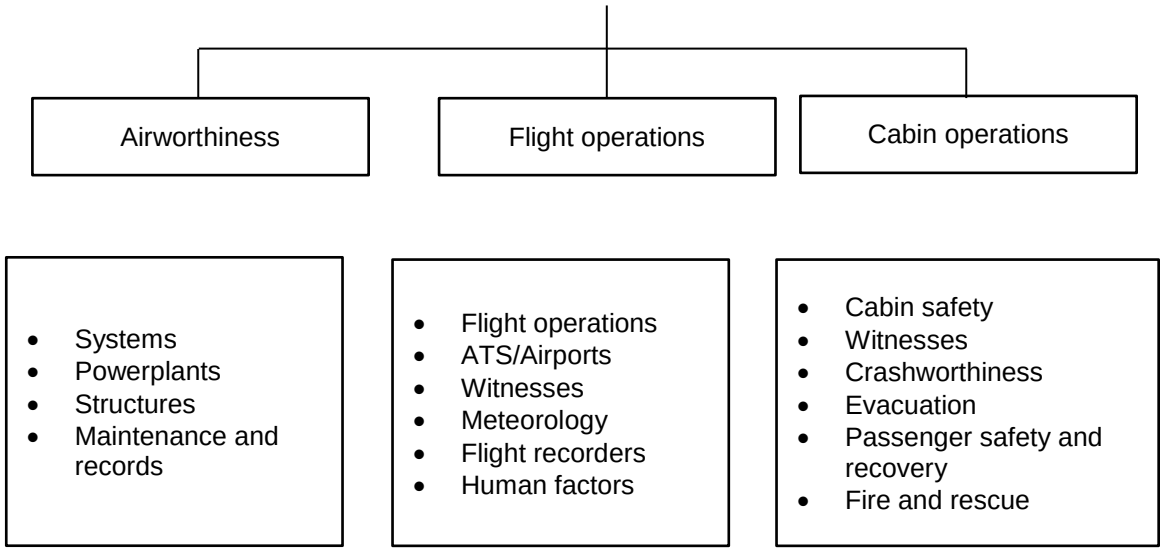


Figura A1-4. Smaller accident investigation team organization - B

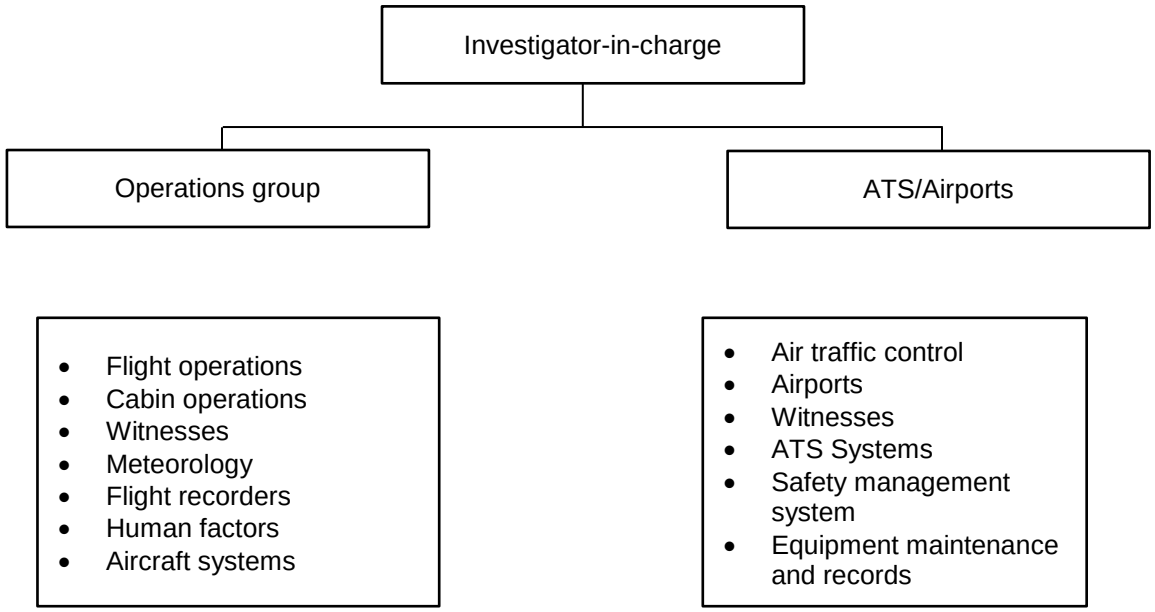


Figura A1-5. Smaller accident investigation team organization - C

Appendix 2

INVESTIGATION MANAGEMENT SYSTEM EVENTS

1. Initial response
2. Initial actions at the site
3. Secure flight operations documents
4. Human remains recovery
5. Eyewitness interviews
6. Flight recorder recovery
7. Secure weather documents
8. Secure air traffic services and airport documents
9. Search and rescue operations
10. Secure pertinent cabin documents
11. Secure maintenance documents
12. Examination of systems
13. Examination of structures
14. Examination of engine(s) and propeller(s)
15. Initial survey of the accident site
16. Site photography (Phase 1)
17. Review of operations documents
18. Crew member medical examinations
19. Plot flight path
20. Read-out of flight recorders
21. Review of weather documents
22. Review air traffic services and airport documents
23. Evacuation operations
24. Review pertinent cabin documents
25. Review of maintenance documents
26. Examination and testing (Systems)
27. Fire and explosion
28. Examination and testing (Powerplants)
29. Wreckage distribution plotting
30. Site photography (Phase 2)
31. Flight crew members interviews
32. Victim identification
33. Interviews of next of kin
34. Analysis of flight recorders data
35. Interviews (Meteorology)
36. Interviews (Air Traffic Services and Airport)
37. Rescue operations
38. Cabin condition
39. Interviews (Maintenance and Records)
40. Interviews (Systems)
41. Crashworthiness
42. Aircraft performance
43. Autopsies
44. Re-interviews (Eyewitnesses)
45. Navigation aids and airport status
46. Firefighting operations
47. Interviews (Cabin crew and passengers)
48. Maintenance management
49. Wreckage reconstruction
50. Analysis and report of Operations Group
51. Analysis and report of Medical/Human Factors Group
52. Analysis and report of Witness Group
53. Analysis and report of Flight Recorders Group
54. Analysis and report of Meteorology Group
55. Analysis and report of ATS and Airport Group
56. Analysis and report of Survivability Group
57. Analysis and report of Cabin Safety Group
58. Analysis and report of Maintenance and Records Group
59. Analysis and report of Systems Group
60. Analysis and report of Structures Group
61. Analysis and report of Powerplants Group
62. Analysis and report of Site Survey Group
63. Analysis and report of Photo/Video Group
64. Operations analysis and findings
65. Technical analysis and findings
66. Report of the Investigator-in-charge

Appendix 3

INVESTIGATION EVENT TASK-ASSIGNMENT CHART

Investigation Group	Assigned Events								
Administration Support									
Head Office Coordinator									
Media Coordinator									
Site Safety									
Investigator-in-charge									
Deputy Investigator-in-charge									
Operations									
Aircraft Performance									
Human Factors									
Medical and Pathology									
Witness									
Flight Recorders									
Meteorology									
Air Traffic Services									
Airports									
Survivability									
Cabin Safety									
Maintenance and Aircraft Records									
Systems									
Structures									
Crashworthiness									
Powerplants									
Site Survey									
Photo/Video									

(Example of a blank chart – Modifications may be necessary).

Investigation Group	Assigned Events								
Administration Support									
Head Office Coordinator									
Media Coordinator									
Site Safety		2							
Investigator-in-charge	1	2					64	65	66
Deputy Investigator-in-charge							64	65	66
Operations	3	17	31		50		64		
Aircraft Performance				42			64		
Human Factors	4	18	32	43	51		64		
Medical and Pathology							64		
Witness	5	19	33	44	52		64		
Flight Recorders	6	20	34		53		64		
Meteorology	7	21	35		54		64		
Air Traffic Services	8	22	36	45	55		64		
Airports							64		
Survivability	9	23	37	46	56			65	
Cabin Safety	10	24	38	47	57		64		
Maintenance and Aircraft Records	11	25	39	48	58			65	
Systems	12	26	40		59			65	
Structures	13	27		49	60			65	
Crashworthiness			41					65	
Powerplants	14	28			61			65	
Site Survey	15	29			62			65	
Photo/Video	16	30			63			65	

(Example of a filled-in chart – Modifications may be necessary)

Appendix 4

INVESTIGATION MANAGEMENT SYSTEM (IMS) — EVENT FLOW CHART

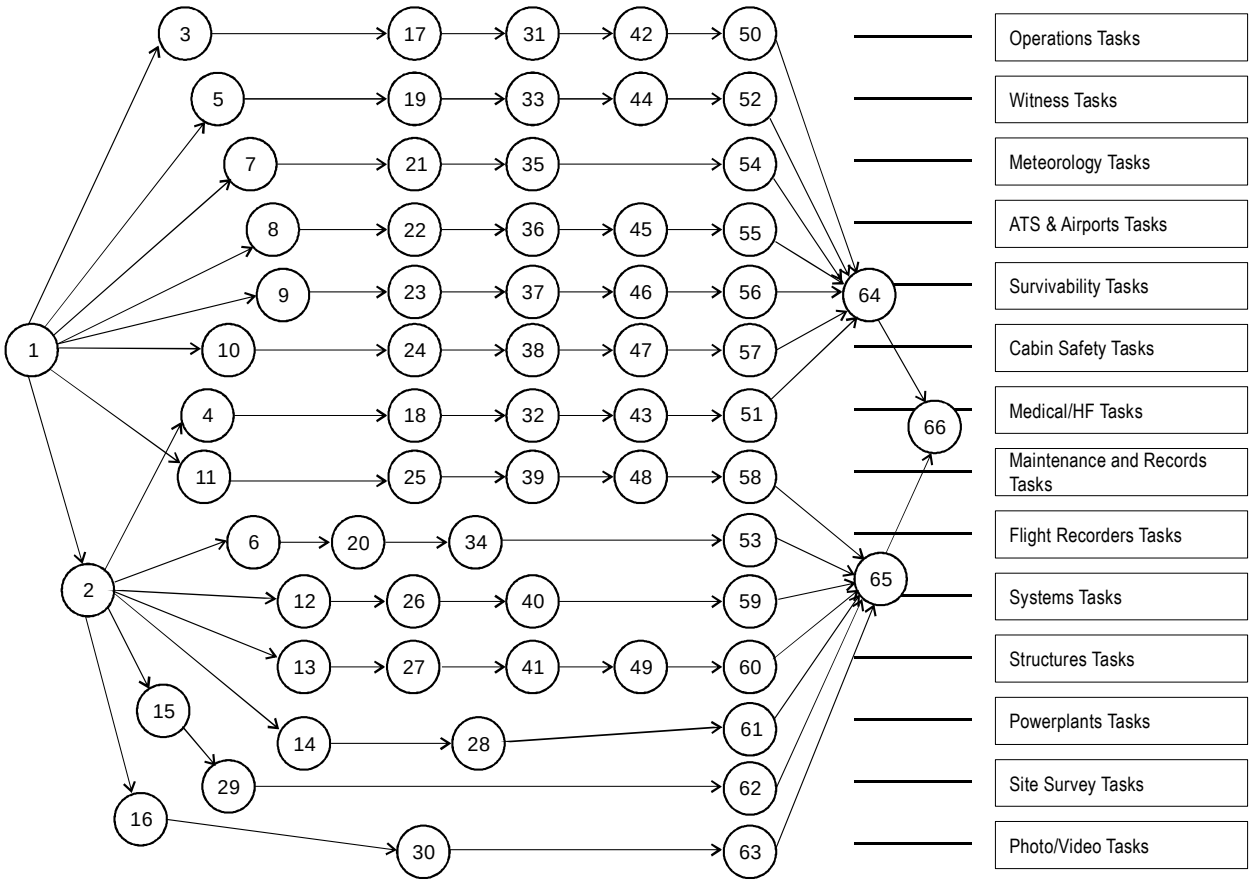


Figure A4-1. Investigation Management System — Event Flow Chart

Appendix 5

INVESTIGATIONS MANAGEMENT SYSTEM (IMS)— EVENT CHECKLIST

Page

EVENT 1. Initial response

1. Collect as much accident-related information as practicable from the reporting source and relevant authorities;

2. Contact the local police or other authority responsible for site security to determine what actions have been taken and convey the intentions and requirements of the accident investigation authority, in particular the safeguarding of recorders and other perishable investigation evidence;

3. As appropriate, advise the coroner, the attorney-general or the police of the requirements of the investigation authority regarding the recovery and handling of the human remains, in particular the safeguarding of perishable investigation evidence;

4. Determine from the air operator if hazardous material, such as chemicals, explosives, biological and radioactive materials, were carried on the aircraft;

5. Determine the composition of the investigation team, taking into account pre-assignments, such as a go-team;

6. Make arrangements for travel, accommodation, and facilities required for meetings, briefings, and other investigation activities; and

7. Complete and dispatch the notification to other States involved and to ICAO as per Chapter 4 of Annex 13, and Part 1, Chapter 4 of this manual.

EVENT 2. Initial actions at the accident site

Event 1 refers.

1. Review the guarding arrangements and adjust the limits of the site as required;

2. Arrange for guarding of the site for the time period envisaged for the field investigation;

3. Obtain a briefing from the local authorities on actions taken at the site; and

4. Make a preliminary survey of the site with the investigation team.

EVENT 3. Secure flight operations documents

1. Obtain and secure the following documents, as appropriate:
   a) From the operator/company:
      – Air Operator Certificate;
      – Air Operator Operations Manual;
      – Flight Manual (FM);
      – Flight crew and cabin crew members' training records;
      – Aircraft Operating Manual (including Standard Operating Procedures);
      – Copy of current cockpit checklists (normal, abnormal and emergencies);
      – Pilot log books;
      – Pilot's flight log;
      – Pilot flying schedule for the last six months;
      – Aircraft Journey Log Book;
      – Minimum Equipment List (MEL);

- Air Operator dispatch logs;
- Daily dispatch logs, including the week prior to and the day of the accident;
- Mass and balance and centre-of-gravity calculations for the accident flight and previous flight;
- Passenger and freight manifests;
- Air Operator schedules and aircraft schedules;
- Air Operator Route Manual;
- National and international agreements associated with the transfer of some or all of the State of Registry's responsibilities (if applicable);
- Refuelling documentation; and
- Record of pertinent communications.

b) From the pertinent civil aviation authority:
- Flight crew personnel licensing file;
- Copy of approved Flight Manual (FM);
- Copy of approved Minimum Equipment List (MEL);
- Copy of company Master Minimum Equipment List (MMEL);
- Files on chief pilot, chief inspector, cabin crew, chief flight engineer and chief of maintenance;
- Copy of in-flight inspections covering the last six months;
- Documentation in support of applications for the Air Operator Certificate;
- Copy of any civil aviation authority Policy Letters applicable to the company;
- National and international agreements associated with the transfer of some or all of the State of Registry's responsibilities (if applicable);
- Copy of the last company audit by the civil aviation (regulatory) authority; and
- Air operator files.

EVENT 4. Human remains recovery

1. Coordinate with forensic personnel for human remains recovery.

2.
2. During the recovery, photograph the remains and record their location; and

3. Prepare a plot of the locations of the human remains.

EVENT 5. Eyewitness interviews

1. Search for and identify eyewitnesses;

2. Interview eyewitnesses, at their location of observation, if feasible;

3. Obtain photographs and videos taken by witnesses, and those recorded by security or operations monitoring devices; and

4. Develop an initial plot of the aircraft flight path.

EVENT 6. Flight recorder recovery

1. Locate the flight recorders, as well as any other recorders such as standby recorders and quick-access recorders;

2. Photograph the flight recorders in situ;

3. Examine and record the condition of the flight recorders;

4. Recover the flight recorders;

5. Prepare the flight recorders for transportation;

6. Arrange for the timely and secure transport of the flight recorders to the playback facility; and

7. Carry the flight recorders by hand to the readout facility.

EVENT 7. Secure weather documents

1. Determine where the flight crew obtained a weather briefing;

2. Interview the individual(s) who provided the weather briefing;

3. Secure copies of briefings and other weather documentation given to the flight crew;

4. Obtain and secure the following documents, as appropriate:
   - The actual and forecast weather conditions for the route, area, terminal, destination, alternate and site of the accident;
   - Hourly and special reports;
   - Weather radar reports;
   - Pilot weather reports (PIREP);
   - Surface observations, logs and records;
   - Precipitation records;
   - Barograph records;
   - Wind records;
   - Synoptic charts;
   - Upper air charts;
   - Runway Visual Range (RVR) records;
   - Radiosonde observations;
   - Satellite pictures;
   - Conditions of natural light and sunrise/sunset;
   - Special weather observations;
   - Significant Meteorological Information (Sigmets) weather advisories; and
   - Witness weather reports.

EVENT 8. Secure air traffic services and airport documents

1. Obtain and secure the following documents, as appropriate:
   - Flight plan;
   - Flight plan message;
   - Departure message;
   - Notices to Airmen (NOTAMs);
   - Pertinent air traffic services and airport recordings;
   - Aerodrome control progress strips;
   - Area control progress strips;
   - Approach control progress strips;
   - Approach terminal progress strips;

- Radar recordings (including military recordings, if available);
- Names and files of air traffic services personnel on duty;
- Unit logs;
- Pertinent manuals and directives;
- Pertinent outage reports;
- Airport Certificate;
- Airport certification safety standards/reports;
- Braking action reports;
- Master airport plan;
- Station logs;
- Equipment inspection documents;
- Airport manager's log; and
- Names and files of airport personnel on duty.

EVENT 9. Search and rescue operations

1. Determine and record the following:
   - How and when the search operations were initiated;
   - What units or agencies participated in the search operations;
   - Search means and methods adopted, in part and such as visual, electronic, and infrared;
   - The environmental conditions at the time of the search, such as weather, ground or water conditions;
   - Any factors which facilitated or hindered the search effort; and
   - The time at which the accident site was located.

2. Review search and rescue procedure manuals, and operations logs and recordings; and

3. Determine the adequacy of the search actions.

EVENT 10. Secure pertinent cabin documents

1. Liaise with Operations, and Maintenance and Records Group Chiefs to locate and secure the following documents:
   - Air Operator Operations Manual;
   - Cabin crew training records;
   - Air operator and aircraft standard operating procedures (SOPs);
   - Cabin crew log books;
   - Pilot's flight log;
   - Cabin crew flying schedule (last six months);
   - Aircraft Journey Log;
   - Air operator dispatch logs;
   - Maintenance release forms;
   - Passenger and freight manifests;
   - Air operator's Maintenance Control Manual;
   - Air operator schedule;
   - Air operator Route Manual;
   - Record of pertinent phone calls;
   - Cabin Crew Manual;
   - Cabin Crew Emergency Manual;
   - Air operator approved aircraft Safety Announcements;
   - Air operator passenger safety briefings and video, if applicable;
   - Copy of approved Aircraft Flight Manual;

- Copy of approved Minimum Equipment List (MEL);
- Copy of the applicable Master Minimum Equipment List (MMEL);
- Cabin crew licensing and medical status;
- Copy of any civil aviation authority Policy Letters applicable to the company;
- Copy of last air operator audit by the civil aviation (regulatory) authority;
- Air operator files; and
- Civil aviation authority approved cabin crew training curriculum.

2. Locate and secure the following information:
   - The aircraft cabin furnishings;
   - Pre-flight servicing documents;
   - Snag rectification sheets;
   - Cabin-related outstanding and recurring snags and unserviceabilities; and
   - Cabin and freight configurations;

3. Obtain the autopsy results of cabin crew members and passengers; and

4. Obtain a transcript of the cockpit voice recorder and conduct a preliminary review of the recorded information for cabin-related factors.

5. Submit all original documents to the Administration Coordinator.

EVENT 11. Secure maintenance documents

1. Obtain and secure the following documents, as appropriate:
   a) From the air operator:
      - Air Operator Certificate;
      - Certificate of Airworthiness;
      - Certificate of Registration;
      - Aircraft Journey Log;
      - Aircraft Technical Log;
      - Maintenance Control Manual;
      - Maintenance Log;
      - Airframe Log;
      - Engine Log(s);
      - Propeller Log(s);
      - Pre-flight servicing logs;
      - Snag rectification sheets;
      - Airworthiness Directives records;
      - Standards and procedures;
      - Quality assurance;
      - Personnel and training;
      - Equipment and facilities;
      - Extended-range Twin-engine Operational Performance Standards (ETOPS) maintenance requirements (Annex 6, Attachment E);
      - Flight recorder files, including documents associated with flight data recorder data-frame and periodic calibrations;
      - Major repairs or alterations;
      - Major work done by approved maintenance organization or sub-contractor;
      - Hazardous material cargo records;
      - International leasing arrangements;
      - Mandatory Occurrence Reporting (trend analysis) reports; and
      - System Difficulty Reporting (SDR) reports.

b) From the pertinent civil aviation authority:
   – Technical personnel files;
   – Air Operator Certificate;
   – Aircraft files;
   – Copy of the Master Minimum Equipment List (MMEL);
   – Maintenance reliability information on aircraft fleet;
   – Mandatory Occurrence Reporting reports; and
   – System Difficulty Reporting (SDR) reports.

EVENT 12. Examination of systems

1. Prepare a checklist of systems to be investigated from the following general list:
   – Hydraulic power;
   – Flight controls;
   – Ailerons;
   – Elevators;
   – Rudder;
   – Horizontal stabilizer;
   – Trims;
   – Flaps;
   – Speed brakes;
   – Spoilers/lift dumpers;
   – Autopilot/stability augmentation/stall avoidance;
   – Landing gear/wheels/brakes;
   – Fuel;
   – Electric power distribution;
   – Aircraft computers (such as flight management systems, traffic collision avoidance system, and terrain awareness and warning system);
   – Other electronics;
   – Ice and rain protection;
   – Pneumatics;
   – Instruments/pitot-static/caution and warning (light bulb analysis);
   – Navigation systems;
   – Portable navigation systems, photo and video cameras, and cell phones;
   – Communications;
   – Emergency Locator Transmitter (ELT);
   – Fire detection and protection;
   – Air conditioning and pressurization;
   – Oxygen; and
   – Thrust reversers.

2. Locate and identify all systems and components;

3. Determine the requirements for special handling of system computers to preserve memory;

4. Record and photograph the systems and components prior to safeguarding;

5. Safeguard and deactivate hazardous systems and components;

6. Conduct a detailed examination of all systems and components, including flight controls, hydraulics, pneumatics, electrical, electronics, instruments, communication, navigation, air conditioning, pressurization, ice and rain detection, airframe, fuel, fire protection and oxygen;

7. Document all systems selections, indications, positions and condition;
8. Photograph in detail the components suspected of failure; and
9. Request special technical assistance, if required.

EVENT 13. Examination of structures

1. Conduct an overall examination of the complete airframe, including the flight control surfaces;
2. Determine the involvement of the structure in the accident;
3. Select the components that require examination and testing;
4. Prepare detailed statements of requirements for examination and testing; and
5. Assess the requirements for wreckage reconstruction.

EVENT 14. Examination of engine(s) and propeller(s)

1. Locate the engine(s) and verify make, model and serial number(s);
2. Record the position and the condition of the engine(s);
3. Determine the engine(s) pre-impact integrity;
4. Locate the propeller(s) and verify make, model and serial number(s);
5. Record the position and the condition of the propeller(s);
6. Determine the propeller(s) pre-impact integrity;
7. Locate and identify all major engine and propeller components, such as engine controls, auxiliary fuel, oil and coolant components, and instruments;
8. Record the position of engine and propeller controls, components and reading of related instruments;
9. Determine the pre-impact serviceability of the controls, components and related instruments;
10. Photograph engine(s), propeller(s), components, and instruments in situ;
11. Obtain oil and fuel samples;
12. Determine the engine power developed at impact, if feasible;
13. Select the engine(s), propeller(s) and components for examination and testing; and
14. Prepare detailed statements of requirements for examination and testing.

EVENT 15. Initial survey of the accident site

1. Determine the probable distribution of wreckage by cursory examination of angle of impact, speed and pre-impact integrity indications;

2. Delineate the area requiring search for components and evidence;

3. Determine the method and intent of search for debris;

4. Determine the material and personnel resources required;

5. Obtain the material and personnel resources;

6. Identify significant components; and

7. Mark and tag components.

EVENT 16. Site photography (Phase 1)

1. Establish photographic priorities;

2. Photograph the general wreckage from at least four directions;

3. Photograph human remains in situ in relation to other objects;

4. Photograph easily perishable evidence, in part and such as ground impact marks and the presence/absence of fire;

5. Photograph flight recorders in situ prior to removal;

6. Photograph hazardous systems and components in situ prior to deactivation or removal;

7. Photograph the terrain and general impact area;

8. Photograph the general components in part and such as wings, engine(s), and empennage;

9. Determine the requirements for photogrammetry;

10. Determine the requirements for aerial photography;

11. Elaborate photo coverage of any suspect areas or components;

12. Liaise with the Site Survey Group Chief for photographic requirements such as:
    – Significant ground features;
    – Point of initial impact;
    – Location of major components;
    – Ground fire areas;
    – Serious property damage;
    – Flight path to impact; and
    – Witness locations.

13. In conjunction with the Operations Group Chief, photograph the cockpit environment with particular attention to:
    – Instruments;

- Position of controls;
- Switch positions;
- Circuit breaker panels;
- Radio settings;
- Automatic pilot setting;
- Fuel control positions;
- Pilot seats, seat belts, harness; and
- Maps, charts.

14. Liaise with the Operations Group and Systems Group chiefs for additional specific photo requirements of the cockpit area;

15. Liaise with the Medical/Human Factors Group and Structures (Crashworthiness) Group chiefs for requirements for photos of items with possible design deficiencies such as:
    - Design/location of instruments;
    - Design/location of controls;
    - Work space incompatibility;
    - Visual restriction due to structure;
    - Lack of cockpit standardization;
    - Personal equipment interference; and
    - Seat design/configuration.

16. Liaise with the Medical/Human Factors Group and Structures (Crashworthiness) chiefs for photo requirements of:
    - Cabin environment;
    - Unsecured interior equipment;
    - Seats, seat structures;
    - Belts, seat belt anchorages;
    - Belt buckles;
    - Cabin floor;
    - Cargo restraint; and
    - Emergency exits.

17. Liaise with the Structures (Crashworthiness) Group chief for photo requirements of:
    - Terrain angle;
    - Angle of impact;
    - Width, length and depth of ground scars;
    - Depth of damage to underside of aircraft;
    - Compression of energy-attenuation devices;
    - Initiation and propagation of fire;
    - Smoke smears, soot, discoloration;
    - Surface pitting; and
    - Evidence of explosion.

18. Liaise with the Air Traffic Services and Airports Group Chief for specific photo requirements of:
    - Runway or taxiway;
    - Aerodrome layout;
    - Obstructions to air traffic services and airport controllers' vision;
    - Aerial photo record of access routes; and
    - Tower cab layout.

19. Liaise with the Powerplants Group, Systems Group and Structures Group chairpersons for specific photo requirements of selected aircraft components.

EVENT 17. Review of operations documents

Event 3 refers.

1. Review all the documents obtained from the operator and summarize the pertinent information;

2. Review all the documents obtained from the civil aviation authority and summarize the pertinent information; and

3. Compile in chronological order, the history for each flight crew member and for the operator.

EVENT 18. Crew member medical examinations

Event 4 refers.

1. Obtain the list of flight crew and cabin crew members (names and positions);

2. Determine the location and condition of the surviving flight crew members;

3. Obtain the permission of crew members to submit to medical examination;

4. Arrange for examinations of the flight crew members by a competent medical practitioner, including blood and urine samples, and obtain the following information:
   – Medical status and history, including medications;
   – Personal history, including habits; and
   – Pre-flight activities with human factors significance.

5. If relevant, arrange for examination of the cabin crew members by a competent medical practitioner, including blood and urine samples, and obtain the following information:
   – Medical status and history, including medications;
   – Personal history, including habits; and
   – Pre-flight activities with human factors significance.

EVENT 19. Plot flight path

Event 5 refers.

1. Plot the aircraft flight path from eyewitness information showing:
   – Aircraft flight direction, altitude and attitude;
   – Aircraft configuration, in part and such as position of flaps, spoilers, and gear;
   – Evidence of fire or explosion;
   – Evidence of structural failure; and
   – Point(s) of collision or impact.

EVENT 20. Read-out of flight recorders

Event 6 refers.

1. Obtain the most recent flight recorders' calibration information from the operator;

2. Copy and play back the CVR data and provide the Investigator-in-charge with an initial written précis of the information;

3. Copy all CVR channels separately and present them on a storage medium in a format applicable for the Investigator-in-charge, normally a four-channel copy;

4. Make a transcript of the CVR and transmit it to the Investigator-in-charge;

5. Contact the Investigator-in-charge to determine the gross FDR requirements;

6. Copy the FDR data and provide the Investigator-in-charge and the pertinent group chiefs with the required initial data plots, along with an appropriate written briefing;

7. Using crosschecks and data obtained from other groupchiefs, determine the reliability of the flight recorder data, and refine the FDR data and CVR transcripts;

8. Synchronize timing of the FDR and CVR records together with the air traffic services data, if possible; and

9. Forward the refined information to the Investigator-in-charge, the Operations Group Chief and other group chiefsneeding this information.

EVENT 21. Review of weather documents

Event 7 refers.

1. Review all the documents and summarize the pertinent information;

2. Arrange for a qualified meteorologist to review and analyse all the documents;

3. Consider the following hazardous phenomena:
   – Mountain wave effect;
   – Revolving storms;
   – Severe turbulence;
   – Freezing precipitation;
   – Wind shear;
   – Subsidence; and
   – Electrical storms.

EVENT 22. Review air traffic services and airport documents

Event 8 refers.

1. Review all the documents obtained from the air traffic services and airport authorities, and summarize the pertinent information;

2. Make copies of the air traffic services recorded data from the originals;

3. If air traffic services data are not available in a digital form for copy, playback and analysis, make a video copy of the air traffic services display screens for playback; and

4. Make transcripts from the air traffic services recorders (all channels).

EVENT 23. Evacuation operations

Event 9 refers.

1. From information derived from survivors' interviews and/or the cockpit voice recorder, determine and record the following pre-accident actions:
   – General briefing of the passengers regarding the various safety and rescue equipment at their disposal, in part and such as seat belt, oxygen supply, and life jacket;
   – Member(s) of the crew who gave the briefing, time of the briefing, its intelligibility and audibility (pertinent language[s]) to all passengers;
   – Special instructions given regarding the removal of dangerous articles, in part and such as spectacles, ties, and shoes; the tightening of seat belts; the cushioning of each passenger in part and such as with pillows and blankets; and clarity and understanding of these instructions;
   – Special instructions regarding emergency exits, measures taken to free the access to all emergency exits;
   – Type of the emergency equipment available, in part and such as portable fire extinguishers, axes, crow-bars, flashlights, and first-aid kits;
   – Measures taken by the crew with respect to the emergency equipment; and
   – Assistance provided by passengers, either requested, offered or given, and behaviour and morale of the passengers prior to the accident.

2. Evaluate the crew training and implementation of emergency procedures, particularly by cabin crew members, as well as the adequacy of these procedures;

3. In the case of ditching, evaluate the following:
   – Special instructions on the location, donning and use of life jackets;
   – Action by the crew to ensure that each passenger had properly donned and adjusted the life jacket;
   – Precaution to have extra life jackets available near the emergency exits; and
   – Special instructions given to the passengers regarding which life raft, when, and how to board after the ditching.

4. Determine the relationship to regulatory requirements of the following items and assess their adequacy:
   – Number, location and design of emergency exits;
   – Presence of placards near each exit;
   – Clear and readable instructions on the operation of the opening mechanisms, including location and lighting;
   – Number and location of exits used, number of persons who used each exit, and reasons for not

using a particular exit;

- The emergency equipment used, in part and such as portable extinguishers, axes, escape ropes, and chutes;
- Presence and effectiveness of instructions on how to use the equipment;
- Adequacy and functioning of the equipment; and
- Additional equipment that would have been helpful.

5. The following information should be recorded:
   - Passengers injured in relation to their location;
   - Injuries sustained during the evacuation;
   - Help provided by the crew, passengers and third parties;
   - Time required to complete the evacuation, by exit if relevant;
   - Difficulties encountered such as:
     - language problems;
     - presence of fire and smoke;
     - failure of emergency lighting;
     - abnormal position of aircraft;
     - distance from the ground;
     - aged, infirmed or infant passengers;
     - injured passengers;
     - panic among passengers or crew; and
     - debris, including luggage.
   - In the case of ditching:
     - water conditions, such as roughness and temperature;
     - light conditions;
     - type and number of life jackets available;
     - number of passengers inflating life jackets prior to egress;
     - effectiveness of life jackets;
     - difficulties in locating passengers;
     - type and number of life rafts used, including position in the aircraft, difficulties in launching, inflating, locating and boarding;
     - number of survivors in each raft;
     - adequacy of instructions on use of rafts and life-saving equipment.

6. Evaluate the effectiveness of the following:
   - Emergency escape hatches;
   - Emergency lights;
   - Fire extinguishers;
   - Fire extinguishing systems;
   - Fire detectors or alarms;
   - Megaphone(s);
   - Oxygen bottles;
   - Smoke mask(s) and oxygen bottle(s);
   - Smoke hoods and personal breathing equipment;
   - Flashlights;
   - Escape tapes/reels;
   - Vivopak/Physician’s kit;
   -
   - First aid kit;
   - Resuscitation mask;
   - Protective gloves;
   - Search mirror; and
   - Portable radio beacons.

EVENT 24. Review pertinent cabin documents

Event 10 refers.

1. Review all the documents obtained from the air operator and summarize the pertinent information;

2. Review all the documents obtained from the civil aviation authority and summarize the pertinent information; and

3. Compile, in chronological order, the history for each cabin crew member and for the operator.

EVENT 25. Review of maintenance documents

Event 11 refers.

1. Review all the documents obtained from the air operator and summarize the pertinent information;

2. Review all the documents obtained from the civil aviation authority and summarize the pertinent information;

3. Compile, in chronological sequence, the history of the powerplants, airframe and their major components, complete with incorporated modifications;

4. List all outstanding powerplant and airframe modifications;

5. Record all outstanding and recurring snags and unserviceabilities;

6. Record all snags that may be related to the accident; and

7. Summarize all irregularities.

EVENT 26. Examination and testing (Systems)

Event 12 refers.

1. Select the components that require more detailed examination;

2. Prepare statements of requirements for examination and testing;

3. Arrange for the transportation of selected components to a suitable location for the required examination and testing; and

4. Arrange for investigators to be present at all examinations and testings.

EVENT 27. Fire and explosion

Event 13 refers.

1. Photograph all evidence having a direct bearing on the fire before the wreckage is removed;

2. Review maintenance and parts manuals to gain information on the aircraft structure and systems;

3. Review the following information:
   – Survivor statements;
   – Eyewitness statements;
   – Type of cargo carried;
   – Quantity and type of fuel on board;
   – Air traffic services recorded data;
   – Flight recorders information; and
   – Pathological information for evidence of smoke or soot in the respiratory system, carbon monoxide or other toxic chemicals, and indications of in-flight explosion such as ruptured eardrums or penetration by small fragments.

4. Determine the requirements for expert technical assistance;

5. Prior to removal of fire extinguishing agent, consider all options in order to reduce destroying evidence;

6. Complete a wreckage diagram including burned areas;

7. Determine if the fire was in-flight or post-impact by reviewing the following:
   – Survivor and eyewitness evidence;
   – Cockpit configuration;
   – Mishap circumstances;
   – In-flight fire effects;
   – Ground fire effects;
   – Crash dynamics, such as location of burned parts with respect to burn areas; and
   – Impact effects.

8. Determine if there was an in-flight explosion by the presence of:
   – Omnidirectional fire pattern;
   – “Opening up” effect;
   – Unusual damage to heavy structures;
   – Fragmentation of structures; and
   – High-speed penetration by fragments.

9. Reconstruct the area where the in-flight fire or explosion is suspected; and

10. Determine the point or area of origin, fuel type and ignition source.

EVENT 28. Examination and testing (Powerplants)

Event 14 refers.

1. Forward engine(s), propeller(s), components and instruments to the appropriate testing facilities;

2. Arrange for investigators to be present at all examinations and testings;

3. Monitor, photograph and film all phases of examinations and testings;

4. Determine if power was being developed at impact;

5. Select components for further examination and testing; and

6. Interview witnesses with powerplant information.

EVENT 29. Wreckage distribution plotting

Event 15 refers.

1. Plot wreckage distribution to include:
   – Significant ground features;
   – Point(s) of initial impact;
   – Location of major components and pieces;
   – Impact direction;
   – Ground fire areas;
   – Ground scars;
   – Indication of serious property damage; and
   – Witness locations.

2. Determine the flight path form the first contact with a ground object, to ground contact, to position of rest; and

3. In a mid-air collision, reconstruct the path by using trajectory analysis based on radar plots, flight recorder data, satellite navigation systems data and witness statements.

EVENT 30. Site photography (Phase 2)

Event 16 refers.

1. Photograph/video wreckage recovery operations;

2. Photograph/video re-assembly operations (if applicable);

3. Photograph/video engine tear down operations (if applicable);

4. Photograph/video components under examination and testing; and

5. Provide analysis of photo/video evidence.

EVENT 31. Flight crew members interviews

Events 3 and 17 refer.

1. Obtain and review flight crew statements; and

2. Conduct individual interviews.

EVENT 32. Victim identification

Events 4 and 18 refer.

1. Collaborate with the coroner and judicial authorities in the identification of victims; and

2. As appropriate, assist in providing victim identification information, such as wallets, clothing, jewellery, age, sex, face, complexion, colour of hair and eyes, height, weight, dental records, scars, growths, skeletal deformities, medical disorders, tattoos, blood group, identification tags and medical files.

EVENT 33. Interviews of next of kin

Events 5 and 19 refer.

1. Complete interviews of next of kin of crew members, covering:
   – Personal habits;
   – Personal background;
   – Current medication; and
   – Psychological problems.

EVENT 34. Analysis of flight recorders data

Events 6 and 20 refer.

1. In concert with designated group chiefs and assigned specialists, conduct a detailed examination of the flight recorders information;

2. In coordination with the Structures Group, Systems Group and Powerplants Group determine the in-flight serviceability of the aircraft, systems and powerplants; and

3. In coordination with the Operations Group, Witness Group, and the Air Traffic Services and Airport Group, reconstruct the flight path, taking into account the satellite navigation systems data, if available.

EVENT 35. Interviews (Meteorology)

Events 7 and 21 refer.

1. Conduct interviews of witnesses, such as:
   – Eyewitnesses;
   – Other flight crews;
   – Weather forecasters or observers; and
   – Weather broadcasters.

2. Review and assess personnel qualifications;

3. Determine the accuracy of weather measuring equipment; and

4. Update the cross sectional weather profile.

EVENT 36. Interviews (Air Traffic Services and Airport)

Events 8 and 22 refer.

1. Conduct interviews with those persons directly involved with the aircraft progress, such as:
   – Ground controller;
   – Tower controller;
   – Area controller;
   – Terminal controller;
   – Radio station operator;
   – Radar operator;

- Other flight crews who may have rendered assistance;
- Other flight crews who may provide pertinent information on in-flight conditions, aircraft communications and serviceability of radio aids;
- Airport manager; and
- Other airport personnel.

EVENT 37. Rescue operations

Events 9 and 23 refer.

1. Determine and record the following:
   - Time and means of alerting rescue units, in part and such as alarm bells, and telephone;
   - First instructions given to rescue units, by whom and by what means;
   - Number and location of rescue vehicles by type on standby and in reserve, including manpower and equipment;
   - Access roads to the site;
   - Environmental conditions during the rescue operations;
   - Communications equipment on the various vehicles;
   - Time at which the rescue units arrived on site;
   - Difficulties in locating the site and bringing the injured out of the wreckage;
   - The means and personnel providing first medical assistance;
   - The arrangements to transport the injured to medical facilities, and adequacy of medical services available; and
   - Time at which the rescue operations were completed.

EVENT 38. Cabin condition

Events 10 and 24 refer.

1. Review and record (in situ) the condition of:
   - General cabin interior;
   - Cabin structure;
   - Floor structure;
   - Aircraft doors;
   - Air stairs;
   - Emergency exits;
   - Breaches of cabin structure;
   - Passenger seats;
   - Seat pitch for each class;
   - Aisle width;
   - Flight attendant seats;
   - Seat belts (passengers and flight attendants);
   - Overhead bins;
   - Galleys, including controls and circuit breaker positions;
   - Trolleys/carts;
   - Public address system, including controls and circuit breaker positions;
   - Life preservers;
   - Seat bottom cushions;
   - Safety features cards;
   - Evacuation alarm system;

   - Emergency equipment:

  - Fire extinguisher(s);
  - Fire axe;
  - Megaphone;
  - Oxygen bottles;
  - Smoke mask/oxygen bottle;
  - Smoke hoods;
  - Flashlights;
  - Escape tapes/reels;
  - Vivopak/physician's kit;
  - Medical kit;
  - First aid kit;
  - Resuscitation mask;
  - Protective gloves;
  - Search mirror;
  - Portable radio beacons;
- Cabin baggage;
- Floor level lights; and
- Seat blocking.

2. Determine the passenger/freight configuration.

EVENT 39. Interviews (Maintenance and Records)

Events 11 and 25 refer.

1. Identify personnel to be interviewed;

2. Coordinate the interviews with other groupchiefs;

3. Prepare questions;

4. Conduct the interviews; and

5. Review and examine interviews for areas of conflict, errors and inconsistencies.

EVENT 40. Interviews (Systems)

Events 12 and 26 refer.

1. Identify personnel to be interviewed;

2. Coordinate the interviews with other groupchiefs;

3. Prepare questions;

4. Conduct the interviews; and

5. Review and examine interviews for areas of conflict, errors and inconsistencies.

EVENT 41. Crashworthiness

Events 13 and 27 refer.

1. Determine the requirement for mechanical or aeronautical engineering assistance;

2. Assess the volume of liveable space remaining within the occupied section of the aircraft after impact forces had dissipated;

3. Determine the volume of liveable space which may have been compromised during the accident sequence, since ductile materials can rebound after impact forces leaving no traces of their invasion of liveable space;

4. Determine the space between seats and aircraft structures, in part and such as instrument panel, control column, seat backs, trays, and galley that may have contributed to the nature and extent of injuries;

5. Determine if the container was penetrated by objects from outside the aircraft;

6. Determine the effects of unsecured interior aircraft equipment or cargo acting as missiles, in part and such as serving carts and oxygen bottles;

7. Determine the effects of passenger luggage on liveable space;

8. Assess the adequacy of walkways and exits;

9. Record the original seating position of deceased passengers and positions where bodies came to rest after the accident;

10. Record the type of seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed in the aircraft;

11. Record the damage to each of the items in task 10 above;

12. Record the effects of webbing material on the nature and extent of injuries, in part and such as cotton/rayon, and nylon; as well as their flammability, elasticity, and adjustment-buckle slippage;

13. Record the type and load-limiting adequacy of cargo restraints, such as nets, lines and pallets;

14. Record the seat geometry for structural strength and energy absorption properties;

15. Record the seat cushions' energy absorption properties and flammability;

16. Assess the adequacy of the seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed;

17. Assess the effects of the cockpit and cabin environment on occupant survivability;

18. Record the following basic data for the determination of energy absorption:
    - Terrain angle;
    - Flight path angle;
    - Angle of impact;
    - Crash force resultant;
    - Crash force angle; and

- Aircraft attitude at impact.

19. Record the width, length, depth and orientation of all gouge marks;

20. Record the depth of damage to the underside of aircraft, extent of compression of energy-attenuation devices;

21. Record the horizontal stopping distances, length of airframe compression in the horizontal plane, backward displacement of each wing and empennage surfaces;

22. Determine the direction, magnitude and duration of G-forces;

23. Determine the acceleration forces experienced by the aircraft occupants; and

24. Estimate the impact forces survivability potential.

EVENT 42. Aircraft performance

Events 3, 17 and 31 refer.

1. Collect all information affecting aircraft performance, and review:
   - Flight crew and passenger interviews;
   - Air traffic services and cockpit voice recorder data;
   - Flight data recorder plots;
   - Flight data recorder information related to previous flights of the aircraft;
   - Eyewitness interviews;
   - Weather data;
   - Engine performance findings;
   - Structures findings; and
   - Systems findings.

2. For take-off or landing phase accidents, the following basic information is required:
   - Aircraft gross weight;
   - Aircraft configuration;
   - Airfield elevation;
   - Temperature;
   - Pressure and density altitudes;
   - Wind direction and velocity;
   - Runway slope;
   - Runway surface (type and braking action);
   - Runway length;
   - Pertinent obstacles; and
   - Engine thrust.

3. Complete a mathematical analysis of the theoretical take-off or landing performance of the aircraft;

4. Compare actual and theoretical flight path and assess the significance of differences;

5. Obtain specialist assistance as required;

6. Consider the requirement for the conduct of flight tests or simulator tests to determine the effects of various combinations of aircraft configuration, engine performance and pilot techniques; and

7. If required, assess accuracy of performance charts.

EVENT 43. Autopsies

Events 4, 18 and 32 refer.

1. Collaborate with the coroner and police authorities regarding the autopsy requirements, and specify a list of essential tissue and fluid specimens to be collected;

2. Request autopsies of the flight crew members, including the determination of the cause of death and the presence of any pre-existing disease;

3. Request autopsies of the cabin crew members and passengers, including the cause of death and the presence of any pre-existing disease;

4. For each flight crew and cabin crew member obtain the following information:
   – Position in the aircraft at impact and evidence of activity;
   – Position relative to angle of impact (to establish direction of forces on bodies);
   – Evidence of injury, incapacitation or any physiological or toxicological irregularities prior to impact;
   – Pre-impact physical or emotional stress;
   – Pre-impact impairment from disease, injury or abnormality;
   – Pre-impact impairment from alcohol, drugs, carbon monoxide, or toxic substances;
   – Pre-impact exposure to explosion and fire; and
   – Adequacy of restraint systems.

5. If feasible, for each passenger obtain the following information:
   – Position relative to angle of impact (to establish direction of forces on bodies);
   – Pre-impact injury of any kind;
   – Pre-impact exposure to explosion, fire, carbon monoxide or toxic substances;
   – Physiological or toxicological irregularities; and
   – Adequacy of seat belts.

6. Obtain the autopsy reports.

EVENT 44. Re-interviews (Eyewitnesses)

Events 5, 19 and 33 refer.

1. Compile a list of witnesses to be re-interviewed;

2. Prepare questions; and

3. Re-interview witnesses.

EVENT 45. Navigation aids and airport status

Events 8, 22 and 36 refer.

1. Obtain the appropriate navigation and approach charts;

2. Request ground and flight checks of pertinent navigation and approach aids for:
   – Location (geographic coordinates);

- Identification signal;
- Power output and supply;
- Emergency equipment;
- Radiation pattern;
- Normal level of performance; and
- Interference(s).

3. Review:
   - Operating and maintenance schedules;
   - Past complaints; and
   - Serviceability status.

4. Examine status of airport and associated facilities, such as:
   - Runway in use;
   - Apron and taxiways;
   - Lighting;
   - Rescue and firefighting services;
   - Station logs; and
   - Equipment inspection documents.

EVENT 46. Firefighting operations

Events 9, 23 and 37 refer.

1. This aspect of the investigation should, if applicable, be conducted in cooperation with the Structures Group responsible for investigating the initiation and spread of the fire;

2. Determine and record the following:
   - Time and means of alerting the various firefighting units;
   - First instructions given and how;
   - Number of vehicles by type on stand-by and in reserve;
   - Type, quantity and rate of discharge of extinguishing agents;
   - Special tools, in part axes, crow-bars, and powered tools;
   - Personnel available on each vehicle and their equipment;
   - Location of the various firefighting units that participated;
   - Route taken to the site by each vehicle and adequacy of the access roads;
   - Environmental conditions, such as weather, terrain, ground or water conditions;
   - Communications capabilities of each vehicle;
   - Time at which the firefighting vehicles arrived at the site; and
   - Difficulties encountered such as:
     - locating the site;
     - reaching the wreckage;
     - lack or poor detail of charts;
     - inadequately trained personnel;
     - intensity of the fire;
     - wind direction and strength;
     - temperature;
     - availability of water and/or extinguishing agents;
     - control and supervision;
     - precautionary measures taken to prevent spreading or restarting the fire;
     - time at which the fire was under control and completely extinguished; and
     - training and standards of rescue and firefighting personnel.

EVENT 47. Interviews (Cabin crew and passengers)

Events 10, 24 and 38 refer.

1. All cabin crew members should provide a written statement prior to the interview;

2. The cabin crew members should be questioned from a list of prepared questions covering:
   – General details of the operation;
   – Phase of flight at time of accident;
   – Weather conditions at time of accident;
   – Serviceability of aircraft;
   – Flight attendant's flying background and experience;
   – Crew rest periods;
   – Movements over the last 24 hours, and over 72 hours;
   – Post-accident activities, in part and such as physical condition, and evacuation; and
   – Any other question pertinent to the circumstances.

3. This interview could be followed at a later date by a more in-depth interview during which elements critical to the investigation should be discussed in detail;

4. Interview witnesses with cabin safety information;

5. Interview next of kin, company representatives and civil aviation authority personnel;

6. Interview as many passengers as possible; and

7. If required, mail questionnaires to surviving passengers not interviewed.

EVENT 48. Maintenance management

Events 11, 25 and 39 refer.

1. Review the following maintenance management aspects;
   – Standards and procedures;
   – Quality assurance programmes;
   – Equipment and facilities; and
   – Personnel and training.

EVENT 49. Wreckage reconstruction

Events 13, 27 and 41 refer.

1. Select a suitable re-assembly area;

2. Determine the method of reconstruction;

3. Obtain the personnel and material resources;

4. Complete the re-assembly;

5. Photograph the re-assembly operations;
6. Interview witnesses; and

7. Select components for examination and testing, if required.

EVENT 50. Analysis and report of the Operations Group

Events 3, 17, 31 and 42 refer.

1. Complete required air operator interviews;

2. Complete interviews of civil aviation authority personnel;

3. Review information from other groups;

4. Review, evaluate and analyse all information collected; and

5. Prepare and submit the group report to the Investigator-in-charge.

EVENT 51. Analysis and report of the Medical/Human Factors Group

Events 4, 18, 32 and 43 refer.

1. Assemble the medical data;

2. Review witnesses' statements;

3. Review, evaluate and analyse all information collected;

4. Prepare the group report using the following headings and sub-headings:
   - Crew:
     - personal history, including habits;
     - medical status and history, including current medication;
     - pre-flight activities having human factors significance;
     - physiological, psychological and toxicological irregularities;
     - incapacitation or injury prior to impact;
     - position in aircraft and crew activity at impact;
     - position of members relative to angle of impact; and
     - injuries resulting from the accident.
   - Passengers:
     - pre-accident physiological conditions; and
     - injuries resulting from the accident.
   - Human engineering:
     - instrumentation, controls, autopilot, crew seats, armrests, and other fatigue-combating devices.
   - Survival equipment performance:
     - seat belts and harnesses;
     - seats and anchorages;
     - escape devices;
     - dinghies;
     - food and clothing kits; and
     - medical kits; and

5. Submit the group report to Investigator-in-charge.

EVENT 52. Analysis and report of the Witness Group

Events 5, 19, 33 and 44 refer.

1. For ease of reference and if the number of interviews warrants, summarize each interview and attach a précis of the interview to the front of each interview record. Such a précis should also contain an assessment of the credibility of the information;

2. Prepare a matrix of witness testimonies that highlights critical issues; and

3. Prepare and submit the group report to the Investigator-in-charge.

EVENT 53. Analysis and report of the Flight Recorders Group

Events 6, 20, and 34 refer.

1. Review, evaluate and analyse all information collected; and

2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 54. Analysis and report of the Meteorology Group

Events 7, 21 and 35 refer.

1. Review, evaluate and analyse all information collected; and

2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 55. Analysis and report of the Air Traffic Services and Airport Group

Events 8, 22, 36 and 45 refer.

1. Review, evaluate and analyse all information collected; and

2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 56. Analysis and report of the Survivability Group

Events 9, 23, 37 and 46 refer.

1. Review, evaluate and analyse all information collected; and

2. Prepare and the submit group report to the Investigator-in-charge.

EVENT 57. Analysis and report of the Cabin Safety Group

Events 10, 24, 38 and 47 refer.

1. Review, evaluate and analyse all information collected; and
2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 58. Analysis and report of the Maintenance and Records Group

Events 11, 25, 39 and 48 refer.

1. Review, evaluate and analyse all information collected; and
2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 59. Analysis and report of the Systems Group

Events 12, 26 and 40 refer.

1. Review, evaluate and analyse all information collected; and
2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 60. Analysis and report of the Structures Group

Events 13, 27, 41 and 49 refer.

1. Review, evaluate and analyse all information collected; and
2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 61. Analysis and report of the Powerplants Group

Events 14 and 28 refer.

1. Assemble examination and testing data;
2. Review, evaluate and analyse all information collected; and
3. Prepare and submit the group report to the Investigator-in-charge.

EVENT 62. Analysis and report of the Site Survey Group

Events 15 and 29 refer.

1. Review, evaluate and analyse all information collected; and
2. Prepare and submit the group report to the Investigator-in-charge.

EVENT 63. Analysis and report of the Photo/Video Group

Events 16 and 30 refer.

1. Complete photo and video requirements;

2. Review, evaluate and analyse all information collected; and

3. Prepare and submit the group report to the Investigator-in-charge.

EVENT 64. Operations analysis and findings

1. This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2. Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3. Identify the areas requiring clarification;

4. Determine the procedure for achieving clarification;

5. Complete the operations analysis and determine findings with assistance from the technical groups;

6. Identify safety hazards and deficiencies; and

7. Suggest safety recommendations.

EVENT 65. Technical analysis and findings

1. This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties, as dictated by local regulations and procedures.

2. Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3. Identify the areas requiring clarification;
4. Determine the procedure for achieving clarification;
5. Complete the technical analysis and determine findings with assistance from the operations groups;
6. Identify safety hazards and deficiencies; and
7. Suggest safety recommendations.

EVENT 66. Report of the Investigator-in-charge

1. Organize the narrative;
2. Analyse the information;
3. Determine and assemble the findings;
4. Determine the causes;
5. Identify safety hazards and deficiencies;
6. Propose safety recommendations;
7. Organize and attach appendices;
8. Assemble the report;
9. Incorporate late information;
10. Submit report to investigation authority;
11. Following revision by the investigation authority, revise report as required; and
12. Submit the investigation report to investigation authority for approval.

Appendix 6

MAJOR ACCIDENT INVESTIGATION GUIDE

(Name of investigation authority)

ACCIDENT NUMBER _____

OPERATOR _____

AIRCRAFT TYPE/MODEL _____

AIRCRAFT REGISTRATION_____

LOCATION _____

DATE OF ACCIDENT _____

INVESTIGATOR-IN-CHARGE _____

INTRODUCTION

In order to discharge his duties effectively, the Investigator-in-charge of a major accident investigation must receive appropriate directing principles for the conduct of his investigation. This document provides the Investigator-in-charge with basic fundamentals for use as a reference. These guidelines are not exhaustive. The Investigator-in-charge and the members of the team should exercise common sense and initiative dependent on the circumstances.

The group system as represented in this document has repeatedly been demonstrated to be an excellent method of conducting a thorough investigation of a major accident. It may prove to be impractical, however, to approach each investigation with a full investigation team; consequently, some investigation groups may be combined or eliminated altogether. The final determination of the team composition rests with the Investigator-in-charge. All personnel assigned to an investigation will remain responsible to the Investigator-in-charge until released by him.

The team concept of investigations and procedures is predicated on sound working relationships between the various groups forming the investigation team. Tasks assigned to one group invariably overlap with those of other groups. This overlap of tasks may at times be a sensitive issue. In order to avoid misunderstandings and possible disruption of the investigation process, all investigation team members should ensure they have a basic understanding of the tasks and responsibilities assigned to other groups.

One of the pitfalls of major accident investigations is a potential for the breakdown of effective communications between the various groups. This document attempts to eliminate that possibility. It must be emphasized, however, that to avoid overlooking of contributory evidence, all significant findings must be shared freely with other groups.

INVESTIGATION TEAM

DEPUTY INVESTIGATOR-IN-CHARGE _____

COORDINATORS

HEAD OFFICE COORDINATOR _____

SITE SAFETY COORDINATOR _____

ADMINISTRATION COORDINATOR _____

MEDIA RELATIONS COORDINATOR _____

OPERATIONAL GROUP CHAIRPERSONS

OPERATIONS _____

MEDICAL/HUMAN FACTORS _____

WITNESS _____

FLIGHT RECORDERS _____

METEOROLOGY _____

AIR TRAFFIC SERVICES/AIRPORT _____

SURVIVABILITY _____

CABIN SAFETY _____

TECHNICAL GROUP CHAIRPERSONS

MAINTENANCE & RECORDS _____

SYSTEMS _____

STRUCTURES _____

CRASHWORTHINESS _____

POWERPLANTS _____

SITE SURVEY _____

PHOTO/VIDEO _____

ACCREDITED REPRESENTATIVES

STATE OF REGISTRY _____

STATE OF THE OPERATOR _____

STATE OF DESIGN_____

STATE OF MANUFACTURE_____

OTHER STATE _____

OTHER STATE _____

OTHER STATE _____

ADVISORS

STATE/COMPANY _____

STATE/COMPANY _____

STATE/COMPANY _____

OBSERVERS/PARTICIPANTS

STATE/COMPANY _____

STATE/COMPANY _____

STATE/COMPANY _____

TABLE OF CONTENTS

INVESTIGATOR-IN-CHARGE

The Investigator-in-charge should be authorized by, and be accountable to, the investigation authority of the State of occurrence membere of the ARCM to organize, conduct and manage the investigation. The objective should be to gather and analyse factual information, to report on the findings and causes related to the accident, to identify the safety deficiencies that contributed to the accident, and to submit recommendations that will reduce or eliminate the related safety deficiencies.

THE INVESTIGATOR-IN-CHARGE SHOULD KEEP PERSONAL NOTES OF SIGNIFICANT EVENTS THROUGHOUT THE INVESTIGATION.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. To facilitate the completion of the tasks of Event 1, the following persons should be in contact with the Investigator-in-charge at this early stage of the investigation: the Deputy Investigator-in-charge, the Head Office Coordinator, the Site Safety Coordinator, the Administration Coordinator and the Media Relations Coordinator;

2. Complete Event 1;

   EVENT 1. Initial response

   1) Collect as much accident-related information as practicable from the reporting source and relevant authorities;

   2) Contact the local police or other authority responsible for site security to determine what actions have been taken and convey the intentions and requirements of the accident investigation authority, in particular the safeguarding of recorders and other perishable investigation evidence;

   3) As appropriate, advise the coroner, the attorney-general or the police of the requirements of the investigation authority regarding the recovery and handling of the human remains, in particular the safeguarding of perishable investigation evidence;

   4) Determine from the air operator if hazardous material, such as chemicals, explosives, biological and radioactive materials were carried on the aircraft;

   5) Determine the composition of the investigation team, taking into account pre-assignments, such as a go-team;

   6) Make arrangements for travel, accommodation, and facilities required for meetings, briefings, and other investigation activities; and

   7) Complete and dispatch the notification to other States involved and to ICAO as per Chapter 4 of Annex 13.

3. When the team has been assembled and organized, convene a pre-departure briefing. A briefing guide is provided at Appendix 1 to this Section; and

4. Establish interim communications procedures for use while in transit to the site.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Complete Event 2;

EVENT 2. Initial actions at the site

Event 1 refers.

1) Review the guarding arrangements and adjust the limits of the site as required;

2) Arrange for guarding of the site for the time period envisaged for the field investigation;

3) Obtain a briefing from the local authorities on actions taken at the site; and

4) Make a preliminary survey of the site with the investigation team.

2. Liaise with the Media Relations Coordinator, in part, for the scheduling of press releases and media interviews;

3. Ensure the Administration Coordinator has initiated document control procedures;

4. As required, brief the Photo/video Group Chief on priorities for photographs, including aerial photography;

5. Convene an organizational meeting. A briefing guide is provided at Appendix 2 to this Section;

6. As time allows, conduct personal briefings with each groupchief;

7. Provide feedback to the Head Office Coordinator on the progress of the investigation;

8. Use the Investigation Management System Checklist;

9. Manage the human and material resources;

10. Conduct daily meetings with the investigation team; and

11. Conduct daily press conferences, as required.

POST-FIELD PHASE

1. Convene investigation team meetings as required;

2. Chair and complete both Events 64 and 65;

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;

- Air Traffic Services/Airport;
- Survivability;
- Cabin Safety; and
- Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chairpersons attending:
   - Maintenance and Records;
   - Systems;
   - Structures;
   - Powerplants;
   - Site Survey;
   - Photo/Video; and
   - Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

3. Complete an investigation report in accordance with Chapter 6 of Annex 13 and ARCM *Manual on aircraft accidents and incidents investigation reporting*, and complete Event 66.

EVENT 66. Report of the Investigator-in-charge

1) Organize the narrative;

2) Analyse the information;

3) Determine and assemble the findings;
4) Determine the causes;

5) Identify safety hazards and deficiencies;

6) Propose safety recommendations;

7) Organize and attach appendices;

8) Assemble the report;

9) Incorporate late information;

10) Submit report to investigation authority;

11) Following revision by the investigation authority, revise report as required; and

12) Submit the investigation report to the investigation authority for approval.

4. If required, complete a performance evaluation report for each Group Chairperson.

Appendix 1 to Section 1

INVESTIGATOR-IN-CHARGE'S PRE-DEPARTURE BRIEFING

1. ACCIDENT INFORMATION

Brief the investigation team on the nature of the accident, including:

– Type, model, nationality and registration marks of the aircraft;

– Name of owner, operator and customer, if any, of the aircraft;

– The qualification of the pilot-in-command and the other flight crew members;

– Date and time of the accident;

– Last point of departure and point of intended landing;

– Position of the accident, including specific directions on how to reach the site;

– Description of dangerous cargo (if any);

– Number of crew and passengers (if known, number killed or seriously injured);

– Nature of the accident and the extent of damage to the aircraft as far as it is known;

– Disposition of the flight recorders; and

– Physical characteristics of the accident site, the security arrangements and the on-site point of contact.

2. THE INVESTIGATION

– Assign group chiefs and group members, as required;

– Emphasize the importance of cooperation, coordination and communications, because the investigation team cannot function effectively if groups work in isolation;

– Ensure that each team member is provided with the checklist for his group responsibilities, and emphasize your expectations;

– Remind all the investigation team members to review and be familiar with the ICAO *Manual of Aircraft Accident and Incident Investigation* and the local procedures applicable to their respective assigned responsibilities;

Brief the team on:

– the expected environmental conditions, the existence of hazardous materials, the biological hazards and the general safety precautions required while on the site. This portion of the briefing may best be conducted by the Site Safety Coordinator;
– the degree of activity and possible confusion to be expected at the site. Team members should present an air of professionalism and remain calm so as to not add to the confusion;

- the roles and participation status of the accredited representatives, advisors and observers/participants; (Appendix 3 to this Section)

- the Administration Coordinator's functions acting as a process and control centre for all documents and coordinating access to the accident site;

- all the photo and video requirements to initially be coordinated through the investigation operations centre;

- the policy regarding media relations, including the pitfalls of discussing investigation issues in the presence of lawyers or insurance agents;

- the policy regarding protective clothing;

- the policy regarding discussions of the accident and the investigation in public places; and

- the travel, accommodation, administrative and financial arrangements; and, if already known, the location of the operations centre and important phone numbers.

NOTES

Appendix 2 to Section 1

ORGANIZATIONAL MEETING

1. GENERAL

– Arrange for the recording of the meeting; and

– Circulate an attendance roster (Appendix 4 to this Section).

2. OPENING OF THE MEETING

– Call the meeting to order;

– Introduce yourself;

– Excuse members of the news media, attorneys, insurers, or persons representing claimants;

– If news media are present, establish a time for a progress briefing.

3. INTRODUCTIONS

– Deputy Investigator-in-charge, Administration Coordinator and Site Safety Coordinator;

– Media Relations Coordinator;

– Groupchiefs. Each chief should introduce his group members;

– Determine the presence of and introduce members of other organizations, in part and such as local authorities, coroner, military, accredited representatives, advisors, observers and participants.

4. PROTECTED INFORMATION

– Review the restrictions regarding the disclosure of records. Refer to Chapter 5 of Annex 13, the local laws and regulations, and the investigation authorities' policies and procedures.

5. ACCIDENT INFORMATION

Brief the investigation team on the information gathered to date. The following format may be used:

– Type, model, nationality and registration marks of the aircraft;

– Name of owner, operator and hirer, if any, of the aircraft;

– Number and qualifications of aircrew (if known);

– Date and time of the accident;

– Last point of departure and point of intended landing;

- Position of the accident;
- Number of passengers (if known, number killed or seriously injured);
- Nature of the accident and the extent of damage to the aircraft as far as it is known;
- Disposition of the flight recorders; and
- Physical characteristics of the accident site including the environmental conditions which may have an effect on the investigation.

6. CONDUCT OF THE INVESTIGATION

- Ensure each group chief has been provided with a checklist appropriate for his group;
- Ensure each group chief is aware of which members, including observers/participants, are assigned to his group;
- Ensure each group chief s aware of the status and restrictions imposed upon the observers/participants;
- Request all observers/participants debrief the Investigator-in-charge prior to their departure, solicit their ideas and request copies of any reports they prepare;
- Assign the responsibility for managing the site activities to the Site Safety Coordinator;
- Stress site safety, re-introduce the Site Safety Coordinator and explain his functions;
- Brief on dangerous cargo;
- Brief on biological hazards and stress the requirements and procedures regarding the use of personal protective equipment;
- Brief on the following site security issues:
  - Site boundaries and controlled entry point(s);
  - Issue and control of identification badges;
  - Controlled access procedures;
  - Point of contact;
  - Site working hours; and
  - Responsibility of escorts;
- Brief on the time and place of future meetings and who is required to attend; and
- Brief on due dates for group reports. A written report should be prepared at the completion of the field phase and given to the Administration Coordinator.

7. OTHER/GENERAL

Safety Issues

– Group chiefs must record all perceived safety issues and advise the Investigator-in-charge.

Media Relations

– Unless advised otherwise, the Investigator-in-charge is the sole spokesperson.

Next of Kin

– The coroner or the police normally have the responsibility to notify the next of kin (NOK) of a deceased person. The Investigator-in-charge should be informed when the notification to the NOK of all deceased persons has been completed.

Documentation

– Ensure everyone understands that all original documents must be turned over to the Administration Coordinator for cataloguing and filing;

– **All** documents and correspondence must be given a file number corresponding to the Master Index - (Administration Coordinator – Appendix 1 to Section 5); and

– Stress the requirement for a thorough follow up on the movement/location of **all** documents and aircraft parts.

Information Transfer

– Stress the importance of communications within the various groups and of information flow between the groups. **No individual or group should be working in isolation.**

Appendix 3 to Section 1

GRANTING OBSERVER/PARTICIPANT STATUS LETTER

(Name of investigation authority)

Date.....

Dear (Name of Observer/Participant.....).

GRANTING OF OBSERVER/PARTICIPANT STATUS

ACCIDENT FILE NO: .....
AIRCRAFT: .....
LOCATION: .....

The (name of the investigation authority) is empowered to investigate aircraft accidents in the (name of State). The objective of the investigation is to advance aviation safety by identifying safety deficiencies and making recommendations designed to eliminate or reduce such deficiencies.

During the course of an accident investigation, the (name of the investigation authority) may authorize a person to attend as an observer when the person is designated as such by a Minister responsible for a government department having a direct interest in the investigation, or as a participant when, in the opinion of the (name of the investigation authority), the person has a direct interest in the subject-matter of the investigation and will contribute to achieving the objective of (name of the investigation authority).

By this letter, you are granted the status of an observer or a participant to this accident and, subject to any conditions that the (name of the investigation authority) may impose and under the supervision of an investigator, you may:

a) attend at the accident site;

b) examine the aircraft, its component parts and contents;

c) unless otherwise prohibited by law, examine relevant documents; and

d) attend laboratory examinations and testings.

Your attendance as an observer/participant is subject to the following conditions:

a) you shall limit your activities at the accident site to those outlined by the Investigator-in-charge;

b) you shall ensure that your activities do not restrict or otherwise interfere with the investigators in the performance of their duties; and

c) you shall ensure that the information you gain as a result of your observer/participant status is not disclosed to any unauthorized person.

Failure to comply with any of the above conditions and responsibilities could result in the immediate revocation of your observer/participant status.

You should also understand that the privileges of an observer/participant will be exercised at your own risk. Please sign and return the attached copy of this letter to the Investigator-in-charge, indicating your understanding and acceptance of the above-mentioned conditions and responsibilities.

Yours truly,

Investigator-in-charge

I understand and accept the conditions outlined above with respect to my attendance as an observer/participant at the subject investigation.

I also understand that the privileges of an observer/participant will be exercised at my own risk, and I hereby agree to indemnify and save harmless the (name of the investigation authority) for any damage or injuries I may suffer as a result of my attending the investigation as an observer.

Signed:

Appendix 4 to Section 1

(Name of the investigation authority)

ATTENDANCE RECORD

ACCIDENT:

Date:

Started/Completed:

Location:

FULL NAME	ORGANIZATION	GROUP	TELEPHONE #	SIGNATURE

Section 2

DEPUTY INVESTIGATOR-IN-CHARGE

The Deputy Investigator-in-charge assists the Investigator-in-charge in the organization, conduct and control of the investigation. He is required to provide continuity in the investigation process during the absence of the Investigator-in-charge and is also expected to assist in the flow of information to the various groups of the investigation team.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Assist the Investigator-in-charge in establishing the investigation team and its organizational structure;

2. Ensure that all group chief positions are accounted for and that each group chief is provided with a copy of the Investigation Management System Event Checklist and the Major Accident Investigation Guide;

3. Assist the Investigator-in-charge in preparing for the pre-departure briefing of the investigation team;

4. Assist the Administration Coordinator with the following:

   – arranging transport for the investigation team to the accident site;

   – arranging ground transportation at the accident site;

   – requesting advances for the investigation team;

   – making accommodation arrangements;

   – obtaining appropriate office spaces; and

   – making arrangements for the transportation of the readiness and toxicological kits.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Assist the Investigator-in-charge in preparing for the organizational meeting;

2. Ensure a copy of the Investigation Management System Event Checklist and Major Accident Investigation Guide is available in the operations centre;

3. Forward further information required to update the notification to the Head Office Coordinator;

4. Ensure the Investigation Management System Event Checklist is being adhered to and that activities are recorded;

5. Insure that sufficient administrative support is available to effect proper document control;

6. Maintain radio or telephone communications with the team members at the accident site;

7. Provide the investigation team with technical, administrative and financial support;
8. Maintain a written log of daily activities; and

9. Assist the Investigator-in-charge with contact with the media, as required.

POST-FIELD PHASE

1. Attend meetings Events 64 and 65; and

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

2. Assist the Investigator-in-charge for Event 66.

EVENT 66. Report of the Investigator-in-charge

1) Organize the narrative;

2) Analyse the information;

3) Determine and assemble the findings;

4) Determine the causes;

5) Identify safety hazards and deficiencies;

6) Propose safety recommendations;

7) Organize and attach appendices;

8) Assemble the report;

9) Incorporate late information;

10) Submit report to investigation authority;

11) Following revision by the investigation authority, revise report as required; and

12) Submit the investigation report to the investigation authority for approval.

Section 3

HEAD OFFICE COORDINATOR

The Head Office Coordinator provides the Investigator-in-charge with related assistance, informs various agencies of the accident, and acts as the point of contact between the Investigator-in-charge and the investigation authority senior management.

1. Advise:

   – All appropriate Directors;

   – Media relations;

   – Civil aviation authority;

   – State of Registry;

   – State of the Operator;

   – State of Manufacture;

   – State of Design;

   – Aircraft/Engine Manufacturer; and

   – Owner/Operator of the aircraft.

2. Request all the pertinent documents from the civil aviation authority, the owner/operator of the aircraft and air traffic services;

3. Ensure that all pertinent documents, recordings and data/media are secured;

4. Record names and phone numbers of persons advised, including date and time;

5. Inform the Investigator-in-charge of the persons contacted and which parties have requested observer/participant status;

6. Attend the Investigator-in-charge's pre-departure briefing;

7. Promulgate the initial notification when the information has been received from the Investigator-in-charge;

8. Assist the Deputy Investigator-in-charge; and

9. Assist the Investigator-in-charge by coordinating the Head Office investigation activities during the field phase.

Section 4

SITE SAFETY COORDINATOR

The Site Safety Coordinator ensures that all activities at the accident site are properly coordinated, with specific emphasis on site security and site safety. The Site Safety Coordinator is responsible to the Investigator-in-charge and coordinates his activities with the whole investigation team.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Establish communications with the agency responsible for site security;

2. Determine if there was any hazardous cargo on the aircraft;

3. Determine the environmental conditions that investigators will be subjected to on the site;

4. Attend the Investigator-in-charge's pre-departure briefing;

5. Brief the investigation team on the expected environmental conditions and existence of hazardous materials on the site (if any); and

6. Coordinate with the Investigator-in-charge to ensure that the site-safety and site-security requirements specified in Event 1 are completed;

EVENT 1. Initial response

1) Contact the local police or other authority responsible for site security to determine what actions have been taken and convey the intentions and requirements of the accident investigation authority, in particular the safeguarding of recorders and other perishable investigation evidence;

2) As appropriate, advise the coroner, the attorney-general or the police of the requirements of the investigation authority regarding the recovery and handling of the human remains, in particular the safeguarding of perishable investigation evidence;

3) Determine from the air operator if hazardous material, such as chemicals, explosives, biological and radioactive materials were carried on the aircraft;

AFTER ARRIVING AT THE ACCIDENT SITE

1. Coordinate with the Investigator-in-charge to ensure that the site-safety and site-security requirements specified in Event 2 are completed;

EVENT 2. Initial actions at the site

Event 1 refers.

1) Review the guarding arrangements and adjust the limits of the site as required;
2) Arrange for guarding of the site for the time period envisaged for the field investigation;

3) Obtain a briefing from the local authorities on actions taken at the site; and

4) Make a preliminary survey of the site with the investigation team.

2. Initial coordination

- Contact the person responsible for the site security;
- Confirm the existence/nonexistence of hazardous materials on the site. The following should be considered:
  - chemical;
  - explosive;
  - biological; and
  - radioactive.
- If the responsibility for the site security will remain with an agency other than the investigation authority, ensure that agency is aware of the possible hazards to personnel posed by various aircraft components, in part and such as pressure vessels, fuel tanks, and tires;
- Ensure security guards are properly briefed to:
  - protect the public;
  - protect property;
  - prevent disturbance of wreckage;
  - protect and preserve ground marks made by the aircraft; and
  - admit only those persons with the required passes to the site.
- Conduct a preliminary survey of the site and make an assessment of the physical limits to be established as the site boundaries;
- Establish site limits;
- Attend the Investigator-in-charge's organizational meeting;
- Ensure the investigation team is briefed on the existence and location of any known or suspected hazards on the site and that all team members are aware of their responsibilities with respect to their personal safety while working on the site;
- Ensure all personnel seeking access to the site have the proper site access passes;
- Ensure compliance with site opening/closing times;
- Maintain a record of personnel on the site; and
- Maintain a log of all significant site activities.

3. First aid

- Ensure an adequate first-aid kit is available at the site, including a stretcher;
- Maintain a list of first aid trained personnel;
- Maintain an accurate record of injuries and first-aid treatment provided; and
- Ensure that a vehicle is available at the site for medical evacuations.

4. Communications

   – If practicable, arrange for telephone installation at the site;

   – Maintain a ready reference list of emergency phone numbers including:
     – Police;
     – Ambulance;
     – Doctors;
     – Poison centre; and
     – Operations centre.

   – In the absence of telephone capabilities, arrange for practical radio communications with the operations centre.

5. Hazards

   – Seek expert assistance for the safe handling of hazardous materials;

   – Identify and arrange for the elimination of potential hazards such as:
     – Fuel;
     – Inflated tires;
     – Pressure vessels;
     – Compressed air;
     – Compressed springs;
     – Hydraulics;
     – Oleos;
     – Batteries;
     – Igniters;
     – Oxygen system;
     – Oxygen bottles;
     – Aerosol containers;
     – Fire extinguishers;
     – Evacuation chutes;
     – Flares;
     – Life rafts/jackets; and
     – Composite materials.

   – Ensure an accurate record is kept, including photographs, of the “as found” condition of the hazards prior to neutralizing.

6. Firefighting

   – Ensure all fires are extinguished;

   – Ensure fire extinguishers are available at the site;

   – Ensure the investigation team members are aware of hazardous areas; and

   – Designate smoking areas away from the site.

7. Site command post

   – Consider and arrange for the following, as required:
     – Shelter;
     – Sleeping quarters;
     – Lighting;
     – Heating;
     – Washing facilities;
     – Drinking water;
     – Meals; and
     – Sanitation.

8. Site safety

   – Establish site working hours, in collaboration with the Investigator-in-charge and the groupchiefs;

   – Ensure personnel on the site are adequately equipped with personal protection equipment, such as:
     – Head protection;
     – Eye protection;
     – Face protection;
     – Hearing protection;
     – Protective footwear;
     – Protective clothing; and
     – Hand protection.

   – Liaise with the Administration Coordinator for the procurement of the personal protective equipment described in item 7 above.

9. Helicopter operations

   – If helicopter support is required, the following should be considered:
     – Rotorcraft type suitability;
     – Requirement for a helipad;
     – Removal of obstructions;
     – Air traffic services implications;
     – Availability of aviation fuel; and
     – Availability of fire extinguishers.

   – Ensure the flight crew are thoroughly briefed on the operation required, and that flight safety is paramount;

   – Ensure ground crews are briefed and properly equipped to conduct the operation safely;

   – Consider the following major contributing factors in helicopter mishaps:
     – Obstacles in the area, on approach and departure;
     – Snagged sling gear;
     – Poorly prepared and maintained landing pad;
     – Incorrectly rigged slung loads;
     – Overloading; and
     – Improperly trained/briefed personnel.

10. Transportation of material and site clean-up

- Assist the technical group persons in the packaging and shipment of aircraft parts and components; and

- Locate required equipment and personnel for the clean-up of the accident site.

POST-FIELD PHASE

1. Prepare a report to the Investigator-in-charge outlining the site activities including appropriate recommendations to address any deficiencies.

Section 5

ADMINISTRATION COORDINATOR

The Administration Coordinator provides administrative support to the investigation team and establishes a secure on-site office for the collection, retention, distribution and follow-up of material collected during the on-site investigation.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Coordinate necessary pay advances;

2. Ensure that the finance section is aware of the Responsibility Code (RC) for the pay advances;

3. Coordinate transportation arrangements of Head Office personnel;

4. Coordinate living accommodation arrangements and obtain meeting facilities;

5. Obtain a series of Purchase Order (PO) numbers from the Head Office Administration;

6. Obtain a petty cash advance from the finance section;

7. Ensure completeness of the Head Office readiness kit;

8. Arrange for the transportation and security of the Head Office readiness kit, including but not limited to the following:
   - Laptop computer;
   - Printer and paper for the printer;
   - Supplies of paper, pens, pencils, rulers, tape measures, instant markers;
   - Audio recorders;
   - On-site communication radios, mobile phones and satellite phones;
   - CDs, DVDs, flash memory sticks, and other data storage media;
   - Batteries;
   - Satellite navigation devices;
   - Flashlights;
   - Camera equipment; and
   - Environmental clothing and biohazard clothing and supplies.

9. Attend the Investigator-in-charge's pre-departure briefing and inform the investigation team on travel, pay advance and accommodation arrangements.

AFTER ARRIVING AT ACCIDENT SITE

1. Secure office facilities, equipment and meeting room;

2. Hire additional office support staff as required and ensure affirmation of secrecy forms are signed;

3. Arrange for the installation of telephones in the operations centre. It is recommended that a minimum of three phone lines be established: one private line for the Investigator-in-charge, a second for general use, and a third for public relations. Post the investigation team telephone list in the operations centre;

4. Arrange for the rental of motor vehicles as required, and obtain local maps;

5. Distribute radios to group chiefs and retain a record of distribution;

6. Maintain control of identification cards;

7. Assign a Purchase Order Number for each financial transaction conducted in support of the investigation;

8. Maintain a record of each financial transaction, and inform the Investigator-in-charge on a daily basis of funds expended;

9. Maintain a record of petty cash expenditures;

10. If required, arrange for the transcription of recorded interviews;

11. Arrange for the transportation and security of privileged information;

12. Establish and maintain a catalogue of all incoming information from interviews and documents;

13. Retain and file original copies of all documents. Refer to the attached Appendix 1 for suggested file numbers;

14. Take minutes of daily meetings; and

15. Secure all documents at the end of each day.

AT CONCLUSION OF THE FIELD PHASE

1. Arrange with telephone company for the termination of services;

2. Write thank you letters, for the Investigator-in-charge's signature, to all companies for services rendered;

3. Ensure all identification cards as well as all radios are returned and secured;

4. Ensure all documents are secured; and

5. Arrange for return transportation of the investigation team.

POST-FIELD PHASE

1. Consolidate a report of funds expended during the investigation;

2. Ensure that all investigation documents gathered during the field phase of the investigation are properly secured;

3. Coordinate the production of head office file covers and arrange for the filing of all documents gathered to date; and

4. Submit recommended improvements to the Administration Coordinator’s duties as well as recommended amendments to this checklist.

Appendix 1 to Section 5

MAJOR ACCIDENT INVESTIGATION FILE NUMBERS

SUFFIX	SUBJECT
-0	INDEX
-1	GENERAL
-2	SAFETY ISSUES
-3	SITE SAFETY
-4	MEDIA
-5	OPERATIONS
-6	AIRCRAFT PERFORMANCE
-7	MEDICAL/HUMAN AND ORGANIZATIONAL FACTORS
-8	WITNESS
-9	FLIGHT RECORDERS
-10	METEOROLOGY
-11	ATS/AIRPORTS
-12	SURVIVABILITY
-13	CABIN SAFETY
-14	MAINTENANCE & RECORDS
-15	SYSTEMS
-16	STRUCTURES
-17	CRASHWORTHINESS
-18	POWERPLANTS
-19	SITE SURVEY
-20	PHOTO/VIDEO
-21	ACCREDITED REPRESENTATIVES, ADVISORS, OBSERVERS and PARTICIPANTS
-22	INFORMATION REQUESTS
-23	UNSOLICITED SUBMISSIONS
-24	ORAL REPRESENTATIONS
-25	EXHIBITS
-26	FINANCE
-27	ADMINISTRATION

Section 6

MEDIA RELATIONS COORDINATOR

The Media Relations Coordinator:

a) Provides specific expertise and advice to the Investigator-in-charge in handling the media and their requests, as well as provides advice on community relations;

b) Assures that media requests and community queries are followed up; and

c) Promotes a positive public image for the Investigation Authority.

Note.— The Investigator-in-charge is the spokesperson throughout the investigation process. Arrangements may be entered into by the Investigator-in-charge for the Media Relations Coordinator to take some of the Investigator-in-charge's media workload. The Media Relations Coordinator will provide only that information as agreed to by the Investigator-in-charge.

Some States may assign the responsibility of investigation spokesperson to a senior manager of the investigation authority.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Prepare and issue a news release stating that the investigation authority is sending a team to the accident site. The release should contain only factual information known to that point, a contact phone number, as well as the name of the Investigator-in-charge and of the Media Relations Coordinator at the site;

2. Liaise with the Administration Coordinator to ensure that arrangements are made for a telephone line for exclusive use of the Media Relations Coordinator at the operations centre;

3. Document all media calls before departure (for callback purposes), and ensure that the media is called after arriving on site;

4. Make a list, with telephone numbers and city, of all the media expected to arrive in the area or that will have a direct interest in the accident investigation;

5. Brief the Investigator-in-charge regarding media attention on his arrival at the accident site;

6. Ensure that the following equipment is packed for the use of the Media Coordinator at the site:

   – Portable computer;
   – Printer;
   – Paper for printer;
   – Portable audio recording device;
   – Portable radio;
   – Business cards;
   – Paper and pens;
   – Tapes and batteries;
   – Camera equipment; and
   – Proper environmental clothing.

7. Attend the Investigator-in-charge's pre-departure briefing and advise the team of the type of media coverage that might be expected at the accident site.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Initial coordination

   – Determine which media are on site;

   – Find a proper location for news conferences;

   – Brief the Investigator-in-charge and coordinate arrangements for the initial news conference;

   – Contact all media in the area to let them know who the contact is and when and where the first news conference will be held;

   – Prepare a facts sheet of all the factual information known at that time;

   – Contact the media and get a feel for the types of questions that the journalists may be asking. Use this information for the facts sheet;

   – Prepare a questions sheet and brief the Investigator-in-charge before the first news conference; and

   – Record interviews, organizational meetings and news conferences.

2. First news conference

   – If the news conference is to be held indoors, ensure that the location has adequate power facilities;

   – Ensure that the media are aware of the news conference;

   – Brief the Investigator-in-charge on probable questions and responses;

   – The following information should be provided to the media:
     – The purpose of the conference;
     – How the investigation authority operates;
     – The factual information known at that time;
     – Any other releasable information known to date;
     – The type of information which will not be released by the Investigation Authority;
     – How the investigation will be carried out;
     – Time and place of accident site tours, if feasible;
     – Name of contact person and telephone numbers; and
     – Time of next news conference.

   – Obtain the names and contact points of the journalists for callback purposes;

   – Debrief the Investigator-in-charge;

   – Brief the Head Office Coordinator on the situation; and

   – Guide the media through the accident site, as briefed by the Investigator-in-charge.

3. Continuing services

   – Maintain a list of updated factual information;

   – Make arrangements for site tours with the Investigator-in-charge;

   – Pick up copies of all local media releases;

   – Liaise with Head Office Coordinator;

   – Arrange interviews between the Investigator-in-charge and the media;

   – Prepare statements and speech notes, as required;

   – Maintain contact with the media while on site;

   – Assure follow-up questions are answered;

   – Keep a log of your activities;

   – Arrange for public radio/television announcement, in part to locate witnesses and advise the public of hazards;

   – Arrange continuing news conferences as needed;

   – Assist the Investigator-in-charge in the procurement of media photo/video coverage that may be useful for the conduct of the investigation; and

   – Advise the Investigator-in-charge, as necessary.

POST-FIELD PHASE

1. Submit a consolidated report to the Investigator-in-charge on the media-related activities during the investigation.

Section 7

OPERATIONS GROUP CHIEF

The Operations Group Chief is responsible for all facts concerning the history of the flight and flight crew members' activity. This includes flight planning, dispatching, weight and balance, radio communications, navigation and approach aids, en-route stops, refuelling, aeronautical experience, flight checks and general information about the flight crew members.

The medical history of the crew members should be determined in cooperation with the Medical/Human Factors Group. The final flight path should be determined in cooperation with the Witness, Flight Recorder and Site Survey groups. Other information relating to the history of the flight should be determined in cooperation with the Meteorology and Air Traffic Services/ Airport groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing; and

2. Initiate Event 3.

EVENT 3. Secure flight operations documents

1. Obtain and secure the following documents, as appropriate:

a) From the operator/company:
- Air Operator Certificate;
- Air Operator Operations Manual;
- Flight Manual (FM);
- Flight crew and cabin crew members training records;
- Aircraft Operating Manual (standard operation procedures [SOPs]);
- Copy of current cockpit checklists (normal, abnormal and emergencies);
- Pilot log books;
- Pilots flight log;
- Pilot flying schedule for the last six months;
- Aircraft Journey Log Book;
- Minimum Equipment List (MEL);
- Air Operator dispatch logs;
- Daily dispatch logs, including the week prior to and the day of the accident;
- Mass and balance and centre of gravity calculations for the accident flight and previous flight;
- Passenger and freight manifest;
- Air Operator schedules and aircraft schedules;
- Air Operator Route Manual;
- National and international agreements associated with the transfer some or all of the State of Registry's responsibilities (if applicable)
- Refuelling documentation; and
- Record of pertinent communications.

b) From the pertinent civil aviation authority:
- Flight crew personnel licensing files;
- Copy of approved Flight Manual (FM);
- Copy of approved Minimum Equipment List (MEL);

- Copy of company Master Minimum Equipment List (MMEL);
- Files on chief pilot, chief inspector, cabin crew, chief flight engineer, and chief of maintenance;
- Copy of in-flight inspections covering the last six months;
- Documentation in support of applications for the Air Operator Certificate;
- Copy of any civil aviation authority Policy Letters applicable to the company;
- National and international agreements associated with the transfer some or all of the State of Registry's responsibilities (if applicable);
- Copy of the last air operator audit conducted by the authority; and
- Air Operator files.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Brief the Operations Group members;

3. Liaise with Medical/Human Factors Group Chief regarding the interview of any surviving aircrew members (refer to Appendix 1 of this Section);

4. Ensure appropriate liaison is maintained with all group chiefs in order to reduce duplication;

5. Conduct an initial survey of the accident site in order to get a feel for the dynamics of the accident sequence, in part and such as impact angles, impact attitude, velocity, power, fire, and configuration;

6. Advise Photo/Video Group Chief of requirements;

7. Liaise with Systems GroupChief, in part to review and record (in situ) position of cockpit controls, instruments, switches, circuit breakers, approach charts, and seat belts;

   Note.— Most of the above evidence is perishable. This phase of the investigation is critical and must be carefully recorded.

8. Complete Event 3;

9. Submit all original documents to the Administration Coordinator;

10. Initiate and complete Event 17;

EVENT 17. Review of operations documents

Event 3 refers.

1) Review all the documents obtained from the operator and summarize the pertinent information;
2) Review all the documents obtained from the civil aviation authority and summarize the pertinent information; and
3) Compile in chronological order, the history for each flight crew member and for the operator.

11. Obtain CVR data/transcript and FDR data plots and conduct preliminary review of recorded information for operational factors;

12. Maintain close liaison with Witness Group Chief and police for coordination of a list of potential witnesses

and for the establishment of possible questions;

13. As operational information is collected, inform the appropriate group chief regarding aircraft systems that may be suspect;

14. Gather information required for computation of the aircraft mass and balance and centre of gravity. Have baggage weighed, if necessary;

15. Determine requirements for an Aircraft Performance Sub-Group. If required, initiate Event 42;

EVENT 42. Aircraft performance

This aspect of the investigation is normally the responsibility of the Operations Group. Under certain circumstances, it is desirable to establish an investigation group tasked specifically to conduct a detailed examination of the aircraft performance characteristics which may have been causal to the accident.

Events 3, 17 and 31 refer.

1. Collect all information affecting aircraft performance, and review:
   - Flight crew and passenger interviews;
   - Air traffic services and cockpit voice recorder data;
   - Flight data recorder plots;
   - Flight data recorder information related to previous flights of the aircraft;
   - Eyewitness interviews;
   - Weather data;
   - Engine performance findings;
   - Structures findings; and
   - Systems findings.

2. For take-off or landing phase accidents, the following basic information is required:
   - Aircraft gross weight;
   - Aircraft configuration;
   - Airfield elevation;
   - Temperature;
   - Pressure and density altitudes;
   - Wind direction and velocity;
   - Runway slope;
   - Runway surface (type and braking action);
   - Runway length;
   - Pertinent obstacles; and
   - Engine thrust.

3. Complete a mathematical analysis of the theoretical take-off or landing performance of the aircraft;

4. Compare actual and theoretical flight path and assess the significance of differences;

5. Obtain specialist assistance as required;

6. Consider the requirement for the conduct of flight tests or simulator tests to determine the effects of various combinations of aircraft configuration, engine performance and pilot techniques; and

7. If required, assess accuracy of performance charts

16. Attend interviews of key witnesses with operational information;

17. Commence preparations for interviews of flight crew members;

Note.- Interviews of flight crew members should be planned and conducted in consultation with the Witness and Medical/Human Factors groupchiefs, and in consideration of their requirements.

18. Initiate Event 31;

EVENT 31. Flight crew members interviews

Events 3 and 17 refer.

1) Obtain and review flight crew statements; and

2) Conduct individual interviews.

19. Commence preparations for interviews of next of kin and air operator representatives;

Note.— To avoid duplication, it is imperative that these interviews of next of kin be conducted in concert with the Witness and Medical/Human Factors groupchiefs. Similarly, interviews with other individuals may be of interest to other groupchiefs, such as interviews with company management personnel which may also be required by the Powerplant, Systems, and Maintenance and Records groupchiefs. These interviews should be planned and conducted with consideration of the requirements of other groups.

20. Gather pertinent data from other group chiefs prior to departing the site;

21. If required, conduct a familiarization ride on the same route and on the same aircraft type, preferably with the same operator;

22. If required, arrange for a simulator programme; and

23. Complete Events 31 and 42.

POST FIELD PHASE

1. Complete Event 50;

EVENT 50. Analysis and report of the Operations Group

Events 3, 17, 31 and 42 refer.

1) Complete required air operator interviews;

2) Complete interviews of civil aviation authority personnel;

3) Review information from other groups;

4) Review, evaluate and analyse all information collected; and

5) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Appendix 1 to Section 7

FLIGHT CREW MEMBERS INTERVIEW

The initial interview should be restricted to the events associated with the occurrence flight. All flight crew members should provide a written statement.

The crew members should be questioned from a list of prepared questions covering:

- general details of the operation;
- phase of flight at time of accident;
- weather conditions at time of accident;
- similarity between actual weather and forecast;
- radio and navigation aids used;
- serviceability of aircraft;
- pilot's flying background and experience;
- crew rest periods;
- movements in the last 24 hours;
- post-accident activities;
- physical condition and evacuation; and
- any other question pertinent to the circumstances.

Crew members will be re-interviewed as circumstances dictate.

Note.— Relate pertinent factual information to the Investigator-in-charge and appropriate group chairpersons.

Section 8

MEDICAL/HUMAN AND ORGANIZATIONAL FACTORS CHIEF

Support regarding the investigation of medical and human factors issues normally would be achieved by assigning the subject-matter experts to the investigation group(s) requiring such assistance. A separate Medical/Human Factors Group would only be formed when there is a requirement to conduct an in-depth examination of the aero medical, crash injury, and/or human performance issues.

For human factors issues, this group will gather and analyse evidence on the general physical, physiological and psychological conditions, the environmental factors, and the organizational and management factors that might have adversely affected the crew or other individuals in the performance of their duties. The investigations of human factors should be conducted whenever human performance may have contributed to the occurrence, which could include, among others, cabin crew, air traffic controllers, maintenance crew, engineers, regulatory officials, decision-makers and management. The human factors investigation must go beyond determining what individuals did and must also include the systematic search for the probable reasons why they acted in a certain manner.

For medical factors issues, this group will gather and analyse the evidence associated with the pathological, aviation-medical and crash injury aspects of the investigation, including the identification of the crew, their location at the time of the accident, and by reviewing their injuries, their position and their activity in the cockpit at the time of the impact. This group will cover matters involving autopsies of crew and passengers, as appropriate, not only to identify the victims and to assist in legally determining the cause of death, but also to obtain all possible medical evidence that may be of assistance in the investigation. The group will also investigate the design factors related to human engineering that may have contributed to the causes of the accident, the survival aspects and the crashworthiness of the aircraft leading to the injury or death of the occupants.

The functions of this group must be closely coordinated with the Operations Group, Air Traffic Services and Airports Group, Witness Group, Recorders Group, Maintenance and Records Group, Structures Group and Crashworthiness Group.

CAUTION

The procedures of the investigation authority often overlap with those of police and coroners. Sound working relationships should have been pre-established with these authorities.

The overlap of investigations and procedures with these groups is a sensitive issue. In order to avoid misunderstandings and possible disruption of the investigation process, the Medical/Human Factors Group Chief should be familiar with this issue prior to commencing his investigation.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Consult with the Investigator-in-charge to determine what arrangements may have been concluded with the coroner, the attorney-general or the police;

2. Consult with the Investigator-in-charge and the chairpersons of the other groups to determine what medical and/or human factors expertise is required on their groups;

3. Allocate Medical/Human Factors Group resources as required to other investigation groups;

4. Conclude an agreement with medical authorities on the time and method of recovering human remains, autopsies and physical examinations of surviving crew members;

5. If required, advise the medical authorities of the specific accident investigation requirements (Appendices 1 and 2 of this Section);

6. Obtain the crew members medical file(s) and review as required (coordinate with the Operations Group Chief);

7. Consider the requirement for a review of the personal physician files and medicare records;

8. Attend the Investigator-in-charge's pre-departure briefing; and

9. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Contact the local coroner or appropriate medical authority to determine the progress at the accident site;

2. Conduct a preliminary survey of the accident site in order to get a feel for the dynamics of the accident;

3. Attend the Investigator-in-charge's organizational meeting;

4. Obtain the passenger manifest;

5. Initiate Event 4;

EVENT 4. Human remains recovery

1) Coordinate with forensic personnel for human remains recovery

2) During the recovery, photograph the remains and record their location; and

3) Prepare a plot of the locations of the human remains.

6. Complete Event 4;

7. Initiate Event 18;

EVENT 18. Crew members medical examinations

Event 4 refers.

1) Obtain the list of flight crew and cabin crew members (names and positions);
2) Determine the location and condition of the surviving flight crew members;
3) Obtain the permission of crew members to submit to medical examination;
4) Arrange for examinations of the flight crew members by a competent medical practitioner, including blood and urine samples, and obtain the following information:
   – Medical status and history, including medications;
   – Personal history, including habits; and
   – Pre-flight activities with human factors significance.

5) If relevant, arrange for examination of the cabin crew members by a competent medical practitioner, including blood and urine samples, and obtain the following information:
   – Medical status and history, including medications;
   – Personal history, including habits; and
   – Pre-flight activities with human factors significance.

Note 1.- The human factors investigation should go beyond examining the actions of the aircrew and include a review of the actions of any individual participating in a flight's operation and whose performance may have contributed to the occurrence.

Note 2.- The Investigator-in-charge should have the power to require such medical examinations of aircraft crew members if he believes on reasonable grounds that such examinations may be relevant to the investigation.

No medical examination shall be made that involves surgery, perforation of skin or external tissue or the entry into the body of any drug or other foreign substance.

8. Coordinate the participation of human performance specialist(s) at interviews of involved personnel, to include among others surviving flight crew and cabin crew, air traffic services and airport controllers, maintenance technicians, regulatory officials, and management;

9. Coordinate and attend interviews of flight crew members with the Operations Group Chief (Appendix 1 to Section 7);

10. Complete Event 18;

11. Assist the coroner in carrying out his duties;

12. Complete Event 32;

EVENT 32. Victim identification

Events 4 and 18 refer.

1) Collaborate with the coroner and police authorities in the identification of victims; and

2) As appropriate, assist in providing victim identification information such as wallets, clothing, jewellery, age, sex, face, complexion, colour of hair and eyes, height, weight, dental records, scars, growths, skeletal deformities, medical disorders, tattoos, blood group, identification tags and medical files.

13. Refer to Appendix 1 of this Section for post-mortem examination requirements;

14. Consult with medical authorities regarding the location and time of autopsies;

15. Advise coroner or attorney general of tests required on remains, including human fluids and tissue specimen requirements (Appendix 2 of this Section);

16. Initiate Event 43.

EVENT 43. Autopsies

Events 4, 18 and 32 refer.

1) Collaborate with the coroner and police authorities regarding the autopsy requirements, and specify a list of essential tissue and fluid specimens to be collected;

2) Request autopsies of the flight crew members, including the determination of the cause of death and the presence of any pre-existing disease;

3) Request autopsies of the cabin crew members and passengers, including the cause of death and the presence of any pre-existing disease;

4) For each flight crew and cabin crew member obtain the following information:
   – Position in the aircraft at impact and evidence of activity;
   – Position relative to angle of impact (to establish direction of forces on bodies);
   – Evidence of injury, incapacitation or any physiological or toxicological irregularities prior to impact;
   – Pre-impact physical or emotional stress;
   – Pre-impact impairment from disease, injury or abnormality;
   – Pre-impact impairment from alcohol, drugs, carbon monoxide, or toxic substances;
   – Pre-impact exposure to explosion and fire; and
   – Adequacy of restraint systems.

5) If feasible, for each passenger obtain the following information:
   – Position relative to angle of impact (to establish direction of forces on bodies);
   – Pre-impact injury of any kind;
   – Pre-impact exposure to explosion, fire, carbon monoxide, or toxic substances;
   – Physiological or toxicological irregularities; and
   – Adequacy of seat belts.

6) Obtain the autopsy reports.

17. Forward specimens to laboratory for examination (refer to Appendix 2 to this Section);

18. Review and analyse, in concert with the Operations Group Chief and Flight Recorders GroupChief, the information contained on the cockpit voice recorder (CVR) and flight data recorder (FDR) plots;

19. As human performance factor issues emerge, contact the Witness Group Chief for the introduction of questions on human factors aspects;

20. Complete Event 43;

21. When practicable, coordinate with the Witness Chief for interviews with next of kin (NOK) and personal physicians covering the victims':

    – personal habits;

    – personal background;

    – current medication; and

    – psychological problems.

POST-FIELD PHASE

1. Complete Event 51;

EVENT 51. Analysis and report of the Medical/Human and Organizational Factors Group

Events 4, 18, 32 and 43 refer.

1) Assemble the medical data;

2) Review witnesses' statements;

3) Review, evaluate and analyse all information collected;

4) Prepare the group report using the following headings and sub-headings:
   - Crew:
     - personal history, including habits;
     - medical status and history, including current medication;
     - pre-flight activities having human factors significance;
     - physiological, psychological and toxicological irregularities;
     - incapacitation or injury prior to impact;
     - position in aircraft and crew activity at impact;
     - position of members relative to angle of impact; and
     - injuries resulting from the accident.
   - Passengers:
     - pre-accident physiological conditions; and
     - injuries resulting from the accident.
   - Human engineering:
     - instrumentation, controls, autopilot, crew seats, armrests, and other fatigue-combating devices.
   - Survival equipment performance:
     - seat belts and harnesses;
     - seats and anchorages;
     - escape devices;
     - dinghies;
     - food and clothing kits; and
     - medical kits; and

5) Submit the group report to Investigator-in-charge.

2. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   - Operations;
   - Medical/Human and Organizational Factors;
   - Witness;
   - Flight Recorders;
   - Meteorology;
   - Air Traffic Services/Airport;
   - Survivability;

- Cabin Safety; and
- Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Appendix 1 to Section 8

POST-MORTEM EXAMINATIONS

The general purpose of an aviation post-mortem examination consists of the following three elements:

IDENTIFICATION OF THE HUMAN REMAINS

Sources of identification include, in part, wallets, clothing, jewellery, age, sex, face, race, hair, eyes, height, weight, dental records, scars, growths, resections, skeletal deformities, medical disorders, tattoos, blood group, and dog tags.

AETIOLOGY

Determination of the cause of death and the presence of any pre-existing disease rated as causal, contributory or incidental to the occurrence; includes the evaluation of possible human incapacitation, intoxication or use of drugs, equipment failure, and environmental factors.

DETERMINATION OF SEQUENTIAL FACTORS

Sequential factors: gravitational, chemical, thermal, circulatory or respiratory, ante-mortem, agonal, and post-mortem.

Appendix 2 to Section 8

INSTRUCTIONS FOR PRESERVATION AND CONTINUITY OF SPECIMEN COLLECTION

The tissue and fluid samples submitted will be used for an extensive variety of tests. For the best possible results, generous, well preserved and labelled specimens should be sent. Specimens should be transmitted in a toxicology kit.

Fluid specimens are the most important samples. Twenty (20) ml samples of blood and urine would be ideal, but samples of any volume would be acceptable, even if the quality of the specimen is poor. Diluted, coagulated or dried blood can be used for a number of tests. Three (3) blood samples should be obtained, if possible, and identify the sample sites. Submit any volume of vitreous humour and bile that can be recovered. Seal all vials.

Tissue specimens should measure about 3 x 2 x 1 cm or weigh about 50 grams. Tissues required are: heart, lung, liver, kidney, spleen, skeletal muscle and brain, or if not available, spinal cord or peripheral nerve. For tests regarding pesticides/herbicides send fat tissue. Place the tissues in ziploc plastic bags as quickly as possible with a minimum of handling. Squeeze out the surrounding air and close the ziploc plastic bag. Put the specimen in a second ziploc plastic bag, with a number identification label. The specimens should be placed in a large plastic bag, with salt-ice mixture to freeze the tissues. Seal the bag for legal continuity and to prevent leakage during transit. Make every effort to ensure this bag does not leak.

Two larger plastic containers should be included in the kit. One is to be used for about 100-150 grams of liver tissue required for a drug screen. The other is to be used for a sample of stomach contents. These specimens do not require freezing. The containers should be taped closed, sealed and labelled.

A small plastic container should be provided for specimens for histological identification. Samples approximately 2 x 1 x 1 cm from brain, heart, lung, liver and kidney, as well as any lesion which may assist in identifying, should be placed in 10 per cent buffered formalin solution. These specimens should not be frozen. Indicate what tissues are included and seal the cap securely with tape to prevent leakage.

Freezing the specimens for shipment stabilizes them and prevents degradation. If convenient, pre-freeze the tissues and maintain their temperature with freezer packs. If it is necessary to use a salt-ice mixture, prevent leakage by securely tying and taping the plastic lining bag.

Ensure the legal continuity of the specimens. Place a seal over the lid opening, so that any tampering with the kit would result in breakage of the seal.

To facilitate handling at the airport, label the container as follows:

SHIPPING INSTRUCTIONS

FROZEN SPECIMENS FOR BIOCHEMICAL ANALYSIS.
PLEASE REFRIGERATE AND HOLD FOR PICK-UP.

Section 9

WITNESS GROUP CHIEF

The Witness Group Chief is responsible for contacting and interviewing all survivors of the flight, as well as all persons who may have seen or heard some portion of the flight, or who may have knowledge concerning the flight or of the weather conditions at the time of the accident.

Close coordination must be maintained with all groups, but particularly with the Investigator-in-charge and the Operations and Medical/Human factors groups.

Note.– The timely dissemination to other group chiefs of information gathered during the course of interviews may be critical to the success of the investigation. Therefore, it is crucial that the Witness Group Chief maintain close liaison with all members of the group and must then relay all pertinent information to the appropriate group chiefs as soon as possible.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Liaise with the Investigator-in-charge or Deputy Investigator-in-charge for assignment of additional investigators to the witness group;

3. If possible, all witness group members should visit and walk the accident site prior to commencing interviews;

4. Request a list of all possible witnesses from, in part, the Investigator-in-charge and police agencies;

5. Request copies of statements and interview reports that may have been conducted by other agencies, in part and such as the operator, police, and media;

6. If appropriate, request the Media Relations Coordinator to approach local media for assistance in locating possible eyewitnesses;

7. Thoroughly brief each group member and provide each one with a list of questions that may have been provided by other groupchiefs;

8. In the event that there is a large number of witness and survivor interviews required, consider coordinating these interviews from the operations centre. Consider forming two witness interview subgroups: one for survivor interviews; and one for eyewitness interviews;

9. Arrange for the interview of all eyewitnesses as soon as possible. The interviews should cover the following points:

   – Personal information (names, home address, phone number, email address);

- Time of observation;
- Location of witness;
- Weather conditions;
- Photographs or videos taken;
- Course and altitude of aircraft;
- Configuration (in part, flaps and gear);
- Evidence of fire or explosion;
- Evidence of structural failure; and
- Anything heard or observed concerning the aircraft.

10. Complete Event 5;

EVENT 5. Eyewitness interviews

1) Search for eyewitnesses;

2) Interview eyewitnesses, at their location of observation, if feasible;

3) Obtain photographs and videos taken by witnesses, and those recorded by security or operations monitoring devices; and

4) Develop an initial plot of aircraft flight path.

11. If a delay in conducting the above interviews is anticipated, request that eyewitnesses complete and submit a written account of their observations;

12. Ensure that the applicable group chiefs are informed of the proposed interviews of key witnesses;

13. Attend interviews of key witnesses;

14. Arrange for the transcript of interview records through the Administration Coordinator;

15. Ensure that the Investigator-in-charge and other group chairpersons are regularly informed of interview activities and of information gathered that may be pertinent to the various aspects of the investigation;

16. Submit all original written statements, documents and photographs to the Administration Coordinator;

17. Complete Event 19;

EVENT 19. Plot flight path

Event 5 refers.

1) Plot the aircraft flight path from eyewitness information showing:
   - Aircraft flight direction, altitude and attitude;
   - Aircraft configuration, in part and such as position of flaps, spoilers, and gear;

- Evidence of fire or explosion;
- Evidence of structural failure; and
- Point(s) of collision or impact.

18. Submit copies of the plot to the Investigator-in-charge, Operations Group and Structures Group chairpersons;

19. Complete Event 33;

EVENT 33. Interviews of next of kin

Events 5 and 19 refer.

1) Complete interviews of next of kin of crew members, covering:
   - Personal habits;
   - Personal background;
   - Current medication; and
   - Psychological problems.

20. Review all interview reports;

21. Re-interview eyewitness as required to resolve conflicting testimonies, errors or irregularities. Other group members should be present if evidence is relevant to their component of the investigation; and

22. Complete Event 44.

EVENT 44. Re-interviews (eyewitnesses)

Events 5, 19 and 33 refer.

1) Compile a list of witnesses to be re-interviewed;
2) Prepare questions; and
3) Re-interview witnesses.

POST-FIELD PHASE

1. Complete Event 52;

EVENT 52. Analysis and report of the Witness Group

Events 5, 19, 33 and 44 refer.

1) For ease of reference and if the number of interviews warrants, summarize each interview and attach a précis of the interview to the front of each interview record. Such a précis should also contain an assessment of the credibility of the information;

2) Prepare a matrix of witness testimonies that highlights critical issues; and

3) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 10

FLIGHT RECORDERS GROUP CHIEF

The Flight Recorder Group Chairperson is responsible for the location, retrieval and transportation of the aircraft flight recorders to the flight recorder playback facility, as well as for the extraction, calibration and technical analysis of the data contained on these recorders.

The Flight Recorders Group may also be responsible for recovery and analysis of information contained on other aircraft computers (for example flight management systems, traffic collision avoidance system, and terrain awareness and warning system); on memory units containing satellite navigation information; and on other portable electronic recording devices that can store some data related to the accident. The group may also be responsible for collecting and synchronizing flight data, audio and video information stored on ground-based devices.

In concert with the Investigator-in-charge, the Operations Group Chief and other group chiefs and specialists designated by the Investigator-in-charge, the Flight Recorders Group will also assist in the operational, technical and human performance analysis of the information derived from the aircraft flight recorders.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Consult with the Investigator-in-charge to determine an appropriate method of ensuring the locating and securing of the recorders;

3. Brief the personnel, as required, on the appropriate measures required for the preservation of data contained in the recorders;

4. Arrange to obtain the most recent flight data recorder calibration information from the operator;

5. Determine the location of a suitable readout facility; and

6. Coordinate the method of recovery and transportation of the flight recorders to the playback facility.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct an initial survey of the accident site;

3. Complete Event 6;

EVENT 6. Flight recorder recovery

1) Locate the flight recorders, as well as any other recorders such as standby recorders and quick-access recorders;

2) Photograph the flight recorders in situ;

3) Examine and record the condition of the flight recorders;

4) Recover the flight recorders;

5) Prepare the flight recorders for transportation;

6) Arrange for the timely and secure transport of the flight recorders to the playback facility; and

7) Carry the flight recorders by hand to the readout facility.

Note.— Due to the importance of flight recordings, the recorders must be handled with extreme care to prevent damage. Only fully qualified personnel should be assigned to recover and handle the recorders. A member of the investigation authority should handle and transport the flight recorders from the accident site to the read-out facilities.

4. Submit all original documents and flight recorders information to the Administration Coordinator.

POST-FIELD PHASE

1. Determine and brief the members of the Flight Recorders Group on their respective assignments;

Note. — Flight recorder information SHALL NOT be released.

2. Complete Event 20;

EVENT 20. Read-out of flight recorders

Event 6 refers.

1) Obtain the most recent flight recorders' calibration information from the operator;

2) Copy and playback the CVR data and provide the Investigator-in-charge with an initial written précis of the information;

3) Copy all CVR channels separately and present them on a storage medium in a format applicable for the Investigator-in-charge, normally, a four-channel copy;

4) Make a transcript of the CVR and transmit it to the Investigator-in-charge;

5) Contact the Investigator-in-charge to determine the gross FDR requirements;

6) Copy the FDR data and provide the Investigator-in-charge and the pertinent group chairpersons with the required initial data plots along with an appropriate written briefing;

7) Using crosschecks and data obtained from other groupchiefs, determine the reliability of the flight recorder data, and refine the FDR data and CVR transcripts;

8) Synchronize timing of the FDR and CVR records together with the air traffic services data, if possible; and

9) Forward the refined information to the Investigator-in-charge, the Operations Group Chief and other group chiefs needing this information.

3. Complete Event 34;

EVENT 34. Analysis of flight recorders data

Events 6 and 20 refer.

1) In concert with designated group chiefs and assigned specialists, conduct a detailed examination of the flight recorders information;

2) In coordination with the Structures Group, Systems Group and Powerplants Group determine the in-flight serviceability of the aircraft, systems and powerplants; and

3) In coordination with the Operations Group, Witness Group, and the Air Traffic Services and Airport Group, reconstruct the flight path, taking into account the satellite navigation systems data, if available.

4. Complete Event 53; and

EVENT 53. Analysis and report of the Flight Recorders Group

Events 6, 20, and 34 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

5. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 11

METEOROLOGY GROUP CHIEF

The Meteorology Group Chief is responsible for the collection, compilation and analysis of all factual meteorological data pertinent to the accident. This group would also be responsible for investigating the systems, sensors, equipment and processes used to generate and provide weather information.

Close coordination must be maintained with other groups, particularly the Operations, Air Traffic Services and Airport, Systems and Witness groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Determine the most appropriate location from which to begin gathering weather-related information; and

3. Inform the Investigator-in-charge and the Operations Group –Chief of your planning.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct an initial survey of the accident site;

3. Complete Event 7; and

EVENT 7. Secure weather documents

1) Determine where the flight crew obtained a weather briefing;

2) Interview the individual(s) who provided the weather briefing;

3) Secure copies of briefings and other weather documentation given to the flight crew;

4) Obtain and secure the following documents, as appropriate:
   - The actual and forecast weather conditions for the route, area, terminal, destination, alternate and site of the accident;
   - Hourly and special reports;
   - Weather radar reports;
   - Pilot weather reports (PIREP);
   - Surface observations, logs and records;
   - Precipitation records;
   - Barograph records;
   - Wind records;
   - Synoptic charts;
   - Upper air charts;
   - Runway Visual Range (RVR) records;
   - Radiosonde observations;
   - Satellite pictures;
   - Conditions of natural light and sunrise/sunset;

- Special weather observations;
- Significant Meteorological Information (Sigmets) weather advisories; and
- Witness weather reports.

4. Submit all original documents to the Administration Coordinator.

POST-FIELD PHASE

1. Complete Event 21;

EVENT 21. Review of weather documents

Event 7 refers.

1) Review all the documents and summarize the pertinent information;

2) Arrange for a qualified meteorologist to review and analyse all the documents;

3) Consider the following hazardous phenomena:
   - Mountain wave effect;
   - Revolving storms;
   - Severe turbulence;
   - Freezing precipitation;
   - Wind shear;
   - Subsidence; and
   - Electrical storms.

2. Submit pertinent weather information to the Investigator-in-charge, Operations Group and Systems Group Chairpersons;

3. If weather appears to be a contributing factor, consider utilizing the forecast and en-route weather, and plotting a cross sectional flight profile showing actual weather encountered at the departure point, en-route and at destination;

4. The cross sectional flight profile should depict:

- Cloud formations;
- Precipitation areas;
- Turbulence areas;
- Wind shear areas;
- Freezing level; and
- Storm activity.

5. Submit copies of the pertinent weather and cross sectional flight profile to the Investigator-in-charge and Operations GroupChief, indicating those problem areas that may have had a direct bearing on the accident;

6. Liaise with the Witness Group Chief for the conduct of interviews of witnesses having weather testimony; and

7. Complete Event 35;

EVENT 35 Interviews (Meteorology)

Events 7 and 21 refer.

1) Conduct interviews of witnesses, such as:
   – Eyewitnesses;
   – Other flight crews;
   – Weather forecasters or observers; and
   – Weather broadcasters.

2) Review and assess personnel qualifications;

3) Determine the accuracy of weather measuring equipment; and

4) Update the cross sectional weather profile.

8. Complete Event 54;

EVENT 54. Analysis and report of the Meteorology Group

Events 7, 21 and 35 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

9. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 12

ATS AND AIRPORTS GROUP CHIEF

The ATS and Airport Group Chief is responsible for the review of the original records of the ATS units concerned including when available, radar screen recordings, the monitoring of any original voice recordings, and verification that written transcripts of voice communications are consistent with the recordings. In addition, this group will provide, when appropriate, a reconstruction of the history of the flight based on ATS information.

This group will also determine the operational status, in part, of the airport, pertinent navigation aids, communications equipment, radar, transponder equipment and computers; and provide technical data on all such equipment and its operation, whenever it is deemed necessary.

This group must coordinate its activities with the Operations GroupChief.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct an initial survey of the accident site;

3. Complete Event 8;

EVENT 8. Secure ATS and airport documents

1) Obtain and secure the following documents, as appropriate:
   - Flight plan;
   - Flight plan message;
   - Departure message;
   - Notices to Airmen (NOTAMs);
   - Pertinent air traffic services and airport recordings;
   - Aerodrome control progress strips;
   - Area control progress strips;
   - Approach control progress strips;
   - Approach terminal progress strips;
   - Radar recordings (including military recordings, if available);
   - Names and files of air traffic services personnel on duty;
   - Unit logs;
   - Pertinent manuals and directives;
   - Pertinent outage reports,
   - Airport Certificate;
   - Airport certification safety standards/reports;
   - Braking action reports;
   - Master airport plan;
   - Station logs;
   - Equipment inspection documents;

– Airport manager's log; and
– Names and files of airport personnel on duty.

4. Submit all original documents to the Administration Coordinator;

5. Complete Event 22;

EVENT 22. Review air traffic services and airport documents

Event 8 refers.

1) Review all the documents obtained from the air traffic services and airport authorities, and summarize the pertinent information;

2) Make copies of the air traffic services recorded data from the originals;

3) If air traffic services data are not available in a digital form for copy, playback and analysis, make a video copy of the air traffic services display screens for playback; and

4) Make transcripts from the air traffic services recorders (all channels).

6. Provide all pertinent information and air traffic services data to the Investigator-in-charge;

7. Direct pertinent information to Operations Group Chief as soon as it becomes available;

8. Direct all original documents and media to the Administration Coordinator;

9. Commence preparations for interviews with air traffic services and airport personnel;

Note.— Interviews with air traffic services and airport personnel should be planned and conducted in consultation with the Operations, Witness and Medical/Human Factors groupchiefs, and in consideration of their requirements.

10. Complete Event 36;

EVENT 36. Interviews (Air Traffic Services and Airport)

Events 8 and 22 refer.

1) Conduct interviews with those persons directly involved with the aircraft progress, such as:
   – Ground controller;
   – Tower controller;
   – Area controller;
   – Terminal controller;
   – Radio station operator;
   – Radar operator;
   – Other flight crews who may have rendered assistance;
   – Other flight crews who may provide pertinent information on in-flight conditions, aircraft communications and serviceability of radio aids;
   – Airport manager; and
   – Other airport personnel.

11. Complete Event 45.

EVENT 45. Navigation aids and airport status

Events 8, 22 and 36 refer.

1) Obtain the appropriate navigation and approach charts;

2) Request ground and flight checks of pertinent navigation and approach aids for:
   – Location (geographic coordinates);
   – Identification signal;
   – Power output and supply;
   – Emergency equipment;
   – Radiation pattern;
   – Normal level of performance; and
   – Interference(s).

3) Review:
   – Operating and maintenance schedules;
   – Past complaints; and
   – Serviceability status.

4) Examine status of airport and associated facilities, such as:
   – Runway in use;
   – Apron and taxiways;
   – Lighting;
   – Rescue and firefighting services;
   – Station logs; and
   – Equipment inspection documents.

POST-FIELD PHASE

1. Complete Event 55; and

EVENT 55. Analysis and report of the Air Traffic Services and Airport Group

Events 8, 22, 36 and 45 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;

- Cabin Safety; and
- Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 13

SURVIVABILITY GROUP CHIEF

The Survivability Group Chairperson is responsible for investigating the crash response, firefighting, egress, survival, and rescue issues. The group's inputs are invaluable in the final human factors analysis. Under certain circumstances, this group could be a sub-group of the Medical/Human factors group.

This segment of the investigation should be conducted in close cooperation with the chiefs of the Operations, Structures, Medical/Human Factors, Cabin Safety and Witness groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Walk the site in order to get an initial feel for the dynamics of the accident sequence;

3. Complete Event 9;

EVENT 9. Search and rescue operations

1) Determine and record the following:
   – How and when the search operations were initiated;
   – What units or agencies participated in the search operations;
   – Search means and methods adopted, in part and such as visual, electronic, and infrared;
   – The environmental conditions at the time of the search, such as weather, ground or water conditions;
   – Any factors which facilitated or hindered the search effort; and
   – The time at which the accident site was located.

2) Review search and rescue procedure manuals, and operations logs and recordings; and

3) Determine the adequacy of the search actions.

4. Submit all original documents to the Administration Coordinator;

5. Complete Event 23;

EVENT 23. Evacuation operations

Event 9 refers.

1) From information derived from survivors' interviews and/or the cockpit voice recorder, determine and record the following pre-accident actions:
   – General briefing of the passengers regarding the various safety and rescue equipment at their disposal, in part and such as seat belt, oxygen supply, and life jacket;

- Member(s) of the crew who gave the briefing, time of the briefing, its intelligibility and audibility (pertinent language[s]) to all passengers;
- Special instructions given regarding the removal of dangerous articles in part and such as spectacles, ties, and shoes; the tightening of seat belts; the cushioning of each passenger in part and such as with pillows and blankets; and clarity and understanding of these instructions;
- Special instructions regarding emergency exits, measures taken to free the access to all emergency exits;
- Type of the emergency equipment available, in part and such as portable fire extinguishers, axes, crow-bars, flashlights, and first aid kits;
- Measures taken by the crew with respect to the emergency equipment; and
- Assistance provided by passengers, either requested, offered or given, and behaviour and morale of the passengers prior to the accident.

2) Evaluate the crew training and implementation of emergency procedures, particularly by cabin crew members, as well as the adequacy of these procedures;

3) In the case of ditching, evaluate the following:
   - Special instructions on the location, donning and use of life jackets;
   - Action by the crew to ensure that each passenger had properly donned and adjusted the life jacket;
   - Precaution to have extra life jackets available near the emergency exits; and
   - Special instructions given to the passengers regarding which life raft, when and how to board after the ditching.

4) Determine the relationship to regulatory requirements of the following items and assess their adequacy:
   - Number, location and design of emergency exits;
   - Presence of placards near each exit;
   - Clear and readable instructions on the operation of the opening mechanisms, including location and lighting;
   - Number and location of exits used, number of persons who used each exit, and reasons for not using a particular exit;
   - The emergency equipment used, in part and such as portable extinguishers, axes, escape ropes, and chutes;
   - Presence and effectiveness of instructions on how to use the equipment;
   - Adequacy and functioning of the equipment; and
   - Additional equipment that would have been helpful.

5) The following information should be recorded:
   - Passengers injured in relation to their location;
   - Injuries sustained during the evacuation;
   - Help provided by the crew, passengers and third parties;
   - Time required to complete the evacuation, by exit if relevant;
   - Difficulties encountered such as:
     - language problems;
     - presence of fire and smoke;
     - failure of emergency lighting;
     - abnormal position of aircraft;
     - distance from the ground;
     - aged, infirmed or infant passengers;
     - injured passengers;
     - panic among passengers or crew; and
     - debris, including luggage.

- In the case of ditching:
  - water conditions, such as roughness and temperature;
  - light conditions;
  - type and number of life jackets available;
  - number of passengers inflating life jackets prior to egress;
  - effectiveness of life jackets;
  - difficulties in locating passengers;
  - type and number of life rafts used, including position in the aircraft, difficulties in launching, inflating, locating and boarding;
  - number of survivors in each raft;
  - adequacy of instructions on use of rafts and life-saving equipment.

6) Evaluate the effectiveness of the following:
- Emergency escape hatches;
- Emergency lights;
- Fire extinguishers;
- Fire extinguishing systems;
- Fire detectors or alarms;
- Megaphone(s);
- Oxygen bottles;
- Smoke mask(s) and oxygen bottle(s);
- Smoke hoods and personal breathing equipment;
- Flashlights;
- Escape tapes/reels;
- Vivopak/Physician's kit;
- Medical kit;
- First aid kit;
- Resuscitation mask;
- Protective gloves;
- Search mirror; and
- Portable radio beacons.

Note. — A plan of the aircraft indicating each exit, the location of each crew member and passenger prior to the crash, and the exit used by each person is of great assistance. Photographs are also recommended.

6. Complete Event 37;

EVENT 37. Rescue operations

Events 9 and 23 refer.

1) Determine and record the following:
- Time and means of alerting rescue units, in part and such as alarm bells, and telephones;
- First instructions given to rescue units, by whom and by what means;
- Number and location of rescue vehicles by type on standby and in reserve, including manpower and equipment;
- Access roads to the site;
- Environmental conditions during the rescue operations;
- Communications equipment on the various vehicles;
- Time at which the rescue units arrived on site;
- Difficulties in locating the site and bringing the injured out of the wreckage;
- The means and personnel providing first medical assistance;

- The arrangements to transport the injured to medical facilities, and adequacy of medical

services available; and
- Time at which the rescue operations were completed.

Note.— The following event should, if applicable, be investigated in cooperation with the group responsible for investigating the initiation and spread of fire (Structures Group).

7. Complete Event 46.

EVENT 46. Firefighting operations

Events 9, 23 and 37 refer.

1) This aspect of the investigation should, if applicable, be conducted in cooperation with the Structures Group responsible for investigating the initiation and spread of the fire;

2) Determine and record the following:
   - Time and means of alerting the various firefighting units;
   - First instructions given and how;
   - Number of vehicles by type on stand-by and in reserve;
   - Type, quantity and rate of discharge of extinguishing agents;
   - Special tools, in part axes, crow-bars, and powered tools;
   - Personnel available on each vehicle and their equipment;
   - Location of the various firefighting units which participated;
   - Route taken to the site by each vehicle and adequacy of the access roads;
   - Environmental conditions, such as weather, terrain, ground or water conditions;
   - Communications capabilities of each vehicle;
   - Time at which the firefighting vehicles arrived at the site; and
   - Difficulties encountered such as:
     - locating the site;
     - reaching the wreckage;
     - lack or poor detail of charts;
     - inadequately trained personnel;
     - intensity of the fire;
     - wind direction and strength;
     - temperature;
     - availability of water and/or extinguishing agents;
     - control and supervision;
     - precautionary measures taken to prevent spreading or restarting the fire;
     - time at which the fire was under control and completely extinguished; and
     - training and standards of rescue and firefighting personnel.

POST-FIELD PHASE

1. Complete Event 56;

EVENT 56. Analysis and report of the Survivability Group

Events 9, 23, 37 and 46 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;
   – Flight Recorders;
   – Meteorology;
   – Air Traffic Services/Airport;
   – Survivability;
   – Cabin Safety; and
   – Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 14

CABIN SAFETY GROUP CHIEF

The Cabin Safety Group Chief is responsible for investigating all aspects of the accident related to the actions of the passengers and cabin crew members. This will normally include the following general elements:

- Passenger/crew member survivability factors;
- Company policies and procedures as they relate to passenger/crew member safety;
- Industry policies, procedures and regulations as they relate to passenger/crew member safety; and,
- Cabin crew training with respect to operational safety issues.

This group must coordinate its activities with other groups, particularly Operations, Medical/Human Factors, Witness, Recorders, Survivability, Maintenance and Records, Systems, and Structures groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;
2. Determine materiel/personnel resources required and advise the Investigator-in-charge;
3. Allocate materiel/personnel resources; and
4. Complete Event 10.

EVENT 10. Secure pertinent cabin documents

1) Liaise with Operations, and Maintenance and Records group chiefs to locate and secure the following documents:
   - Air Operator Operations Manual;
   - Cabin crew training records;
   - Air operator and aircraft standard operating procedures (SOPs);
   - Cabin crew log books;
   - Pilot's flight log;
   - Cabin crew flying schedule (last six months);
   - Aircraft Journey Log;
   - Air operator dispatch logs;
   - Maintenance release forms;
   - Passenger and freight manifests;
   - Air operator's Maintenance Control Manual;
   - Air operator schedule;
   - Air operator Route Manual;
   - Record of pertinent phone calls;
   - Cabin Crew Manual;
   - Cabin Crew Emergency Manual;
   - Air operator approved aircraft Safety Announcements;
   - Air operator passenger safety briefings and video, if applicable;

- Copy of approved Aircraft Flight Manual;
- Copy of approved Minimum Equipment List (MEL);
- Copy of the applicable Master Minimum Equipment List (MMEL);
- Cabin crew licensing and medical status;
- Copy of any civil aviation authority Policy Letters applicable to the company;
- Copy of last company audit by Civil Aviation Authority;
- Air operator files; and
- Civil aviation authority approved cabin crew training curriculum.

2) Locate and secure the following information:
   - The aircraft cabin furnishings;
   - Pre-flight servicing documents;
   - Snag rectification sheets;
   - Cabin-related outstanding and recurring snags and unserviceabilities; and
   - Cabin and freight configurations.

3) Obtain the autopsy results of cabin crew members and passengers; and

4) Obtain a transcript of the cockpit voice recorder and conduct a preliminary review of the recorded information for cabin-related factors.

5) Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational briefing;

2. Conduct an initial survey of the accident site in order to get a 'feel' for the dynamics of the accident sequence, in part and such as impact angles, impact attitude, velocity, power, and fire (pre-impact/post-impact) propagation;

3. Complete Event 24;

   EVENT 24. Review pertinent cabin documents

   Event 10 refers.

   1) Review all the documents obtained from the air operator and summarize the pertinent information;

   2) Review all the documents obtained from the civil aviation authority and summarize the pertinent information; and

   3) Compile, in chronological order, the history for each cabin crew member and for the operator.

4. The investigation and analysis of the failure of the aircraft structure is the responsibility of the Structures Group, while the investigation and analysis of the failure of the aircraft systems is the responsibility of the Systems Group;

5. The investigation and analysis of the effects of these systems and structural failures on flight attendant and passenger performance is, however, the responsibility of the cabin safety group. Close cooperation with other groups involved is essential; and

6. Liaise with Systems, Structures, Medical/Human Factors, and Photo/Video group chiefs for the following event.

Note.— Most of the following evidence is perishable and may be critical to the success of the cabin safety investigation. This phase of the investigation should not be rushed and must be carefully recorded.

7. Complete Event 38;

EVENT 38. Cabin condition

Events 10 and 24 refer.

1) Review and record (in situ) the condition of:
   - General cabin interior;
   - Cabin structure;
   - Floor structure;
   - Aircraft doors;
   - Air stairs;
   - Emergency exits;
   - Breaches of cabin structure;
   - Passenger seats;
   - Seat pitch for each class;
   - Aisle width;
   - Flight attendant seats;
   - Seat belts (passengers and flight attendants);
   - Overhead bins;
   - Galleys, including controls and circuit breaker positions;
   - Trolleys/carts;
   - Public address system, including controls and circuit breaker positions;
   - Life preservers;
   - Seat bottom cushions;
   - Safety features cards;
   - Evacuation alarm system;
   - Emergency equipment:
     - Fire extinguisher(s);
     - Fire axe;
     - Megaphone;
     - Oxygen bottles;
     - Smoke mask/oxygen bottle;
     - Smoke hoods;
     - Flashlights;
     - Escape tapes/reels;
     - Vivopak/physician's kit;
     - ;
     - First aid kit;
     - Resuscitation mask;
     - Protective gloves;
     - Search mirror; and
     - Portable radio beacons;
   - Cabin baggage;
   - Floor level lights; and
   - Seat blocking.

2) Determine the passenger/freight configuration.

8. Maintain close liaison with the Witness Group Chief and the police for coordination of a list of potential witnesses and for the introduction of possible questions for eyewitnesses;

9. Commence preparations for interviews with air traffic services and airport personnel;

Note.- Interviews with cabin crews and passengers should be planned and conducted in consultation with the Operations, Witness and Medical/Human Factors groupchiefs, and in consideration of their requirements.

10. Under certain circumstances, it may be desirable to restrict the initial interview with the cabin crews to the time frame of the accident;

11. This interview may then be followed by a more in-depth interview during which elements critical to the investigation may be discussed in detail;

12. Review the "Sample Passenger Questionnaire Form" in Appendix 1 to the section;

13. Complete Event 47;

EVENT 47. Interviews (cabin crew and passengers)

Events 10, 24 and 38 refer.

1) All cabin crew members should provide a written statement prior to the interview;

2) The cabin crew members should be questioned from a list of prepared questions covering:
   – General details of the operation;
   – Phase of flight at time of accident;
   – Weather conditions at time of accident;
   – Serviceability of aircraft;
   – Flight attendant's flying background and experience;
   – Crew rest periods;
   – Movements over the last 24 hours, and over 72 hours;
   – Post-accident activities, in part and such as physical condition and evacuation; and
   – Any other question pertinent to the circumstances.

3) This interview could be followed at a later date by a more in-depth interview during which elements critical to the investigation should be discussed in detail;

4) Interview witnesses with cabin safety information;

5) Interview next of kin, company representatives and civil aviation authority personnel;

6) Interview as many passengers as possible; and

7) If required, mail questionnaires to surviving passengers not interviewed.

14. Commence preparations for interviews with next of kin and company representatives;

Note.- To avoid duplication, it is imperative that these interviews be planned and conducted in consultation with the Operations, Witness and Medical/Human and Organizational Factors groupchiefs, and in consideration of their requirements. Similar coordination with the Powerplant, Systems, and Maintenance and

Records group chairpersons should take place prior to conducting interviews with air operator management personnel.

15. Relate pertinent factual information gathered to the Investigator-in-charge and appropriate GroupChiefs; and

16. Gather pertinent data from other groupchiefs.

POST-FIELD PHASE

1. Review and evaluate the data collected at the accident site;

2. Review the pertinent documents;

3. Review all cabin-safety-related documentation, including witness interviews, gathered by other team members and by other groups;

4. Review post-mortem examination reports and specimen analysis reports;

5. Review and analyse, in concert with the Operations and Recorders groupchiefs, the information contained on the cockpit voice recorder;

6. Consult with Operations, Medical/Human Factors, Survivability, Structures and Systems group chiefs on cabin safety findings;

7. Consider the requirement for a review of, in part, the cabin crews personal physician files, and medicare records;

8. Complete any additional interviews of cabin crews or passengers;

9. If required, conduct a familiarization ride on the same route and on the same aircraft type, and preferably with the same operator;

10. Complete Event 57;

EVENT 57. Analysis and report of the Cabin Safety Group

Events 10, 24, 38 and 47 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

11. Participate in Event 64.

EVENT 64. Operations analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Operations;
   – Medical/Human Factors;
   – Witness;

- Flight Recorders;
- Meteorology;
- Air Traffic Services/Airport;
- Survivability;
- Cabin Safety; and
- Other parties, as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the operations analysis and determine findings with assistance from the technical groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Appendix 1 to Section 14

SAMPLE PASSENGER QUESTIONNAIRE FORM

(Name of the investigation authority)
Preliminary collection of information from passengers

Occurrence Information (airline, flight number, date)

The (name of the investigation authority) is responsible for investigating aircraft occurrences in (name of the State). The purpose of the investigation is to make flying safer. The first step of our accident investigation is to collect information from crew and passengers. To ensure that details are not forgotten **please complete and return this form to the address below as soon as possible**. Thank you for helping to advance aviation safety.

Note 1.— Because this is a generic form, some questions may not be applicable. For those questions, please write N/A.
Note 2.— Your response is voluntary. The information you provide is confidential and will be protected in accordance with (name of the State) law.

Contact Information

In order for us to contact you for additional follow-up later, if necessary, please provide the following information:
Full Name: .....
Please write the name and age of people travelling with you:
……..…….
……..…….
Mailing Address:
…….
……..…
……..…
……..……
Email Address: ……..…..
Phone (day): ……..……
Phone (evening): .....

Return Information

Please return your completed form to (name of the investigation authority) personnel before you depart for home or continue on your trip.

If this is not possible, please mail it to:

The (name of the investigation authority)
(address – line 1)
(address – line 2)
(city, state)
(country, postal code)

If you have any questions, or a point you would like to discuss, please contact us at:
Phone: (authority phone number)
Email: (authority email address)

Location immediately prior to the occurrence
If you were in a passenger-seat, what was your:
Seat row number: ..... Seat letter: ..... ?
Was this the seat listed on your boarding card? Yes / No
Which way was your seat facing? Forward / Rearward / Side facing
If you do not recall your seat number / letter, please indicate the area where you sat. (Circle one response for each category)
Ticket class: First / Business / Economy
Area of cabin: Forward / Mid / Rear
Seat type: Aisle / Centre / Window

If you were not in a passenger-seat at the time of the accident, where were you located?
……..
If you were travelling with a child under 2 years of age, was the child: In a car seat/ Wearing a supplemental loop belt/ Sitting, unrestrained in your lap
Was there a seat on your left? : Yes / No
Was it occupied?: Yes / No Gender: Male/Female
Approximate age..... Name: .....
Was there a seat on your right? : Yes / No
Was it occupied: Yes / No Gender: Male/Female
Approximate age..... Name: .....

Aircraft cabin
Please draw a sketch of the cabin indicating where..:
– you were located
– you exited the aircraft
– the location of any fire, inside or outside the aircraft
– the location of smoke inside the aircraft

What did you see, hear and do during the occurrence?
Were you injured during the occurrence? Yes/No (provide brief details)

……..
……..
At the time of the occurrence, were you: Awake/Asleep
How and when did you first realize something was wrong?
……..
……..
……..
……..
……..
Were you wearing a seat belt? (Yes/No)
Type of seat belt worn: Lap belt only / Lap and shoulder belt

Overhead stowage bins/carry-on items
Did the overhead stowage bins open? Yes/No
Did carry-on items fall out of the overhead stowage bins? Yes/No
Did any of these items strike you, or anyone else? Yes/No
Did any of these items land in the passenger aisles? Yes/No
Cabin/aircraft lighting
Please indicate which of the following, if any, were illuminated during the occurrence. Circle as many responses as is appropriate:
Normal lighting / Emergency ceiling lights / Floor path escape lighting / Emergency exit signs / Escape slide lights
Crew instructions (inside the cabin)
Did the crew make announcements or provide instructions for the passengers during the occurrence? Yes/No
Could you clearly hear the announcements/instructions? Yes/No
Please list any announcements/instructions that you heard.
.....
.....
.....
Did you fully understand the announcements/instructions provided by the crew? Yes/No
Were you able to follow the instructions given by the crew? Yes/No – If no, describe why:
.....
.....
.....

Fire/smoke
Was there any smoke in the cabin? Yes/No
If possible describe where it was coming from; what part of the cabin it was in, what colour it was, how high it rose, what effect it had on you, etc.
.....
.....
.....
Was there any fire? Yes/No
If possible, describe its location; if anything was melting; how the fire affected you; etc.
.....
.....
.....

Evacuating
Was an evacuation required? Yes/No
How and when did you realize you had to evacuate the aircraft?
.....
.....
.....
Were you injured during the occurrence? Yes/No
Were you injured during: Turbulence / On impact / Evacuating / Outside the aircraft?
Briefly describe your injuries and how you were injured
:.....
.....
.....
Did your injuries affect your ability to evacuate the aircraft quickly? Yes/No If yes, please elaborate
.....

.....
.....
.....
Following the accident, were you taken to a hospital? Yes/No
If yes, which hospital? .....
Were you admitted to hospital? Yes/No

General comments
Do you have any additional information or comments that might help us with our investigation?
.....
.....
.....
.....

Personal information
Research has shown that an individual's gender, age, height, weight, occupation, life experiences, etc., can affect how they respond in an emergency. Please supply the following personal information:
Male/Female. Age: ...…….. Height: ……. Weight: ……. Occupation: …….
Aviation experience: Yes/No If yes, please explain
.....
.....
.....
Do you have any experience dealing with emergency situations?: Yes/No If yes, please explain.
.....
.....
.....

Thank you for taking the time to help us with our investigation. Please return your completed form to the (name of the investigation authority) to the Return-Information address shown on page 1.

Section 15

MAINTENANCE AND RECORDS GROUP CHIEF

The Maintenance and Records Group Chief is responsible for locating and reviewing all maintenance records and appropriate flight documents to ascertain the maintenance history of the aircraft in respect to adequacy of inspections, malfunctions that might be related to the accident, time on the aircraft, engines and components, and the time since overhaul.

This group is also responsible for determining background data relative to manufacture, possible design deficiencies, maintenance practices, inspection procedures, and servicing of the aircraft involved.

This group must coordinate its activities with the Operations, Structures, Powerplants, Systems and Recorders GroupChiefs.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Determine materiel/personnel resources required and advise the Investigator-in-charge; and

3. Complete Event 11.

EVENT 11. Secure maintenance documents

1) Obtain and secure the following documents, as appropriate:
   a) From the air operator:
      – Air Operating Certificate;
      – Certificate of Airworthiness;
      – Certificate of Registration;
      – Aircraft Journey Log;
      – Aircraft Technical Log;
      – Maintenance Control Manual;
      – Maintenance Log;
      – Airframe Log;
      – Engine Log(s);
      – Propeller Log(s);
      – Pre-flight servicing logs;
      – Snag rectification sheets;
      – Airworthiness Directives records;
      – Standards and procedures;
      – Quality assurance;
      – Personnel and training;
      – Equipment and facilities;
      – Extended-range Twin-engine Operational Performance Standards (ETOPS) maintenance requirements (Annex 6, Attachment E);
      – Flight recorder files, including documents associated with flight data recorder data-frame and periodic calibrations;
      – Major repairs or alterations;
      – Major work done by approved maintenance organization or sub-contractor;
      – Hazardous material cargo records;

- International leasing arrangements;
- Mandatory Occurrence Reporting (trend analysis) reports; and
- System Difficulty Reporting (SDR) reports.

b) From the pertinent civil aviation authority:
- Technical personnel files;
- Air Operator Certificate;
- Aircraft files;
- Copy of the Master Minimum Equipment List (MMEL);
- Maintenance reliability information on aircraft fleet;
- Mandatory Occurrence Reporting reports; and
- System Difficulty Reporting (SDR) reports.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct an initial survey of the accident site;

3. Submit all original documents to the Administration Coordinator;

4. Complete Event 25;

EVENT 25. Review of maintenance documents

Event 11 refers.

1) Review all the documents obtained from the air operator and summarize the pertinent information;

2) Review all the documents obtained from the civil aviation authority and summarize the pertinent information;

3) Compile, in chronological sequence, the history of the powerplants, airframe and their major components complete with incorporated modifications;

4) List all outstanding powerplant and airframe modifications;

5) Record all outstanding and recurring snags and unserviceabilities;

6) Record all snags that may be related to the accident; and

7) Summarize all irregularities.

5. Complete Event 39;

EVENT 39. Interviews (Maintenance and Records)

Events 11 and 25 refer.

1) Identify personnel to be interviewed;

2) Coordinate the interviews with other groupchiefs

;

3) Prepare questions;

4) Conduct the interviews; and

5) Review and examine interviews for areas of conflict, errors and inconsistencies.

6. Pass pertinent information to the Operations, Structures, Powerplant, Systems and Flight Recorder group chiefs;

7. Complete Event 48;

EVENT 48. Maintenance management

Events 11, 25 and 39 refer.

1) Review the following maintenance management aspects;
   – Standards and procedures;
   – Quality assurance programmes;
   – Equipment and facilities; and
   – Personnel and training.

8. Ascertain whether or not the maintenance system has been followed correctly and record any discrepancies or omissions.

POST-FIELD PHASE

1. Complete Event 58;

EVENT 58. Analysis and report of the Maintenance and Records Group

Events 11, 25, 39 and 48 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and

inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 16

SYSTEMS GROUP CHIEF

The Systems Group Chief is responsible for the detailed examination of all systems and components, among others hydraulics, pneumatics, electrical and electronics, radio communication and navigation equipment, air conditioning and pressurization, ice and rain protection, cabin fire extinguisher, and oxygen. The examinations will include determination of the condition and operational capabilities of components. The examination includes determination of the positions of associated controls and switches, as well as the identification and downloading of built-in test equipment. It is important that all system components be accounted for, within reason.

The Systems Group must coordinate its activities with the Flight Recorders, Operations, Site Survey, Maintenance and Records, Structures and Powerplants groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Collect basic information on the aircraft involved;

3. Obtain the Maintenance and Parts Manuals of the aircraft; and

4. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational briefing;

2. Identify and brief all Systems Group members;

3. Conduct an initial walk-through of the accident site with group members in order to get a feel for the dynamics of the accident sequence;

4. Take action necessary to safeguard and deactivate hazardous systems/components, in part and such as pressure vessel and batteries in coordination with the Site Safety Coordinator;

5. Coordinate with the Site Survey Group Chief to identify and tag systems components as required;

6. Liaise with the Operations Group Chief for a cockpit evaluation;

7. Advise the Investigator-in-charge of special photographic requirements;

8. Complete Event 12;

EVENT 12. Examination of systems

1) Prepare a checklist of systems to be investigated from the following general list:
   – Hydraulic power;
   – Flight controls;

- Ailerons;
- Elevators;
- Rudder;
- Horizontal stabilizer;
- Trims;
- Flaps;
- Speed brakes;
- Spoilers/lift dumpers;
- Autopilot/stability augmentation/stall avoidance;
- Landing gear/wheels/brakes;
- Fuel;
- Electric power distribution;
- Aircraft computers (such as flight management systems, traffic collision avoidance system, and terrain awareness and warning system);
- Other electronics;
- Ice and rain protection;
- Pneumatics;
- Instruments/pitot-static/caution and warning (Light bulb analysis);
- Navigation systems;
- Portable navigation systems, photo and video cameras, and cell phones;
- Communications;
- Emergency Locator Transmitter (ELT);
- Fire detection and protection;
- Air conditioning and pressurization;
- Oxygen; and
- Thrust reversers.

2) Locate and identify all systems and components;

3) Determine the requirements for special handling of system computers to preserve memory;

4) Record and photograph the systems and components prior to safeguarding;

5) Safeguard and deactivate hazardous systems and components;

6) Conduct a detailed examination of all systems and components, including flight controls, hydraulics, pneumatics, electrical, electronics, instruments, communication, navigation, air conditioning, pressurization, ice and rain detection, airframe, fuel, fire protection and oxygen;

7) Document all systems selections, indications, positions and condition;

8) Photograph in detail the components suspected of failure; and

9) Request special technical assistance, if required.

9. Consult with other group chiefs to ensure interface of Systems Group investigation with Powerplants and Structures groups is complete;

10. Advise the Investigator-in-charge of other required technical specialist assistance;

11. Complete Event 26;

EVENT 26. Examination and testing (Systems)

Event 12 refers.

1) Select the components that require more detailed examination;

2) Prepare statements of requirements for examination and testing;

3) Arrange for the transportation of selected components to a suitable location for the required examination and testing; and

4) Arrange for investigators to be present at all examinations and testings.

12. Review witness statements to identify areas for supplementary interviews and conduct or arrange for required interviews with the Witness GroupChief; and

13. Complete Event 40.

EVENT 40. Interviews (Systems)

Events 12 and 26 refer.

1) Identify personnel to be interviewed;

2) Coordinate the interviews with other groupchiefs;

3) Prepare questions;

4) Conduct the interviews; and

5) Review and examine interviews for areas of conflict, errors and inconsistencies.

POST-FIELD PHASE

1. Evaluate the information collected to assess the contribution of the aircraft systems to the accident;

2. Advise the appropriate group chiefs of any pertinent information;

3. Complete Event 59;

EVENT 59. Analysis and report of the Systems Group

Events 12, 26 and 40 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

4. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 17

STRUCTURES GROUP CHIEF

The Structures Group Chief is responsible for the overall examination of the airframe, including the flight control surfaces, and for determining the involvement of the structure in the cause of the accident. Responsibilities also include assessing the pre-impact flight path, speed at impact and impact angle.

This group will locate and identify the parts to be plotted for the wreckage distribution diagram produced by the Site Survey Group. A wreckage distribution diagram is especially helpful in accidents in which an in-flight breakup or in-flight fire is suspected.

At the discretion of the Investigator-in-charge, this group may also be tasked to conduct related portions of the investigation, such as fire and explosion, and crashworthiness.

Close coordination with the Site Survey, Systems, Powerplants and Survivability groups is essential.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Collect basic information on the aircraft involved; and

3. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct an initial survey of the accident site;

3. Mark and store coordinates of the accident site basic points as precisely as possible;

4. Prepare a rough sketch of the accident site;

5. Determine the probable distribution of all wreckage from cursory examination of angle of impact, speed and pre-impact integrity;

6. Submit photo requirements to the Investigator-in-charge;

7. Photograph the wreckage with position reference markers in place;

8. Identify, tag and catalogue pieces of wreckage;

9. Photograph detached items of wreckage in situ;

10. Obtain from Witness, Operations and Flight Recorders group chiefs information pertinent to the final flight path;

11. Plot the aircraft path from first contact with a ground object, to ground impact, to rest;

12. In the case of a mid-air collision or an in-flight structural breakup:

    – Reconstruct the flight path by trajectory analysis;

    – Delineate the area requiring a search;

    – Determine the method and extent of the search;

    – Determine the requirement for, and request, material and personnel resources; and

    – Brief searchers on method of marking and fixing wreckage positions.

13. Complete Event 13;

    EVENT 13. Examination of structures

    1) Conduct an overall examination of the complete airframe, including the flight control surfaces;

    2) Determine the involvement of the structure in the accident;

    3) Select the components that require examination and testing;

    4) Prepare detailed statements of requirements for examination and testing; and

    5) Assess the requirements for wreckage reconstruction.

14. In coordination with the Survivability Group, conduct a detailed analysis of a fire and explosion;

15. Complete Event 27;

    EVENT 27. Fire and explosion

    Event 13 refers.

    1) Photograph all evidence having a direct bearing on the fire before the wreckage is removed;

    2) Review maintenance and parts manuals to gain information on the aircraft structure and systems;

    3) Review the following information:
       – Survivor statements;
       – Eyewitness statements;
       – Type of cargo carried;
       – Quantity and type of fuel on board;
       – Air traffic services recorded data;
       – Flight recorders information; and
       – Pathological information for evidence of smoke or soot in the respiratory system, carbon monoxide or other toxic chemicals, and indications of in-flight explosion such as ruptured eardrums or penetration by small fragments.

    4) Determine the requirements for expert technical assistance;

    5) Prior to removal of fire extinguishing agent, consider all options in order to reduce destroying evidence;

6) Complete a wreckage diagram including burned areas;

7) Determine if the fire was in-flight or post-impact by reviewing the following:
   – Survivor and eyewitness evidence;
   – Cockpit configuration;
   – Mishap circumstances;
   – In-flight fire effects;
   – Ground fire effects;
   – Crash dynamics, such as location of burned parts with respect to burn areas; and
   – Impact effects.

8) Determine if there was an in-flight explosion by the presence of:
   – Omnidirectional fire pattern;
   – "Opening up" effect;
   – Unusual damage to heavy structures;
   – Fragmentation of structures; and
   – High-speed penetration by fragments.

9) Reconstruct the area where the in-flight fire or explosion is suspected; and

10) Determine the point or area of origin, fuel type and ignition source.

16. In consultation with the Medical/Human Factors, Survivability and Cabin Safety groupchiefs, determine crashworthiness and impact forces;

17. Complete Event 41; (or this could be a assigned to a separate Crashworthiness Group)

EVENT 41. Crashworthiness

Events 13 and 27 refer.

1) Determine the requirement for mechanical or aeronautical engineering assistance;

2) Assess the volume of liveable space remaining within the occupied section of the aircraft after impact forces had dissipated;

3) Determine the volume of liveable space which may have been compromised during the accident sequence, since ductile materials can rebound after impact forces, thus leaving no traces of their invasion of liveable space;

4) Determine the space between seats and aircraft structures, in part and such as instrument panel, control column, seat backs, trays, and galley that may have contributed to the nature and extent of injuries;

5) Determine if the container was penetrated by objects from outside the aircraft;

6) Determine the effects of unsecured interior aircraft equipment or cargo acting as missiles, in part and such as serving carts and oxygen bottles;

7) Determine the effects of passenger luggage on liveable space;

8) Assess the adequacy of walkways and exits;

9) Record the original seating position of deceased passengers and positions where bodies came to rest after the accident;

10) Record the type of seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed in the aircraft;

11) Record the damage to each of the items in task 10 above;

12) Record the effects of webbing material on the nature and extent of injuries, in part and such as cotton/rayon and nylon; as well as their flammability, elasticity, and adjustment-buckle slippage;

13) Record the type and load-limiting adequacy of cargo restraints, such as nets, lines and pallets;

14) Record the seat geometry for structural strength and energy absorption properties;

15) Record the seat cushions' energy absorption properties and flammability;

16) Assess the adequacy of the seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed;

17) Assess the effects of the cockpit and cabin environment on occupant survivability;

18) Record the following basic data for the determination of energy absorption:
   – Terrain angle;
   – Flight path angle;
   – Angle of impact;
   – Crash force resultant;
   – Crash force angle; and
   – Aircraft attitude at impact.

19) Record the width, length, depth and orientation of all gouge marks;

20) Record the depth of damage to the underside of aircraft, extent of compression of energy-attenuation devices;

21) Record the horizontal stopping distances, length of airframe compression in the horizontal plane, backward displacement of each wing and empennage surfaces;

22) Determine the direction, magnitude and duration of G-forces;

23) Determine the acceleration forces experienced by the aircraft occupants; and

24) Estimate the impact forces survivability potential.

18. Assess the requirements for wreckage reconstruction and advise the Investigator-in-charge of the requirements; and

19. Complete Event 49.

EVENT 49. Wreckage reconstruction

Events 13, 27 and 41 refer.

1) Select a suitable re-assembly area;

2) Determine the method of reconstruction;

3) Obtain the personnel and material resources;

4) Complete the re-assembly;

5) Photograph the re-assembly operations;

6) Interview witnesses; and

7) Select components for examination and testing, if required.

POST-FIELD PHASE

1. Evaluate the information collected to assess the contribution of the aircraft structure to the accident;

2. Advise the appropriate group chiefs of any pertinent information;

3. Complete Event 60; and

EVENT 60. Analysis and report of the Structures Group

Events 13, 27, 41 and 49 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

4. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 18

CRASHWORTHINESS GROUP CHIEF

The Crashworthiness Group Chief is responsible for the investigation of crash survivability issues for all aircraft occupants. This group's activities will overlap to a great extent with those of the Systems, Structures, Powerplants, Site Survey, Survivability and Witness groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Collect basic information on the aircraft involved; and

3. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational briefing;

2. Establish communications with the Site Survey, Structures, Survivability and Witness groupchiefs;

3. Conduct an initial survey of the accident site;

4. Determine the photographic requirements and advise the Investigator-in-charge;

5. Discuss your plan of action and requirements with the group chiefs of the aforementioned groups and request their assistance as required;

6. Determine the requirement and availability of mechanical or aeronautical engineering assistance and advise the Investigator-in-charge;

7. Complete Event 41;

EVENT 41. Crashworthiness

Events 13 and 27 refer.

1) Determine the requirement for mechanical or aeronautical engineering assistance;

2) Assess the volume of liveable space remaining within the occupied section of the aircraft after impact forces had dissipated;

3) Determine the volume of liveable space which may have been compromised during the accident sequence, since ductile materials can rebound after impact forces, thus leaving no traces of their invasion of liveable space;

4) Determine the space between seats and aircraft structures, in part and such as instrument panel, control column, seat backs, trays, and galley that may have contributed to the nature and extent of injuries;

5) Determine if the container was penetrated by objects from outside the aircraft;

6) Determine the effects of unsecured interior aircraft equipment or cargo acting as missiles, in part and such as serving carts and oxygen bottles;

7) Determine the effects of passenger luggage on liveable space;

8) Assess the adequacy of walkways and exits;

9) Record the original seating position of deceased passengers and positions where bodies came to rest after the accident;

10) Record the type of seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed in the aircraft;

11) Record the damage to each of the items in task 10 above;

12) Record the effects of webbing material on the nature and extent of injuries, in part and such as cotton/rayon and nylon; and their flammability, elasticity, and adjustment-buckle slippage;

13) Record the type and load-limiting adequacy of cargo restraints, such as nets, lines and pallets;

14) Record the seat geometry for structural strength and energy absorption properties;

15) Record the seat cushions' energy absorption properties and flammability;

16) Assess the adequacy of the seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages, and floor installed;

17) Assess the effects of the cockpit and cabin environment on occupant survivability;

18) Record the following basic data for the determination of energy absorption:
   – Terrain angle;
   – Flight path angle;
   – Angle of impact;
   – Crash force resultant;
   – Crash force angle; and
   – Aircraft attitude at impact.

19) Record the width, length, depth and orientation of all gouge marks;

20) Record the depth of damage to the underside of aircraft, extent of compression of energy-attenuation devices;

21) Record the horizontal stopping distances, length of airframe compression in the horizontal plane, backward displacement of each wing and empennage surfaces;

22) Determine the direction, magnitude and duration of G-forces;

23) Determine the acceleration forces experienced by the aircraft occupants; and

24) Estimate the impact forces survivability potential.

8. Utilize the acronym "CREEP" for the main tasks:

C – Container;
R – Restraints;
E – Environment;
E – Energy absorption; and
P – Post-crash factors.

9. Container

- Assess the volume of liveable space remaining within the occupied section of the aircraft after impact forces had dissipated;

- Analyse the volume of liveable space that may have been compromised during the occurrence sequence. Ductile materials can rebound after impact forces leaving no traces of their invasion of liveable space;

- Consider the space between seats and aircraft structures, in part and such as instrument panel, control column, seat backs, trays, and galley that may have contributed to the nature and extent of injuries;

- Determine if the container was penetrated by objects from outside the aircraft;

- Determine the effects of unsecured interior aircraft equipment or cargo acting as missiles, in part and such as serving carts and oxygen bottles;

- Determine the effects of passenger luggage on liveable space; and

- Assess the adequacy of walkways and exits;

10. Restraints

- Record the original seating position of deceased passengers and positions where bodies came to rest after the occurrence;

- Record the type of seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages and floor installed in the occurrence aircraft;

- Record the damage to each of the above;

- Consider the effects of webbing material on the nature and extent of injuries, in part and such as cotton/rayon and nylon fabrics and their flammability, elasticity, and adjustment-buckle slippage;

- Consider the type and adequacy of cargo restraint, in part and such as nets, lines, pallets, location of personnel, and load-limiting devices;

- Consider the seat geometry for both crew and passengers, for structural strength and energy absorption properties;

- Consider the seat cushions, in part for energy absorption properties and flammability; and

- Assess the adequacy of the seat belt, seat belt anchorage, shoulder harness and anchorage, seat structure and anchorages and floor.

11. Environment

- Assess the effects of the aircraft cockpit/cabin environment on occupant survivability;

12. Energy Absorption

- Record the following:
  - Terrain angle;
  - Flight path angle;
  - Angle of impact;
  - Crash force resultant;
  - Crash force angle; and
  - Aircraft attitude at impact.

- Determine and record the width, length, depth and orientation of all gouge marks;

- Determine and record the depth of damage to the underside of aircraft, extent of compression of energy-attenuation devices;

- Determine and record the horizontal stopping distances, length of airframe compression in the horizontal plane, backward displacement of each wing, empennage surfaces;

- Determine the direction, magnitude and duration of G-forces;

- Determine the acceleration forces experienced by the aircraft occupants; and

- Estimate the impact forces survivability potential.

13. Post-Crash Factors

- Consider the following:
  - How and why of the fire;
  - Combustibles: fuel/oil/hydraulics, upholstery/cargo/etc.;
  - Ignition sources: flames/hot surfaces, electrical/friction/static sparks;
  - Accident dynamics; occupiable area, fuel tanks/fuel lines/breakaway fittings, oil tanks/hydraulic tanks;
  - Control of the fire; and
  - Human tolerance to fire: heat/toxicity/other.

Note.— The Structures Group may be conducting a detailed investigation of the initiation and propagation of the fire. Close cooperation and collaboration with the Structures Group is therefore essential.

14. Evaluate all information gathered in the context of human survivability;

15. Review, evaluate and analyse all information collected; and

16. Prepare and submit the group report to the Investigator-in-charge.

POST-FIELD PHASE

1. Evaluate the information collected to assess the survivability issues for all aircraft occupants;

2. Advise the appropriate group chiefs of any pertinent information;

3. Complete Event 41;

4. Review, evaluate and analyse all information collected;

5. Prepare and submit to the Investigator-in-charge either an individual Crashworthiness Group report or integrate the crashworthiness factors and analysis into the Structures Group report; and

6. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 19

POWERPLANTS GROUP CHIEF

The Powerplants Group Chief is responsible for the investigation of the engine(s), auxiliary power unit (APU), including fuel and oil systems to the firewall, propeller(s) and engine and powerplant controls. This group is also responsible for investigating the type of fuel, the possibility of fuel contamination and the effectiveness of the powerplant(s).

The functions of this group must be coordinated with the Site Survey, Structures, Systems, Flight Recorders and Operations groups.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Contact the powerplant manufacturer to determine whether it will participate in the investigation and, if so, the expected time of arrival of its representative (Coordinate with the Head Office Coordinator);

2. Obtain the powerplant parts catalogue;

3. Assess the requirement to obtain fuel samples;

4. Attend the Investigator-in-charge's pre-departure briefing; and

5. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Conduct a preliminary survey of the site to get a feel for the dynamics of the accident;

Note.— It is preferable to wait until the arrival of the manufacturer's representative before conducting a detailed examination of the powerplant(s), which may result in disturbing evidence.

3. Complete Event 14;

EVENT 14. Examination of engine(s) and propeller(s)

1) Locate the engine(s) and verify make, model and serial number(s);

2) Record the position and the condition of the engine(s);

3) Determine the engine(s) pre-impact integrity;

4) Locate the propeller(s) and verify make, model and serial number(s);

5) Record the position and the condition of the propeller(s);

6) Determine the propeller(s) pre-impact integrity;

7) Locate and identify all major engine and propeller components, such as engine controls, auxiliary fuel, oil and coolant components, and instruments;

8) Record the position of engine and propeller controls, components and reading of related instruments;

9) Determine the pre-impact serviceability of the controls, components and related instruments;

10) Photograph engine(s), propeller(s), components, and instruments in situ;

11) Obtain oil and fuel samples;

12) Determine the engine power developed at impact, if feasible;

13) Select the engine(s), propeller(s) and components for examination and testing; and

14) Prepare detailed statements of requirements for examination and testing.

4. Prepare statements of requirements for the examination and testing;

5. Direct pertinent information to the Operations and Records groupchiefs;

6. Arrange for and monitor the testing of the components; and

7. Complete Event 28.

EVENT 28. Examination and testing (Powerplants)

Event 14 refers.

1) Forward engine(s), propeller(s), components and instruments to the appropriate testing facilities;

2) Arrange for investigators to be present at all examinations and testings;

3) Monitor and photograph all phases of examinations and testings;

4) Determine if power was being developed at impact;

5) Select components for further examination and testing; and

6) Interview witnesses with powerplant information.

POST-FIELD PHASE

1. Complete Event 61;

EVENT 61. Analysis and report of the Powerplants Group

Events 14, and 28 refer.

1) Assemble examination and testing data;

2) Review, evaluate and analyse all information collected; and

3) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 20

SITE SURVEY GROUP CHIEF

The Site Survey Group Chief is responsible for producing, in pictorial and graphic format, a description of the accident site, showing the location and distribution of the wreckage, human remains and other associated items, such as impact marks. This group must establish a probable flight path, an impact angle and impact speed.

The activities of this group are linked to the Aircraft Performance Group, Structures Group, Flight Recorders Group, and the Site Safety Coordinator.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing; and

2. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Attend the Investigator-in-charge's organizational meeting;

2. Coordinate all site activities with the Site Safety Coordinator;

3. Assess the requirement for a personal overflight of the accident site and review with the Investigator-in-charge. The objective of the flight includes the determination of:

   – pre-impact swath through trees, obstructions, and ground scars;

   – approximate location of all aircraft debris;

   – orientation of wreckage trail;

   – available site access routes;

   – prominent terrain features surrounding the site;

   – post-impact swath; and

   – the preparing of a rough sketch of the accident area for team briefing.

4. Assess the requirement for, and request, detailed aerial photographs of the site, consider photogrammetry;

5. Advise the Structures GroupChief on defining limits of the accident site;

6. Request general ground-level photographs;

7. Ensure that explosives, hazardous cargo and pressure systems have been safetied prior to commencing the survey;

8. Arrange, with the assistance of the Site Safety Coordinator, for the preservation and subsequent restoration of severely soaked or burned documents found in or near the wreckage;

9. Complete Event 15;

EVENT 15. Initial survey of the accident site

1) Determine the probable distribution of wreckage by cursory examination of angle of impact, speed and pre-impact integrity indications;

2) Delineate the area requiring search for components and evidence;

3) Determine the method and intent of search for debris;

4) Determine the material and personnel resources required;

5) Obtain the material and personnel resources;

6) Identify significant components; and

7) Mark and tag components.

10. Complete Event 29.

EVENT 29. Wreckage distribution plotting

Event 15 refers.

1) Plot wreckage distribution to include:
   – Significant ground features;
   – Point(s) of initial impact;
   – Location of major components and pieces;
   – Impact direction;
   – Ground fire areas;
   – Ground scars;
   – Indication of serious property damage; and
   – Witness locations.

2) Determine the flight path from the first contact with a ground object, to ground contact, to rest; and

3) In a mid-air collision, reconstruct the path by using trajectory analysis based on radar plots, flight recorder data, satellite navigation systems data and witness statements.

POST-FIELD PHASE

1. Complete Event 62;

EVENT 62. Analysis and report of the Site Survey Group

Events 15 and 29 refer.

1) Review, evaluate and analyse all information collected; and

2) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

Section 21

PHOTO/VIDEO GROUP CHIEF

The Photo/Video Group Chief is to ensure that a systematic photographic record of the accident is created.

Photography in general should be commenced without delay in order to obtain a good coverage of the wreckage and the condition in which it is found. Whenever appropriate to the type of accident, aerial photography should be arranged.

Coordination with the Investigator-in-charge and all the group chairpersons is required.

BEFORE LEAVING FOR THE ACCIDENT SITE

1. Attend the Investigator-in-charge's pre-departure briefing;

2. Determine the photographic equipment requirements;

3. In consultation with the Deputy Investigator-in-charge, establish tentative photographic priorities;

4. Determine the requirements for aerial photography and inform the Investigator-in-charge of the anticipated requirements for an overflight of the accident site; and

5. Submit all original documents to the Administration Coordinator.

AFTER ARRIVING AT THE ACCIDENT SITE

1. Proceed directly to the accident site, commence photographing the site and reassess photographic priorities;

2. Ensure that each roll of film or digital storage device, and all photographs are identifiable by date, photographer, and subject;

3. Maintain a frame-by-frame photographic log;

4. Maintain a record, when required, of the location from where the photo/video evidence was taken; and

5. Complete Event 16;

EVENT 16. Site photography (Phase 1)

1) Establish photographic priorities;

2) Photograph the general wreckage from at least four directions;

3) Photograph human remains in situ in relation to other objects;

4) Photograph easily perishable evidence, in part and such as ground impact marks and the presence/absence of fire;

5) Photograph flight recorders in situ prior to removal;

6) Photograph hazardous systems and components in situ prior to deactivation or removal;

7) Photograph the terrain and general impact area;

8) Photograph the general components, in part and such as wings, engine(s), and empennage;

9) Determine the requirements for photogrammetry;

10) Determine the requirements for aerial photography;

11) Elaborate photo coverage of any suspect areas or components;

12) Liaise with the Site Survey Group Chief for photographic requirements such as:
    - Significant ground features;
    - Point of initial impact;
    - Location of major components;
    - Ground fire areas;
    - Serious property damage;
    - Flight path to impact; and
    - Witness locations.

13) In conjunction with the Operations Group Chief, photograph the cockpit environment with particular attention to:
    - Instruments;
    - Position of controls;
    - Switch positions;
    - Circuit breaker panels;
    - Radio settings;
    - Automatic pilot setting;
    - Fuel control positions;
    - Pilot seats, seat belts, harness; and
    - Maps, charts.

14) Liaise with the Operations Group and Systems Group chiefs for additional specific photo requirements of the cockpit area;

15) Liaise with the Medical/Human Factors and Structures (Crashworthiness) Group chiefs for requirements for photos of items with possible design deficiencies such as:
    - Design/location of instruments;
    - Design/location of controls;
    - Work space incompatibility;
    - Visual restriction due to structure;
    - Lack of cockpit standardization;
    - Personal equipment interference; and
    - Seat design/configuration.

16) Liaise with the Medical/Human Factors and Structures (Crashworthiness) chiefs for photo requirements of:
    - Cabin environment;
    - Unsecured interior equipment;
    - Seats, seat structures;
    - Belts, seat belt anchorages;

- Belt buckles;
- Cabin floor;
- Cargo restraint; and
- Emergency exits.

17) Liaise with the Structures (Crashworthiness) Group Chief for photo requirements of:
    - Terrain angle;
    - Angle of impact;
    - Width, length and depth of ground scars;
    - Depth of damage to underside of aircraft;
    - Compression of energy-attenuation devices;
    - Initiation and propagation of fire;
    - Smoke smears, soot, discoloration;
    - Surface pitting; and
    - Evidence of explosion.

18) Liaise with the Air Traffic Services and Airports Group Chief for specific photo requirements of:
    - Runway or taxiway;
    - Aerodrome layout;
    - Obstructions to air traffic services and airport controllers' vision;
    - Aerial photo record of access routes; and
    - Tower cab layout.

19) Liaise with the Powerplants Group, Systems Group and Structures Group chiefs for specific photo requirements of selected aircraft components.

6. Complete Event 30.

EVENT 30. Site photography (Phase 2)

Event 16 refers.

1) Photograph wreckage recovery operations;

2) Photograph re-assembly operations (if applicable);

3) Photograph engine tear down operations (if applicable);

4) Photograph components under examination and testing; and

5) Provide analysis of photo/video evidence.

POST-FIELD PHASE

1. Complete Event 63;

EVENT 63. Analysis and report of the Photo/Video Group

Events 16 and 30 refer.

1) Complete photo and video requirements;

2) Review, evaluate and analyse all information collected; and

3) Prepare and submit the group report to the Investigator-in-charge.

2. Participate in Event 65.

EVENT 65. Technical analysis and findings

1) This event should be chaired by the Investigator-in-charge with the following group chiefs attending:
   – Maintenance and Records;
   – Systems;
   – Structures;
   – Powerplants;
   – Site Survey;
   – Photo/Video; and
   – Other parties as dictated by local regulations and procedures.

2) Review all group findings to determine adequacy of information, areas of conflict, errors and inconsistencies;

3) Identify the areas requiring clarification;

4) Determine the procedure for achieving clarification;

5) Complete the technical analysis and determine findings with assistance from the operations groups;

6) Identify safety hazards and deficiencies; and

7) Suggest safety recommendations.

— END —

Agenda Item 5: ARCM AIG training programme

5.1 Under this agenda item, the Secretariat presented a proposal of amendment to the ARCM AIG training programme.

5.2 In this regard, the Meeting took note that, based on the latest results obtained within the framework of the activities of the ICAO Universal Safety Oversight Audit Programme (USOAP), one of the audit areas with the lowest effective implementation (EI) regarding the safety oversight capacity of SAM States continues to be the accident and incident investigation (AIG) area.

5.3 In this regard, the Meeting took note that, in order to conduct objective, well-targeted investigations with high-impact recommendations, States should have the appropriate personnel. However, many States do not have staff exclusively devoted to accident investigation, in which case it would be advisable to select qualified personnel to receive training in accident investigation methods before being assigned an actual investigation case.

5.4 A concern especially of accident investigators and their organisations is referred to training and the continuous updating of knowledge and skills in order to thoroughly carry out the entrusted tasks. Investigators must not only receive basic training in aircraft accidents but also initial, on-the-job (OJT), periodic, advanced, and specialised training in order to maintain and improve their skills.

5.5 It is of vital importance to have a training programme that is common to all member States in order to facilitate the harmonisation of knowledge and skills. This harmonisation of knowledge and skills will allow the SAM Region to have a select group of investigators that may participate in the investigation of aircraft accidents in the Region at the request of any State.

5.6 The Second Meeting of AIG Authorities (AIG-SAM/2) was presented with the First edition of the harmonised ARCM training programme.

5.7 In this sense, the Meeting took note that the First edition of the aforementioned programme had been circulated among ARCM States, which submitted their comments and differences, and that the ARCM Technical Committee had analysed the relevance of including the comments sent by the States.

5.8 Regarding Chapter 3 – Training guide, all changes were accepted as follows:

3.1 ***PHASE 1 – INITIAL TRAINING***

The objective of initial training is to familiarise newly-hired investigators with the applicable legislation of ARCM member States and the procedures and requirements of the AIG authority. ~~The following topics will be included in the initial training:~~

~~a) Administrative provisions:~~

~~(i) Applicable legislation~~

~~(ii) International agreements (including Annex 13 – Aircraft accident and incident investigation)~~

~~*(iii) Memorandum of agreement with other organisations (if applicable)*~~

~~*(iv) Liaison mechanisms with local and national authorities*~~

~~*(v) Structure of the AIG authority*~~

~~*(vi) Manual on aircraft accident and incident investigation, policies, and procedures*~~

~~*(vii) Definitions and classification of accidents*~~

~~*(viii) Equipment and tools*~~

~~*(ix) Travel arrangements*~~

~~*(x) Ethics and conduct of the investigator*~~

~~*b) Investigation procedures*~~

~~*(i) Response procedures (investigator on duty)*~~

~~*(ii) Custody de recordings and components of a wrecked aircraft*~~

~~*(iii) Competencies and security at the site of the accident*~~

~~*(iv) Investigator's safety, including psychological stress*~~

~~*(v) Cooperation for the recovery of human remains*~~

~~*(vi) Autopsy requests*~~

~~*(vii) Assistance to relatives*~~

~~*(viii) Authority and responsibility*~~

~~*(ix) Management of the investigation*~~

~~*(x) Use of experts*~~

~~*(xi) Parties to the investigation, accredited representatives, advisors, and observers*~~

~~*(xii) Delivery of information to the media*~~

~~*(xiii) SMS applied to the investigation – SSP*~~

3.6 PHASE 5 – PERIODIC ACCIDENT INVESTIGATION COURSE

3.7.1 After completing the basic training in aircraft accident and incident investigation, the investigator must continue its training through periodic courses, structured as a partial basic course, and whose subject matters may be combined according to an internal diagnosis done by

the organisation through investigation quality control processes and various methods, such as assessments, interviews with the investigators, etc.

These recurrent courses will be conducted every 2 calendar years and their daily burden should not exceed 50% of a basic investigation course. Their duration may be 30 days, adjusting the daily burden on a weekly basis, in accordance with the activities and number of investigators.

5.9 Regarding Chapter 4 – Accident investigation – Curriculum of the courses, all changes were accepted as follows:

4.1 ***INITIAL COURSE ON AIRCRAFT ACCIDENT INVESTIGATION***

4.1.1 *Objectives:*

a) Learn about the INITIAL concepts of the methodology established by ~~the Accident Investigation Board~~ the investigation body for the investigation of civil aviation accidents and incidents, in accordance with the standards and recommended practices enacted by ICAO.

4.2.1 *Content*

4.2.6.1 The basic course on aircraft accident investigation must cover the following topics:

Basic course on aircraft accident investigation		
Subject		
a)	*Responsibilities of the States involved*	
b)	*Reporting procedures*	
c)	*Handling of investigations*	
d)	*Team of investigators*	
e)	*Safety at the site of the accident*	
f)	*Protection of evidence*	
g)	*Initial measures at the site of the accident*	
h)	*Information collection techniques*	
i)	*Communication and recordings*	
j)	*Interviewing witnesses*	
k)	*Flight recorders (FDR, CVR) and ATS recordings*	
l)	*Applied airworthiness*	
m)	*Fires and explosions*	
n)	*Survivability*	
o)	*Structures*	
p)	*Systems*	
q)	*Aerodynamics*	
r)	*Power plants*	
s)	*Rotary-wing aircraft*	
t)	*Human and organisational factors*	
	Aeronautical medicine and pathology	
u)	*Methods for analysing factual information collected*	

v)	*Drafting of reports*	
w)	*ECCAIRS/ADREP reporting system*	
x)	*Media and public relations*	

4.2.6.2 Detailed breakdown of topics to be covered

a) ECCAIRS/ADREP reporting system

Introduction to the ECCAIRS reporting system, under the ADREP taxonomy, to allow each investigator to use this tool to upload the details of the investigation being conducted into the ECCAIRS system, making use of the ADREP

4.4.1 *Learning to use the tool of the ECCAIRS/ADREP system is extremely important for the investigator, since it is a fundamental tool for reporting events and feeding the database of the AIG organisation, and for integration with other databases and the ARCM database.*

4.5 PERIODIC COURSE ON AIRCRAFT ACCIDENT INVESTIGATION

4.5.1 Objectives:

a) Strengthen the methodology and procedures for conducting the technical investigation of the events occurred, according to the State AIG regulations and in accordance with ICAO Annex 13 and the new procedures or guidelines emanating from the organisation.

b) Strengthen and update the various sources from which information can be obtained and their interrelationship in accordance with the area of knowledge involved, making adjustments for the integration of interdisciplinary work teams.

c) Strengthen and update the investigators' staff on the proper tools for conducting a logical analysis of the facts and evidence, in order to arrive at verifiable.

4.5.2 Requirements:

a) The course is addressed to investigators who have already completed initial and basic accident and incident investigation training, and who are acting as investigators in the AIG organisation.

4.5.3 Scope:

a) Strengthen and update the concepts and knowledge acquired during initial and basic training as accident and incident investigators.

Course certification: Periodic course approved

4.5.4 Methodology:

a) The methodological axis of the course will be the theoretical-practical integration, and the use and knowledge of existing documentation and any updates performed. It

will consist of classroom lessons combining lectures and case studies, discussions, etc. It will encourage reflection and transfer of knowledge through group work. An interdisciplinary approach will be applied in accordance with the proposed objective.

4.5.5 Assessment:

a) For the assessment of the course, investigators will put in practice their knowledge in an accident investigation they are conducting.

b) In case the documentation and/or procedures related to the investigation or operation of the organisation have been updated, only those items will be assessed in writing using the multiple-choice methodology.

4.5.5 Topics

4.5.5.1 *The periodic aircraft accident investigation course must cover some of the following topics in a combined manner, trying as far as possible not to repeat them in the following periodic course.*

Periodic aircraft accident investigation course	
Subject	
Strengthen and/or update	
a) Responsibilities of the States involved	
b) Reporting procedures	
c) Handling of the investigation	
d) Team of investigators	
e) Safety at the site of the accident	
f) Protection of evidence	
g) Initial measures at the site of the accident	
h) Information collection techniques	
i) Communication and recording media	
j) Interviewing witnesses	
k) Flight recorders (FDR, CVR) and ATS recordings	
l) Applied airworthiness	
m) Fires and explosions	
n) Survivability	
o) Structures	
p) Systems	
q) Aerodynamics	
r) Power plants	
s) Rotary-wing aircraft	
t) Human and organisational factors	
u) Aeronautical medicine and pathology	
v) Methods for the analysis of factual information collected	
w) Drafting of reports	
x) Media and public relations	

4.5.5.2 For a detailed breakdown of the topics, refer to item 4.2.6.2, taking into account that the

topics to be included may be of a partial nature based on the diagnosis made by the organisation, and must be reinforced and/or updated.

5.10 Regarding Attachment C – Individual development plan form, all changes were accepted as follows:

Investigation procedures			
Authority and responsibilities			
Size and scope of the investigation			
Handling of investigations (group leader and IIC) on the scene			
Use of experts			
Parties to the investigation, accredited representatives, advisors, and observers			
Dealing with the press ~~news media~~			
Expert procedures (operations, airworthiness, human factors, etc.)			

5.11 Upon analysing the proposal of amendment of the ARCM harmonised training programme, the Meeting adopted the following conclusion:

CONCLUSION AIG-SAM/3-04 Approval of the proposal of amendment of the ARCM harmonised AIG training programme

a) Approve Amendment No. 1 to the First edition of the ARCM harmonised AIG training programme.

b) **Attachment A** to this Agenda item of the report contains Amendment No. 1 to the approved First edition of the AIG training programme.

AIG Regional Cooperation Mechanism (ARCM) of South America

ARCM AIG training programme of South America

First edition
June 2015

Record of amendments			
Amendment No.	**Date applicable**	**Date entered**	**Entered by:**

Amendments to AIG training programme			
Amendment	**Origin**	**Subjects**	**JG ARCM approved**
First edition	AIG-SAM/2	Training programme base on ICAO documents	June 2015
No 01	Proposals of Argentina and Colombia	Cap. 3 Training guidelines Cap. 4 Accident investigation – Course guidelines	March 2016

List of effective pages			
Detail	**Pages**	**Amendment**	**Dates**
Foreword		Original	June 2015
List of abbreviations		Original	June 2015
Chapter 1 Terminology		Original	June 2015
Chapter 2 Background of experience for investigators		Original	June 2015
Chapter 3 Training guidelines		01	March 2016
Chapter 4 Accident investigation – Course guidelines		01	March 2016
Attachment A SAM regional centres for aircraft accident investigation training		Original	June 2015
Attachment B Courses available in the CENIPA		Original	June 2015
Attachment C Individual development form		Original	June 2015

TABLE OF CONTENT

FOREWORD

The investigation of an aircraft accident is a task that can be almost unlimited in scope. Therefore, some investigations will be curtailed by the resources available, unless proper management of the investigations is exercised. The AIG Authority is responsible for ensuring that the expenditure of the resources available results in an investigation that extracts the maximum benefit to the safety of aviation and not squandered on irrelevant lines of inquiry. At the same time, the AIG Authority must also ensure, as much as is practicable, that relevant lines of inquiry are terminated as soon as they have achieved the level beyond which further expenditure of resources will be uneconomical in terms of enhancing safety.

As more occurrences are investigated, besides the new technologies in the industry, higher is the need to increase the knowledge and upgrade the skills in a continuing process. While training is essential, the optimization of an investigator's capabilities generally depends upon a personal commitment to excellence.

During the First Meeting of AIG Authorities of the SAM Region, Lima, Peru, in March 2014, the States of South America expressed the view that there was a need to develop common standards for the training of investigators. The training standards were to be compiled in such a way that they would be adaptable to a variety of cultures and operational requirements. Based on the discussion, the meeting agreed that the AIG regional cooperation mechanism (ARCM) would develop guidelines for the training of investigators.

In response to the recommendation, the ARCM developed the harmonized AIG training programme with the training guidelines contained in these guidelines. This training programme discusses the experience and employment background required for training as an aircraft accident investigation. It also outlines the progressive training that is considered necessary to qualify a person for the various investigation roles, including appointment as the *investigato-in-charge (IIC)* of an investigation into a major accident involving a large transport category aircraft. The ARCM, in compliance with what ICAO suggests, acknowledges that training guidelines are evolutionary in nature and may need to be updated periodically. .

Throughout this proposal, with the exception of the definitions in Chapter 1, the use of the male gender should be understood to include male and female persons and the term "accident" should be understood to include "serious incident and incident".

In order to keep this text relevant and updated guidance, suggestions to improve them in terms of format, content or presentation are welcome. Any recommendation or suggestion shall be examined, and, if convenient, it shall be included in the next edition of this document.

LIST OF ABBREVIATIONS

AAC	Civil Aviation Authority
AASANA	Administration of Airports and Services of Air Navigation
ACCID	Accident
ADREP	Accident/Incident Data Reporting System
AIG	Accident/Incident Investigation
ARCM	AIG Regional Cooperation Mechanism (South America)
ATC	Air Traffic Control
ATS	Air Traffic Services
AVSEC	Aviation Security
DGAC	Directorate General of Civil Aviation (AAC)
DS	Supreme Decree
ECCAIRS	European Coordination Centre for Aviation Incident Reporting Systems
IIC	Investigator-in-charge (IIC)
INCID	Incident
MoU	Memorandum of Understading
ICAO	International Civil Aviation Organization
OJT	On-the-job Training
PDI	Individual development Plan of the Accident Investigator
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SSP	State Safety Programme
SMS	Safety Management Systems
USOAP	Universal Safety Oversight Audit Programme

Chapter 1

TERMINOLOGY

When the terms listed below appear in the training programme, they will mean the following:

Accident investigation authority. The State organization responsible for conducting aircraft accident investigations.

Accident investigator. A person, specifically trained, engaged in the investigation of civil aviation accidents, serious incidents and incidents.

Accredited representative. A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State.

Adviser. A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

Expert/Specialist. A person invited to participate in an investigation, on the basis of his or her specialized knowledge, skills or experience.

Investigation. A process conducted for the purpose of accident prevention. It includes the gathering and analysis of information, the drawing of conclusions, the determination of causes and the making of safety recommendations.

Investigator-in-charge (IIC). A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Observer. A person permitted to be present in an investigation for the purpose of observing the investigation process.

Chapter 2

BACKGROUND EXPERIENCE FOR INVESTIGATORS

2.1 Aircraft accident investigation is a specialized task which should only be undertaken by qualified investigators. Many States establish an accident investigation authority manned by qualified and experienced investigators. Some States have both an independent accident investigation authority and an accident investigation unit within the regulatory authority; others rely on investigation by the regulatory authority alone. Some States do not have any personnel employed solely for aircraft accident investigation. Such States should train appropriately qualified personnel in the accident investigation techniques required to participate in or to conduct an aircraft accident investigation. When assigned to an accident investigation, such personnel should be relieved of their regular duties for the duration of the investigation.

2.2 Accident investigators must have considerable practical experience in aviation as a foundation on which to build their investigation skills. This experience can be acquired from civil or military qualification as a pilot, aeronautical engineer or aircraft maintenance engineer. Personnel qualified in flight operations, airworthiness, air traffic management, or aviation related management might also be suitable for accident investigator training.

2.3 Normally, a small team or even a single investigator conducts the investigation of an accident involving a general aviation or small commuter aircraft. However, two investigators are advisable to conduct the investigation: an operations investigator (OPS) and an airworthiness investigator (AIR). In addition, the investigators should have a comprehensive understanding of the interrelationship of each of the supporting services that are necessary to operate an aircraft in the aviation environment.

2.4 Since the outcome of an accident investigation is largely dependent upon the aviation knowledge, skills and experience of the assigned aircraft accident investigators, they should have:

a) an understanding of the depth of investigation that is necessary in order for the investigation to conform with the legislation, regulations and other requirements of the State for which they are conducting the investigation;

b) a knowledge of aircraft accident investigation techniques;

c) an understanding of aircraft operations and the relevant technical areas of aviation;

d) the ability to obtain and manage the relevant technical assistance and resources required to support the investigation;

e) the ability to collect, document and preserve evidence;

f) the ability to identify and analyse pertinent evidence in order to determine the causes and, if appropriate, make safety recommendations; and

g) the ability to write a final report that meets the requirements of the accident investigation authority of the State conducting the investigation.

2.5 In addition to technical skills and experience, an accident investigator requires certain personal attributes. These attributes include integrity and impartiality in the recording of facts; ability to analyse facts in a logical manner; perseverance in pursuing inquiries, often under difficult or trying conditions; and tact in dealing with a wide range of people who have been involved in the traumatic experience of an aircraft accident.

Chapter 3

TRAINING GUIDELINES

3.1 GENERAL

3.1.1 Aircraft accident investigators require different levels of experience, knowledge and training according to the particular role to which they are assigned. Aircraft accident investigators should receive training commensurate with their responsibilities as an accident investigator, group leader, investigator-in-charge, accredited representative, adviser or expert/specialist. The training guidelines and course syllabi should be planned in such a way that the investigators receive appropriate levels of training that will enable them to perform efficiently in any of the roles assigned to them by the AIG Authority.

3.1.2 Training a person for aircraft accident investigation involves several phases. These phases include initial training, on-the-job training, a basic accident investigation course and an advanced accident investigation course supplemented by specialized courses. While on-the-job training is an ongoing process that continues for many years, there should be sufficient time intervals between each formal course to allow the investigator to consolidate the information and the techniques learned.

3.2 REQUIREMENT

Formal courses are designed to complement on-the-job training by exposing trainee investigators to a cadre of experts who can pass on the details of their specialties to their students. The experts are usually recruited from those with experiences in a particular area of accident investigation. They include experienced investigators, aviation medicine physicians, psychologists, aeronautical engineers and manufacturers' representatives.

3.3 PHASE 1 – INITIAL TRAINING

~~3.1.3~~ The aim of the initial training is to familiarize new investigators with the legislation applicable in the ARCM member States and with the procedures and requirements of the accident investigation authority. ~~The following subjects should be included in the initial training or indoctrination:~~

~~a) Administrative arrangements:~~

~~(i) Applicable legislation~~

~~(ii) International agreements (including Annex 13 – Aircraft Accident and Incident Investigation)~~

~~(iii) Memorandum of understanding with other organizations (if applicable)~~

~~(iv) Liaison arrangements with local and national authorities~~

~~(v) Structure of the AIG Authority~~

~~(vi) Aircraft accident investigation manuals, policies and procedures~~

~~(vii) Definitions and accident classification~~

~~(viii) Equipment and tools~~

~~(ix) Transport arrangements~~

(x) Ethics and conduct

b) Investigation procedures

(i) On-call procedures (on-call investigator)

(ii) Securing of records, recordings and samples

(iii) Accident site jurisdiction and security

(iv) Investigator safety including psychological stress

(v) Cooperation in the recovery human remains

(vi) Requests for autopsies

(vii) Family assistance

(viii) Authority and responsibility

(ix) Investigation management

(x) Use of specialists

(xi) Parties to the investigation, accredited representatives, advisers and observers

(xii) Release of information to the news media

(xiii) SMS applied to the investigation - SSP

3.4 PHASE 2 – ON-THE-JOB TRAINING (OJT)

Following the initial training, the AIG Authority should provide on-the-job training for a new investigator. During this second phase, the new investigator will practice the procedures and tasks covered in the initial training, and gain familiarity with investigation techniques. This training will also familiarize him with the investigation tasks at the accident site, the collection of factual information, the analysis of the factual information and the development of the final report. The conduct of on-the-job training often involves more than one experienced investigator and is not limited to investigations within the State that employs the trainee/investigator.

3.5 PHASE 3 – BASIC ACCIDENT INVESTIGATION COURSE

After completing the initial familiarization training, the aircraft accident investigator who is under training should attend a basic accident investigation course as soon as is practicable, preferably within the first year of training. A basic course should have a syllabus that includes the subjects discussed in Chapter 4.

3.6 PHASE 4 – ADVANCED ACCIDENT INVESTIGATION COURSE AND ADDITIONAL TRAINING

3.6.1 Advanced accident investigation courses. As a trained investigator gains experience, he should be enrolled for an advanced accident investigation course where he can update his knowledge of the basic techniques and increase his knowledge in special areas relevant to accident

investigations. Additional training, investigators may be called upon to investigate accidents involving a variety of aircraft types. It is impracticable to train an investigator on each of the aircraft types that he may encounter. Nevertheless, investigators should have a basic knowledge of most of the major air transport aircraft types that are operated in the ARCM member States or of the Region. It is therefore recommended that investigators attend aircraft type courses on the most common aircraft types used by the airlines in their State. Preferably, such aircraft type courses should include specialized technology transport category aircraft (i.e. aircraft equipped with a glass cockpit, fly-by-wire systems and aircraft which contain composite materials in their structure). There is no need for each investigator to attend type courses on all the large aircraft types used. Training on the various aircraft types can be shared equitably among the investigators. For example, one investigator could be trained on one or two large aircraft types and another investigator on other aircraft types. Investigators with a technical or engineering background could attend the aircraft type courses for technical/maintenance personnel. Similarly, investigators with a pilot background could attend the aircraft type courses for pilots, which could include introductory flight training in a flight simulator.

3.6.2 In accordance with Annex 13, the State of Design and the State of Manufacture participate as accredited representatives in investigations involving the type of aircraft that are designed or manufactured in their State. Although the accredited representatives of the State of Design and the State of Manufacture are usually accompanied by expert advisers from the designer organization and the manufacturer, it is essential that the investigators, who are appointed as accredited representatives of the State of Design and the State of Manufacture, have a basic knowledge of the aircraft designed or manufactured in their State.

3.6.3 Other additional training can be obtained by attending conferences and seminars conducted by aircraft accident investigation organizations, by reading related material, such as aircraft accident magazines and aircraft accident reports issued by other States.

3.7 PHASE 5 – PERIODIC ACCIDENT INVESTIGATION COURSE

3.7.1 After completing basic accident investigation course, the investigator must continue their training through periodic courses, the structure is the basic course in a biased manner and whose subjects can be combined according to the diagnosis internal conducted by the organization through quality control processes in the investigations and/or deficiencies identified through various methods such as assessments, interviews with investigators etc.

These recurrent courses are held every 2 years calendars and workload should not exceed 50% over the basic accident investigation course. The same may be performed in a time period of 30 days, adjusting the number of hours weekly according to the activities and staff of investigators.

Chapter 4

ACCIDENT INVESTIGATION – COURSE GUIDELINES

4.1 INITIAL AIRCRAFT ACCIDENT INVESTIGATION COURSE

4.1.1 Goals:

a) Knowing the INITIAL concepts of the methodology established by the Accident Investigation Board for the civil aviation accident and incident investigations, in accordance with the standards of the Annexes to the Convention of Civil Aviation related.

b) Knowing the initial procedures to conduct an investigation in such a way that the student can start the OJT in the field investigation (being part of a FIELD INVESTIGATION TEAM – ETIC).

c) Identifying and using the sources to be able to obtain updated information coming from the different areas of knowledge that an accident investigation can be related with in such a way that the student can be part of interdisciplinary work teams with experienced supervision in aircraft accident and incident investigation.

4.1.2 Requirements:

a) Having a degree in a discipline that can be related to aircraft accident/incident investigation, or demonstrable training and experience equal to aircraft operations or maintenance, air traffic management and/or related collateral disciplines.

4.1.3 Scope:

a) For the candidates for aircraft accident investigator in AIG organizations, they shall have reached the minimum level of knowledge compatible with the requirements necessary to initiate the OJT phase with the aim of obtaining the specific knowledge to be able to conduct the tasks related to the participation as assistant to the accident investigator in the conduction of a field investigation.

Certification of course approved: Assistant in investigation.

b) For the candidates that take the course in assistant in investigation with the intention of increasing their knowledge of safety, this course allows them to obtain appropriate information to understand the theoretical grounds that guide the conduction of the investigations with the intervention of the aeronautical authority of the State responsible of the conduction of the accident investigation (AIE) in accordance with the Convention of Chicago and its Annexes.

Certification of in-class course: Assistant in investigation

4.1.4 Methodoly:

4.1.5 The methodological concept of the course shall be the theoretical-practical integration and the use and knowledge of the documentation that has been introduced. The course shall be developed in classes with presentations with studies of cases, debates, role playing game, etc. Reflection and transference shall be promoted through team work. An interdisciplinary focus shall be applied in the course according to the proposed objective.

4.1.6 Assessment:

a) Throughout the course, teachers shall be committed to make a continuous assessment of the knowledge learned by the students, which can be occasional and/or systemic.

b) *Occasional* shall be the assessment made through the observation of all the actions the students take; *systemic,* is the one that shall be complemented in the planning of the course with learning verification tests in the process, that shall be made through integrating workshops with trouble-shooting and a multiple-choice questionnaire or other types.

4.1.7 Subjects

4.1.7.1 The initial aircraft accident investigation course must cover at least the following subjects:

Initial aircraft accident investigation course	
Subjects	
ADMINISTRATIVE ARRANGEMENTS	
a) Legislation applicable to the State	
b) Annex 13 – Annex 19	
c) International agreements	
d) Liaison arrangements with local and national authorities	
e) Structure of the AIG Authority	
f) Aircraft accident and incident investigation manual, policies and procedures	
g) Definitions and accident and incident classification	
h) Equipment and tools	
i) Transport arrangements	
j) Ethics and conduct	
INVESTIGATION PROCEDURES	
k) On-call procedures (on-call investigator)	
l) Securing of recordings and samples	
m) Accident site jurisdiction and security	
n) Investigator safety including psychological stress	
o) Cooperation in recovery of human remains	
p) Requests for autopsies	
q) Family assistance	
r) Authority and responsibility	
s) Size and scope of the investigation	
t) Investigation management	
u) Use of specialists	
v) Parties to the investigation, accredited representatives, advisers and observers	
w) Release of information to the news media	
x) SMS applied to the investigation - SSP	

4.1.8 Goals

a) Department of administrative arrangements

As the development of the subjects ends, the student shall have understood the general context of the requirements of the system in such a way that he/she can initiate the OJT integrating an ETIC in a field investigation as assistant with the supervision of an expert investigator.

b) Department of investigation procedures

As the development of the subjects ends, the student shall have known and been able to use the common documents available to contribute to the investigation in his/her specific area of expertise, with the supervision of an expert investigator at the momento of initiating the OJT integrating an ETIC in a field investigation.

4.2 BASIC AIRCRAFT ACCIDENT INVESTIGATION COURSE

4.2.1 Goals:

a) Knowning the basic methodology and procedures to conduct the technical investigation of the occurrences in accordance with the AIG State regulations in compliance with ICAO Annex 13.

b) Identifying the different sources where information can be obtained from and the relation between them according to the area of knowledge they belong, adapting them to integrate interdisciplinary work team.

c) Giving the investigation staff the appropriate tools to be able to make a logical analysis of the facts and proofs with the aim of reaching demonstrable conclusions.

4.2.2 Requirements:

a) The course aims at expert pilots, aeronautical engineers and expert aircraft maintenance engineers that have completed the initial investigation course and the OJT as assistants in the technical investigation of occurrences in the civil aviation field, with the aim of being able to effectively relate with other disciplines applying the knowledge of their area of expertise in the investigation process.

b) However, other professionals with a degree (doctors, engineers, lawyers, etc.) that have planned to work in safety can consider their participation necessary to have general knowledge of the basic procedures in an aircraft accident/incident technical investigation with the aim of facilitating and guiding their participation.

4.2.3 Scope:

a) For the assistants in aircraft accident investigation in AIG organizations that have reached the minimum level of knowledge compatible with the requirements needed, once the OJT is completed, with the aim of obtaining and completing the specific knowledge to be able to conduct the tasks related to the participation as aircraft accident investigator in an investigation process.

Certification of course approved: Aircraft accident investigator.

4.2.4 Methodology:

a) The methodological concept of the course shall be the theoretical-practical integration and the use and knowledge of the documentation that has been introduced. The course shall be developed in classes with presentations with studies of cases, debates, role playing game, etc. Reflection and transference shall be promoted through team work. An interdisciplinary focus shall be applied in the course according to the proposed objective.

4.2.5 Assessment:

a) Throughout the course, teachers shall be committed to make a continuous assessment of the knowledge learned by the students, which can be occasional and/or systemic.

b) *Occasional* shall be the assessment made through the observation of all the actions the

students take; *systemic,* is the one that shall be complemented in the planning of the course with learning verification tests in the process, that shall be made through integrating workshops with trouble-shooting and a multiple-choice questionnaire or other types.

4.2.6 Subjects

4.2.7 The basic aircraft accident investigation course shall cover at least the following subjects:

Basic aircraft accident investigation course	
Subjects	
a) Responsibilities of the States involved	
b) Accident notification procedures	
c) Investigation management	
d) Investigators' equipment	
e) Accident site safety	
f) Protection of evidence	
g) Initial action at the accident site	
h) Information gathering techniques	
i) Communication and recording media	
j) Witness interviews	
k) Flight recorders (FDR, CVR) and ATC recordings	
l) Applied airworthiness	
m) Fires and explosions	
n) Survival aspects	
o) Structures	
p) Systems	
q) Aerodinamycs	
r) Power plants	
s) Rotary-wing aircraft	
t) Organizational and human factors (FHOs)	
Aeronautical medicine and pathology	
u) Methods of analysing the factual information gathered	
v) Report writing	
w) ECCAIRS/ADREP notification system	
x) The news media and public relations	

4.2.6.1 Detailed breakdown of the topics that must be covered

a) Responsibilities of the States involved: The first phase of a course should introduce the investigator to the history of aircraft accident investigation, the development of the international agreements on the conduct of investigations, and the Standards and Recommended Practices (SARPs) adopted by ICAO and its Contracting States in the field of aircraft accident investigation. The applicable international agreements and SARPs are contained in Annex 13 — Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation. Relevant guidance material is provided in the Manual of Aircraft Accident Investigation (Doc 6920) and Manual of Aircraft Accident and Incident Investigation (Doc 9756). A review of these documents and their salient points is required so that the investigator knows where to find the information on the relevant topics. General guidance should also be given on the investigation of accidents involving unlawful interference, both civil and military aircraft or facilities, and inaccessible aircraft.

b) Accident notification procedures: The investigator should be introduced to the accident

notification systems and the appropriate responses to be expected from the AIG Authority and organizations that are notified. This introduction should cover the ways on how the notification of the occurrence of an accident initiates the process of an investigation. It should also cover the support to be provided to the AIG Authority in the State of Occurrence by the State of Registry, the State of the Operator, the State of Design, the State of Manufacture, and any other States that are involved by virtue of the number of their nationals involved in the accident or are involved by providing a permanent base for the investigation due to their proximity to an accident site. Accident investigators should be made aware of the requirements of Annex 13 in relation to this phase of an investigation. Preparation for overseas travel in the form of passports and visas and airport airside passes provided by the international agreements inherent in Annex 9 — Facilitation.

c) Investigation management: The introduction should cover the role of the investigator, the skills he will need to acquire, and the accident investigation process. He should be made aware of the value of assessing the availability of resources (such as funding, personnel, equipment and buildings) as well as the planning for the investigation of a major accident beforehand. He should give guidelines for determining the appropriate size and scope of an investigation, the differences between the management of large and small investigations, and the type of circumstances in which assistance from specialists will contribute to the success of the investigation. An appreciation of the realities of the limits imposed by the resources available and the optimum use of those resources should be discussed. The value of memoranda of understanding with departments and organizations that might be involved in an investigation should also be addressed.

d) Investigators' equipment: The equipment to be used during investigations will be determined not only by availability and cost but also by the means available to transport it to the site. Information on the use of contemporary aids such as global positioning systems (GPS), satellite telephones, and data links back to base, as well as on the use of basic items such as compasses and inclinometers should be made available. Means of recording in extreme wet or cold conditions should not be overlooked. Instruction on the proper method of taking samples of aircraft fluids and the appropriate containers should also be included.

e) Accident site safety: The safety of personnel at an aircraft accident site is of paramount importance and must be understood by participants of an investigation. An investigator is a valuable resource and it is important that he is protected and well equipped to do his work in the field with as little risk as is practicable and with the optimum efficiency. Aircraft accidents frequently occur in adverse weather conditions in areas of inhospitable terrain such as mountainsides, swamps and deserts, or in adverse climatological conditions involving snow and ice or fierce heat. The need to take appropriate measures to protect those on the site against exposure to the elements, to any hazardous cargo or dangerous materials released from the aircraft, and against injury or infection must be understood. There are medical risks and hazards from the aircraft wreckage itself and they must be explained to the investigators. Another subject that must be covered is how to deal with psychological stress of investigators and other personnel with exposure at an accident site. Disease is an ever-present risk and inoculations against such risks as hepatitis, malaria and tetanus are essential. The use of protective equipment against airborne and blood borne pathogens should be demonstrated. Utilities such as gas mains, electricity transmission lines and main transport routes require special consideration. Finally, a plan for aid and rescue in the event of an accident involving personnel at the site is required by many occupational health and safety organizations and is also dictated by common sense.

f) Protection of evidence: To establish a suitable environment for a competent examination of the area and the accident debris, measures should be taken to protect the wreckage

from fires, meteorological hazards and souveniring. The need to give priority to recording transient evidence, securing light objects that may be lost in the wind, and recording ground scars and other site markings that may become obliterated should be addressed. The conduct of interviews with the rescue personnel should also be discussed in order to facilitate the determination of the movement of items of wreckage, which they may have caused inadvertently.

g) Initial action at the accident site: The investigator should be given a thorough understanding of the numerous considerations that should be taken into account at the accident site. With some exceptions such as accidents involving missing aircraft or resulting in wreckage that is inaccessible, the accident site is the primary area of investigation. The methods of apportioning time effectively, prioritizing the types of information to be gathered, plotting the position of surface marks, and identifying and plotting the position of items of wreckage, as well as the preparation for the removal of any exhibits to a secure site are important considerations that the investigator should become familiar with from the outset.

h) Information gathering techniques: The investigator under training should be introduced to the methods of gathering and reviewing relevant documentation and procedures; the interview techniques used for different types of witnesses; the transcription of air traffic services and other recordings; and the review of aerodrome facilities, emergency services responses and meteorological data.

i) Communication and recording media: The various media available for communicating to and from an accident site and for recording the evidence at the accident site and throughout the investigation are essential elements of an investigation course. Digital video cameras and digital cameras, standard film photography, laptops and hand-held computers with connections via satellite telephones to sources of information of immediate use at the accident site, and tape recorders are all useful for recording the available information as accurately and rapidly as is practicable. As each type of equipment is evolving rapidly, it is an essential subject in the training of an investigator.

j) Witness interviews: The range of witnesses varies with physical condition, nature of involvement, and differences in ethnic backgrounds. They will also vary in their value based on their understanding of the required information and their proximity to the scene. They may be a visual witness who saw an event or an aural witness who heard a sound or relevant conversation. The preparation for interviews, information to be gleaned from body language, the relative positioning of the interviewer and interviewee, preparation of the questions to be asked, the use of open questions, the art of listening and general conduct of the interview, the use of recorders such as video cameras and tape recorders, the value of written statements and signed transcripts must be considered. The precautions to be taken when interviewing the injured or persons in ill health, the young, the aged, and hostile witnesses as well as the use of experts in the field of inquiry should be discussed.

k) Flight recorders (FDR, CVR) and ATS recordings: In addition to the flight recorders, there are many other forms of recorders used in the aviation industry, from the security cameras on the aerodrome perimeter fence to the maintenance recorders in the aircraft, each with potential use to an investigator. The value of each form of recorder, the methods of interpreting and downloading the information, and the sources of readout must be in the course syllabus. Equally, the value of manufacturer's expertise in recovering information from damaged recorders (such as global positioning receivers, solid-state flight recorders and inertial navigation unit components) should be explored. Another aspect of importance is the means of locating the flight recorders and recovering them from locations that are difficult to reach. Recorders at air traffic services facilities, particularly those that record radar returns, should be the subject of a separate study and

guidance regarding their potential use to an investigation.

l) Applicable airworthiness: The maintenance history of the aircraft is established primarily from the records held by the operator. However, the investigator must learn to establish whether the maintenance, inspection procedures and servicing that are recorded as having been completed have in fact been carried out, and he must also learn to determine the adequacy of the specified maintenance procedures.

m) Fires and explosions: The evidence available to distinguish an in-flight fire or explosion from post-accident fires forms a valuable lesson that must be passed on to the new investigator. The means of determining the ignition source and the fuel supply of a fire are important. It is necessary to teach about the effectiveness of firefighting measures available on board the aircraft and the means for preventing post-accident fires during an investigation.

n) Survival aspects: The chances of occupants surviving an accident can be assessed and the means to do so should be given to the accident investigator. The investigator should know the formulae for impact force calculations and the various forms of attenuating impact forces. A discussion on the limits of human tolerance to heat and impact forces is worthwhile, as are the effects of toxic by-products of the accident environment. The efficiency of the rescue and firefighting services, standard pre-flight passenger briefing spiels, restraint systems, seat anchorages and aids to egress from the aircraft are items that should be studied under this heading. It is also very important to review the factors that affect the occupants' chances of surviving the accident. The means of determining the after effects of a fire on the occupants and the fire's impediment to passenger evacuation must be discussed, as must the availability of such items as smoke hoods and smoke goggles. An understanding of the methods used to protect the aircraft occupants from the impact forces and post-impact effects (such as thermal stress and water immersion) is very important for the accident investigator. He must be able to assess the effectiveness of the methods and make recommendations which will provide better protection for the occupants in the future.

o) Structures: As the basis for the examination of the wreckage, the study of structures is an area of prime interest to the investigator. The study of structures should comprise metallurgy, fibre reinforced plastics and timber structures, stress analysis and the strength of these materials. It should also include the various modes of failure and the characteristics of such failures in the materials used in aircraft structures. The methods of failure analysis, reconstruction of areas of interest in the airframe, and the evidence of the various modes of failure are important considerations. The various types of flight controls and landing gear structures should also be studied under this heading. This section of the syllabus should cover the advanced equipment used in the study of failure mechanisms, the preparation of samples for examination by such equipment, and the methods for comparative testing of similar materials. The study of structures also provides a platform for introducing the means of wreckage trajectory analysis. Every effort should be made to provide examples of the various failure modes in materials used in aircraft construction.

p) Systems: Aircraft systems vary from mechanical controls that are still found in general aviation aircraft to the fly-by-wire systems already extant in wide-bodied transport aircraft. There are a wide variety of systems that the investigator should become familiar with in general terms. However, the focus should be on the resources available to assist the investigator in the event of an accident involving a complex system and on common causes of system failure that might be experienced. A lead to system health can often be found in past maintenance records or on-board recorders. It is necessary to discuss, in general terms, fuel, hydraulic, pneumatic, electrical, pressurization, flight control, instruments, navigation, autopilot and instrument systems. Other topics that should be

considered include software failures in airborne computers and the adequacy of the protection against catastrophic events ensuing from such failures.

q) Aerodynamics: The common areas of aerodynamics that frequently assume importance in an investigation are those related to performance and in-flight structural failure caused by overload or flutter. A review of basic aerodynamics and the means of detecting failure from aerodynamic factors should be included in the investigator's basic training. The topics of engine failure recognition speed, V1 and V2, climb gradient, over-speed, engine-out performance, icing and stability also deserve special attention.

r) Power plants: The detailed analysis of power plants is normally the subject of a separate course and is usually carried out in conjunction with the engine manufacturer's representatives. Nevertheless, the explanation of the basic principles of reciprocating and turbine engines has a place in basic and advanced investigation courses. The same is true with regards to the analysis of damage to propellers and helicopter rotors, and a general overview of methods of evaluating damage to determine if further investigation of the particular propeller or engine is warranted. For example, propellers and turbines can give a worthwhile indication of an absence of engine power at the time of impact. This is another subject in which examples of failures and accident damage form an essential part of the course.

s) Rotary wing aircraft: A general introduction to the principles of flight for helicopters and their control systems is relevant. However the subject of investigating helicopter and other rotary wing aircraft accidents is usually the subject of a separate specialty course.

t) Organizational and human factors:

Organizational and management information is a section of the final report format and it concerns the organizations and the management involved in influencing the operation of the aircraft. The organizations include, for example, the operator; the air traffic services, airway, aerodrome and weather service agencies; and the regulatory authority. Conducting a review of the organizational structure and functions as well as the management policies and practices of the agencies, authorities and aircraft operator involved is a subject that should be covered. For example, an investigator should have the competence to review an aircraft operator's management functions, policies and practices in their entirety. There are many aspects of the supervisory process which may have a direct bearing on the accident, such as acceptance of inadequate flight crew qualifications; deficient guidance material; maintenance shortcuts; improper crew rostering; failure to provide proper training in aircraft type; shortcomings in crew resource management; and unreasonable pressure to complete schedules on time. The methods of investigating management and organizational aspects of an organization to determine the presence of any risk factors or other shortcomings is a requirement of a well-rounded accident investigation course. An examination of the means of supervision is very important and will include a review of orders, regulations, manuals and independent audits as well as the performance of supervisors, instructors and company management.

(i) No accident investigation can be complete without a thorough consideration of Human Factors issues involved. The demands of the environment and the aircraft on the human often approach the physiological and psychological limits of the flight crew, maintenance and servicing crews, air traffic services personnel and other personnel required to support aircraft operations. The study of human limitations, communications, fatigue, decision-making processes, flight crew health and the information available from post-mortem examinations are vital components of this section of an investigation course. An examination of the handling of the aircraft will encompass the areas of operations and training.

(ii) The area of operations includes the man-machine relationship and the actions or lack of actions in the events leading to the accident. The investigation in this area covers specifically how the flight crew members reacted, analysed and attempted to cope with the complexities of the flight.

(iii) The area of training will cover the extent and adequacy of the training relevant to the accident flight. The Manual of Civil Aviation Medicine (Doc 8984), the Human Factors Training Manual (Doc 9683), the Human Factors Guidelines for Air Traffic Management (ATM) Systems (Doc 9758) and the Human Factors Guidelines for Safety Audits Manual (Doc 9806) are references which can be used in this section of the training.

(iv) Determination of the flight crew's suitability for the flight. The flight crew members are required to meet certain licensing, training and experience requirements before conducting any flight. In addition, they must be fit for their duty and the complement of the crew must be appropriate. Familiarity with the flight crew documentation and requirements is essential. Fitness of the flight crew for the flight can be considered as part of several Human Factor considerations and should be explained in detail.

u) Methods of analysing for the factual information gathered.
There are several structured procedures for analysing the evidence and facts determined during the investigation. Knowledge of these procedures will enable the investigator to establish whether further investigation is required in order to complete the investigation or to test any hypotheses that the investigation team is considering.

v) Report writing.
Report writing is an integral responsibility of an accident investigator. ICAO has developed a format for writing reports that leads logically from the history of the flight to the safety recommendations. There is a minimum of duplication and a full consideration of aspects of the flight that are relevant to the improvement of safety. Knowledge of this format and process gives the investigator a sound basis for drafting the final report, including the formulation of appropriate safety recommendations.

w) ECCAIRS/ADREP notification system
Introduction to the ECCAIRS reporting system under the ADREP taxonomy, so that each investigator will use this tool to upload the details of the investigation being conducted in the ECCAIRS system, using the ADREP taxonomy.

x) The news media and public relations.
Almost any aircraft accident is of interest to the news media and will to some extent involve the investigator-in-charge in public relations activities. There are two aspects to this subject: the information made available to the public, and the more specialized approach to the survivors and the families of those involved in an accident. The importance of keeping others informed on the progress of an investigation, while not speculating as to causes and protecting the privacy of those who assist with sensitive information, must be explained to investigators. The Guidance on Assistance to Aircraft Accident Victims and their Families (Cir 285) is a sound basis for addressing this subject.

4.3 ADVANCED COURSES

4.3.1 Recommended topics

Most topics covered in the basic course will also apply to advanced courses, but the instructors are expected to vary their treatment of these topics to suit the purpose of the course and the experience level of the students. In addition to the review of the topics in the basic course, an advanced course should cover the topics deeply and expand on them. In general, an advanced course is desirable for preparing an investigator for the responsibilities of group leader or investigator-in-charge of a major investigation. Such a course should aim to give the investigator an understanding of and some competence in the organization of a major accident investigation.

4.3.2 In addition to the review of the organization of a major investigation, topics that should be discussed include:

a) the provision of family assistance to those involved in an accident;

b) relations with the media;

c) an introduction to methods for cataloguing a large number of fragments of wreckage;

d) management of a large accident site for security, safety and protection of the personnel;

e) preparation of briefings and answers to formal questions for members of government;

f) the methods of undertaking investigations that involve both civil and military aircraft, and

g) liaison with the law enforcement authorities in accidents involving unlawful interference.

4.3.3 Other specific subjects which should be included in advanced courses include:

a) techniques used to investigate accident damaged systems that involve specialized technologies such as glass cockpit, fly-by-wire systems, GPS, and enhanced ground proximity warning systems (EGPWS);

b) reconstruction of evidence recorded in damaged solid state recorders;

c) the use of virtual video presentations in large structural reconstructions of wreckage,

d) the use of computer simulations and programmes for flight simulators to recreate aspects of the aircraft's flight path which are of interest to the investigation.

4.4 SPECIALITY COURSES

4.4.1 Specialty courses may be introduced to an investigator at any stage after a basic course. The courses would augment the skills and knowledge acquired by the inspector in order to meet the needs of a particular area of accident investigation that is relevant to his assigned duties.

4.4.2 For topics such as helicopter accident investigation, gas turbine engine accident investigation, accident survival aspects, fires and explosions, Human Factor investigation, family assistance and media relations, they are generally extensive enough to warrant a short course of their own with a specialized syllabus.

4.4.3 Description of the systems involving specialized technologies (such as glass cockpit, fly-by-wire systems, GPS, electronic flight instrument system (EFIS) and EGPWS) is usually provided

during aircraft type courses. However, aircraft type courses do not include the investigation aspects nor the investigation techniques of such complex systems. Extensive information can be obtained from memory chips and other solid state electronic circuits used in new technology systems. Increasingly, the investigation techniques for solid state electronic circuits are covered in accident investigation courses. Nevertheless, aircraft accident investigation authorities should contact the manufacturers of such systems for specialty courses, since most manufacturers have accident investigators and support personnel that are familiar with the systems and the investigation techniques required to extract the information stored in the systems.

4.4.4 Learning the use of ECCAIRS / ADREP system tool is important to the investigator, as this is an essential tool for reporting events and feed the AIG organization database, the integration with other databases and ARCM the database.

4.5 PERIODIC ACCIDENT INVESTIGATION COURSE

4.5.1 Goals:

a) Emphasize the methodology and procedures for the technical investigation of occurrences related to AIG regulation States, in accordance with the provisions of ICAO Annex 13 and the new procedures or guidelines issued by the organization.

b) Enhance and update the various sources from which information can be obtained and the interrelationship between them according to the area of knowledge that is engaged in investigation, adapting to integrate interdisciplinary teams.

c) Enhance and update the team of investigators on the proper investigation tools so they can make a logical analysis of the facts and evidence in order that they arrive at verifiable conclusions.

4.5.2 Requirements:

a) The course is aimed at staff of investigators who have completed the initial and basic training as investigators of accidents and incidents and who are working in jobs as investigators at AIG organization.

4.5.3 Scope:

a) Review and update the concepts and knowledge acquired during the training, initial and basic, accident investigator.

Certification of course approved: periodic accident investigation course

4.5.4 Methodology:

a) The course of the methodological approach will be theoretical and practical integration and the use and knowledge of existing documentation, with updates that were made. The same applies to the classes that combine exhibitions, case studies, debates, etc. Promote reflection and the transfer of knowledge through group work. An interdisciplinary approach will be applied throughout the course due to the proposed objective.

4.5.5 Assessment:

a) The evaluation of the course is directed in the sense that each investigator applies their knowledge in an accident investigation that is performing.

b) They will be evaluated in written form and the methodology of multiple choice matters relating to

AIG documents that have been updated as well as the procedures relating to the functioning of the state organism forming modified.

4.5.5 Subjects

4.5.5.1 The periodic accident investigation course should cover in combination some of the following topics. The subjects that were treated in a periodic course should not be treated again in another periodic course. The themes of the courses should be rotated so that all are covered regularly.

The periodic accident investigation course	
Subject	
Emphasize and/or to update	
a) Responsibilities of States involved	
b) Notification procedures	
c) Management of investigations	
d) Team of investigator	
e) Security at the site of the accident	
f) Protection of evidence	
g) Initial steps in the crash	
h) Information gathering techniques	
i) Communication and recording media	
j) Witness interviews	
k) Flight recorders (FDR, CVR) and ATS recordings	
l) Airworthiness applied	
m) Fires and explosions	
n) Survival	
o) Structures	
p) Systems	
q) Aerodynamics	
r) Power plants	
s) Wing aircraft rotatory	
t) Human and organizational factors (HOFs)	
u) Aviation Medicine and Pathology	
v) Methods of analysis of the information collected on the facts	
w) Writing reports	
x) Media and public relations	

4.5.5.2 Detailed breakdown of topics should refer to Point 4.2.6.2 and should take into account the topics in the subjects to be taught can be partial according to the diagnosis made by the organization and must be strengthened and / or updated.

Attachment A

TRAINING CENTRES IN THE SAM REGION RELATED TO AIR ACCIDENTS INVESTIGATION

1. Worldwide there are state and private organizations that offer multiple alternatives for accidents investigation training. They provide not only basic training, but also they currently have academic programmes created to specialize the different aviation fields regarding investigation.

2. Argentina: Civil Aviation Accident Investigation Board (JIAAC):

- ✓ Initial course: Aviation accidents investigation
- ✓ Basic course: Aviation accidents investigation
- ✓ Special course: Helicopter accidents investigation

3. Brazil: Aeronautical Accidents Investigation and Prevention Centre (CENIPA). CENIPA available courses are described in attachment B.

4. Colombia: The Aeronautical Studies Centre (CEA):

- ✓ Basic course: Aviation accidents investigation

5. The use of these training centres in an atmosphere of cooperation among the ARCM member States of the SAM Region might facilitate the exchange of knowledge, experiences and different qualified trainers in the area, with the view to improve the level of initial investigators training and regular training for more experienced investigators.

Attachment B

TRAINING OF ARCM AIG PERSONNEL

1. Worldwide there are state and private organizations that offer multiple alternatives for accidents investigation training. They provide not only basic training, but also they currently have academic programmes created to specialize the different aviation fields regarding investigation.

2. All the training centres aligned with the provisions established in ICAO Circular No 298 AN/172, in relation to the aviation accidents investigators instruction guidelines, could offer an adequate training to the investigator from the ARCM member States.

3. In South America, the ARCM member States could, with training purposes, have training centres from the following AIG Authorities from the Region: the Civil Aviation Accident Investigation Board (JIAAC) of Argentina; Aeronautical Accidents Investigation and Prevention Centre (CENIPA) from Brazil; and Aeronautical Studies Centre (CEA) from Colombia, which, through the AIG regional cooperation mechanism (ARCM), will be able to offer training courses harmonized in line with this programme and according to SAM State's needs.

4. CENIPA has the following curses:

Basic Aeronautical Accidents Prevention Course (CBPAA).

The course is oriented to the training of professionals to act as assistants in the aeronautical accidents prevention. CBPAA is conducted in the distance learning modality, and it is compulsory in order to sign in for some of the other AIG courses in CENIPA.

Aeronautical Accidents Investigation Course (CIAA).

The course is oriented to the training of professionals to act in the activities of aeronautical occurrences investigation.

Aeronautical Accidents Prevention Course – Human Factors (CPAA-FH).

The course is oriented to the training of professionals to act in the activities of prevention and investigation of aeronautical occurrences related to the medical aspect of the human factor or psychological aspect of the human factor in the AIG topic.

Aeronautical Accidents Prevention Course – Material Factors (CPAA-FM).

The course is oriented to the training of professionals to act in the activities of prevention and investigation of aeronautical occurrences related to the material factor that follow: investigation of issues related to the aircraft project, material handling and manufacture, backing for holding the components tests and trials, in the testing workshop or laboratory, with the objective of investigating the origin of the problem; the conduction of investigations of similar occurrences with the manufacturer and the certification authorities; evaluation of the certification process, manufacture and operation of the aircraft or the components involved.

Aeronautical Accidents Prevention Course – Aircraft Maintenance (CPAA-MA).

The course is oriented to the training of professionals to act in the activities of prevention and investigation of aeronautical occurrences related to aircraft maintenance in the IAG headings detailed as follows: conduction of detailed examinations of all systems and components, among others, the

hydraulic, electrics and electronic pneumatics systems, radio communication and navigation equipment, air conditioning and pressurisation, ice and rain protection, fire extinguishers and oxygen in the cockpit, the examinations shall cover the determination of the components condition and operational capacity; and record keeping verification to determine the aircraft maintenance history with respect to the inspection adequacy, malfunctioning that might be related to the occurrence, flying time of the aircraft, engines and components and the flying time from the equipment's checking or refurbishing.

Aeronautical Accidents Prevention Course – Airspace Control.

The course is oriented to the training of professionals to act in the prevention of occurrences related to air traffic control.

Aeronautical Accidents Prevention Course – Airport Activities.

The course is oriented to the training of professionals to act in the prevention of occurrences related to airport activities.

Advanced Aeronautical Accidents Prevention Course (CAIAA).

The course is oriented to the training of investigators to act in the investigation activities of a major accident of great complexity and/or with other States participation.

Aeronautical Accidents Prevention Course – Spanish Language (CPAA-LE).

The course is oriented to the training of foreigner, spanish-speaking, professionals in knowledge necessary for them to act in the prevention of aeronautical occurrences.

Aeronautical Accidents Prevention Course – Aero Agricultural (CPAA-AG).

The course is oriented to the training of professionals to act in the prevention of occurrences related to aero agricultural activities.

Safety Management Course – SGSO

The course is oriented to the training of professionals to act in the activities related to the management functional responsibilities in relation to safety with respect to process compliance to identify the real or potential dangers to safety and to evaluate the risks, the processes to define and apply the mitigation methods required to keep an acceptable safety level, and provisions to continually observe and regularly evaluate the adequacy and effectiveness of safety management activities.

Flight Recorders Basic Course – CBGRAV.

The course is oriented to the training of aeronautical accidents investigators in flight recorders, covering topics related to operability, investigation practical proceedings and requirements, with the aim of enabling the collection and analysis of recorded data.

Aeronautical Accidents Prevention Course – CPAA.

The course is oriented to the training of professionals to act in aeronautical accidents and incidents prevention.

The investigator's training in CENIPA, in order for it to act in the investigation, shall be conducted through the OJT and a specific programme provided by the training centre, divided in a specialized and an advanced stage.

Attachment C

Individual Development Plan Form

AIG Authority (ARCM) – Aircraft accident investigator

Name of the investigator			
Post (OPS/AIR/ATC/etc.):			
Degree or position:			
Name of supervisor:			
Knowledge, expertise and experience	Name of course	Course or training date	Observations
Initial response procedures			
On-Call procedures			
Notification of other national authorities and organizations			
Securing of records and recordings.			
Accident site jurisdiction and security			
Investigator safety – equipment and guidelines on biological hazards			
Investigator safety – including familiarization with psychological stress			
Coordination for recovery of human remains			
Requests for autopsies			
Family assistance			
Investigation procedures			

Authority and responsibility			
Size and scope of the investigation			
Investigation management (group leader and IIC) in the scene			
Use of specialists			
Parties to the investigation, accredited representatives, advisers and observers			
Release of information to the news media			
Specialists procedures (operations, airworthiness, human factors, etc.)			
Reporting			
Internal and external correspondence			
Field notes and factual report specialist			
Report and analysis specialist			
Safety recommendations			
Final reports			
Attendance at seminars and meetings			
International Society of Air Safety Investigators (ISASI)			
Flight Safety Foundation (FSF)			
Seminars related to technical specialists			

ICAO work groups			
Regional work groups			
Others			
Specialty basic or advanced courses attendance and certificates – After recruitment			
Name of course or institution	Dates	Observations (Certificates, etc.)	
Periodic training			
Name of course or institution	Dates	Observations (Certificates, etc.)	

Practical training at the workstation (OJT) (two cases minimum)			
Accidents identification	Dates	Observations	
OJT – domestic accident			
OJT – domestic accident			
Participation as an observer (OJT) at investigations conducted by other States			
Accidents identification	Dates	Observations	

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1. Annex 13, OACI – Aircraft Accident and Incident Investigation
2. Doc 9756, OACI – Manual of Aircraft Accident and Incident Investigation
3. Doc 9683, OACI – Human Factors Training Manual (Doc 9683)
4. Cir 298, OACI - Training Guidelines for Aircraft Accident Investigators
5. States Regulations

Agenda Item 6: Review of procedures for the implementation of the ARCM safety data collection and processing system (SDCPS)

6.1 Under this Agenda item, the Third Meeting of AIG Authorities (AIG-SAM/3) was presented with the procedures for the implementation of the safety data collection and processing system (SDCPS) within the framework of the AIG Regional Cooperation Mechanism (ARCM).

In this regard, the Meeting took note that *Paragraph 8.1 of Annex* 13 – *Aircraft accident and incident investigation* prescribes the following:

> *A State shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine the preventive measures needed*.

In this regard, the SDCPS is an integration of databases of ARCM member States.

6.2 Since 2008, the SAM Region has been implementing the European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) in order to meet the accident and incident reporting requirements of Annex 13 and the relevant protocol questions (PQs), which are the subject of the following USOAP CMA activities: CMA audits, ICAO coordinated validation missions (ICVM), and off-site validation activities.

6.3 Accordingly, the ECCAIRS software was adopted as the platform for the SDCPS, which is the aircraft accident and incident database of the SAM Region.

6.4 The Meeting took note that 76.92% of SAM States had already implemented the ADREP/ECCAIRS reporting system, which would facilitate the implementation of the ARCM SDCPS.

6.5 The Meeting noted that in order to optimise the potential benefits of a centralised database, the States had to take care of some basic operational aspects, such as the security and integrity of reporting procedures, and data management and analysis for the establishment of effective indicators by the ARCM, in order to have a clear understanding of hazards and their associated consequences.

6.6 In order for the SDCPS to be implemented by ARCM member States, the corresponding procedures were developed for the storage, aggregation, and maintenance of concise and updated information. These procedures will be structured to allow for:

a) notification to define what and how will the States report to the ARCM;

b) standard recording of notifications;

c) collection and capture;

d) data processing;

e) safety performance indicators;

f) preventive measures to mitigate safety risks;

g) risk-based safety oversight;

h) information protection;

i) exchange of information; and

j) delivery of accessible safety information, such as annual ARCM safety reports, to ARCM States and their users.

6.7 The Meeting agreed that SDCPS data would only be used by the ARCM to generate reports on a periodical basis and upon request, on items that might affect the safety of aircraft operations, and also to generate and feed indicators, obtaining useful information for making safety decisions at regional level.

6.8 The Meeting also considered that data should be stored in a server that meets security specifications and only accessed by qualified and authorised individuals. Data handling and distribution without the consent of the State owning the data is forbidden.

6.9 The Meeting also noted that the implementation of SDCPS in the ARCM does not replace the obligation to notify ICAO under Annex 13.

6.10 The Meeting agreed that, in order to conduct comprehensive analyses of accident and incident data at regional level, the ARCM SDCPS had to be established as a solution for decision-making and as a tool for States to formulate timely and effective safety recommendations, both at national and regional level.

6.11 In this regard, the Meeting agreed to collect the following types of safety data in the SDCPS, *inter alia*, to be used for analysing the safety data handled by the ARCM:

a) accident investigation data;

b) serious incident investigation data; and

c) data on the investigation of incidents in which the AIG organisation.

6.12 Finally, the Meeting agreed to collect safety data on the following operations provided by each of the ARCM States:

a) scheduled commercial air transport;

b) non-scheduled commercial air transport;

c) general aviation;

d) business aviation;

e) aerial work; and

f) unmanned aviation (remotely piloted aircraft systems – RPAS).

6.13 Upon analysing the proposed procedures for the implementation of SDCPS within the framework of the ARCM, the Meeting formulated the following conclusion:

CONCLUSION AIG-SAM/3-05 Approval of the implementation of the safety data collection and processing system (SDCPS) of the ARCM

a) approve the implementation of the ARCM safety data collection and processing system (SDCPS);

b) approve the implementation of the ECCAIRS system and the ADREP taxonomy as the platform for the ARCM SDCPS and the databases of each ARCM member State;

c) approve the First edition of the procedural handbook for the implementation of the ARCM SDCPS;

d) approve the collection of data on:

- ✓ accident investigations;
- ✓ serious incident investigations; and
- ✓ investigations of incidents in which the AIG organisation intervenes.

e) approve the collection of safety data on the following operations provided by each of the ARCM States:

- ✓ scheduled commercial air transport;
- ✓ non-scheduled commercial air transport;
- ✓ general aviation;
- ✓ business aviation;
- ✓ aerial work; and
- ✓ unmanned aviation (remotely piloted aircraft systems – RPAS).

f) request the ICAO South American Regional office to host the ARCM AIG database.

South American AIG Regional Cooperation Mechanism (ARCM)

Procedures manual for the implementation of the South American ARCM safety data collection and processing system (SDCPS)

First edition
March 2016

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Definitions

Term	Definition
Attribute	The attributes are the characteristics through which an entity can be described. In the case of ADREP/ECCAIRS, the attributes are the fields for data entry. Their entry can be mandatory, optional, with pull-down list, or text entry, etc.
Database	A database is the set of informative data organized in a same context for use and relation.
Query	A query is the method to access data in the databases. With the queries, data in a database can be modified, deleted, shown and added. For this a query language is used.
Data manager	Module of the system that allows to import/export information in different formats (*mdb, xls, txt*) with specific parameters.
Data exchange	Module of the system management used to exchange information between repositories, make backups, as well as change between taxonomies versions.
E5f (*Eccairs 5 file*)	Format used by ADREP/ECCAIRS in order to store up to 1000 encrypted records for exchange.
Id	Unique identification code; each attribute of the system has a numeric "id" for indexation in the database.
Interface	It is the means through which the user can communicate with a system or device, and comprises all the points of contact between the user and the equipment. Easy to understand and easy to activate, "friendly and intuitive".
Record	(*line or tuple*) It represents a unique object with implicitly organized data in a table. In ADREP/ECCAIRS it is a specific occurrence.
Repository	ADREP/ECCAIRS module for the general management of the system, such as security policies, connection to the database, roles, users, etc.
Software	Set of programmes and routines that allow the computer to fulfil specific tasks.
Taxonomy	Science that studies the principles, methods and purposes of the classification.

Abbreviations

Abbreviation	Meaning
ADREP	Accident/Incident data reporting system
AIG	Accident and incident investigation

ARCM	South American AIG Regional Cooperation Mechanism
TC	ARCM Technical Committee
DBA	Database administrator
ECCAIRS	European Co-ordination Centre for Accident and Incident Reporting Systems
IT	Information technology
JRC	Joint Research Centre
RAIO	Regional accident and incident investigation organizations
RE	Runway excursion
SAM	South American Region
SDCPS	Safety data collection and processing systems
SPI	Safety performance indicators
SPIES	Safety performance indicators for ECCAIRS system, ECCAIRS tool for the SPI management
SQL	Structure query language
SSP	State safety programme

Procedures manual for the implementation of the safety data collection and processing system (SDCPS)

Chapter 1 - General

1.1 Foreword

The importance of the aircraft accident and incident investigations lies in determining the causes to issue effective recommendations and the necessary measures to avoid recurrence. Regarding the South American Region (SAM), it is necessary that the AIG Regional Cooperation Mechanism (ARCM) has a tool that allows it to achieve the proposed objectives and to contribute to safety.

Considering that ICAO adopted since 2004 the ADREP/ECCAIRS (*European Co-ordination centre for Accident and Incident Reporting Systems*) system developed by the JRC (*Joint Research Centre*) of the European Commission (EC), based on the ADREP taxonomy from the International Civil Aviation Organization (OACI), the SDCPS will use the ADREP/ECCAIRS system as a technological platform for the AIG data notification, registry and exchange. Therefore, all the SAM Region will be able to store and notify events using the same language and criteria.

1.2 About ADREP/ECCAIRS

Since 1998 the JRC, at the request of the EC, developed a set of computing solutions for transport safety information exchange and analysis. This pack of tools was successfully implemented in the European Union; it has a license of use for AIG organizations and safety-related agencies. This allows that AIG investigation organizations, aviation authorities, operators, air traffic service providers use ADREP/ECCAIRS individually and collectively to notify and share information.

The JRC website (http://eccairsportal.jrc.ec.europa.eu) is available to users to download software and share opinions, experiences, analysis and results in favor of constant development.

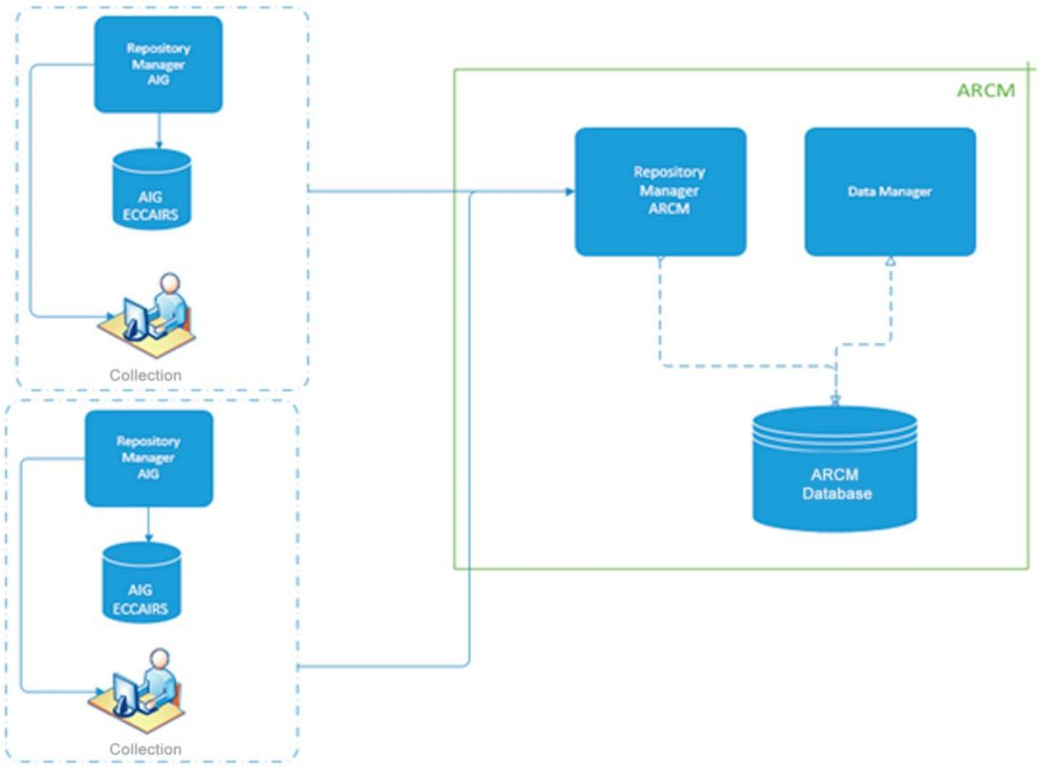
The ADREP/ECCAIRS system provides a great variety of technologies for the exchange, export and import for safety data analysis; it is the ideal tool for the SDCPS implementation.

1.3 ARCM Database (SDCPS)

The ARCM database based on ADREP/ECCAIRS (SDCPS) could be physically located in the technological infrastructure of the ICAO South American Regional Office (or where the Executive Committee determines). The client/server mode will give access to the ARCM TC (Technical Committee) members and to the users assigned by the States according to their information management policies.

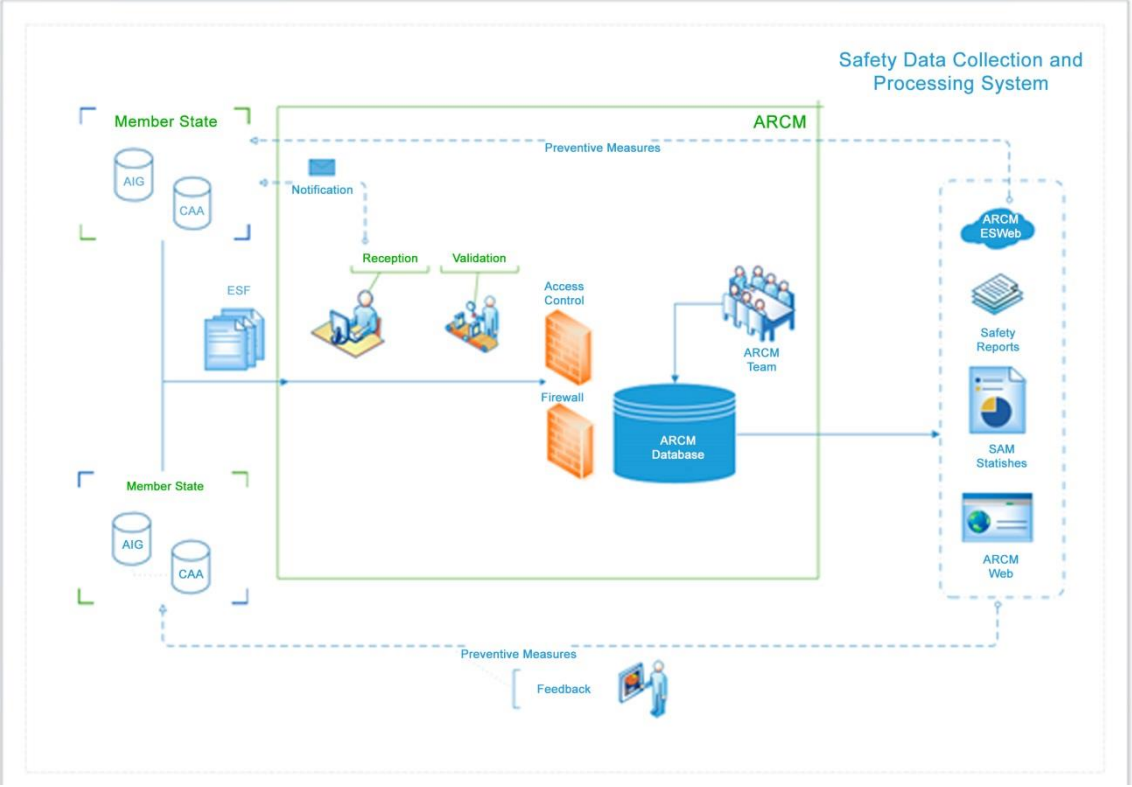
For the SDCPS implementation, the implementation of the ADREP/ECCAIRS system is necessary in each State (*); this will ensure the standardization of the SDCPS data, allowing to adopt the corresponding procedures, for example, notification, validation, publication, etc. The ARCM TC will evaluate the ADREP/ECCAIRS versions and revisions and new tools and will technically advise the States in order to keep the standard.

Figure 1 – SDCPS general diagram



* 3.1 Implementation procedure

Figure 2 – Detailed diagram



1.4 Scope of the SDCPS

The data specification that will be collected by the system is considered the scope of the SDCPS.

In accordance with Chapter 5 of the Manual on Regional Accident and Incident Investigation Organizations (RAIO)" (*ICAO Doc. 9946*), which establishes the development of a regional information exchange system as its main objective in order to improve the access to safety information. Therefore, it is established that the information to be stored in the SDCPS will be the reactive type of occurrences (accidents/serious incidents/incidents) that correspond to AIG organizations.

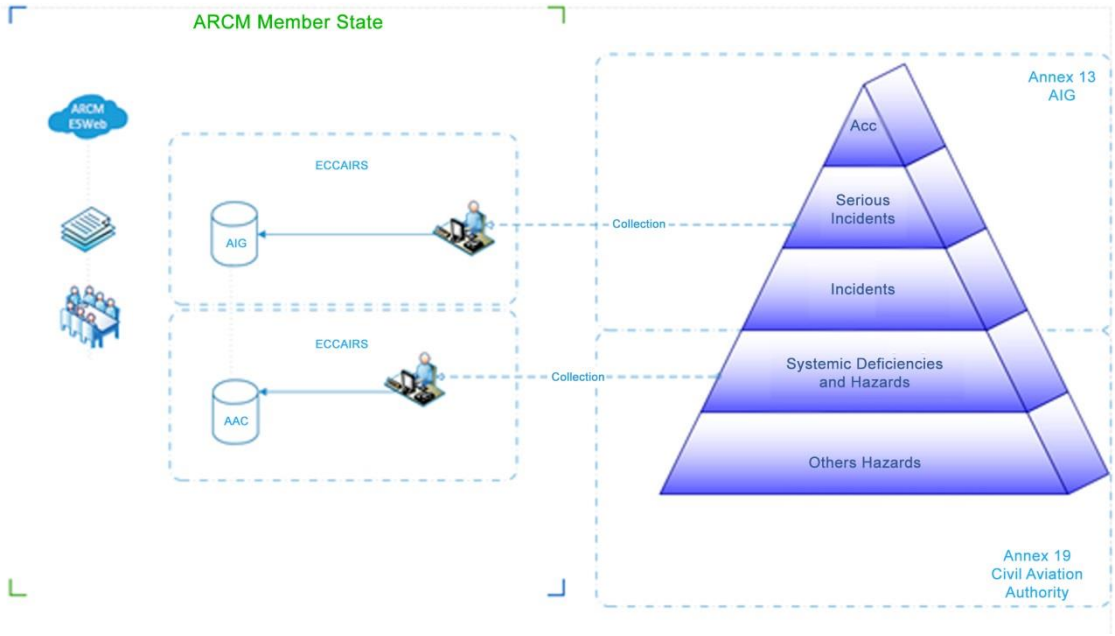
"The SDCPS is a database with data coming from other databases"

If we analyze the previous concept, it is clear that for the success of the SDCPS at regional level, success at local level is required. Therefore, the ARCM will provide technical/operational assistance for the correct implementation of ADREP/ECCAIRS as primary accident/incident database to the States that request according to their organizational policies and standards.

In turn, each State will assign the one/s responsible for notifying the events through notification dynamic procedures (*).

The ARCM will, through the TC, assign the ones responsible for the notified events validation (**).

Fig. 3 – Occurrences and competencies



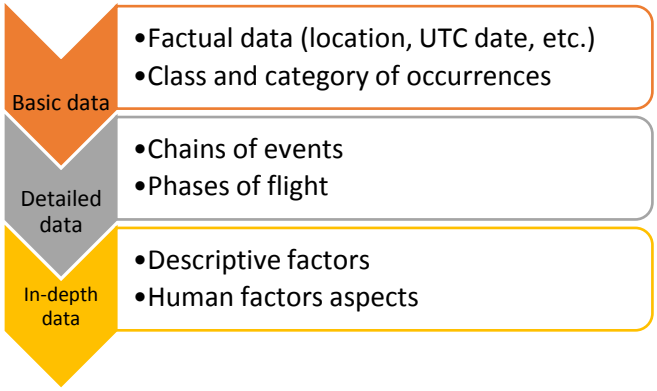
1.5 Levels of information

Technical investigations of occurrences have different levels of information according to their state and depth. The system allows to show those states through levels of information expressed in “views”, allowing the display of information with different levels of depth according to the indicators managed in terms of safety. Initially, the compulsory data required is the file number and the reporting organization. However, for a notification to the ARCM it is recommended that the highest amount of available data is stored; likewise, the ADREP/ECCAIRS system allows the storage of over 800 attributes according to the criteria and scopes of the investigations.

** 3.1 Events notification procedures*

*** 3.2 Events validation procedures*

Figure 4 – Levels of information



These levels of information allow to manage, through the SDCPS, the general and in-depth data, allowing the identification of potential factors and specific elements that can be subject of occurrence dynamics analyses at a regional level. This represents an opportunity to document real or potential deficiencies of the system, which must go through a useful analysis for decision making.

Chapter 2 – System management

2.1 Repository

The central management of the SDCPS is conducted through a "repository manager", which is a general management module that works as the interface between the user and the database. Its function is to manage occurrence through security means, presentation standards and data access configuration. The ADREP/ECCAIRS manager uses the repository to make all the specific adjustments of the users, to configue access methods, databases and application properties.

The management task is a very important task since it will depend on the integrity of the stored data.

"One State, two repositories"

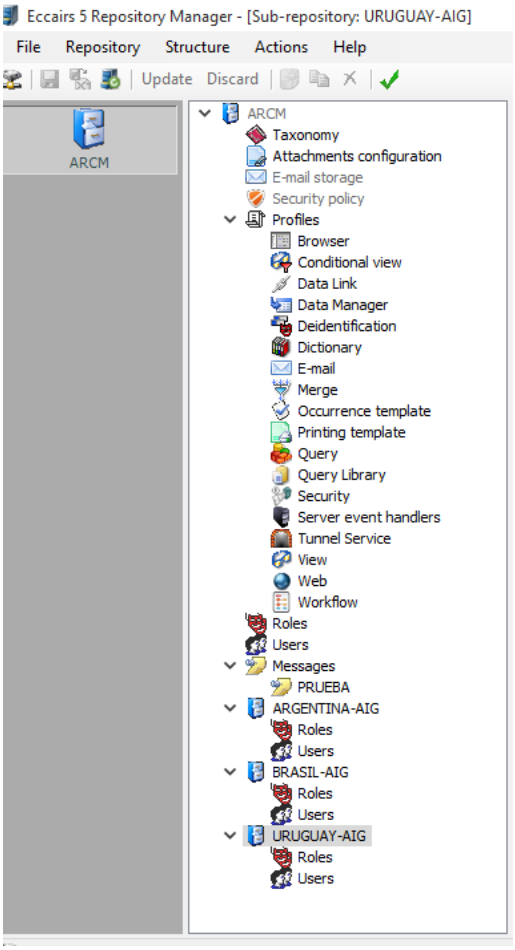
Each State with its local ADREP/ECCAIRS system has its own repository and, as part of the ARCM it has a repository in the SDCPS, that includes all the configuration of the main repository (ARCM), but with specific users and roles. Each State will store the occurrences that they notify in this repository, having the control of the notifications

as to when and who notified. This information collection mechanism is dynamic and simple, and it has the additional function of supporting the State AIG information.

Note:

- A State cannot have access to other State´s repository.
- The States cannot manage the SDCPS repositories; however, they can request modifications.
- The repositories have a backup service, essential condition upon the occurrence of any contingency.

Figure 5 – SDCPS repository



2.2 Protection of information

The SDCPS provides tools that ensure the protection of information, connections are private, and data sent by email are encrypted through compression algorithms in E5F files, a specific file type that stores up to 1000 records of occurrences and is only compatible with ADREP/ECCAIRS.

The ADREP/ECCAIRS system needs a license of use "k*ey*", therefore its use is limited to safety agents.

The SDCPS has 3 levels of protection of information:

- Database level
- Repository level
- User level

At database level, only the owner has access to the stored data; this avoids unauthorized access or conflicts with other databases, systems, etc.

At repository level, the security of information is clear and precise. The users and roles are managed through rules and profiles. The SDCPS repository managements is protected with password.

At user level, the system requires identification information and users have specific functions with appropriate permissions. Besides, the system records all the users´ activities.

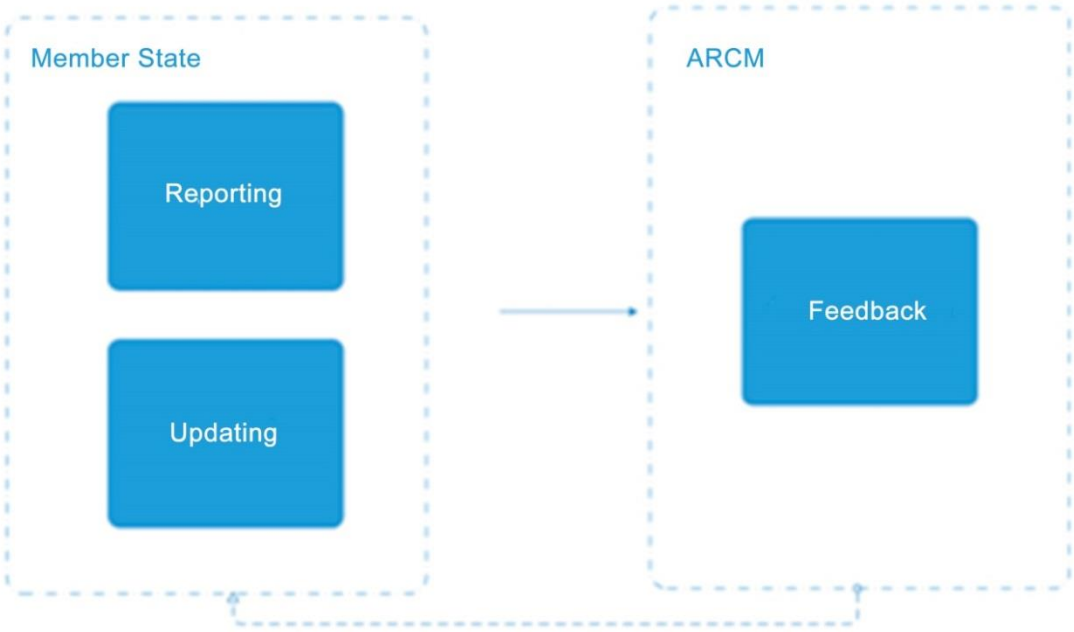
2.3 Interaction between the States and the ARCM

As mentioned above, each AIG organization must have its ADREP/ECCAIRS system implemented, for internal use and to report occurrences to the ARCM and to ICAO in compliance with Annex 13 to the Convention on International Civil Aviation. Unlike notifications to ICAO (sent as attachments via email), the States can connect to ARCM with access to queries libraries, graphics predefined by the ARCM, facilitating the familiarization with the system, especially when we refer to safety information exchange, with sensitive and developing data. .

It is essential to have into account that the most important thing in the interaction among the AIG States is feedback on safety reports, risk analysis, etc., by the ARCM to the SAM States.

The interactions can be defined in three levels:

Figure 6 – Interaction diagram



Level 1 – Initial notification

Notification of every occurrence (accidents, incidents and serious incidents) investigated by the State AIG organization.

Such notification has to be given as quickly as possible with the factual data of the occurrence.

Level 2 – Updating

In the course of the investigation, analysis and conclusions, the record has to be updated filling in all the information available in order to determine the high and low impact indicators. This information is validated by the ARCM TC.

Level 3 – Feedback

The ARCM TC will, through the experts panel, provide the member States with periodic reports and safety recommendations that allow the analysis of the safety information

in a regional context.

2.4 Safety performance indicators:

SPI (*Safety performance indicators*)

"Data-based safety parameter used to observe and evaluate the safety performance"

The SPIs development is an essential aspect of the SDCPS in the context of continuing monitoring that allows the determination of deficiencies affecting safety.

For high-impact SPIs

- ✓ the accident rate that could be monthly, quarterly, biannual and annual;
- ✓ the accident rate related to runway excursions (RE) quarterly, biannual and annual;
- ✓ the accident rate related to loss of control in-flight (LOC-I) quarterly, biannual and annual;
- ✓ the accident rate related to controlled flight into terrain (CFIT) quarterly, biannual, and annual;
- ✓ the serious incident rate that could be monthly, quarterly, biannual and annual

For low-impact SPIs

- ✓ the incident rate.

Indicators and levels of reference

The indicators are the result of the application of a formula that expresses the quantitative and qualitative relation between two or more variables to be determined and they are used to measure if the objective has been achieved.

Indicator example

$$\textit{Acc/Million departures} = \frac{\textit{2 accidents x 1.000.000}}{\textit{1.900.000}} = \mathbf{1.05}$$

In order to verify the result of the indicator, there has to be a level of reference, historical, standard, theoretical, etc.

To facilitate the monitoring, the safety analyst must determine what indicators the SDCPS will create. This will be achieved with the use of the tool and the analysis of the information sent.

"What it cannot be measured cannot be managed"

Alerts

The performance markers are reference values used to activate the alert of the high incident rate within each SPI, or to establish the level of objective of the planned improvement within each SPI. (*Doc. 9859*)

Figure 7 – SPI example

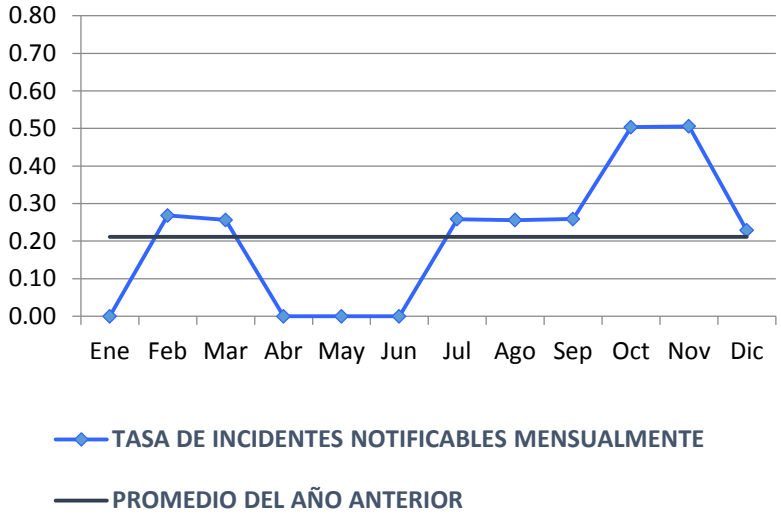
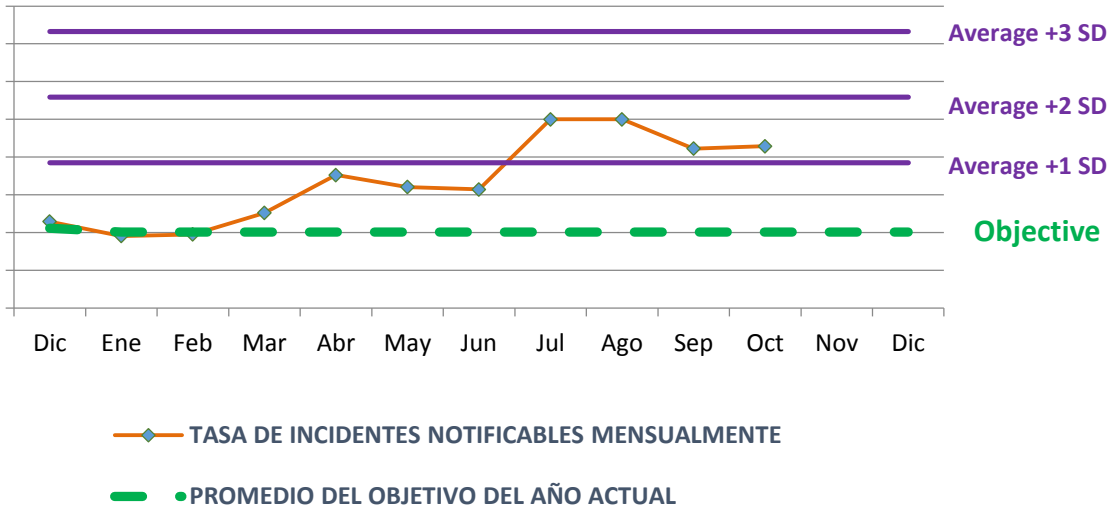


Figure 8 – Alerts

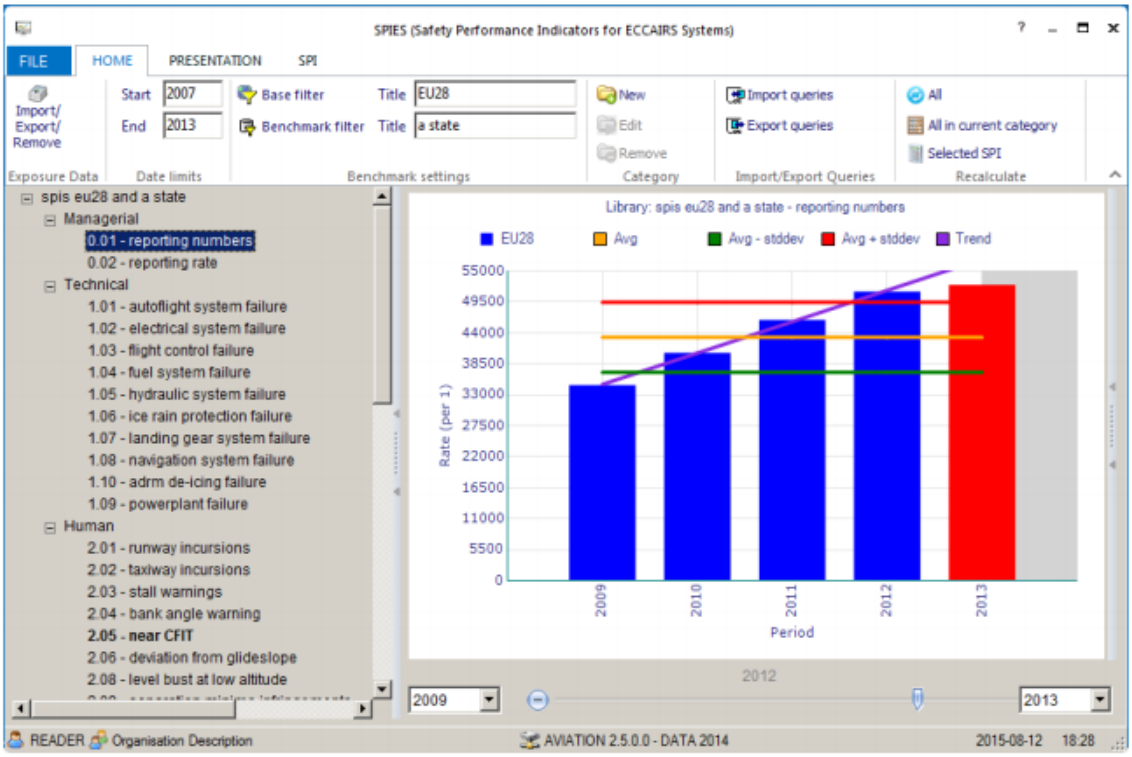


In order to achieve the correct functioning of SPIs and alerts in the SDCPS, SPIES (*Safety Performance Indicators for ECCAIRS System*) tool will be used.

This complement integrates into the ADREP/ECCAIRS system to obtain the expected alerts and indicators allowing for a great variety of parameters configuration among them:

- Time period to evaluate (1 year, 10 years, etc.)
- Cross references (queries)
- Technical indicators (hydraulic system failure)
- Human factors indicators (runway incursions)

Figure 9 – SPIES



The different SPIES can be modified according to what the ARCM TC requires and exported to other tools (spreadsheets, word processors, etc.) for subsequent analysis.

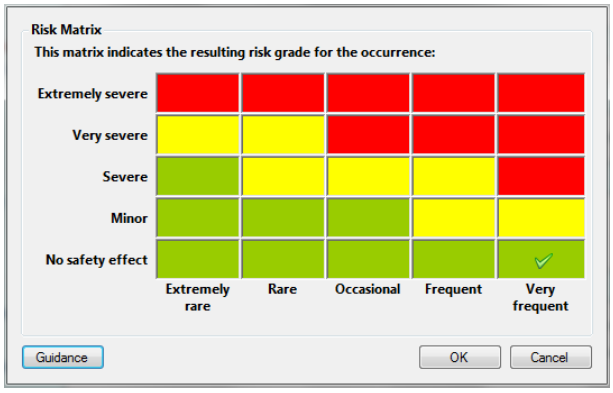
2.5 Hazards identification and prioritization:

In the ARCM framework, the State accident and incident reports must contain precise and timely hazards information allowing the SDCPS to appropriately manage risks.

The SDCPS allows the identification of hazards using the risk matrix that ADREP/ECCAIRS provides. Here, occurrences are classified according to the “severity” and “frequency”, which allows to obtain information about more frequent and more severe hazards through the query module.

This requires the individual (State) and general (SAM Region) information analysis from safety analysts. The ARCM will then be able to monitor the behaviour of the accident rate and identify the areas that need to have risk mitigation strategies developed at regional and individual (by State) level.

Figure 10 – Risk matrix



The SDCPS hazards identification and analysis will generate greater benefits if there is a standardized data treatment. To this aim, the ARCM will articulate training, standardization, and updating of the system with the technical support to create technical channels for the flow of information.

2.6 Safety surveillance system:

The SDPCS will determine how often the safety surveillance will be needed when the levels of alert established by the SPIs are announced.

2.7 Trends presentation:

The result of the query to the ADREP/ECCAIRS database can show analysis and trends with the “Grapher” tool.

Chapter 3 - Procedures

3.1 ADREP/ECCAIRS implementation procedure:

For the correct implementation of the ADREP/ECCAIRS system, each AIG organization must have the assurance that this system is reliable and the decision to manage the technical investigation data through the ADREP/ECCAIRS system.

As regards staff, an IT specialist is required for the configuration and management of the system and a safety analysis specialist, for information validation.

The State safety analyst will be in charge of determining "what" must be entered, "how" this entry will be made and "when". Besides, this person will determine the indicators and trends to get from the system.

Each State IT staff has the task of implementing the ADREP/ECCAIRS server for internal use and the connection with the ARCM repository, and obtaining from the system the information the safety analyst requires.

It is possible to create multiple implementation diagrams, adapting to the organizations and taking advantage of the potential benefits of the system.

The software and hardware requirements for the implementation depend on the size of the organization, the number of users, the number of records (occurrences) and they are available in the ECCAIRS documentation; the repository and database configuration procedures are described in the ADREP/ECCAIRS installation manual.

The registration in the JRC website is recommended in order to keep the system updated and access relevant information (news*, work documents*).

Each State must request a license of use "*Organization ID*" to the JRC *(eccairs@jrc.ec.europa.eu)* to use the system.

3.2 Occurrence notification procedure:

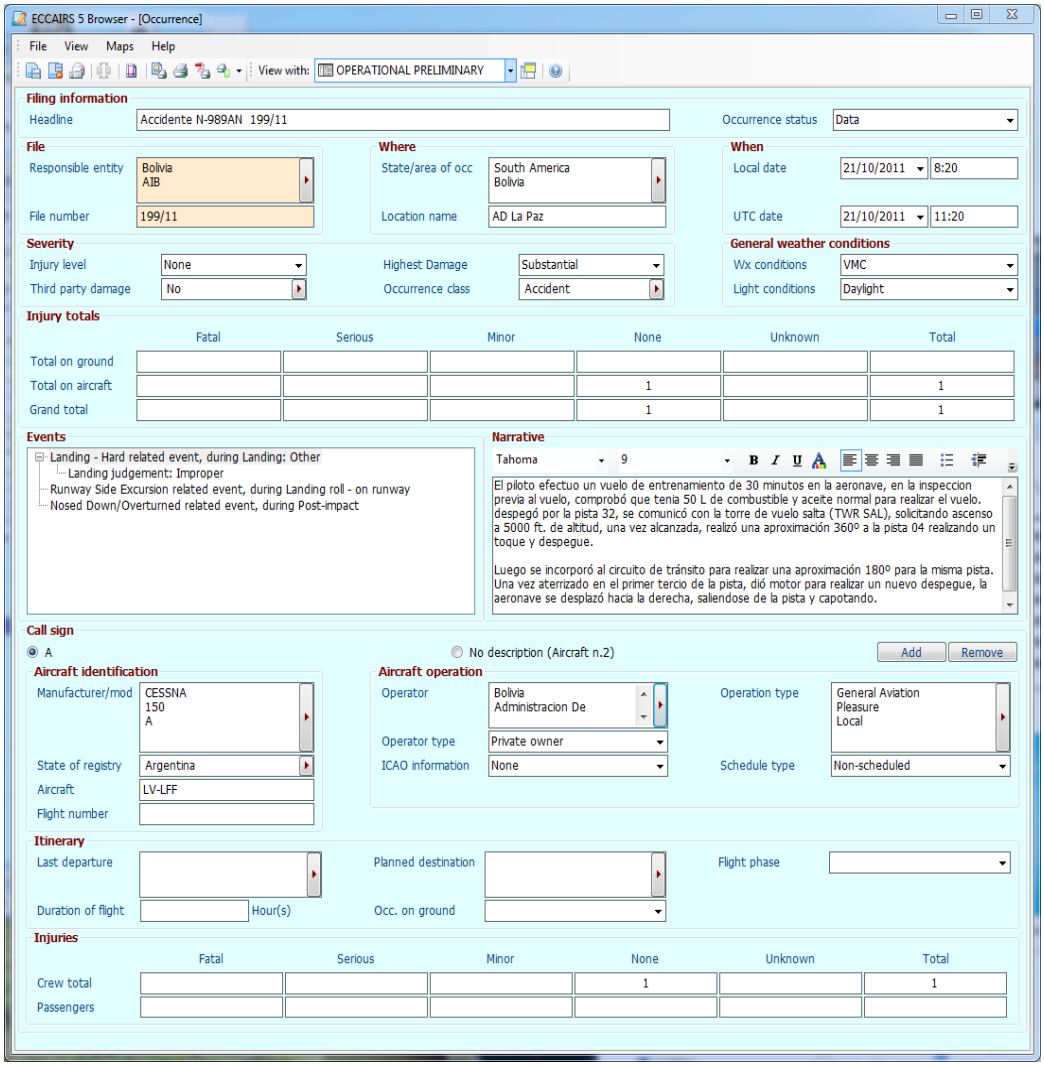
For the notification of new occurrences, a series of steps must be followed to enter data in order to have the advantage of notifying at the moment of entry and/or update. This can be done by means of a link for desktop platform or logging into the ARCM website (*https://arcm-sam.org/eccairs*).

Capture mechanism

The system data capture mechanism (forms), backed up by the ADREP taxonomy, is mostly represented by selection lists, multiple choices, and manual input data. The selection lists, as well as the choices, give integrity to data, since each attribute has its corresponding explanation in the "taxonomy browser"; however, the manual input data require a standardized criteria and previous knowledge, so that the data entered truly reflects the occurrence.

The constant use of the system allows that the users' learning curve is continuous, removing any potential barriers in the use of the tool.

Figure 12 – Initial notification



The initial notification has a capture mechanism of about 30 attributes (fields), with mandatory attributes ("Responsible Entity" and "File Number", highlighted in yellow).

Minimum data allowing the creation of high-impact indicators (accidents and serious incidents):

	ID	Name Attribute
-	430	Occurrence Category
-	431	Occurrence Class
–	214	Operation Type
-	32	Aircraft Category
-	14	Events
	12	Descriptive Factor
	15	Explanatory Factor
	319	Mass Group

Likewise, low-impact indicators (incidents):

	ID	Name Attributes
-	430	Occurrence Category
-	431	Occurrence Class

The steps to give notification are described below.

1- Create a local folder (temporary) to store the notified files.
2- Enter the "Browser" system connected to the State AIG repository.
3- Enter the occurrence data and record them in the database (File/Send to/ Database).
4- Save the record in the previously created folder (File/Send to/File)
5- Open the created file and select the ARCM repository
6- Record in the ARCM database (File/Send to/Database)
7- Exit (File/Exit)

Alternate procedure:

In case connection to the State ARCM repository cannot be established (connection failure, stand alone, etc.), a notification can be sent to sdcps@arcm-sam.org attaching the e5f file with the following nomenclature:

- Country code: 3 capital letters (ARG, BRA, URU, PAR, CHI, etc.)
- - hyphen (separator)
- State file number
- - hyphen (separator)
- PREL (preliminary report) DATA (final report)

ARG-353-16-PREL.e5f

ARG-353-16-DATA.e5f

3.3 Events validation procedures (ARCM):

With the purpose of ensuring the consistency of the data stored in the SDCPS, quality rules will be established using the ADREP/ECCAIRS “data quality” tool in order to avoid inconsistencies in the record, for example, the fields MASS GROUP y MAXIMUM TAKEOFF MASS not being related, or differences regarding the number of injured people in the aircraft and total number of occurrences, etc.

The unique identification attribute of each record is the “file number”; the SDCPS will keep the format used by each State.

Cases with no data validation:

- ✓ Incomplete or incorrect classification
- ✓ Invalid data
- ✓ Occurrence involving crime
- ✓ Aircraft with military registration

The validation process can extend depending on the observations from the ARCM data management expert, therefore each time the State revises a record, the validation by the ARCM data management expert can be repeated.

Each verification or validation process or its repetition will take place within a period of 5 working days.

Steps to follow

- ✓ Open “Browser” with the appropriate identity information (provided by the TC) for the ARCM repository.
- ✓ Build the query “not validated occurrences” and select the corresponding State (database/build query/not validated occurrences)
- ✓ Verify the data entered taking into account the considerations in this document.
- ✓ In the case the validation is approved, the attributes “validation status” and “validation date” will be completed. Afterwards, they will be sent to the database (file/send to/database).

- ✓ In the case the validation process is not approved (inconsistency, lack of data), the user that notified will be contacted and the appropriate information requested.

This process can be repeated depending on the quality of data sent.

Chapter 4 – Technical aspects

4.1 Roles of IT staff:

The management of distributed systems requires defined responsibilities and functions; each role is important and they determine the level of integrity of the system in general. In information technology it is not always feasible to have the necessary staff for each role, and it is common that a person or a team manages several roles.

IT in charge

- Responsible of the general working of the system
- Coordination of the IT team
- Link with ARCM operational analysts (for the elaboration of reports)
- Link with JRC (recommendations of improvements, errors report, etc.)
- Coordination with States IT in charge.

Server manager (sysadmin)

- Infrastructure security, user management (DBA), safety policies, firewalls, ports configuration, updatings, etc.

Database management (DBA)

- Database configuration (script of tables creations)
- E5Manager user management
- Data integrity
- Performance

Repository manager

- Roles (management/reading/writing/report creation/query, etc.)
- Users (roles assignment, admissions, discharges)

Profiles (browser/views/customization)

Repository connection to the database (with information provided by DBA)

Web access (IIS7 management), responsible for web repository

Technical support

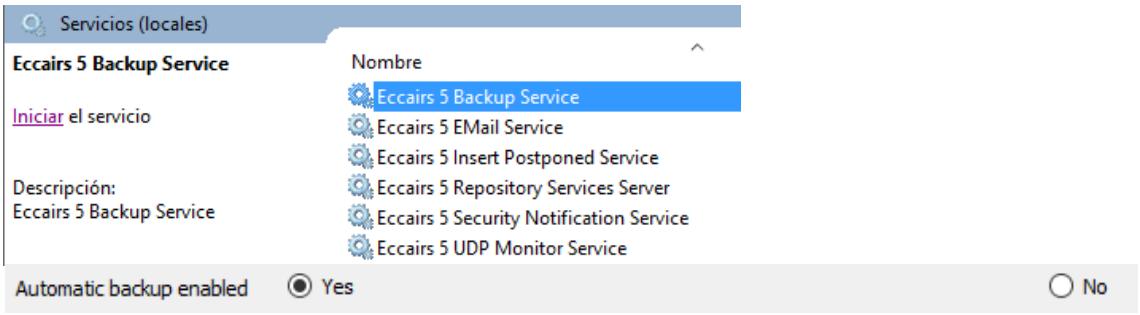
Technical assistance to the States about installation, configuration and management

Distribution of software updatings

4.2 Contingencies

In case of any contingency, or service interruption due to lack of hardware, unauthorized access or operating errors, the system is prepared to avoid any information losses and improve the level of availability.

Figure 13 –ADREP/ECCAIRS backup service



ECCAIRS has “backup services”, a service that protects general configuration data and is able to reset to a previous point in case of a general failure of the system.

At database level, engines like SQL (*Structure Query Language)* have a backup service to protect the information. This configuration is done by the database manager.

Chapter 5 - Bibliography

5.1 Bibliography and sources of information

- State AIG regulations
- Report on regional database implementation Mr. Winston San Martin
- Annex 13 – Aircraft accident and incident investigation
- Annex 19 – Safety management
- Doc. 9946 – Manual on regional accident and incident investigation organization (RAIO).
- ICAO Accident/Incident Data Reporting System (ADREP).
- Joint Research Centre http://eccairsportal.jrc.ec.europa.eu (ECCAIRS).

Agenda Item 7: Investigation of non-serious incidents

Role of the organisations involved in the investigation of non-serious incidents

7.1 Continuing with the agenda items, the Meeting took note of the role played by the organisations involved in the investigation of non-serious incidents.

7.2 Within the framework of the ARCM, one of its objectives is to cooperate with, and assist, States in the investigation of aircraft accidents and incidents. Accordingly, the Regional Mechanism will:

- ✓ contribute to the application of best practices in the investigation of accidents and incidents;
- ✓ analyse and clarify those concepts that may create difficulties for the application of standards and recommended practices; and
- ✓ oversee the continuous compliance with, and evolution of, documents containing accident and incident investigation requirements and procedures, in order to make proposals of amendment as required to keep the documents up to date.

7.3 The Meeting noted that SSP implementation in ARCM member States requires AIG organisations to take on a proactive role as participating and custodian organisation, together with the other aeronautical authorities.

7.4 In this sense, a clear and harmonised concept must exist at regional level as to the intervention of AIG organisations upon the occurrence of a non-serious incident, what should be their level of involvement therein, and how should they coordinate with the other aeronautical authorities that make up the SSP.

7.5 Each AIG organisation, upon the occurrence of a non-serious incident, should apply established criteria that define the level of intervention in accordance with Annex 13, which suggests that the investigation of an occurrence should be carried out taking into account whether or not its results will have a high impact on safety.

7.6 In the case of non-serious incidents in which the AIG Authority has no interest to investigate, such occurrences may be investigated by other aeronautical authorities or service providers, provided they have the capacity to do so, and the AIG organisation would only intervene as observer, if it so deems advisable.

7.7 The Meeting was convinced of the importance of establishing coordination mechanisms among the different aeronautical authorities responsible for the implementation of the State safety management system, for the purpose of optimising resources and efforts in order to obtain and process information and produce safety intelligence allowing for the establishment of trends and indicators and the formulation of the corresponding recommendations to mitigate the risks identified in the aeronautical system.

7.8 In accordance with the State safety programme (SSP), AIG organisations agreed that they had to actively contribute to the strengthening of the State *safety date collection and processing system (SDCPS)*, forwarding all processed information emerging from the investigations that might show

indicators and trends affecting safety. Taking into account that the State SDCPS could consist of one or more mandatory and voluntary notification systems and of collection systems specific to each aeronautical authority and AIG authority, capturing both reactive (AIG organisations) as well as proactive information (actual or possible safety deficiencies), this system (SDCPS) will require an effort of coordination among aeronautical and investigation authorities for the articulation and processing of the required information with a view to strengthening safety management in the State.

7.9 In view of the foregoing, the Meeting formulated the following conclusion:

CONCLUSION AIG-SAM/3-06 Establishment of an ARCM task force to define the intervention criteria for the AIG Authority, the aeronautical authority, the SSP coordinating bodies, and service providers

a) Approve the establishment of an ARCM task force to coordinate with the SSP coordination bodies of the States that are party to the Agreement, the intervention criteria for the AIG authority, the aeronautical authority, and service providers upon the occurrence of an event classified as *non-serious incident,* as well as the criteria for defining the *investigative capabilities* of both the aeronautical authorities and service providers;

b) Ask the ICAO South American Regional Office to authorise the presentation of a working paper at the Fifth Meeting on SSP Implementation to be held in September 2016 in Lima, Peru, establishing the intervention criteria for the AIG authority, the aeronautical authority, SSP coordinating bodies, and service providers upon the occurrence of an event classified as *non-serious incident;*

c) That the established task force review ICAO documents (Annexes and documents) related to accident and incident investigation and propose the necessary amendments concerning the use of the terms accident, serious incident, incident, safety deficiencies, as appropriate;

d) Support the AIG organisations so that they may play an active role in the SSP together with State aeronautical authorities.

Agenda Item 8: 2016 ARCM activities programme approval

2016 ARCM activities programme proposal

8.1 Regarding this agenda item, the Meeting was reported that, according to the manual of organization and functions of the ARCM, the Executive Committee of this mechanism has to examine the annual activities programme for approval.

8.2 Taking into account the conclusions and recommendations agreed upon in the First and Second AIG Authorities Meeting of South America, the development of the 2016 activities programme shall allow the consolidation of the ARCM implementation.

8.3 For the implementation of the ARCM, the 2016 activities programme has been divided into the following areas of work:

- ✓ harmonization of the regulations;
- ✓ activities with multinational teams;
- ✓ training activities and seminars;
- ✓ meetings; and
- ✓ development and implementation of the ARCM safety data collection and processing system (SDCPS).

8.4 Regarding the activities presented, the meeting committed itself to achieving the following objectives:

a) implementing the South American ARCM;

b) harmonizing the regulations, investigation procedures, verification lists, training programmes and ARCM safety data exchange, processing, collection and notification procedures;

c) training the investigators in ARCM safety data collection and processing system (SDCPS), regulations and procedures;

d) establishing an ARCM team of investigators in order to manage cooperation among the States;

e) providing the States with assistance to improve the AIG effective implementation (EI), revising together the progress of not satisfactory protocol questions (PQs) and, if necessary, satisfactory PQs; and

f) contributing to the reduction of accidents in the SAM Region in all areas of aviation through the identification of hazards, management of risks and establishment of the preventive actions necessary according to Chapter 8 of Annex 13.

8.5 The Meeting took note that all the 2016 activities planned by the ARCM do not require financial contribution by the ARCM member States and that they shall only cover the participants´ travel allowances and ticket costs.

8.6 After analyzing each activity of the work areas, the Meeting reached the conclusion stated below.

CONCLUSION AIG-SAM/3-07 Approval of the 2016 ARCM activities programme

a) Approval of the 2016 ARCM activities programme;

b) Encouragement of the ARCM member States to participate in all the 2016 planned activities, which shall allow the effective implementation of the ARCM;

c) **Attachment A** of this agenda item of the report includes the 2016 ARCM activities programme.

ARCM PROGRAM OF ACTIVITIES FOR 2016

1. Harmonization of regulations

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
Accident Investigation				
AIG 1.1 Delivery of working papers to be presented in the Third Meeting of AIG SAM Authorities (AIG-SAM/3) of ARCM		Working papers developed by SAM States' AIG specialists with proposed changes to ARCM regulations, procedures and training program.	Lima, 08-Jan	Task Group Reporters
AIG 1.2 Review of the working papers to be presented at the Third Meeting of AIG SAM Authorities (AIG-SAM/3) of ARCM		Analysis and debate of NE by CT and task groups.	Lima, 18-29 Jan	Mr. Marcio Abreu Mr. Daniel Barafani Task Group Reporters
AIG 1.3 Publication of working papers on the website of the ICAO South American Office.		Working papers published and ready to be presented at the Third Meeting of AIG SAM Authorities of ARCM	Lima, 01-29 Feb	Mr. Marcio Abreu Mr. Daniel Barafani Task Group Reporters
2. Activities with Multinational Teams				
Accident and Incident Investigations				
AIG 2.1 Create AIG Investigators Bank of the ARCM		Send letter to ARCM States asking them to appoint their investigators who meet the requirements to serve on the bank of AIG investigators of the ARCM.	Lima, 01-29 Jul	CT and ARCM Secretary
AIG 2.2 Progress review of Argentina's unsatisfactory AIG PQ	6.501 and 6.505	a. 2 teleconferences b. Report on PQ compliance status of and improved effective implementation in the Subgroup "ACCID and INCID prevention measures."	January	Argentina, CT and ARCM Secretary

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
AIG 2.3 Progress review of Argentina's unsatisfactory AIG PQ	6.005, 6.015, 6.017, 6.005, 6.015, 6.017, 6.113, 6.117, 6.129, 6.319, 6.405, 6.425, 6.435, 6.437 and 6.505	a. 3 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Initial Accident and Incident Notification," "IF Development, completion and dissemination," "Development, disclosure and registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."	March	Bolivia, CT and ARCM Secretary
AIG 2.4 Progress review of Brazil's unsatisfactory AIG PQ	6.113, 6.405, 6.435 and 6.437	a. 2 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Organization, staffing and personnel training," "IF Development, completion and dissemination," "ACCID and INCID Data Notification (ADREP)"	March	Brazil, CT and ARCM Secretary
AIG 2.5 Progress review of Chile's unsatisfactory AIG PQ	6.005, 6.011, 6.101, 6.135, 6.303, 6.315, 6.317, 6.321, 6.323 and 6.367.	a. 2 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious accident and incident investigation."	May	Colombia, CT and ARCM Secretary
AIG 2.6 Progress review of Colombia's unsatisfactory AIG PQ	6.005, 6.017, 6.359, 6.029, 6.031, 6.371, 6.105, 6.107, 6.117, 6.121, 6.123, 6.127, 6.131, 6.133, 6.303, 6.315, 6.319, 6.361, 6.397, 6.409, 6.415, 6.423, 6.425, 6.503 and 6.505.	a. 4 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "IF Development, completion and dissemination," "Development, disclosure and registration of recommendations," and "INCID and ACCID prevention measures."	May	Colombia, CT and ARCM Secretary

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
AIG 2.7 Progress review of Ecuador's unsatisfactory AIG PQ	6.131, 6.135, 6.201, 6.207 and 6.505	a. 3 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Organization, staffing and personnel training," "Facilities and Equipment," and "INCID and ACCID prevention measures."	June	Ecuador, CT and ARCM Secretary
AIG 2.8 Progress review of Guyana's unsatisfactory AIG PQ	6.003, 6.005, 6.007, 6.009, 6.011, 6.401, 6.015, 6.017, 6.023, 6.359, 6.355, 6.029, 6.031, 6.371, 6.035, 6.201, 6.203, 6.205, 6.207, 6.209, 6.301, 6.303, 6.311, 6.313, 6.315, 6.317, 6.319, 6.325, 6.327, 6.329, 6.341, 6.343, 6.345, 6.347, 6.349, 6.351, 6.353, 6.357, 6.361, 6.363, 6.365, 6.369, 6.373, 6.375, 6.377, 6.379, 6.381, 6.391, 6.393, 6.395, 6.397, 6.417, 6.405, 6.407, 6.409, 6.411, 6.413, 6.415, 6.421, 6.423, 6.425, 6.437 and 6.503.	a. 6 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Facilities and Equipment," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "IF Development, completion and dissemination," "Development, disclosure and registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."	June and July	Guyana, CT and ARCM Secretary
AIG 2.9 Progress review of Panama's unsatisfactory AIG PQ	6.359, 6.113, 6.125, 6.127, 6.329, 6.343, 6.345, 6.349, 6.375, 6.405, 6.503, 6.507 and 6.511.	a. 3 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "IF Development, completion and dissemination," and "INCID and ACCID prevention measures."	August	Panama, CT and ARCM Secretary

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
AIG 2.10 Progress review of Paraguay's unsatisfactory AIG PQ	6.003, 6.005, 6.007, 6.011, 6.015, 6.017, 6.029, 6.031, 6.033, 6.371, 6.121, 6.123, 6.125, 6.127, 6.129, 6.131, 6.203, 6.207, 6.209, 6.317, 6.319, 6.321, 6.327, 6.329, 6.347, 6.365, 6.367, 6.369, 6.373, 6.375, 6.381, 6.391 6.397 and 6.431	a. 4 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Facilities and Equipment," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "ACCID and INCID Data Notification (ADREP)"	September	Paraguay, CT and ARCM Secretary
AIG 2.11 Progress review of Peru's unsatisfactory AIG PQ	6.003, 6.005, 6.007, 6.017, 6.359, 6.123, 6.125, 6.127, 6.131, 6.133, 6.135, 6.203, 6.301, 6.303, 6.311, 6.325, 6.329, 6.343, 6.361, 6.369, 6.375, 6.377, 6.381, 6.393, 6.397, 6.417, 6.403, 6.405, 6.407, 6.409, 6.413, 6.415, 6.425, 6.431, 6.435, 6.437, 6.507 and 6.509.	a. 4 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Facilities and Equipment," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "IF Development, completion and dissemination," "Development, disclosure and registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."	October	Peru, CT and ARCM Secretary
AIG 2.12 Progress review of Surinam's unsatisfactory AIG PQ	6.001, 6.003, 6.005, 6.009, 6.011, 6.401, 6.015, 6.017, 6.021, 6.023, 6.025, 6.027, 6.359, 6.355, 6.029, 6.031, 6.033, 6.371, 6.035, 6.101, 6.111, 6.115, 6.117, 6.119, 6.121, 6.123, 6.125, 6.127, 6.129, 6.131, 6.133, 6.135, 6.205,	a. 8 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Facilities and Equipment," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "IF Development, completion and dissemination," "Development, disclosure and	October and November	Surinam, CT and ARCM Secretary

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
	6.207, 6.301, 6.313, 6.315, 6.317, 6.319, 6.321, 6.323, 6.325, 6.327, 6.329, 6.343, 6.345, 6.347, 6.351, 6.353, 6.357, 6.361, 6.363, 6.365, 6.367, 6.369, 6.377, 6.379, 6.381, 6.391, 6.393, 6.395, 6.397, 6.417, 6.403, 6.405, 6.407, 6.409, 6.411, 6.413, 6.415, 6.421, 6.423, 6.425, 6.431, 6.433, 6.435, 6.437, 6.503, 6.505, 6.507 and 6.511.	registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."		
AIG 2.13 Progress review of Uruguay's unsatisfactory AIG PQ	6.005, 6.007, 6.009, 6.015, 6.017, 6.021, 6.023, 6.025, 6.029, 6.031, 6.033, 6.371, 6.105, 6.107, 6.109, 6.117, 6.119, 6.121, 6.123, 6.125, 6.127, 6.129, 6.131, 6.133, 6.135, 6.205, 6.207, 6.303, 6.319, 6.327, 6.329, 6.341, 6.347, 6.351, 6.353, 6.357, 6.361, 6.363, 6.365, 6.369, 6.373, 6.375, 6.379, 6.381, 6.391, 6.397, 6.417, 6.405, 6.407, 6.409, 6.411, 6.413, 6.415, 6.421, 6.425, 6.431, 6.435, 6.437, 6.501, 6.505, and 6.511	a. 6 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Organization, staffing and personnel training," "Facilities and Equipment," "Investigation Policies and Procedures," "Initial Accident and Incident Notification," "Serious Accident and Incident Investigation," "Participation in ACCID and INCID investigations," "IF Development, completion and dissemination," "Development, disclosure and registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."	November and December	Uruguay, CT and ARCM Secretary

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
AIG 2.14 Progress review of Venezuela's unsatisfactory AIG PQ	6.017, 6.021, 6.023, 6.027, 6.029, 6.031, 6.317, 6.421, 6.435, 6.437, 6.503 y 6.505.	a. 3 teleconferences b. Report on PQ compliance status and improved effective implementation in the Subgroups "Legislation and Regulations," "Initial Accident and Incident Notification," "Development, disclosure and registration of recommendations," "ACCID and INCID Data Notification (ADREP)" and "INCID and ACCID prevention measures."	December	Venezuela, CT and ARCM Secretary
3. Training and Seminary Activities				
Accident and Incident Investigations				
AIG 3.1 First Course on ADREP / ECCAIRS system under the ARCM.		a) Course Announcement b) Course Preparation c) Course and Workshops Review d) Course Development	a) 04-08 Jan b) 02 Feb – 04 Mar c) 04-08 Apr d) 11-15 Apr, Lima	a) CT b) CT c) CT d) CT
AIG 3.2 First ARCM AIG Investigator's Course		a) Course Announcement b) Course Preparation c) Course and Workshops Review d) Course Development	a) 08 Feb – 11 Mar b) 11 Apr – 13 May c) 13-17 Jun d) 20-24 Jun, Lima	a) CT b) CT c) CT d) CT
AIG 3.3 Second Course on the ADREP/ECCAIRS System under the ARCM		a) Course Announcement b) Course Preparation c) Course and Workshops Review d) Course Development	a) 09 May – 10 Jun b) 11 Jul – 12 Aug c) 12-16 Sep d) 19-23 Sep, Lima	a) CT b) CT c) CT d) CT
4. Meetings				
Accident Investigation				
AIG 4.1 Third South American AIG Authorities		a) Task Development for AIG-SAM/03 b) Monitoring and coordination of ARCM	a) 17 Aug 15-30 Oct 2015 b) 01-30 Jan	a) CT

Tasks	PQ	Deliverables	Place and date (start and finish)	Accountability and Resources
Meeting (AIG-SAM/3)		members for NE development c) Prepare Meeting d) Development and report of meeting	 c) 01-29 Feb d) 07-09 Mar	b) CT & ARCM c) CT & Secretary d) CT & Secretary
AIG 4.2 39th Session of ICAO Assembly		Filing an NE at the 39th Session of the ICAO Assembly on the progress of the AIG Regional Cooperation Mechanism (ARCM)	27 Sep – 07 Oct 2016	ARCM Executive Committee
5. Safety Data Collection and Processing System (SDCPS)				
Accident Investigation				
AIG 5.1 Delivery of Working papers on the SDCPS of the ARCM that will be presented at the Third AIG SAM Authorities Meeting (AIG-SAM/3)		Working papers developed by the ADREP/ECCAIRS expert panel, with proposed architecture, software definition and SDCPS procedures manual	Lima, 08 Jan	Task force reporter
AIG 5.2 Review and discussion of the SDCPS working papers by CT and the work group.		Final working papers on SDCPS	Lima, 18 – 29 Jan	Mr. Marcio Abreu Mr. Daniel Barafani Task force reporter
AIG 5.3 Publication of SDCPS working papers in the web page of ICAO's South American Office		Working papers published and ready to be presented at the Third AIG SAM Authorities Meeting of the ARCM	Lima, 01 Feb	ARCM Secretary
AIG 5.4 Development of ARCM's First Safety Report Draft		ARCM Safety Report Draft	Lima, 01-30 Dec	ARCM Secretary Mr. Marcio Abreu Mr. Daniel Barafani

Agenda Item 9: South American ARCM multinational investigator certification

9.1 Under this Agenda item, the Secretariat presented the manual proposal for the ARCM accident and incident multinational investigator certification.

9.2 Regarding this, the Meeting considered that the South American AIG Regional Cooperation Mechanism (ARCM) was established in the Second AIG Authorities Meeting of the SAM Region, held in Buenos Aires, Argentina, to support the States that request in the aspects related to aircraft accident and incident investigation in a regional cooperation environment that allows to improve the effective implementation in the AIG area and to contribute to the reduction of the aircraft accident and incident rate of the SAM Region below the global rate in all the aviation

9.3 In this sense, the ARCM Executive Committee recognized that, for the development of objective and well-conducted investigations and with high impact in their recommendations, the States shall have appropriate staff for that.

9.4 However, many States do not have staff exclusively dedicated to accident investigations; in such cases, it is convenient, in a cooperation environment and at the request of the interested State and approval from the State providing the staff, to use multinational investigators available from the ARCM.

9.5 For that, the ARCM must establish and monitor the requirements of the investigators´ minimum professional competencies. For the ARCM investigators to be able to fulfil their tasks in a regional environment, it is necessary that their knowledge and aptitudes in relation to their responsibilities are in continuous development.

9.6 The investigation is conducted by investigators that have the investigation techniques required to participate in an aircraft accident and incident investigation.

9.7 Likewise, each type of investigation requires different competencies´ requirements according to the levels and scopes provided. The accident and incident multinational investigator certification means that the ARCM recognizes the investigator´s competence.

9.8 Besides abilities, techniques and experience, an accident investigator requires some personal characteristics. These attributes include integrity and impartiality in the factual analysis, capacity to logically analyze the facts, perseverance to search for questions, often in difficult situations, and good treatment with a great variety of people that have participated in the traumatic experience of an air accident.

9.9 The meeting considered that the intention of this manual is oriented to accident and incident investigators of the AIG Authorities of the ARCM member States.

9.10 In this sense, the manual has the purpose of establishing the profiles and competencies´ requirements that the aircraft accident and incident investigators must gather under the ARCM framework. Besides, in this framework it is necessary to incorporate a tool to ensure the homogeneity of the investigators´ competence.

9.11 Regarding Chapter 2 – Levels of certification and requirements for the certification, all the changes were accepted as follows:

2.5.1.1 The summary of the requirements for the certification in this level is the following:

a) ***Education*** *(See Note 1)*

At a minimum, technical or third-level education with an appropriate major in the category investigator (operational or technical).

b) ***Work experience in the AIG authority*** *(See Note 2)*

~~*Five (5) years*~~ *Three (3) years of work experience in the AIG authority as accident investigator with his major, according to the specific requirements of the performance category; and*

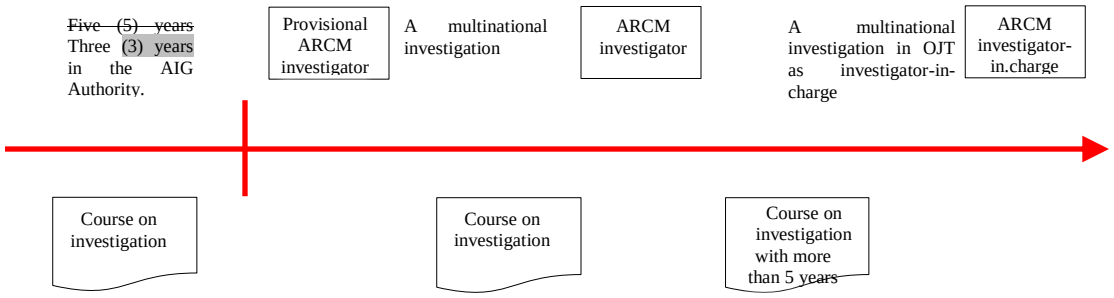
2.5.4.1 ***Note 2: Work experience***

- *For all levels, regarding accident investigations, the candidate for multinational investigator shall have completed at least ~~five (5) years~~ three (3) years of work experience in the State AIG authority, in the industry or in military organizations, having developed functions as accident investigator, specialist, expert or advisor;*

  The ~~five (5) years~~ three (3) years of experience regarding Item (a) must have accumulated in the last ten (10) years.

2.5.4.4 ***Note 4: Investigation experience***

Figure 2-1 Progression of the levels of the ARCM multinational investigator



9.12 Once the Meeting analyzed the proposal for the ARCM harmonized training programme, the Meeting agreed upon reaching the following conclusion:

CONCLUSION AIG-SAM/3-08 Approval of the manual for the ARCM accident and incident multinational investigator certification

a) Approval of the First edition of the manual for the ARCM accident and incident multinational investigator certification;

b) **Attachment A** of this agenda item of the report includes the approved First edition of the manual for the ARCM accident and incident multinational investigator certification;

c) Authorization of the certification of the investigators complying with the ARCM requirements.

South American AIG Regional Cooperation Mechanism (ARCM)

ARCM multinational accident and incident investigator certification manual

First edition
March 2016

Record of amendments			
Amendment No.	**Origin**	**Subjects**	**Approved by the ARCM Executive Committee**
First edition	South American Third AIG Auhorities Meeting (AIG-SAM/3), Lima, Peru, 07 to 09 March 2016	ARCM multinational accident and incident investigator certification manual It includes Part II of Doc 9756, First edition 2012	09 March 2016 AIG-SAM/3

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FOREWORD

The South American AIG Regional Cooperation Mechanism (ARCM) was established in the Second AIG Authorities Meeting of the SAM Region, held in Buenos Aires, Argentina, to support the States that request in the aspects related to aircraft accident and incident investigation in a regional cooperation environment that allows to improve the effective implementation in the AIG area and to contribute to the reduction of the aircraft accident and incident rate of the SAM Region below the global rate in all the aviation segments. The main objectives of the ARCM are:

1. to establish, in accordance with the Global aviation safety plan (GASP), a regional environment that allows the cooperation among the States, with trained, independent and impartial professionals that can support the States that request in aircraft accident and incident investigation tasks**;**

2. to increase cooperation and collaboration among ARCM member States with respect to aircraft accident and incident investigation;

3. to increase cooperation within the ARCM and at international level with respect to the exchange of information on accidents and incidents;

4. to ensure that all aircraft accidents and incidents that occur in the ARCM member States are subject to an investigation that complies with the provisions of Annex 13 to the Convention on International Civil Aviation – *Aircraft accident and incident investigation and with ARCM documentation*;

5. to help ensure that all aircraft accident and incident investigations carried out in ARCM member States are free of any political or other type of interference or pressure;

6. to coordinate so that member States may have adequate resources, including equipment and qualified personnel, for conducting one or all investigations;

7. to foster the use by all member States of a common set of regulations that are consistent with the provisions of Annex 13 – *Aircraft accident and incident investigation*, including regulations for the protection of information obtained through safety data collection and processing systems (SDCPS) as set forth in Attachment E to Annex 13;

8. to foster the use by all member States of common guidelines, investigation procedural handbooks and guides;

9. to promote the use of harmonized AIG regulations for all member States;

10. to promote the implementation of a harmonized AIG training programme for investigators of all member States;

11. to encourage the implementation of a SAM AIG database in order to facilitate, through the risk management process, the effective analysis of information obtained on accidents, serious incidents, incidents and latent conditions, so as to mitigate risks and establish safety performance indicators, targets and the corresponding alerts in the SAM Region in the AIG area;

12. to promote the use of best practices concerning accident prevention; and

13. to cooperate to increase the qualifications and experience of accident investigators in all member States.

The ARCM is represented by an Executive Committee and its Chairman. The Executive Committee recognizes that for the development of objective and well-conducted investigations and with high impact in their recommendations, the States shall have qualified staff. However, many States do not have staff exclusively working in accident investigation; in such cases, it is advisable to use the cooperation resources offered by the ARCM.

For the ARCM to be able to manage cooperation, it is necessary to establish and monitor the minimum requirements for its investigators´ professional competencies. In turn, the investigators representing the ARCM should keep their knowledge and abilities in relation to their responsibilities.

The purpose of this manual is to establish the profiles and competencies requirements for the aircraft accident and incident investigators participating in the ARCM. Under this framework, it is necessary to incorporate a tool to ensure the homogeneity in the investigators´ competencies.

The ARCM multinational accident and incident investigator certification manual provides a valuable tool to keep a record of ARCM investigators with a homogeneous level of human resources that will verify the appropriate application of the harmonized investigation requirements and offer a quality assurance mechanism to create the necessary trust for the reciprocal recognition of the investigations conducted by the ARCM member States.

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CHAPTER 1

ARCM ACCIDENT AND INCIDENT MULTINATIONAL INVESTIGATOR CERTIFICATION PROGRAMME

1.1 This programme focuses on the accident investigators that will participate as support investigators in the accident and serious incident investigations conducted by the AIG Authorities of the ARCM member States.

1.2 The investigation must be carried out by investigators having the technical and non-technical competencies to conduct an accident and serious incident investigation or participate as specialist, advisor or observer.

1.3 Likewise, each type of investigation requires different competencies requirements according to the levels and scope given, as described in Chapter 2.

1.4 The multinational accident investigator certification means that the ARCM recognizes the investigator´s competence (depending on the level listed in the certificate´s scope) to:

a) keep the ethical principles, appropriate behaviour, good appearance and professional care, as described in Appendix 3;

b) clearly communicate orally and in written with the staff at all organizational levels;

c) support the planning, organization and management of multinational investigation;

d) understand the scope and complexity of the investigation in accordance with legislation, regulations and other requirements of the State of occurrence that are necessary to conduct the investigation;

e) have the knowledge of the technical and non-technical methodologies for the aircraft accident investigation;

f) have the ability to collect, document and preserve the evidence;

g) have the ability to identify and analyze the relevant evidence in order to determine the causes, latent failures and, as appropriate, make the safety recommendations with high impact in the aviation system;

h) have the ability to contribute in the making of the final report complying with the requirements of the accident investigation authority of the State conducting the investigation;

i) participate as member of a multinational investigation team and assist in the investigation management process.

1.5 Besides the skills, techniques and experience, an accident investigator requires some personal attributes. These attributes include integrity and impartiality in analyzing the facts, the ability to analyze the facts in a logical way, perseverance to search for questions, in difficult situations often, and being sympathetic to a wide range of people that have participated in the traumatic experience of suffering an air accident.

1.6 This manual is targeted to the accident investigators of the AIG Authorities of the ARCM member States.

1.7 This document provides information and instructions on:

a) the different certification levels;

b) the certification process and how to request it;

c) the requirements for the initial certification;

d) the requirements to renew the certification including the continuing professional development (DPC) requirements;

e) the types of investigation necessary for the certification; and

f) the code of conduct.

1.8 The details of all certified investigators are included in a record available at the ARCM website.

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CHAPTER 2

CERTIFICATION LEVELS AND CERTIFICATION REQUIREMENTS

2.1 The ARCM will evaluate the requests based on the demonstration of the competencies needed for the special function the aircraft accident and serious incident investigators will be assigned to. These investigators shall have the ability and knowledge in accordance with the responsibilities to perform as investigator-in-charge (IIC), accredited representative, advisor or expert/specialist. The applicant will be able to show these competencies through a combination of knowledge, work experience, training as investigator and experience in a specific accident investigation area.

2.2 The certification programme will be targeted to accident investigators of the ARCM member States, which will be appointed to participate in the investigations in the ARCM framework using the set of regulations of the referred mechanism.

2.3 Investigators can normally be divided into two categories: the operational category and the technical category. The operational category can be comprised of the following groups: operations, aircraft performance, medical aspects/human factors, witnesses, flight recorders, meteorology, air traffic services/airports, survival, and cabin safety. The technical category can be comprised of the following groups: maintenance and records, facilities, structures, propulsion engines, site mapping, resistance to impact, and photography/video.

2.4 Certification levels

The programme has three (3) certification levels for the ARCM multinational accident investigator:

a) Provisional ARCM investigator

b) ARCM investigator

c) ARCM investigator-in-charge (IIC)

2.5 Summary of each certification level

The characteristics of each level and a summary of the certification requirements are described as follows. Notes are included at the end of each section for a more complete description.

2.5.1 Provisional ARCM investigator

2.5.1.1 At this entry level or training level, the applicant starts the career as ARCM multinational accident investigator. For this level, the ARCM recognizes that the applicant has the personal attributes, education, technical and professional competence but still requires compliance with the requirement of experience in investigations in order to certify for the next level. All the investigators that expect to certify at multinational level must start their career at this level as a first step.

2.5.1.2 This level also includes investigators with experience that have stopped working as ARCM multinational investigators for a period of three (3) years or more.

2.5.1.3 The summary of requirements to certify at this level are the following:

a) **Education** (See Note 1)

Technical education or third-level education with a major appropriate for the category investigator (operational or technical) category at a minimum.

b) **Work experience in AIG Authority** (See Note 2)

- Five (5) years of work experience in the AIG Authority as accident investigator according to the specific requirements of the performance category; and
- Being active in accident investigation for the State authority in charge of investigations at the time of the application.

c) **Previous qualification**

- Being qualified as investigator or belonging to groups of investigators in the technical or operational categories in their States and being certified for that.

d) **Training as ARCM investigator** (See Note 3)

- Approval of a course oriented to the training of investigators in order to perform in a major accident investigation of great complexity and/or the participation of other States; and
- Approval of the course on knowledge and application of the ARCM AIG regulations.

e) **Experience in investigations**

See Note 4

2.5.2 **ARCM investigator**

2.5.2.1 The provisional ARCM investigator can request this level once the experience requirements have been completed. This level recognizes that the applicant is a competent accident investigator that can effectively contribute in an investigation team. It is considered as the next step in the career of an ARCM multinational accident investigator and most of the investigators here have the condition to upgrade to the level of ARCM investigator in charge.

2.5.2.2 The summary of the certification requirements for this level is the following:

a) **Education** (See Note 1)

Same requirements as the provisional ARCM investigator.

b) **Work experience in the AIG Authority** (See Note 2)

Same requirements as the provisional ARCM investigator.

c) **Training as ARCM investigator** (See Note 3)

Same requirements as the provisional ARCM investigator.

d) **Experience in investigations** (See Note 4)

A multinational investigation as provisional ARCM investigator.

2.5.3 **ARCM investigator-in-charge (IIC)**

2.5.3.1 This level is reserved for investigators that have satisfactorily complied with the certification levels as provisional ARCM investigator, ARCM investigator and that complies with requirements of the

higher level and proves to be competente, have experience when dealing with investigations and lead work teams.

2.5.3.2 The summary of the certification requirements for this level is the following:

a) **Education** (See Note 1)

Same requirements as the ARCM investigator.

b) **Work experience in the AIG Authority** (See Note 2)

Same requirements as the ARCM investigator.

c) **Training as ARCM investigator-in-charge (IIC)** (See Note 3)

Same requirements as the ARCM investigator.

d) **Experience in investigations** (See Note 4).

- Having more than five years of experience performing as investigator in charge of the State AIG organization in at least 5 investigations (demonstrable).
- Having participated in at least 2 multinational accident investigations as investigator.
- Having an investigation as ARCM investigator-in-charge in practical on-the-job (OTJ) training.

2.5.4 **Notes**

2.5.4.1 **Note 1: Education**

- For all the levels the applicant or investigator must have completed higher education or technical education appropriate for the type of specialization or qualifications and equivalent experience necessary for the category of investigation to be performed. Besides being required for the specialization area, the investigator must have the State certification, as applicable.

a) In case of a technical investigator, he must prove training in aviation medicine.

2.5.4.2 **Note 2: Work experience**

- For all the levels, in terms of accident investigations, the applicant for multinational investigator must have completed at least five (5) years of work experience in the State AIG Authority, the industry or military organizations, having developed functions as accident investigator, specialist, expert or advisor.
- The five (5) years of experience Item (a) makes reference to must have accumulated in the last ten (10) years.

2.5.4.3 **Note 3: Training as investigator**

- The investigator course must have been successfully completed within a period of three (3) years immediately before the request to obtain the certification. The TC will be able to accept a longer period if there is evidence of relevant recent work experience and if it is possible to demonstrate all the established requirements to perform as ARCM accident investigator are met.

2.5.4.4 Note 4: Experience in investigation

a) To fulfil the functions of provisional ARCM investigator

- He must have been part of an investigation team in his area of specialization in at least 9 investigations that have been conducted in his State investigation organization in the last three (3) years.

b) *For the ARCM investigator level*

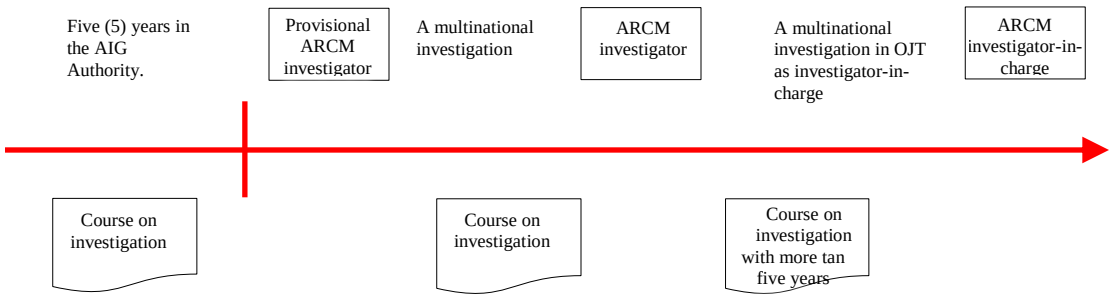
- The provisional investigator must have completed at least one complete multinational investigation. The investigation activity must include the investigation tasks at the site of the accident, collection and analysis of the factual information and the development of the final report.

- The IIC will be required to grade the competence of all members of the investigation team in all multinational investigations.

c) For the ARCM investigator-in-charge (IIC) level

- The ARCM investigator must complete the OJT of a multinational investigation as investigator-in-charge of a multinational investigation with a supervisor that will make a report suggesting a qualification.

Figure 2-1 Progression through the levels of the ARCM multinational investigator



CHAPTER 3

HOW TO REQUEST THE CERTIFICATION

3.1 What to do to request the certification documentation

The documentation for the certification request as ARCM multinational investigator is available at the ARCM website.

3.2 How to fill in and send the request form and documentation

3.2.1 In order to apply for the ARCM multinational investigator certification, the request forms (ARCM-RA1, ARCM-RA2 y ARCM-RA3) must be appropriately filled in, including the required additional material and sent to the ARCM TC.

3.2.2 All the supporting documentation can be sent in Spanish, Portuguese or English and can have attached the certified translations of the originals. This is especially important for education qualifications, training courses and inspections/audits.

3.2.3 All the qualifications presented must be supported with documented evidence. An example of acceptable evidence would be a good-quality copy of the original certificates with the institution issuing the certificate, the degree and issuance date as well as the name of the person receiving the certificate. If this information is not available or it is not clear, more evidence may be requested.

3.2.4 The same applies if a copy of a certificate is not available, for example missing or destroyed. Acceptable evidence would be an official letter from the institution issuing the certificate.

3.2.5 An official transcription with the content of the course would mean acceptable evidence if the date and degree are clearly mentioned.

3.2.6 The lack of documented evidence may be reason for a rejected request.

3.3 How long does the process take?

3.3.1 The ARCM takes a maximum of four (4) weeks for the process of evaluating the request. This amount of time may vary depending on the time required to verify the information sent with the request. If all the information needed is presented, the process may accelerate.

3.3.2 The process has the following sections:

a) **Administrative verification**

All the requests are first verified by the TC in order to ensure all the information needed is included.

b) **Technical evaluation**

The TC evaluates the information provided by the applicant in relation to the certification requirements and verifies one or all the requirements.

- Subsequently, the TC will decide whether it sends the certification to the Chairman of the ARCM Executive Committee.

- The verification is considered an essential element to give credibility to the certification process. Therefore, the TC will pay special attention when checking and verifying the requests in relation to all the aspects of the certification requirements. The evaluations will be carried out as fast as possible.

- When processing the requests, it is probable that it takes longer if the applicant presents qualifications that are incomplete, not common or if the answers of the institutions involved are not timely obtained.

c) **Certification**

The final decision for the certification as investigator is taken by the ARCM Executive Committee. This decision is independent from the evaluation process detailed above. In order to accelerate the process, the members of the Executive Committee will be reported through the fast-track communication method, with no need to get together in order to issue the certification. The Chairman of the Executive Committee will report to the rest of the members of this Committee through the mentioned method.

d) **Issuance of the certification**

- In case the decision of the ARCM Executive Committee is favourable, the applicant and the AIG Authority will be reported in written, with the certification card attached in the corresponding level.

- The details of the certification will be attached to the record of the ARCM certified accident and incident multinational investigators.

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CHAPTER 4

REQUIREMENTS TO RENEW THE CERTIFICATION

4.1 The investigator must renew his certification every three (3) years. The ARCM will send a reminder three months before the expiration of the ARCM multinational accident investigator certification and request that he sends the forms of experience in investigation processes (ARCM-RA3), continuing professional development (ARCM-RA2) and other documents. The documentation sent will be evaluated in relation to the renewal requirements and a decision will be taken for the certification renewal. The ARCM Executive Chairman will report the results.

4.2 The certification renewal includes the following requirements:

- Continuing professional development (DPC)
- Experience in investigations
- Complaint statements
- Compliance with the ARCM investigator code of conduct

4.2.1 Continuing professional development (DPC)

4.2.1.1 For all the levels, the investigator must have completed at least thirty (30) hours of appropriate CPD within a period of three years before the certification renewal.

4.2.1.2 The investigator will be required to provide evidence about compliance of this requirement.

Note. *Appendix 1 includes guidance material about this.*

4.2.2 Experience in investigations

The investigator must record and present his experience of the last three (3) years in ARCM investigations (See ARCM-RA3 form at the ARCM website).

a) For the provisional ARCM investigator level

Having participated in investigation processes of his State as member of an investigation team or as investigator-in-charge.

b) For the ARCM investigator level

The investigator must complete at least one (1) accident investigation as multinational investigator.

c) For the ARCM investigator-in-charge level

The investigator must complete at least one (1) acceptable investigation, performing as investigator-in-charge of a multinational investigation.

4.2.3 Complaint statement

In case there is a complaint statement about an ARCM multinational accident investigator´s conduct, the ARCM Technical Committee will conduct the corresponding investigations in order to determine its origin and veracity and put it at the ARCM Executive Committee disposal for evaluation and following decision.

It is important that the ARCM knows about any complaint since this is part of the certification renewal process.

All the requests for complaints will be investigated. In case there is a complaint against the investigator´s conduct and this was not stated by him, consequences would be more serious and may result in the suspension or withdrawal of the certification.

4.2.4 Compliance with the code of conduct

The investigator is required to make a statement that will always act in compliance with the code of conduct (See Appendix 3).

CHAPTER 5

REQUEST TO UPGRADE

5.1 The investigator can request to upgrade the level at any time. When the initial certification is issued, the experience in multinational investigations and competences required to upgrade will be reported to the investigator. To request to upgrade, the investigator must fill in the ARCM-RA1 form with any required additional information attached.

5.2 A successful request to upgrade will not necessarily imply a change in the date of certification renewal.

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CHAPTER 6

ADDITIONAL INFORMATION

6.1 Certification period

6.1.1 When the applicant gets the certification, this will last for three (3) complete calendar years, and may be renewed for a similar period on the condition that it meets the requirements mentioned in this document.

6.1.2 The certification may be suspended if there is evidence of any failure to comply with the code of conduct and the procedures established in the ARCM regulations.

6.2 Certification cards, certificate and record

6.2.1 Once the certification has been approved, the Chairman of the ARCM Executive Committee will issue the corresponding document and the Technical Committee will deliver a certification card with ARCM-RA4 format to the investigator. All the cards are valid for a period of three years as of the issuance.

6.2.2 The certification card shall be shown at the beginning of an ARCM multinational investigation activity and when necessary. Although the card is issued to the investigator, it belongs to the ARCM and it must be returned upon request.

6.2.3 The ARCM certificate has the intention of demonstrating formal recognition of the certification in a specific level. It must not be used as proof of certification.

6.2.4 The record of all the ARCM multinational investigators is published in the ARCM website.

6.3 Appeals and complaints

The investigator has the right to appeal any decision on the certification taken by the ARCM, as well as any complaint filed about his performance as ARCM investigator.

6.4 Conditions to keep the certification

6.4.1 The ARCM has the right to withdraw the certification as ARCM multinational investigator when there is evidence of noncompliance of the certification criteria. In most cases, the certification withdrawal will be preceded by an offer for an alternative level for a period of time long enough to gather the requirements and go back again to the previous level.

6.4.2 If during the certification period the ARCM multinational investigator stops belonging to his AIG Authority, the certification will automatically become invalid and the investigator will not be able to enjoy its privileges.

6.4.3 Likewise, the ARCM reserves the right to take any action against the certification if the code of conduct is not being followed. The options available are suspension or, under serious circumstances, the certification withdrawal.

6.5 Confidentiality

The ARCM will deal with the information received in a way that the certification is strictly confidential.

6.6 Revisions

The revision of this document will be made by the TC and approved by the Executive Committee of the ARCM States, in a plenary meeting or through the fast-track communication method.

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ATTACHMENT 1

CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

a. The CPD is a scheme to encourage the multinational investigator to continuously update his professional knowledge, technical and non-technical, personal abilities and competencies with the purpose of optimizing the performance. The CPD concept and its added value is well-known in all specialties.

b. When renewing the certificate, the investigator must demonstrate that he has completed thirty (30) hours of CPD in the last three years in areas related to safety and accident investigation.

c. Due to the fact that there are many subjects that strengthen the competence of the multinational investigator, they have been put into groups according to three main objectives:

1. To strengthen the methodology and procedures to conduct the technical investigation of the events that occurred according to the State AIG regulations in accordance with the provisions of ICAO Annex 13 and new procedures or directives issued by the organization.

2. To strengthen and update the different sources where information can be taken from and the interrelation between them according to the area of knowledge, and adapting themselves in order to join interdisciplinary work teams.

3. To strengthen and update the investigation staff on the appropriate tools to make a logical analysis of the facts and evidence in order to arrive at demonstrable conclusions.

d. It is also acceptable that there is not a unique learning method that can be applied to all the multinational investigators. Therefore, it will be accepted that the CPD is acquired informally (own study and readings) as well as formally (class training). It is acceptable that some forms of acquiring CPD are more effective than others, so a “deliberation” system is applied where some activities are more prudent than others. The activities are divided into three (3) categories:

1. Unstructured: where three (3) hours are accepted as one CPD hour. It includes distance learning and open studies that are not examined and there are no grades, the reading of professional and technical magazines, books and other publications, relevant aspects of on-the-job training, where the objectives have been planned and identified.

2. Half-structured: where two (2) hours are accepted as one CPD hour. It includes non-interactive readings, meetings, conferences, informal meetings of social nature professional organizations, investigation, elaboration and presentation of conferences/courses, articles publication, open education and distance learning involving evaluation and grades.

   Note.- In order to pass the unstructured and half-structured activities, the investigators shall present works in relation to the aforementioned work to the Technical Committee and Executive Committee for approval.

3. Structured: where every hour is accepted as one CPD hour. Examples of this category would be interactive and participatory courses and seminars, formal meetings of professional organizations with formal presentations and the participation in the development of regulatory requirements.

4. Regarding all the aforementioned categories, the unstructured one will not be able to be higher than fifteen (15) hours of the acceptable CPD.

5. It is the responsibility of the investigator to provide enough evidence of each activity. This implies that records and verification of the activities must be made and kept. The CPD form (ARCM-RA2) has been developed for that purpose.

ATTACHMENT 2

DEFINITIONS

Certification

Formal evaluation and confirmation issued by the competent authority regarding aviation safety, or at the behalf of such authority, that a person has the necessary competencies to fulfil the functions assigned at the level the competent authority considers acceptable.

TC

ARCM Technical Committee

It assigns the AIG specialists and, if required, other specialists in areas related to accident and incident investigation, such as specialists in safety, ADREP/ECCAIRS system, risk management analysis, etc., requested by the Chairman to the Executive Committee and assigned by their corresponding States. In order to fulfil the assigned AIG functions, the appointed specialists will be able to work at the ARCM headquarters, at their own States or in other ARCM States, as agreed by the Chairman of the Executive Committee, the Executive Committee and the ARCM States.

ARCM multinational investigation team

A team comprised of ARCM multinational aircraft accident investigators, assigned by the Chairman of the Executive Committee at the request of the ARCM Technical Committee in order to get involved in a multinational investigation process. Its intervention will be subject to the request of an ARCM member State and the approval by the Executive Committee.

ARCM multinational investigator

A person legally competent to act as accident investigator in one of the ARCM States, assigned by his State in order to get involved in multinational investigation processes and that has demonstrated the competencies required and is in the records of the ARCM multinational accident and incident investigators.

ATTACHMENT 3

CODE OF ETHICS AND CONDUCT

It is a condition for the certification that the multinational investigator is committed to act and be governed by the following code of ethics and conduct.

The multinational accident investigator shall:

1. Act in a reliable and impartial way in relation to the ARCM, AIG Authority of the investigator, AIG Authority responsible for the investigation and any other organization involved in an investigation that has been conducted by the multinational investigator or by staff under his authority or supervision;

2. inform the ARCM about any relation or conflict of interests with the investigation process before accepting any function as multinational investigator;

3. not accept any type of influence, gift, commission, discount, or any other type of profit from the service provider that is going to be investigated, his representatives or interests parties;

4. not comment on nor disseminate information about the findings or their parts, or any other information collected during the investigation to people external to the multinational investigation process, unless it is established in the State AIG regulations or ARCM regulations provided that it is authorized by the competent authority;

5. not act in a way that can damage the reputation or interests established in the ARCM AIG regulations;

6. not act in a way that can damage the ARCM credibility, interests or reputation;

7. in case any violation to this code of conduct is reported, he shall cooperate in any formal investigation proceeding.

ATTACHMENT 4

ARCM MULTINATIONAL INVESTIGATOR CERTIFICATION CARD

ARCM-SAM
MECANISMO REGIONAL DE COOPERACIÓN AIG DE SUDAMÉRICA

ACCIDENT INVESTIGATOR

DANIEL BARAFANI – ARG

AIG. 0001

Valid until 11.03.17

ARCM-SAM
MECANISMO REGIONAL DE COOPERACIÓN AIG DE SUDAMÉRICA

This document identifies the holder as aircraft accident and incident investigator of the South American AIG Regional Cooperation Mechanism (ARCM) and its use is personal and non-transferrable.

The ARCM States are requested to provide this document´s bearer with the necessary facilities.

In case of emergency or if you are not the holder of this document, please call the South American Regional Office in Lima, Peru, to the following phone numbers.

(511) 6118686 Ext. 108/112/139

Chairman of the ARCM Executive Committee

Information about the holder
DANIEL BARAFANI
DNI: 123456789 ARG
GS. O RH +
NAC: 01.01.1900

ATTACHMENT 5

APPOINTMENT OF THE MULTINATIONAL INVESTIGATION TEAM

1. At the request of a member State or other State, of a multinational investigation team, investigator-in-charge IIC, investigator, specialist or expert, to conduct or participate in an accident or serious incident investigation or part of it, the Technical Committee shall propose the team or multinational investigator according to the characteristics of the accident, taking into account what is described in Section 3, which shall be approved by the ARCM Executive Committee.

2. The ARCM multinational investigation team will be set up by a group of multinational investigators, whose amount will be determined by the magnitude and complexity of the investigation, unless otherwise stated in an agreement signed by the States. One of them will be appointed as investigator-in-charge of the investigation (IIC). The other members of the team can have any qualifications, whether he is provisional ARCM investigator, ARCM investigator or ARCM investigator-in-charge.

3. The ARCM Technical Committee shall avoid that the multinational investigation teams are composed of the same investigators, as well as the appointment of investigators as specialists and experts, with the aim of allowing the participation of all the investigators of the States recorded in the ARCM.

Note.- *The Technical Committee will have a record of the participation of the multinational investigators in order to keep a fair and transparent policy considering the availability and sequence of the record established. For this, the Technical Committee must publish at the ARCM webpage the record and monitoring of the participation of the multinational investigators in the investigation processes. This information will only be public for the States.*

4. This appendix establishes the minimum requirements for the appointment of the investigators staff of the ARCM AIG authorities; they can be appointed as part of a multinational investigation team:

a) To comply with what is established in the “ARCM multinational investigator certification” document, which can be found at the ARCM webpage:

www.arcm-sam.org

b) To be part of the ARCM multinational investigators records that is published at the ARCM webpage.

c) Not to receive any objection from any ARCM State.

5. The AIG Authority of an ARCM member State can request an investigator as observer for the multinational investigation team. The AIG Authority requesting the inclusion will cover the costs that the participation of its additional investigator in the investigation implies.

6. The additional investigators of a State signing the Agreement will be appointed by the States that request

7. Requirements

Every member of a multinational investigation team must be registered as an ARCM multinational investigator; therefore he must have approved the ARCM investigator course and meet all the requested requirements for the ARCM accident investigator certification.

Agenda Item 10 Other matters

ARCM website proposal

10.1 Regarding this topic, the Meeting took note of the SAM ARCM website and institutional mail account proposals.

10.2 In this regard, it highlighted the importance of implementing the ARCM website as the official communication channel among all States for the exchange of information, contributing to the seriousness and reliability of the ARCM.

10.3 It also agreed to provide the basic website services, such as email, comments, calendar, and specific services like access to the SDCPS, in addition to technical support and documentation.

10.4 As noted during the presentation, website hosting was independent of any State. The holder of the website was the chairperson of the ARCM Executive committee, who would designate a technical expert to act as website administrator.

CONCLUSION AIG-SAM/3-09 Approval of the ARCM website

a) Approve the ARCM website.

b) **Attachment A** to this part of the report contains the SAM ARCM website manual.

Proposed ARCM logo

10.5 Under this agenda item, a proposal was presented of the institutional logo to represent the SAM AIG Regional Cooperation Mechanism (ARCM).

10.6 In this regard, the Meeting analysed three logo proposals presented by Uruguay, Colombia, and Argentina. The proposal of Argentina was selected by members of the ARCM Executive Committee, who adopted the following conclusion:

CONCLUSION AIG-SAM/3-10 Approval of the ARCM logo

a) Approve the ARCM logo.

b) **Attachment B** to this part of the report contains the ARCM logo.

Proposed venue for ARCM Executive Committee meetings

10.7 Continuing with the agenda items, the attending States were requested to offer their States for hosting the Fourth Meeting of AIG Authorities (AIG-SAM/4) to be held in 2017.

10.8 In response to this request, Colombia and Brazil offered to host the AIG-SAM/4 meeting. The Meeting went on to vote for the State that would host the AIG-SAM/4 meeting in 2017. The majority of States chose Brazil as venue for the next AIG meeting, and Colombia for the 2018 meeting. Accordingly, the Meeting adopted the following conclusion:

CONCLUSION AIG-SAM/3-11 Venues for the Fourth and Fifth Meetings of AIG Authorities of ARCM States

Designate Brazil as venue for the Fourth Meeting and Colombia as the venue for the Fifth Meeting of AIG Authorities of ARCM States, on the dates to be determined by such States.

Review of the proposal of ARCM organization and planning manual

10.9 Under this agenda item, the Secretariat presented the proposed ARCM organisation and planning manual.

10.10 In this regard, the Meeting felt that, in accordance with Article 26 of the Convention on International Civil Aviation, the State in which the accident occurs has the obligation to institute an inquiry into the circumstances thereof. This obligation can only be fulfilled if there is appropriate aircraft accident investigation legislation in place which contemplates the establishment of an accident investigation bureau (or committee, board, or other body) for the investigation of aircraft accidents and incidents that is independent of the State aeronautical authorities and other bodies that might interfere in the conduction or the object of an investigation.

10.11 The accident investigation bureau must be strictly objective and totally impartial, and must also be considered as such. Said bureau shall be established in such a way that it is not subject to political or other type of interference or pressure.

10.12 There must be appropriate legislation that defines the rights and powers of the aircraft accident investigation bureau. The accident investigation bureau shall be authorised by law to have immediate and unrestricted access to all relevant elements, without requiring prior authorisation from legal bodies or other authorities.

10.13 According to protocol question (PQ) AIG 6.003, the State must have formally designated a specific organisation/committee/council or other body responsible for the investigation of aircraft accidents and serious incidents, and if the State has not done so, it must verify if official agreements have been entered into with other State(s) to delegate the investigation.

10.14 Likewise, PQ 6.101 requires the State to establish an organisational structure for the investigation of aircraft accidents and serious incidents, which should clearly define its lines of responsibility.

10.15 In turn, PQ 6.102 requires a clear definition of the functions and responsibilities of the authority responsible for the investigation.

10.16 The following 49 PQs are based on Part I of Doc 9756 – Organization and planning, which corresponds to 42% of all AIG-related PQs (113):

6.001; 6.003; 6.005; 6.007; 6.009; 6.011; 6.021; 6.101; 6.102; 6.103; 6.105; 6.107; 6.109; 6.111; 6.113; 6.115; 6.119; 6.120; 6.121; 6.122; 6.123; 6.131; 6.133; 6.135; 6.201; 6.203; 6.205; 6.207; 6.209; 6.211; 6.301; 6.303; 6.311; 6.313; 6.315; 6.317; 6.319; 6.343; 6.345; 6.349; 6.351; 6.353; 6.355; 6.357; 6.359; 6.375; 6.379 and 6.380

10.17 Upon analysing the proposed ARCM organisation and planning manual, the Meeting adopted the following conclusion:

CONCLUSION AIG-SAM/03-12 Approval of the ARCM organisation and planning manual

a) Approve the First edition of the ARCM organisation and planning manual.

b) **Attachment C** to this part of the report contains the approved First edition of the ARCM organisation and planning manual.

Review of the proposed Manual on accident and incident investigation policies and procedures of the ARCM

10.18 Under this agenda item, the Secretariat presented the proposed Manual on aircraft accident and incident investigation policies and procedures of the ARCM.

10.19 In this regard, the Meeting considered that the authorities responsible for accident investigation should establish policies and procedures describing their accident investigation duties, including organisation and planning, investigation, and reports.

10.20 The proposed aircraft accident and incident investigation policies and procedures manual was presented so that ARCM States could have a tool for drafting their respective accident and incident investigation policies and procedures manuals. This manual is consistent with international best practices and includes policies and procedures examined during ICAO USOAP audits.

10.21 Protocol question (PQ) AIG 6.343 requires the State to establish and apply a process for investigating the different types of accidents, and to publish guidelines to help determine the scope of an accident investigation in accordance with its circumstances and the lessons expected to be learned from the safety investigation.

10.22 Likewise, PQ 6.345 requires the State to establish a process for investigating serious incidents and guidelines to help determine what type of incidents must be investigated by the authority in charge of the investigation, in accordance with Annex 13.

10.23 Similarly, 59 of the 113 AIG-related PQs refer to ICAO Doc 9962 – Manual on accident and incident investigation policies and procedures, representing 52.21%. These PQs are as follows:

6.109; 6.115; 6.119; 6.121; 6.122; 6.123; 6.125; 6.129; 6.131; 6.135; 6.201; 6.207; 6.301; 6.303; 6.311; 6.315; 6.317; 6.319; 6.327; 6.329; 6.343; 6.345; 6.347; 6.349; 6.351; 6.353: 6.357; 6.361; 6.363; 6.365; 6.369; 6.375; 6.377; 6.379; 6.380; 6.381; 6.391; 6.393; 6.395; 6.403; 6.404; 6.407; 6.409; 6.411; 6.413; 6.415; 6.421; 6.423; 6.425; 6.429; 6.431; 6.435; 6.437; 6.501; 6.503; 6.505; 6.507; 6.509 and 6.511.

10.24 After analysing the proposed manual on aircraft accident and incident investigation policies and procedures of the ARCM, the Meeting adopted the following conclusion:

CONCLUSION AIG-SAM/03-13 Approval of the manual on aircraft accident and incident investigation policies and procedures of the ARCM

a) Approve the First edition of the manual on aircraft accident and incident investigation policies and procedures of the ARCM.

b) **Attachment D** to this part of the report contains the approved First edition of the manual on aircraft accident and incident investigation policies and procedures of the ARCM.

Progress made in the ARCM programme of activities

10.25 Upon analysing this item, the Meeting took note of the progress made in the 2016 programme of activities of the ARCM of the South American Region.

10.26 In this regard, the Meeting took note that the 2016 programme of activities was being implemented with respect to activities scheduled for January, February, and March in the areas of harmonisation of regulations; activities with multinational teams; training activities; seminars and meetings; and development of the safety data collection and processing system (SDCPS).

10.27 Likewise, the Meeting took note of the working papers (WPs) prepared for the Third Meeting of AIG Authorities of South America (AIG-SAM/03).

10.28 Regarding activities with multinational teams, the Meeting took note that the ARCM had reviewed the protocol questions (PQs) with the AIG Authorities of the following States: Ecuador, Suriname, Guyana, and Uruguay. Furthermore, a virtual meeting had been scheduled with the *Junta de Investigación de Accidentes de Aviación Civil* (JIAAC) of Argentina in order to start reviewing all the AIG-related PQs on the third week of March 2016.

10.29 Regarding training activities and seminars, the ARCM circulated among its States the respective summons to the first course on the ADREP/ECCAIRS system within the framework of the ARCM, and to the first course of AIG investigators of the ARCM.

10.30 With respect to the safety data collection and processing system (SDCPS), the ARCM ADREP/ECCAIRS panel drafted the corresponding working paper for analysis by the Meeting. Information was also provided on the working paper concerning the ARCM website.

10.31 **Attachment E** contains detailed information on the activities carried out in the working areas mentioned in Paragraphs 10.25 to 10.30.

Proposal to incorporate BEA and NTSB into the ARCM as special observers

10.32 Continuing with the agenda items, the Meeting was presented with WP/17 concerning the proposal to incorporate BEA (investigation organisation of France) and the NTSB (investigation organisation of the United States) into the ARCM as *special observers.* Both entities sent the respective letters, which are attached to this part of the report.

10.33 It should be noted that BEA sent a representative to participate in the AIG-SAM/3 meeting and learn more about the ARCM. This representative also made a brief presentation of institutional information about BEA.

10.34 It was stated that it was extremely important for the ARCM, during this consolidation stage, to receive support from a body such as BEA, which is internationally recognised in the area of aircraft accident investigation.

10.35 Both BEA and the NTSB, upon being incorporated into the ARCM as special observers, can facilitate collaboration and cooperation to AIG organisations of ARCM member States, not only in the technical investigative field, but also in the area of training and exchange of information.

10.36 At the request of BEA and the NTSB, the Meeting unanimously adopted the following conclusion.

CONCLUSION AIG-SAM/03-14 **Approval of the request of BEA and the NTSB to join the ARCM as special observers**

a) Approve the incorporation of BEA of France, and the NTSB of the United States into the ARCM as special observers.

b) **Attachment F** to this part of the report contains the letter of request submitted by BEA.

c) **Attachment G** to this part of the report contains the letter of request submitted by the NTSB.

AIG Regional Cooperation Mechanism (ARCM) of South America

South American ARCM Web Page

March 2016

Content

Definitions

Antivirus	Software that detects and removes viruses on a computer.
Antispam	Method to prevent junk email. There are various techniques for that.
Domain	Unique name that identifies a web site.
E5Web	ADREP/ECCAIRS web interface, used for the SDCPS.
Hosting	Service of hosting web documents, associated to a specific domain.
https	Hiper text transfer protocol secure
IMAP	Internet Message Access Protocol, electronic mail management protocol.
Pc	Personal computer
POP	Post Office Protocol, electronic mail management protocol.
RWD	Responsive web design
SDCPS	ARCM Safety Data Collection and Processing System
Smartphone	Mobile phone device with internet access.
ssl	Secure socket layer
www	World wide web

ARCM Web Site Implementation

Introduction

An organization needs to communicate its mission, strategies and services to the development environment and the community in general; at the moment the standard is World Wide Web. Therefore, the ***arcm-sam.org*** web platform was developed.

Web Site Project

Stages

Stage 1 – Survey and planning

In this stage all the information and current standards of design and provisions of web services were gathered by the ARCM.

Members of the Technical Committee were interviewed to identify solutions to the requirements.

Stage 2 – Design and layout

Functional demos and layouts adaptable to mobile devices were created.

Stage 3 – Registration and implementation

The domain international registration was made, the hosting was configured and the finished design was stored.

Considerations and characteristics

Domain

A website domain is the unique identification name where the DNS (*Domain Name Server*) translates the IP addresses (numerical) of every website in the world to memorable terms and easy to find. This abstraction makes it possible for a website to move from a geographical place to another one on the Internet, even when the change implies a different IP address.

Therefore the name “arcm-sam” was implemented, since it is easy to remember and it was available. Regarding the extension, there is a big list of extensions that must be applied according to the mission and function of the organization; there follow some explanatory examples:

.com (commercial)

.org (organizational)

.net (sites organized in nets)

For arcm-sam, the extension ".org" was selected because it appropriately adapts to the ARCM activities and functionalities; the domain is eventually the following:

www.arcm-sam.org

Note: Since the ARCM is an international mechanism, the domain registration was done internationally so that there were no extensions from a specific country (.ar, .py, .pe, .uy, .br, etc.).

Regarding ownership, the arcm-sam.org domain has the following people in charge:

Owner: President of the ARCM Executive Committee

Administrative Manager: Member of the Technical Committee

Technical Manager: Site Manager

The ownership and responsibilities are transferable.

"Hosting"

The web documents have to be hosted in a high availability (24x7) server, with uninterrupted power supply (UPS/Generator) and 50 GB data storage capacity and monthly transference of at least 300 GB/month. Additionally, it is advisable to have the antivirus and antispam service and an automatic backup system.

Due to the fact that the ARCM does not have the infrastructure necessary for the implementation of a web server with the aforementioned characteristics, a hosting service that meets the requirement was hired.

Note: the payment is every three months, and transferable.

Design

One of the main challenges for the success of the project was creating a design appropriate to the organization it represents; in this sense the design guidelines are simple and minimalist. A clear colour palette (*green, grey and white*) and basic font (*arial*) were chosen, focusing users´ attention on ARCM relevant points such as the schedule of activities, meetings, working papers and the SDSCP.

Figure Nº 1 - Homepage (Spanish)

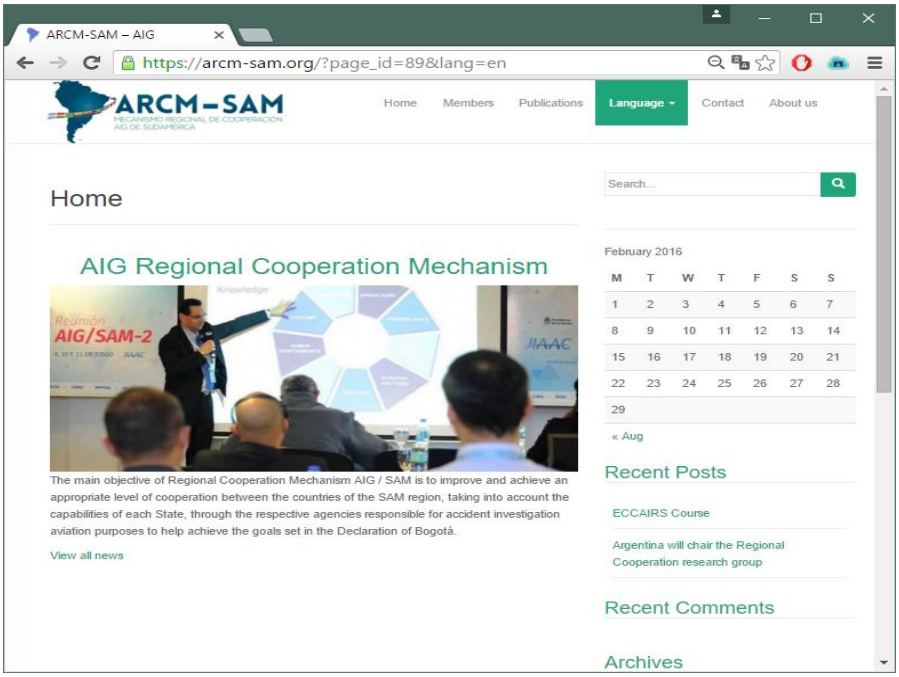
Another important point of this diagram is that it has RWD (*responsive web design*) that adapts the web page look to the device being used (*tablets, smartphones, desktop, etc.*), which it provides adaptability and facilitates access to the website information.

Figure Nº 2 - ARCM web (Smartphone)

Functionality

Regarding functionality, a website´s goal is to be useful. Therefore, information is precise, menus are clear and access to all information can happen in less than 5 clicks, besides the fact that all the content is in Spanish/English.

Figure Nº 3 – Home (English)



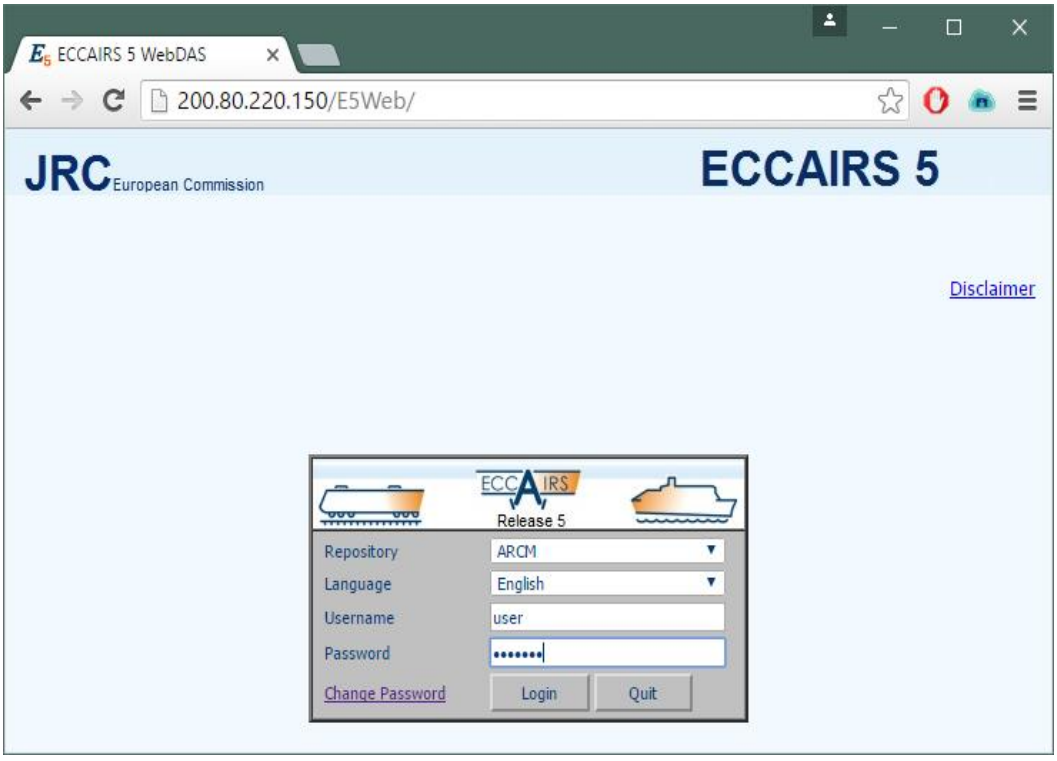
Main functions

Access to the SDCPS

Users can access the system (it requires authentication) with all the functionalities of the desktop platform, make notifications, analyse the information, graphics, etc., reported to the ARCM from any device connected to the Internet, entering the following:

https://www.arcm-sam.org/eccairs

Figure Nº 4 – Access to the SDCPS of the ARCM (ECCAIRS)



ARCM Documentation

All the ARCM official documentation must be available in the site in PDF format, public as well as confidential information (it requires authentication).

Schedule of activities

Every activity of the ARCM will be written on the schedule of the homepage.

Confidential news

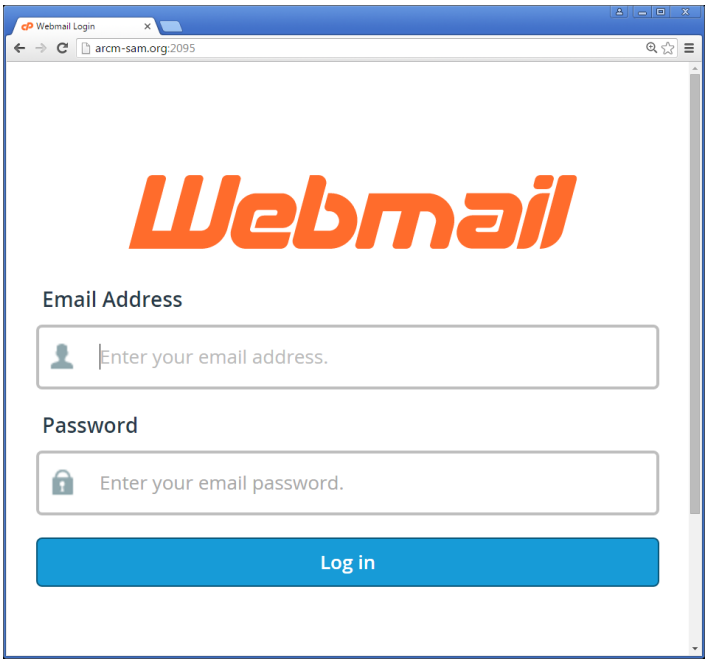
News is a publication that can have multimedia content, documents, links, working papers, etc. Confidential news is only visible to authorized and registered users allowing them making comments similar to the ones in debate forums.

Webmail

The ARCM institutional webmail (*user@arcm-sam.org*) can be configured for email clients chosen by the user (Outlook, thunderbird, etc.) in multiple devices with POP or IMAP settings. However, they can access the institutional email entering the following address:

https://arcm-sam.org/webmail

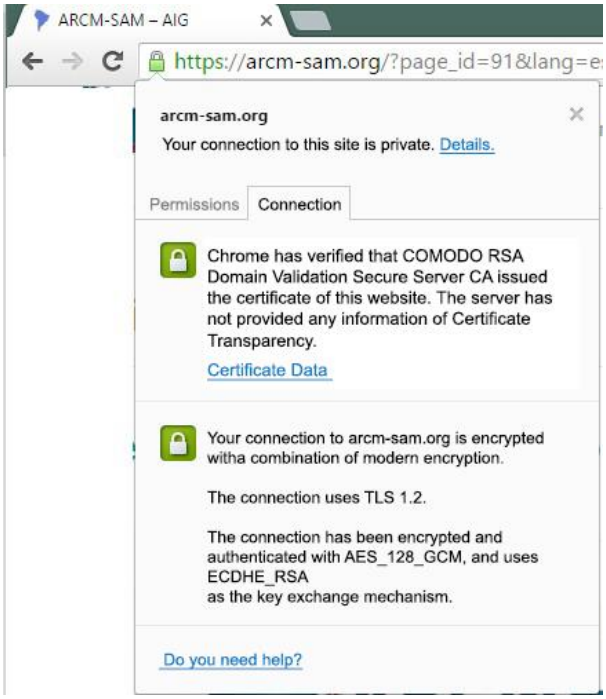
Figure Nº 5 – Webmail



Security

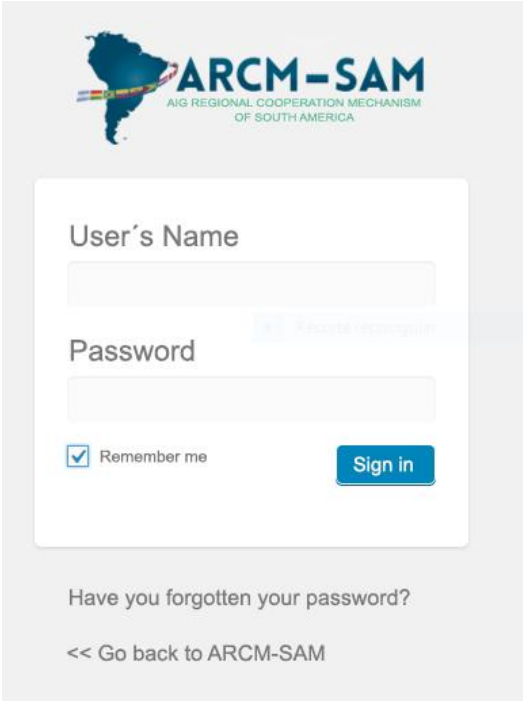
Information security is the most important subject in the development of a web platform. The ARCM website has a SSL security certificate (https / green lock) indicating that the information provided is reliable; it is a required protocol for many services offered in the webpage.

Figure Nº 6 – Security Certificate (SSL)



The registered users can recover their access codes with the registered email.

Figure Nº 7 – Users´ Access



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- Joint Research Centre http://eccairsportal.jrc.ec.europa.eu (ECCAIRS).

Argentina

ARCM institutional logotype for the documentation

90 px

300 px

Negative version

Web addresses and mobile applications Icon toolbar (16 x 16 pixeles ó 32 x 32 pixeles)

Uruguay

South American AIG Regional Cooperation Mechanism (ARCM)

ARCM AIG Authority organization and planning manual

Approved by South American ARCM General Coordinator and published under his responsibility

First edition
March 2016

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AMENDMENTS

Amendments are published on the ARCM website www.arcm-sam.org. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

FOREWORD

The purpose of this manual is to encourage the uniform application of the Standards and Recommended Practices contained in Annex 13 to the Convention and to provide information and guidance to the AIG Regional Cooperation Mechanism (ARCM) member States on the procedures, practices and techniques that can be used in aircraft accident investigations. Since accident investigations vary in complexity, a manual of this kind cannot cover all eventualities. The more common techniques and processes, however, have been included. Although this manual will be of use to experienced and inexperienced investigators alike, it is **not** a substitute for investigation training and experience.

Because this manual deals with both accident and incident investigations and, for reasons of brevity, the term “accident investigation”, as used herein, applies equally to “incident investigation”.

The following ICAO documents provide additional information and guidance material on related subjects:

- Annex 13 — *Aircraft Accident and Incident Investigation*;
- Annex 9 — *Facilitation*
- Manual of Aircraft Accident and incident investigation (Doc 9756)
- *Manual on Accident and Incident Investigation Policies and Procedures* (Doc 9962);
- *Manual on Regional Accident and Incident Investigation Organization* (Doc 9946);
- *Human Factors Training Manual* (Doc 9683);
- *Manual of Civil Aviation Medicine* (Doc 8984);
- *Hazards at Aircraft Accident Sites* (Circular 315);
- *Training Guidelines for Aircraft Accident Investigators* (Circular 298); and
- *Human Factors Digest No. 7 — Investigation of Human Factors in Accidents and Incidents* (Circular 240).

This manual will be amended periodically as new investigation techniques are developed and new information becomes available.

Throughout this manual, the use of the male gender should be understood to include male and female persons.

Readers are invited to submit material for possible inclusion in subsequent editions of this manual. This material should be addressed to:

General Coordinator
International Civil Aviation Organization
Av. Víctor Andrés Belaúnde N° 147
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Centro Empresarial Real
San Isidro – Lima 15073, Peru

TABLE OF CONTENTS

Chapter 1

THE OBJECTIVE OF AN AIRCRAFT ACCIDENT INVESTIGATION

1.1 GENERAL

1.1.1 The sole objective of an investigation into an aircraft accident or incident conducted under the provisions of Annex 13 shall be the prevention of accidents and incidents. Annex 13 also states that it is not the purpose of an investigation to apportion blame or liability. Any judicial or administrative proceedings to apportion blame or liability shall be separate from any investigation conducted under the provisions of Annex 13.

1.1.2 An aircraft accident or incident provides evidence of hazards or deficiencies within the aviation system. A well-conducted investigation shall identify all immediate and underlying systemic causes and/or contributing factors of the accident or incident. The investigation may also reveal other hazards or deficiencies within the aviation system not directly connected with the causes of the accident. The emphasis of an aircraft accident or incident investigation shall be on determining why the accident or incident happened and on recommending appropriate safety actions aimed at avoiding the hazards or eliminating the deficiencies. A properly conducted accident investigation is an important method of accident prevention.

1.1.3 An investigation shall also determine the facts, conditions and circumstances pertaining to the survival or non-survival of the occupants of the aircraft. Recommendations for improvements to the crashworthiness of the aircraft are aimed at preventing or minimizing injuries to aircraft occupants in future accidents.

1.1.4 The Final Report, which is produced at the completion of an investigation, constitutes the official conclusions and record of the accident or incident.

1.2 DEFINITIONS

In addition to the definitions contained in Chapter 1 of Annex 13, the following definitions apply to this manual:

Occurrence. Any accident or incident associated with the operation of an aircraft.

Major accident investigation. An investigation into an accident involving a large aircraft and usually involving fatalities.

Smaller investigation. An investigation into an incident involving any aircraft or into an accident involving a small aircraft.

Chapter 2

THE ACCIDENT INVESTIGATION AUTHORITY

2.1 STRUCTURE

2.1.1 In conformity with Article 26 of the Convention on International Civil Aviation, it is incumbent on the State in which an aircraft accident occurs to institute an inquiry into the circumstances of the accident. This obligation can be met only when appropriate legislation on aircraft accident investigation is in place. Such legislation shall make provision for the establishment of an accident investigation authority (or commission, board or other body) for the investigation of aircraft accidents and incidents that is independent from State aviation authorities and other entities that could interfere with the conduct or objectivity of an investigation.

2.1.2 The accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. The authority shall be established in such a way that it can withstand political or other interference or pressure. Many States have achieved this objective by setting up their accident investigation authority as an independent statutory body or by establishing an accident investigation organization that is separate from the civil aviation administration. In these States, the accident investigation authority reports directly to Congress, Parliament or a ministerial level of government (see Figure I-2-1 and Figure I-2-2 as examples).

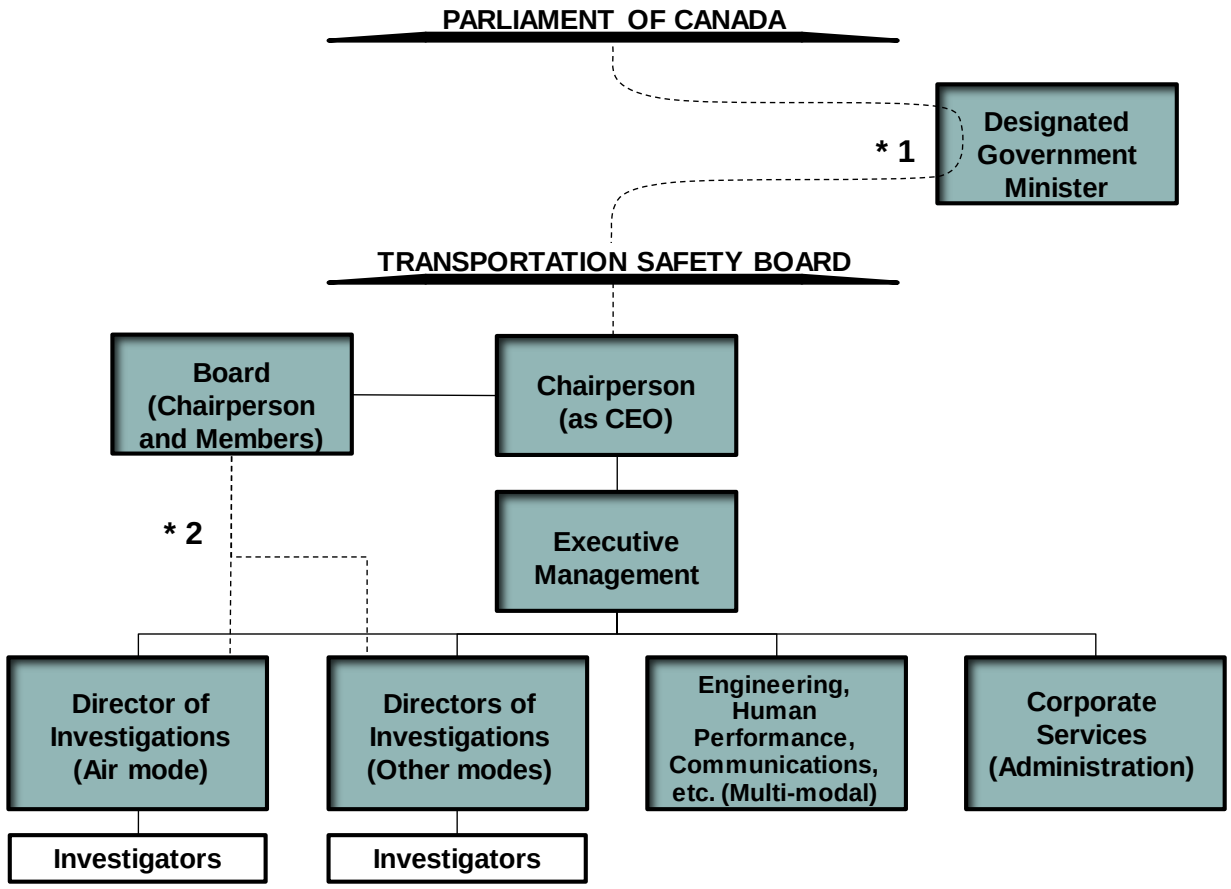
2.1.3 In accordance with Annex 13, the AIG Authority of State conducting the investigation shall designate the investigator-in-charge of the investigation, who will be responsible for the organization, conduct and control of the investigation. The investigator-in-charge would preferably come from the accident investigation authority. Notwithstanding, nothing precludes the assignment of the functions of the investigator-in-charge to a commission or other body.

2.1.4 In some ARCM member States, there might be a need for the accident investigation commission to be composed of members seconded from the civil aviation authority. It is essential that such a commission report directly to a ministerial level of government so that the findings and safety recommendations of the investigation are not diluted during passage through regular administrative channels.

2.1.5 Experts seconded from the civil aviation authority must be responsible to the investigator-in-charge for the duration of an investigation. This is not an ideal arrangement; in particular because seconded personnel may fear retribution when they return to their normal duties shall the civil aviation authority react unfavorably to the findings in the Final Report of the investigation. The AIG Authority ARCM member States shall take steps to alleviate any possibility of retribution.

2.1.6 The accident investigation authority is required to determine the causes and/or contributing factors of an accident or incident and to make safety recommendations. However, responsibility for the implementation of safety recommendations shall normally rest with the civil aviation authority. This division of responsibility is appropriate since the civil aviation authority has overall responsibility for the regulatory framework of aviation and its development.

2.1.7 ICAO encourages States to foster regional accident and incident investigation organizations and regional aviation safety groups. Regional arrangements may include aircraft accident and incident investigation matters, such as the delegation of investigations or parts thereof, or enlisting the mutual assistance and cooperation of States in an investigation.



Notes

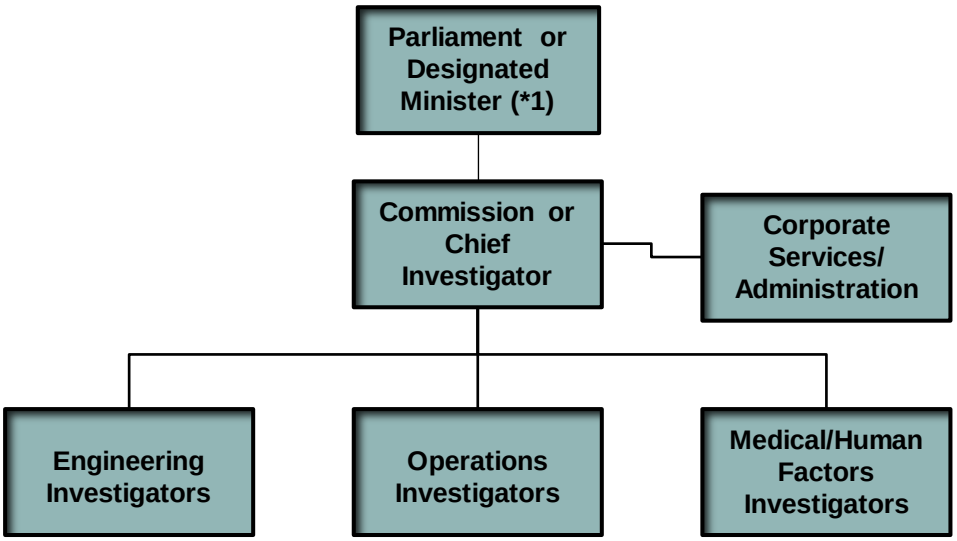
*1 The Board reports annually to Parliament through a Minister who tables the Board's annual report and audited financial statements. The Minister's responsibilities are not related to transportation or the legal system.

*2 The Directors have legislative authority to conduct investigations in accordance with Board policies and to report to the Board with respect to their investigations.

Figure I-2-1. Structure of the Transportation Safety Board of Canada

2.2 LEGISLATION

2.2.1 Appropriate legislation that defines the rights and responsibilities of the aircraft accident investigation authority is required. The accident investigation authority shall, through legislation, have immediate and unrestricted access to all relevant evidence without requiring prior consent from judicial bodies or other authorities. Accident investigators shall be aware that aircraft accidents may be subject not only to a technical investigation but also to some form of judicial, regulatory, administrative and/or disciplinary inquiry. However, accident investigation procedures shall not be constrained by these types of processes, and national legislation and regulations shall specify the procedures to be followed in order to keep the technical investigation separate from judicial or administrative proceedings. The legislation shall make it clear that accident prevention is the sole objective of the investigation and shall emphasize that it is not the role of the accident investigation authority to apportion blame or liability.



Note
*1 The investigation authority shall not report to the same Minister responsible for the regulation and/or safety oversight of civil aviation in the State or to a judicial authority.

Figure I-2-2. Example of a streamlined organizational structure

2.2.2 The legislation shall also protect certain documents and information obtained in the course of an investigation from public disclosure. To provide further safeguards in this respect, AIG State Regulation, Chapter 5, states that the following records shall not be made available for purposes other than accident or incident investigation, unless the appropriate authority for the administration of justice in the State conducting the investigation determines that the benefits of their disclosure outweigh the adverse domestic and international impact such action may have on that or any future investigations:

a) all statements taken from persons by the investigation authorities in the course of their investigation;

b) all communications between persons having been involved in the operation of the aircraft;

c) medical or private information regarding persons involved in the accident or incident;

d) cockpit voice recordings and transcripts from such recordings;

e) recordings and transcriptions of recordings from air traffic control units;

f) cockpit airborne image recordings and any part or transcripts from such recordings; and

g) opinions expressed in the analysis of information, including flight recorder information.

2.2.3 These records shall be included in the Final Report or its appendices only when pertinent to the analysis of the accident or incident, and those parts of the records not relevant to the analysis shall not be disclosed. This is

essential since information contained in these records, which includes information given voluntarily by persons interviewed during the investigation, could be utilized inappropriately for subsequent disciplinary, civil, administrative and criminal proceedings. If such were the case, people would, in future, be reluctant to openly disclose information to investigators, which would impede the investigation process and seriously affect flight safety.

2.3 FUNDING

The accident investigation authority shall have ready access to sufficient funds to enable it to properly investigate those accidents and incidents which fall within its area of responsibility. Since it is impossible to accurately forecast annual budget requirements for accident investigation, provision shall be made for supplementary funding as required.

2.4 PERSONNEL

2.4.1 Aircraft accident investigation is a specialized task, which shall be undertaken only by qualified investigators. However, many AIG Authority of States will not have personnel dedicated solely to accident investigation. In these States, appropriately qualified personnel shall be identified and trained in accident investigation techniques prior to being assigned to accident investigation duties. When assigned to an accident investigation, such personnel shall be relieved of their regular duties.

2.4.2 The investigation of an aircraft accident is a daunting task that could be almost unlimited in scope. The more often investigators participate in investigations, the more experienced they become. As they gain experience, they soon realize that the need to increase their knowledge and upgrade their skills is never-ending. While training is essential, improvement in an investigator's capabilities generally results from a personal commitment to excellence. Since the outcome of an accident investigation is largely dependent on the skill and experience of the investigators assigned to it, at least one experienced investigator shall be assigned to each investigation to ensure an adequate level of experience.

Note.—ARCM AIG training programme of South America*, discusses the experience and employment background required for training as an aircraft accident investigator. It also outlines the progressive training that is considered necessary to qualify a person for the various investigation roles, including appointment as the investigator-in-charge of an investigation into a major accident involving a large transport category aircraft.*

2.4.3 It is essential that accident investigators have a practical background in aviation as a foundation on which to develop investigation skills. This experience can be acquired by working as a professional pilot, as an aeronautical engineer or as an aircraft maintenance engineer. Other specialized areas of aviation which could also provide useful experience include management, operations, airworthiness, air traffic services, meteorology and human factors. Since accident investigations will often involve all of these specialized areas, it is important that investigators understand the aviation infrastructure and are able to relate to each of these different areas. It is also beneficial for investigators to have some piloting experience in addition to their other expertise.

2.4.4 In addition to technical skills, an accident investigator requires certain personal attributes. These include integrity and impartiality in the recording of facts; analytical ability; perseverance in pursuing inquiries, often under difficult or trying conditions; and tact in dealing with a wide range of people who have been involved in the traumatic experience of an aircraft accident.

2.4.5 To effectively discharge their duties, accident investigators shall be granted suitable statutory powers, including authority over an accident site, possession of evidence, the right to test anything seized and the right to obtain relevant documents. These powers shall, however, be used only when necessary and with the utmost discretion.

Investigators shall realize that during the initial part of an investigation their task is essentially one of gathering information which is best undertaken in an atmosphere of cooperation.

2.4.6 Some persons may be reluctant to cooperate with the investigation because of a natural desire not to become involved. Often this resistance will disappear when it is explained that their assistance may help to eliminate similar accidents in future. An investigator relies extensively on other people as a source of information and, thus, shall be able to relate well to people in any situation.

2.5 EQUIPMENT

2.5.1 Proper planning and preparedness are essential in facilitating the prompt arrival of investigators at an accident site and have considerable bearing on the efficiency of the investigation. In this regard, accident investigators shall have their investigation field kits and essential personal items packed and ready so that they can proceed without delay to the accident site. Advance consideration shall also be given to such details as inoculations, passport requirements and travel facilities. To protect against biological hazards such as blood-borne pathogens, investigators who work amongst wreckage are advised to have tetanus and Hepatitis B vaccinations (and any recommended boosters to maintain immunity) and to wear the necessary personal protective equipment.

Note.— ICAO Circular 315, Hazards at Accident Sites*, was produced to assist individuals to consider and apply effective occupational safety management practices at accident sites, both to their own activities and to the activities of the teams that they work with, or for which they are responsible. The circular also discusses the nature and variety of occupational hazards and the management of risk associated with exposure to these hazards.*

2.5.2 Accidents and incidents are apt to occur anywhere: at airports, in mountains, swamps, deeply wooded areas, deserts, etc. Hardships are often encountered in reaching accident sites in remote areas, and it is therefore important that investigators be physically fit and that working gear be selected with due consideration to terrain and weather.

2.5.3 Clothing shall be comfortable and afford protection against the conditions or elements that may be encountered. Spare clothing may also be required. The most essential items of personal clothing are good footwear, a windproof and waterproof jacket and trousers, and appropriate headgear. The investigator shall wear suitable boots which provide protection against the hazards at the accident site. Specifically, the boots shall provide protection against crushing and piercing injuries and shall be waterproof and oil and acid resistant. A “paratroop” type of boot with a heavy moulded sole gives good service as general-purpose footwear in difficult terrain and, “desert” boots have been found suitable in dry, broken ground. Protective items, such as sun block, anti-glare spectacles and insect repellent, shall also be available.

2.5.4 Before proceeding to the accident site, investigators shall have adequate supplies and equipment most appropriate to the territory to be covered (food, water, first-aid kit, camping gear, communication equipment, etc.) and shall have a competent guide if it is necessary to enter wild or rugged terrain. They shall anticipate the need for special equipment (i.e. snowmobiles and skis) and have ready access to this type of equipment so that there is no delay in procuring it. They shall also be familiar with the use of such equipment.

2.5.5 The investigation field kit shall contain sufficient equipment to enable examination of the wreckage, the plotting of impact points and wreckage patterns, parts identification and the recording of observations. The list of items in Appendix 1 to this chapter provides guidance on the type of equipment which might be selected for the investigation field kit.

2.6 OTHER INVESTIGATION READINESS ISSUES

2.6.1 Investigation authority readiness

2.6.1.1 The readiness of an investigation authority does not only rely on it having appropriate legislation, regulations, ready access to sufficient funds, and sufficient experienced and equipped investigators, but also on it having documented policies, plans, procedures and checklists required for investigations. Notwithstanding the above, investigation authorities will rarely, if ever, have sufficient internal resources and competencies for all eventualities, such as for a major/complex accident investigation. Therefore, it is imperative that the investigation authority determine its internal competencies and have plans to acquire additional resources to fill any competency gaps.

2.6.1.2 In the event of a major accident, most of these competency gaps would normally be filled by using investigators and equipment from the State investigation authorities involved in the occurrence investigation, as well as subject-matter experts from the involved civil aviation authorities, operators and manufacturers. Without adequate planning there is a risk that these resources might not be immediately available for the investigation. In this regard, each State investigation authority shall consider establishing working relationships with the investigation authorities of those States wherein their State-manufactured products are operated, with other States wherein their State airlines operate, with States whose airlines or products operate in the State, and with any other State investigation authority that has the expertise and equipment required for investigations.

2.6.1.3 To better ensure the availability of external resources, the State investigation authority shall establish working arrangements and or memoranda of understanding with other States, government departments and other organizations that will likely be used to support its investigations. It will be prudent to document these arrangements/agreements and to have them readily accessible in the event of an accident/incident investigation. Appendix 2 to this chapter documents criteria that shall be considered when developing a State-to-State investigation authority memorandum of understanding (MoU); Appendix 3 is a model State-to-State MoU; and Appendix 4 is a sample MoU with a State investigation authority.

2.6.1.4 Article 3 a) of the *Convention on International Civil Aviation* (Doc 7300), signed at Chicago on 7 December 1944 and amended by the ICAO Assembly, states: “This Convention shall be applicable only to civil aircraft, and shall not be applicable to state aircraft.” Furthermore, Article 3 b) states that “Aircraft used in military, customs and police services shall be deemed to be state aircraft.” Thus, the State accident investigation authority shall establish working arrangements (e.g. memoranda of understanding) with government agencies and organizations which operate State aircraft. These arrangements shall address, as appropriate, the participation of the accident investigation authority and government agencies/organizations during investigations of accidents and incidents involving both civil aircraft and State aircraft (e.g. a collision between a civil and a State aircraft). Some States already have joint investigation authorities to carry out such investigations, and it is recommended that relevant working arrangements be timely documented and readily accessible.

2.6.1.5 The State accident investigation authority will also benefit from undertaking a similar approach with authorities that have first-responder responsibilities (such as police, firefighters, and search and rescue), with organizations that may become involved in or that might provide support to the safety investigation (such as government departments and the military); and with other authorities that have investigation mandates related to the aircraft accident or incident (such as judiciaries, police, coroners and civil aviation authorities). Appendix 5 to this chapter is a sample MoU with a police force; Appendix 6 is a sample MoU with a coroner; and Appendix 7 is a sample MoU with a civil aviation authority.

2.6.2 Checklist on assistance

Some AIG Authority of States have found that a checklist-style tool will can further assist a State to determine its readiness, its competency gaps and its assistance needs related to the conduct of investigations. Appendix 8 to this chapter is a sample checklist on assistance.

2.6.3 Delegation of investigations

2.6.3.1 In accordance with AIG State Regulation, the AIG Authority State of Occurrence is responsible[1] for instituting an investigation, but it may delegate the whole or any part of the conducting of such investigation to another State, in ARCM or a regional accident investigation organization by mutual arrangement and consent. When the whole investigation is delegated to another State or a regional accident investigation organization, such a State/organization is expected to be responsible for the conduct of the investigation, including the issuance of the Final Report and the ADREP reporting. When a part of the investigation is delegated, the State making the delegation usually retains the responsibility for the conduct of the investigation and for issuing the Final Report of the investigation. In any event, the AIG Authority of State making the delegation shall use every means to facilitate the investigation.

2.6.3.2 Factors that may suggest the delegation of an investigation to another State or to a regional accident investigation organization may include but are not limited to the following situations:

- The AIG Authority of State of Occurrence may consider delegating the investigation to the AIG Authority of State of Registry, of the State of the Operator, of the State of Manufacture, or a regional accident investigation organization, in particular for those situations when it might be beneficial or more practical for one of these AIG Authority of States or organizations to conduct the investigation; and

- The AIG Authority of State of Occurrence lacks the resources or capability to investigate the occurrence in accordance with Annex 13.

2.6.3.3 Each investigation delegation must be conducted in the framework of a protocol specific to the investigation, making clear the respective responsibilities of the AIG authority of State making the delegation and the AIG Authority of State or regional accident investigation organization accepting the delegation. This protocol shall preferably be made through an official document. Appendix 9 to this chapter contains a Model Delegation Agreement in Respect of Aircraft Accident and Serious Incident Investigation.

2.6.4 Facilitation

ICAO Annex 9 — *Facilitation*, Chapter 8, Section B, contains the Standards and Recommended Practices related to the facilitation of search, rescue, accident investigation and salvage. The following, in part, are the facilitation provisions that are pertinent to the conduct of accident investigations, subject to any conditions imposed by Annex 13:

a) AIG Authority of States shall make arrangements to ensure entry, without delay, into their territories on a temporary basis of qualified personnel required for accident investigation;

b) States shall not require any other travel document than a passport;

c) in cases where a State continues to require entrance visas for the personnel referred to in a) above, States shall issue such visas on arrival or otherwise facilitate the admission of personnel;

d) AIG Authority of States shall ensure that their authorities are adequately informed of the provisions of Annex 13 relating to the facilitation of aircraft accident and incident investigations;

e) AIG Authority of States shall help to arrange transport to the site of the accident or incident without

[1] The State of Occurrence is responsible for instituting an investigation into an accident or serious incident. However, when the accident or serious incident has occurred in the territory of a non-Contracting State which does not intend to conduct an investigation in accordance with Annex 13, the State of Registry, or failing that, the State of the Operator, the State of Design or State of Manufacturer shall endeavour to institute and conduct an investigation. When the location of the accident or serious incident cannot definitely be established as being in the territory of any State, the State of Registry shall institute and conduct any necessary investigation of the accident or serious incident.

delay;

f) States shall facilitate the temporary entry into their territory of all aircraft, tools and equipment required in the accident investigation; and

g) AIG Authority of States shall ensure, without delay, the movement of a part or parts for technical examination or testing to another Contracting State.

Note.— Annex 9, Chapter 8, Section I, contains the Standards and Recommended Practices related to the facilitation of assistance to aircraft accident victims and their families.

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Appendix 1 to Chapter 2

INVESTIGATION FIELD KIT

Note 1.- Investigators shall bring to the accident site those items which they expect to use. Usually, there is no need for each investigator to bring all the items in the following list.

Note 2. For a list of personal protective equipment against biological hazards, see Appendix 1 to Chapter 5.

GENERAL

Identification papers, investigator's official tag, armband or high-visibility jacket
Relevant documentation (regulations, accident investigation manual, checklists, report forms, etc.)
Appropriate aircraft manuals and parts catalogues
Emergency funds

SURVEY EQUIPMENT

Large-scale maps of the accident area
Magnetic compass
Global positioning system receiver
Laser surveying equipment
Clinometer
Navigational computer, protractor and dividers
Measuring tape, at least 20 m long, and a 30-cm-long ruler
Reel of cord, 50 to 300 m long

MARKING EQUIPMENT

Labels, tie-on tags and adhesive tags
Flag markers and stakes
Writing material, graph paper, waterproof notebooks and clipboards
Pens, pencils, grease pencils, indelible marking crayons and permanent markers

TOOLS AND SAMPLING MATERIALS

Toolkit with wrenches, screw drivers and drills (hand- and battery-powered)
Waterproof flashlight with spare batteries and bulbs
Small magnet
Multi-purpose knife
Inspection mirror
Magnifying glass (10 x to 30 x)

Assorted antistatic containers (for electronic components with non-volatile memory) and sterile bottles (for aircraft fuel, oil and fluid samples, as well as for pathological fluid and tissue samples)
Siphons and syringes
Plastic bags (assorted) and plastic sheets
Masking tape and duct tape

MISCELLANEOUS ITEMS

First-aid kit
Recording equipment, such as cameras (digital and/or conventional film), video cameras, audio recorders (digital or conventional tape), and spare batteries, cassettes, film and digital memory devices)
Miscellaneous photographic equipment, such as a zoom lens, macro lens, wide-angle lens and an electronic flash unit
Model aircraft
Heavy gloves, protective overalls and other protective equipment, such as hard hats, goggles and face masks
Protective clothing and equipment to protect against biological hazards (see Appendix 1 to Chapter 5)
Binoculars with an integrated compass and distance measuring capability
Portable means of on-site communication, such as a cellular telephone and/or walkie-talkie, spare batteries and charging units
Notebook computer with high-speed Internet and wireless capability
Facsimile machine

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Appendix 2 to Chapter 2

PRINCIPLES FOR A STATE-TO-STATE INVESTIGATION AUTHORITY MEMORANDUM OF UNDERSTANDING

Note.—- A State-to-State investigation-authority memorandum of understanding shall contain, but not be limited to, the following information.

INTRODUCTION

This section shall cover the following:

- identification of the involved investigation authorities and their governing legislations;
- confirmation of commitment to the International Standards and Recommended Practices contained in ICAO Annex 13; and
- documentation of the definitions and terminology that are used in the MoU.

PURPOSE

This section shall cover the purpose of the MoU, such as to:

- advance aviation safety through the investigation of accidents and incidents in accordance with Annex 13 (and national legislation) in order to prevent accidents and incidents;
- foster cooperation and mutual assistance;
- support each other's investigations; and
- confirm that it is not the purpose of the investigation to apportion blame or liability.

AREAS OF MUTUAL SUPPORT

This section shall cover the following:

- when assistance is requested, the response will be coordinated between the two authorities;
- if conditions permit, the requested assistance will be provided;
- when information on an ongoing investigation is requested, all information will be provided in accordance with Annex 13 and national legislations;
- information received will be protected as per the provisions of Annex 13 and national legislations;

- experience and training opportunities will be shared so as to enhance investigation standards, policies, guidelines and procedures of both authorities.

FINANCIAL CONSIDERATIONS

The MoU shall specify agreements regarding financial and resource issues on the understanding that:

- human and financial resources and workload may limit the ability to provide mutual support;
- each authority would be expected to bear its own costs, in particular when fulfilling the provisions of Annex 13; and
- the authority requesting supplemental support would be expected to bear the incremental costs.

COORDINATION

This section of the MoU shall include:

- the point-of-contact person in each investigation authority for day-to-day investigation operations issues;
- the point-of-contact person in each authority for legislation and policy issues; and
- the MOU shall also state provisions for resolving disputes.

VALIDITY TIME FRAME

The MoU shall state the time-related issues:

- the date that the MoU comes into effect;
- the validity time frame — this would normally be for a medium term, such as 3 to 5 years; and
- the termination time frame could be either termination by a specific date, by written notice, by remaining in force unless otherwise notified or by remaining in force on condition of an annual review.

SIGNATORIES

This section of the MoU shall include:

- the signatories to the State-to-State investigation authority MoU, which would be the head officials of the involved investigation authorities.

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Appendix 3 to Chapter 2

ICAO MEMORANDUM OF UNDERSTANDING IN RESPECT OF AIRCRAFT ACCIDENT AND SERIOUS INCIDENT INVESTIGATION

MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

…… *(Agency/Authority)*

of

…… *(State)*

AND

…… *(Agency/Authority)*

of

…… *(State)*

REGARDING

COOPERATION AND ASSISTANCE

IN THE FIELD OF

CIVIL AIRCRAFT ACCIDENT AND SERIOUS INCIDENT INVESTIGATION

1. INTRODUCTION

1.1 This Memorandum of Understanding (MoU) expresses the understanding of the ……..…… (*Agency/Authority)* of ……..…… (*State*) and the ……..…… (*Agency/Authority)* of ……..…… (*State*), hereafter referred to as the parties to this MoU, concerning cooperation and assistance in the field of civil aircraft accident and serious incident investigations.

1.2 It is recognized that both ……..…… *(State)* and ……..…… *(State)* are parties to the Convention on International Civil Aviation (The Chicago Convention) and that they are therefore bound by the Standards contained in Annex 13 — *Aircraft Accident and Incident Investigation*.

Note.- Both States shall advise each other of their respective existing differences that have been filed or that will be filed against the Standards of Annex 13.

1.3 Both parties to this MoU are authorized by their respective Governments to act as the national authority representing ……..…… (*State*) and ……..…… (*State*) in respect of aircraft accident and serious incident investigation matters.

1.4 This MoU defines the procedural arrangements for cooperation and assistance between the parties pursuant to Annex 13 to the Chicago Convention.

2. TERMINOLOGY

2.1 The words and phrases used in this document have the same meaning as that ascribed to them in Annex 13 — *Aircraft Accident and Incident Investigation*.

3. THE PURPOSE OF INVESTIGATIONS

3.1 The purpose of investigating accidents or incidents in accordance with Annex 13 is the prevention of accidents and incidents. It is not the purpose of such an investigation to apportion blame or liability.

4. CODE OF CONDUCT

4.1 This MoU serves to foster cooperation and mutual assistance between the parties in implementing the provisions of Annex 13. Each party shall strive to overcome difficulties that may arise due to differences in languages, national cultures, legislative systems or geographic locations.

5. EXCHANGE OF INFORMATION

5.1 Each party shall establish a working group of specialists to plan and implement technical exchanges and cooperation between the parties in the field of aircraft accident and serious incident investigations. These technical exchanges will include discussions aimed at improving the understanding of the investigation capabilities of the respective organizations, as well as the scope and extent of any assistance that could be provided under given conditions.

5.2 The exchanges and cooperation between the parties shall also cover appropriate training for investigative staff, including attendance at training courses.

6. ASSISTANCE TO THE STATE OF OCCURRENCE

6.1 When one party, acting as the State of Occurrence, requests the other party for technical assistance for an investigation being conducted under the provisions of Annex 13, the response to the request shall be coordinated between both parties. The two parties shall work together to ensure that a competent investigation is conducted in accordance with the procedures and intent of Annex 13.

6.2 Either party may request information on the progress of an investigation being carried out by the other party. All possible efforts will be made to provide the requested information. In accordance with the relevant laws of the respective States, any such information provided shall be treated with at least the same rules with respect to confidentiality as those to which the providing party is bound.

7. COORDINATION

7.1 The contact person in ……..…… (*Agency/Authority)* of ……..……. (*State*) for the implementation of this MoU is:

……..…….. *(Title*)
……..…… (*Agency/Authority*)
……..…….. (*Address*)

Tel.: …….. *(Office*) …….. *(Mobile*)
Fax: ……..
E-mail: ……..

7.2 The contact person in ……..……(*Agency/Authority)* of ……..……..*(State*) for the implementation of this MoU is:

……..…….. *(Title*)
……..…… (*Agency/Authority*)
……..…….. (*Address*)

Tel.: …….. *(Office*) …….. *(Mobile*)
Fax: ……..
E-mail: ……..

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Appendix 4 to Chapter 2

SAMPLE MOU WITH A STATE INVESTIGATION AUTHORITY

Memorandum of Understanding

BETWEEN THE

Air Accident Investigation Bureau of Singapore

AND THE

Transportation Safety Board of Canada

ON COOPERATION RELATING TO AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION

May 2006 AAIB Singapore-TSB Canada MOU

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE AIR ACCIDENT INVESTIGATION BUREAU OF SINGAPORE AND THE TRANSPORTATION SAFETY BOARD OF CANADA

ON COOPERATION RELATING TO AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION

The Air Accident Investigation Bureau of Singapore (AAIB Singapore) and the Transportation Safety Board of Canada (TSB Canada), hereinafter referred to collectively as "the Parties" or individually as “the Party”,

Reaffirming the objective enshrined in Annex 13 to the Convention on International Civil Aviation (“the Chicago Convention”) that the sole objective of the investigation of an aircraft accident or incident shall be the prevention of accidents and incidents and that it is not the purpose of the investigation activity to apportion blame or provide a means of determining liability;

Committed to enhancing the capabilities and professionalism of their respective aircraft accident investigators;

Desiring to share expertise and experience relating to aviation investigation;

Recognising their common interest in establishing a lasting framework for cooperation in the area of aviation investigation;

HAVE REACHED THE FOLLOWING UNDERSTANDING:

Objective and Areas of Cooperation

1. The sole objective of both Parties in entering into this Memorandum of Understanding is the enhancement of aviation safety.

2. The Parties will cooperate in aircraft accident and incident investigation, investigation training and sharing of information and expertise, consistent with the Standards and Recommended Practices of Annex 13 to the Chicago Convention. The areas of cooperation are as follows:

(a) Each Party will offer assistance and the use of air safety investigation facilities and equipment to the other Party, as it deems appropriate and as resources permit. Such assistance may include expertise in the fields of air traffic services, engineering, operations, flight recorders, human performance and management organisation.

(b) Each Party will, where practicable, invite the other Party's investigators to attend its general and specialist investigation courses and training.

(c) Each Party will to the extent permitted by its laws and regulations facilitate the attachment of the other Party's investigators as observers to its investigation of aircraft accidents and serious incidents, with a view to enhancing the other Party's understanding of its investigation requirements and procedures. This will serve to develop effective cooperation between the Parties in any investigation of aircraft accidents or serious incidents it conducts pursuant to Annex 13 to the Chicago Convention involving an aircraft of which the State of the other Party is the State of Registry, State of the Operator, State of Design or State of Manufacture.

(d) The Parties will maintain regular contact and each Party may organise visits to or meetings with the other Party with the aim of exchanging experiences, skills and technical knowledge.

(e) Each Party will to the extent permitted by its laws and regulations endeavour to share with the other Party relevant information about an investigation it is conducting in which the other Party has expressed an interest. This information, consistent with Annex 13, will not be released by the other Party without the express consent of the Party conducting the investigation.

3. The Parties may develop additional areas of cooperation to widen the scope of this Memorandum of Understanding.

Coordination

4. The contact person in the TSB Canada for the implementation of this Memorandum of Understanding is:

Director
Air Investigations Branch
Transportation Safety Board of Canada
200 Promenade du Portage
Gatineau, Quebec K1A 1H3
Canada

Tel.: 613-994-3813
Fax: 613-953-9586
E-mail: Nick.Stoss@tsb.gc.ca or AirOps@tsb.gc.ca

5. The contact person in the AAIB Singapore for the implementation of this Memorandum of Understanding is:

Director
Air Accident Investigation Bureau of Singapore
Changi Airport Post Office
P.O. Box 1005 Singapore 918155
Republic of Singapore

Tel.: 65 6541 2800
Fax: 65 6542 2394
E-mail: chan_wing_keong@mot.gov.sg

Financial Matters

6. Unless otherwise agreed, each Party shall bear its own cost for the implementation of the matters set out in this Memorandum of Understanding.

Amendment

7. This Memorandum of Understanding may be amended in writing at any time by mutual consent of the Parties.

Commencement and Duration

8. This Memorandum of Understanding will come into effect on the date of signing and will remain in effect unless it is terminated by either Party giving one month's notice in writing to the other Party.

9. The Parties may, by mutual agreement, provide for the continuance of any arrangement entered into under this Memorandum of Understanding but not fully performed prior to the termination of this Memorandum of Understanding.

IN WITNESS WHEREOF, the undersigned, being duly authorised by the Parties, have signed this Memorandum of Understanding.

Signed in duplicate,

_____	_____
DIRECTOR AIR ACCIDENT INVESTIGATION BUREAU OF SINGAPORE	EXECUTIVE DIRECTOR TRANSPORTATION SAFETY BOARD OF CANADA
At: _____	At: _____
Date: _____	Date: _____

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Appendix 5 to Chapter 2

SAMPLE MOU WITH A POLICE FORCE

Memorandum of Understanding

between

The Air Accidents Investigation Branch,

The Marine Accident Investigation Branch,

The Crown Office and Procurator Fiscal Service

and

The Association of Chief Police Officers (Scotland)

For the Investigation of Air and Marine Accidents and Incidents in Scotland

Date: _____

CONTENTS

Contact Details

AIR ACCIDENTS INVESTIGATION BRANCH

Address:
Air Accidents Investigation Branch
Farnborough House
Berkshire Copse Road
Aldershot
Hampshire
GU11 2HH

Telephone numbers:
Accident Reporting Line: 01252 512299 (24 hr)
General use: 01252 510300
DfT Duty Officer (out of hours): 020 7944 5999

Other contact details:
Fax: 01252 376999
e-mail: enguiries@aaib.gov.uk
Website: www.aaib.gov.uk

MARINE ACCIDENT INVESTIGATION BRANCH

Address:
Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
SO15 2DZ

Telephone numbers:
Accident Reporting Line: 023 8023 2527
General use: 023 8039 5500
OfT Duty Officer (out of hours): 020 7944 5999

Other contact details:
Fax: 023 8023 2459
e-mail: maib@dft.gsi.gov.uk
Website: www.maib.gov.uk

CROWN OFFICE AND PROCURATOR FISCAL SERVICE:

Address:
Crown Office (Head Office)
25 Chambers Street
Edinburgh
EH1 1LA

Telephone number:
Reception: 0131 226 2626

Other contact details:
e-mail: PS/COPFS@scotland.gsi.gov.uk
Website: www.crownoffice.gov.uk

ASSOCIATION OF CHIEF POLICE OFFICERS (SCOTLAND)

Address:
Association of Chief Police Officers in Scotland
Police Headquarters
173 Pitt Street,
Glasgow
G24JS

Telephone number:
General use: 0141 532 2052

Other contact details:
e-mail: acpos.secretariat@strathclyde.pnn.police.uk
Website: www.acpos.police.uk

INTRODUCTION

1. This Memorandum of Understanding (MoU) has been agreed between the Air Accidents Investigation Branch (AAIB), the Marine Accident Investigation Branch (MAIB),[1] the Crown Office and Procurator Fiscal Service (COPFS), and the Association of Chief Police Officers in Scotland (ACPOS).

2. It sets out the principles for effective liaison, communication and co-operation between these parties so that air and marine accidents, and related criminal incidents and deaths, can be independently investigated, as necessary, by each party, in parallel with each other, whilst also ensuring that legitimate public expectations are met.

3. The MoU recognises that all parties have duties to perform in relation to investigating air and marine accidents and incidents, and that each party, in discharging these, shall take into account the roles and responsibilities of the other parties, ensuring that independent parallel investigations proceed in cooperation with each other, as appropriate, and in accordance with the public interest.

4. In practice, this will mean that, where possible, parties will exchange factual information about the details of an accident or incident in a timely manner, as their respective investigations proceed in parallel.

5. Successful implementation of this protocol in relation to any air or marine accident or incident will be significantly enhanced by:

- The senior representatives of each organisation at the scene of the incident taking personal responsibility for setting and delivering clear standards of communication and co-operation;
- All representatives of each organisation at the scene of the incident having an understanding and respect for each organisation's interests, professionalism and expertise.

6. All parties agree to keep this MoU under review as appropriate.

ROLES & RESPONSIBILITIES

Air Accidents Investigation Branch

7. The Air Accidents Investigation Branch (AAIB) has a heritage dating back to 1915. The AAIB discharges the United Kingdom's obligations under Annex 13 to the Convention on International Civil Aviation and the European Council Directive 94/56/EC. Its legislative powers are defined by the Civil Aviation Act 1982 and the associated secondary legislation, The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996. (SI 1996/2798).

1. For the purposes of this MOU, the term "AIB" refers to the MAIB or the AAIB and "AIBs" refers to both the MAIB and AAIB.

8. The AAIB investigates aircraft accidents and serious incidents that occur in the UK or involve UK registered or manufactured aircraft overseas. It also participates in accident investigations worldwide where there is a specific UK interest. The AAIB also provides technical assistance to the Ministry of Defence in support of Boards of Inquiry investigating military aircraft accidents.

9. AAIB Inspectors have powers to investigate all civil aviation accidents and incidents within the UK. They are appointed under section 8(1) of the Regulations and have the powers under section 9 to have free access to the accident site; the aircraft, its contents or its wreckage; witnesses; the contents of flight recorders; the results of examination of bodies; the results of examinations or tests made on samples from persons involved in the aircraft's operation and relevant information or records. They also have the power to control the removal of debris or components; examine all persons as they think fit; take statements; enter any place, building or aircraft; remove and test components as necessary and take measures for the preservation of evidence.

10. The AAIB is independent of the Civil Aviation Authority and the European Aviation Safety Agency.

Marine Accident Investigation Branch

11. The Marine Accident Investigation Branch (MAIB) was set up in 1989 with responsibility for investigating accidents to determine their circumstances and causes. Its legislative powers are primarily contained in Part XI of the Merchant Shipping Act 1995 and associated secondary legislation with the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 (SI 2005/881) putting the framework into effect.

12. These regulations are the foundation of the MAIB's work. They apply to merchant ships, fishing vessels and (with some exceptions) pleasure craft. They define accidents, set out the purpose of investigations, and lay down the requirements for reporting accidents. They make provision for the ordering, notification, and conduct of investigations, but allow inspectors the necessary discretion, given the wide variety of cases.

13. Prior to deciding whether to conduct a full investigation, the MAIB will conduct a Preliminary Examination. Only those accidents/incidents which are considered could influence future safety are taken forward as a full investigation, leading to a published report. A short summary of investigations that remain as Preliminary Examinations will be posted on MAIB's website.

14. The MAIB inspectors have powers to investigate accidents involving or occurring on board UK ships anywhere in the world, and any ships in UK territorial waters including accidents that occur on UK inland waterways. They are appointed under section 267 of the Merchant Shipping Act 1995 and have the power under section 259 to enter any premises in the UK or board any UK ship wherever it may be in the world and any other ship which is present in the UK or in UK waters for the purposes of making such examination or inspection as the inspector considers necessary. They also have the power to require any person to attend for interview, obtain documents, information and records

relating to any investigation and prohibit persons from gaining access to, or interfering with any ship, ship's boat or other equipment involved in an accident. Additionally, the MAIB Chief Inspector may require a ship to remain accessible within United Kingdom waters until the process of collecting or preserving the evidence has been completed.

15. The MAIB is independent of the Maritime and Coastguard Agency (MCA) and the European Maritime and Safety Agency.

The Lord Advocate, COPFS & the police in Scotland

16. The Lord Advocate has primary responsibility, under the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976, for the investigation of sudden deaths in Scotland, and at common law for the investigation and prosecution of criminal offences. The Lord Advocate's position in relation to these matters is specifically recognised and preserved by section 48 of the Scotland Act 1998.

17. The Lord Advocate and procurators fiscal, who hold commissions from the Lord Advocate, have a statutory power to instruct the police in their investigation and reporting of crime and all suspicious, sudden and unexplained deaths.

Body recovery and identification

18. The Police are entrusted with the recovery and subsequent identification of human remains, where it is practicable to do so, following an event that results in a death. The processes and procedures utilised during this phase of the investigation will be scrutinised routinely and closely at any subsequent legal proceedings. This key area of an investigation will form part of the early discussion aimed at agreeing a joint strategy to move the investigation forward.

Interface between investigations carried out by the AIBs, COPFS and the police in Scotland

19. The purpose behind the respective investigations carried out by the AIBs, and the police and procurators fiscal is very different.

20. The police, under the instruction of procurators fiscal, investigate potential criminal activity and deaths that may arise out of an air or marine accident or incident. The police investigation is concerned with the cause of the accident to the extent that it is important evidence in any criminal and/or deaths investigation. The focus of their investigation is to gather evidence about the commission of a crime(s), or which points to or helps to explain the circumstances which contributed to, or caused a death(s), with a view to assessing whether there shall be a criminal prosecution and/or a Fatal Accident Inquiry.

21. The AIBs have a statutory responsibility independently to investigate air or marine accidents and incidents, including those which may involve the commission of a criminal offence or where deaths may have occurred, and to establish the surrounding circumstances, and all the causal factors of the accident or incident. Their prime concern is to ensure that safety lessons are identified and promulgated; they do not apportion blame or determine liability.

22. The police, procurators fiscal and AIB inspectors, in carrying out their respective investigations, will take account of the roles and responsibilities of the other parties, and cooperate with one another to ensure the legal requirements of all parties are met. This is particularly important in respect of the collection and preservation of evidence from the accident site, the subsequent examination and analysis of items of evidence, and the interviewing of witnesses.

23. It is essential for the AIBs, the police and procurators fiscal that the highest standard of expertise is employed in an investigation. Generally the police will not be trained to carry out such a technical investigation as members of the AIBs into air or marine accidents, but the police, in working with an AIB in carrying out a criminal and/or deaths investigation, may contribute specialist forensic skills, including examination and analysis of prints and samples. Therefore, in establishing the causes, or reasons for severity of consequences of an accident or incident, the necessary technical expertise[2] will normally lie within the relevant AIB.

24. The police will, in most instances, be first in attendance at the scene of an accident and will make contact, and establish early and good communication with the relevant AIB, discuss any subsequent rescue operation, and the collection and preservation of evidence prior to the arrival of the AIB team.

MANAGEMENT OF THE INVESTIGATION

25. All parties will make every effort to establish and maintain good liaison, communication and cooperation with one another throughout their respective investigations, and to work together as appropriate to achieve the best outcome for all. The responsibility for achieving this lies with the senior representative of each party at the scene of the accident or incident. Where it is not clear initially whether another party has an interest in carrying out an investigation, the potential involvement of the other parties shall be borne in mind in the conduct of any investigation.

2. Technical expertise refers to all aspects of construction and operation of aircraft or marine craft including human factors in aviation and marine operations.

Accident site

26. Parties must have a clear understanding of their respective duties and responsibilities on the accident site to ensure preservation of the best evidence.

Prior to the arrival of the AIB

27. Where any party is made aware of an accident or incident likely to require the attendance of the police or one of the AIBs, that party will contact the other parties as soon as possible to inform them of the accident.

28. The AIBs each have a duty co-ordinator available 24 hours a day who will decide whether the AIB is to undertake an immediate investigation and the form that any such investigation shall take. Where appropriate, the AIB duty co-ordinator will mobilise an AIB investigation team to attend the accident site.

29. The AIB duty co-coordinator will provide the police with information about:

- the intended AIB response and estimated time of arrival;
- contact details for the AIB investigation team;
- advice on technical issues that may require urgent attention.

30. The priority shall be to arrange appropriate medical attention for, and the removal of any casualties, and to identify and secure the accident site. Once cordoned/secured, the police shall maintain the security of the site until the arrival of the AIB.

31. The site shall be preserved as closely as possible in its state immediately after the accident. If it is considered necessary, for the security of evidence, to move items or in any way affect the site, the police shall, where practicable, notify the AIB and agree the steps they intend to take. If it is not possible to discuss such action with the AIB, the police shall inform the AIB as soon as practicable of any action taken.

32. The police may compile an initial list of witnesses and their contact details which can be shared with the AIB team on arrival.

After the arrival of the AIB

33. AIB staff will identify themselves on arrival and the police shall brief them as to actions taken prior to their attendance. The AIB lead inspector will discuss and devise with the police a plan of action for carrying out an investigation of the accident site.

34. The AIB inspectors will need to access the site without delay to allow identification and securing of perishable evidence. As an expert in their field, AIB inspectors will recognise evidence crucial to an air or marine accident investigation that may not be needed for a police investigation. AIB inspectors will also have the expertise necessary to collect and remove evidence expeditiously with the minimum amount of necessary damage.

35. It is important that the AIB and the police review the level of scene preservation and site security throughout the investigation. If any party intends to withdraw from the site they will inform the other parties. This is particularly important where the police wish to withdraw, so that the AIB can make alternative security arrangements before their departure.

36. The AIB may be able to release parts of the site from its investigation in a phased manner, as evidence is gathered and the investigation becomes more focused. In such cases this will be only after consultation with the COPFS and the police to ensure that any hand-over/hand-back is done in a controlled manner, taking account of the interests of all parties.

Accident Site Safety

37. Parties will retain primary responsibility for the safety of both their own staff and those working under their direction, but it is important for all parties to co-operate, and to co-ordinate their activities in order to maintain the safety of the accident site.

COLLECTION AND USE OF EVIDENCE

38. References to evidence in this section relate to evidence in which the AIB, police and COPFS have an interest. Each party shall liaise and agree the overall plan for gathering evidence to ensure all parties remain informed. Steps shall be taken by all parties to clarify their respective interests in a piece of evidence.

39. In this regard, the police and AIB agree to keep a record of any evidence collected and significant steps[3] taken in the course of their investigation which can be shared at any time with the other party, subject to legal restrictions on disclosure.

40. It is essential that the AIBs and the police and procurators fiscal take account of their respective interests in the gathering and preservation of evidence from the accident site, and in any subsequent examination or analysis of items of evidence.

41. In this regard, it is essential for the police and procurators fiscal that the manner in which evidence is gathered in the course of any investigation into an air or marine accident or incident takes account of the evidential requirements of Scots law, in particular those relating to the admissibility of evidence and the need for corroboration of each essential fact in a criminal case.

3. "Significant steps" include actions taken which may impact on the evidence gathering process, e.g. moving a piece of wreckage as part of the rescue operation. It is not intended that parties will note down every minor action taken on the accident site or otherwise in connection with their investigation, but the record of evidence gathered shall contain necessary information about actions taken as part of the evidence collection process, which have been essential for the securing of best evidence.

42. Any evidence gathered by the police or the AIB inspectors shall be properly preserved so that the other parties can access it if required, and if it is within their power to do so. Where one party wishes to dispose of evidence in their possession, and it is unclear whether another party has an interest in retaining that item, parties shall consult with each other prior to its disposal to agree the best course of action.

43. As a general rule, technical evidence gathered by AIB inspectors which requires further examination will be held by the AIB, who will maintain the necessary evidential trail. However, where the police do not, or it appears that they will not require to carry out an investigation into an air or marine accident or incident, it may not be necessary for the same detailed evidential trail to be maintained.

44. Where documentary evidence is collected and retained by the police, normally copies of these documents will suffice for purposes of the AIBs. Where the AIB take possession of documentary evidence, the necessary evidential trail will be maintained.

45. Scottish criminal law requires that all essential facts in the commission of a crime are corroborated, i.e. the prosecution must present corroborated evidence to the court to establish that a crime was committed and who is responsible. This means that there must be evidence of each essential fact from two independent sources.

46. This evidential standard must be taken account of when evidence is being gathered, passed on to any third party, examined or analysed. Therefore, for example, when pieces of evidence are gathered from the accident site this must be done by one person in the presence of another. Both of these people shall be able to speak about the evidence gathering process and the record of the collection of evidence must be maintained by two people. For this purpose AIB inspectors may provide mutual assistance, or require police assistance.

47. These evidential standards are equally important with regard to the examination or analysis of a piece of evidence. This is particularly important where the examination or analysis could result in the controlled destruction of the item; in this event other parties will not have an opportunity to instruct an independent analysis. If this is contemplated then all parties must be consulted, and given the opportunity to be represented during the examination or analysis.

Sharing of Evidence

48. Subject to any legal restrictions on disclosure, the AIBs will make available to COPFS or the police, evidence, including any factual information, with the exception of: witness statements, witness details, medical records, and inspector’s working notes or working documents.

49. The COPFS or the police will make available relevant evidence and findings to the AIBs. This applies even where the AIB has not initially attended at the accident site but subsequently decides to commence an investigation.

INTERVIEWS AND DECLARATIONS

50. Both AAIB and MAIB take evidence from witnesses on the basis that it is confidential and will not be disclosed unless either AIB is required to do so in the public interest by the relevant court. Both AIBs are subject to a statutory prohibition on disclosing witness statements or declarations.

51. The police may assist their own and/or the AIB investigation by compiling a list of persons who have witnessed the accident or incident and their contact details.

52. The AIB must carry out its own separate interviews of those persons as appropriate. The police will also carry out their own separate interviews of witnesses. The AIB will normally interview persons before the police do so, in order to obtain the fullest and most frank account of events. Parties will liaise, as appropriate, to co-ordinate witness interviews.

53. In exceptional circumstances, where a person is suspected of committing an imprisonable offence, and following discussion with the AIB, the police may require to exercise their power under section 14 of the Criminal Procedure (Scotland) Act 1995 to detain the suspect for a period of up to six hours as part of the criminal investigation.

OTHER COORDINATION

Contact with the injured, bereaved and next of kin

54. When accidents result in serious injuries and fatalities, it is important that all the investigating bodies liaise and agree arrangements for keeping the injured and bereaved informed regarding the progress of the investigations. In the first instance the police Family Liaison Officer (FLO) will be the main channel for this process and as far as possible all contact with the bereaved and injured will be co-ordinated through the FLO. It is helpful if the FLO explains to the bereaved the respective roles of the police and the AIB, and the fact that the AIB investigation is independent of any criminal investigation. The AIBs can supply brochures to assist with this process.

Employing third parties

55. As far as is practical parties shall consult with one another on the employment and remit of third parties to be contracted in relation to their investigation to ensure their remit meets the needs of all parties.

Public Statements / Media Coverage

56. In the event of a need to make a public statement, the AIB, the police and COPFS will consult one another to ensure the factual accuracy of any media release and as far as possible to co-ordinate activities.

AIB reports and recommendations /
Potential criminal prosecution / FAI

57. The AIB is required to publish reports on the accidents and incidents it investigates as early as possible so safety lessons can be learned and recommendations made known as soon as possible. Subject to the normal provisions of contempt of court, reports may be published whether or not civil or criminal proceedings are in progress or may be instituted. The AIB may also issue a special bulletin, interim report or immediate safety advice if appropriate.

58. Where a prosecution and/or a fatal accident inquiry is under consideration, the COPFS shall notify the AIB of its interest in their investigation. In this instance, the AIB will make available to the COPFS a pre-publication copy of the finalised report at the earliest opportunity. This will be treated as confidential and not disclosed before the date of publication.

59. The COPFS will keep the AIB informed as to the possible timing of any prosecution or fatal accident inquiry related to an accident which the COPFS is aware the AIB is investigating and will make every effort to give as much notice as possible.

60. The COPFS may comment on the finalised report and any comments made will be considered by the AIB before the report is published, but the AIB is not obliged to take any action as a result. Information given to the AIB by the COPFS will be treated as confidential.

61. If a report has been produced, the AIB will, if required, provide an inspector to a FAI to speak to that report. In the case of a fatal marine accident where the Preliminary Examination (see paragraph 13) is complete and it has been decided that a full investigation will not be conducted, the Chief Inspector of the MAIB will contact the Procurator Fiscal at an early stage to advise of this decision and to outline any safety issues he believes could be considered at a FAI.

62. However, in any criminal proceedings AIB inspectors shall only be cited by the Prosecution as witnesses where the evidence which they are able to give could not be made available from any other source.

Training/awareness

63. COPFS/APCOS will arrange and conduct initial and refresher training for AIBs in evidential requirements in Scotland. The Chief Inspectors of the AIBs will undertake appropriate briefings/training for COPFS and APCOS personnel on the roles and procedures of the AIBs.

On behalf of AAIB _____
Chief Inspector of Air Accidents

On behalf of MAIB _____
Chief Inspector of Marine Accidents

On behalf of COPFS _____
Crown Agent

On behalf of ACPOS _____
Chief Constable Fife Constabulary

Date: _____

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Appendix 6 to Chapter 2

SAMPLE MOU WITH A CORONER

MEMORANDUM OF UNDERSTANDING

BETWEEN: The **Government of Manitoba** represented by the Minister of Justice, being the Minister responsible for the administration of *The Fatality Inquiries Act, R.S.M. 1990,* c. *F-52* in the Province, hereinafter referred to **Manitoba**.

AND: The **Canadian Transportation Accident Investigation and Safety Board** represented by its Chairperson, hereinafter referred to as the **TSB**.

Whereas the Minister of Justice of Manitoba is the Minister responsible for the administration of *The Fatality Inquiries Act* (the *"FIA"*), which confers the jurisdiction and obligation to inquire into the cause of sudden and unexpected deaths within the territorial limits of the Province, and make relevant recommendations about any matter arising out of an inquiry or an inquest.

And whereas the *Canadian Transportation Accident Investigation and Safety Board Act, R.S.C.* (1985) c. *C-23.4* (the *"CTAISB Act"*) establishes the TSB with the mandate to advance transportation safety; its mandate being carried out by investigating transportation occurrences to make findings as to their causes and contributing factors and by making recommendations in order to eliminate or reduce safety deficiencies as evidenced by transportation occurrences.

And whereas Manitoba has the knowledge, experience, skills, and resources to conduct investigations into the causes and circumstances of death of a person, including in any transportation occurrence.

And whereas the TSB has the knowledge, experience, skills and resources to conduct investigations into transportation occurrences to identify safety deficiencies and make findings as to their causes and contributing factors.

And whereas it is in the public interest that, during the investigation of a fatal accident, Manitoba and the TSB coordinate their activities so that each can fulfil its obligations while optimizing the use of resources.

And whereas the parties recognize the desirability of cooperation through the exchange of information and services without compromising their respective independence.

And whereas the parties recognize the desirability of operating with minimal adverse effect on the other's investigations.

And whereas section 16 of the *CTAISB Act* requires the TSB to make all reasonable efforts to enter into agreements with the governments of the provinces in order to ensure that its investigation procedures and practices are as compatible as possible with those followed by Medical Examiners in the provinces.

THE PARTIES HERETO MUTUALLY AGREE AS FOLLOWS:

1. DEFINITIONS

1.1 In this Memorandum of Understanding, hereinafter referred to as the Memorandum, the following words, unless a contrary intention appears, have the following meanings:

"APPENDIX" means the Appendix attached to, and forming an integral part of, this Memorandum, as may be amended from time to time by the parties in accordance with this Memorandum.

"MEDICAL EXAMINER" means the "chief medical examiner" and all "medical examiners" appointed under the FIA, as well as any person acting under the direction of the chief medical examiner or other medical examiner appointed under the FIA, with respect to a FATAL ACCIDENT.

"FATAL ACCIDENT" means an occurrence in Manitoba associated with the operation of a ship, aircraft, railway rolling stock or pipeline (as those terms are defined in the *CTAISB Act*) resulting in a fatality.

"HUMAN REMAINS" means the body of a deceased person and any parts of that body.

"TSB" means the Canadian Transportation Accident Investigation and Safety Board and includes each of the TSB investigators and any other person acting for, or on behalf of, the TSB during the investigation of a transportation occurrence.

1.2 In this Memorandum, the references to "party" or "parties" include the TSB and the MEDICAL EXAMINER, as applicable, it being the intention that this Memorandum will govern their interaction.

2. APPLICATION

2.1 Except as may be otherwise agreed by the parties in specific circumstances, this Memorandum applies to all FATAL ACCIDENTS.

3. MANAGEMENT OF THE OCCURRENCE SITE

3.1 The TSB recognizes that the MEDICAL EXAMINER has certain duties and responsibilities under the *FIA*. The MEDICAL EXAMINER's responsibilities under this Part are, therefore, subject to his obligations pursuant to the *FIA*.

3.2 The party hereto first informed of a FATAL ACCIDENT will forthwith notify the other and provide information on the location and the circumstances of the occurrence.

3.3 The party first informed of a FATAL ACCIDENT will, if such party deems it necessary or advisable, request the services of the police force having jurisdiction over the occurrence, in order to assist in ensuring the protection and preservation of the occurrence site.

3.4 Notwithstanding 3.3, the TSB acknowledges that the MEDICAL EXAMINER shall, pursuant to its obligations under the *FIA*, notify police of the occurrence notwithstanding that the TSB may not deem police assistance necessary or advisable in the circumstances.

3.5 The parties will, subject to their respective statutory duties and responsibilities, have joint management of the occurrence site, and priority will be given to the taking of emergency and remedial measures necessary to ensure the protection of life, health, property and the environment.

3.6 Recognizing that the investigation of FATAL ACCIDENTS involves various activities, each party will endeavour to accommodate the needs of the other whatever the activity taking place.

3.7 The parties will endeavour to accommodate the needs of the police having regard to the circumstances surrounding the FATAL ACCIDENT.

4. IDENTIFICATION OF THE HUMAN REMAINS AND RETRIEVAL PROCESS

4.1 Subject to 4.4 and the MEDICAL EXAMINER's duties under the *F/A*, the parties will be jointly responsible for the protection of information and objects at the site that may be required by either party.

4.2 Recognizing the importance, for investigative purposes, of the location of HUMAN REMAINS and the preservation of information and objects within the occurrence site, the parties, unless otherwise agreed, will coordinate their activities to ensure that no HUMAN REMAINS are disturbed before each has had an opportunity to attend at the site. Each of the parties agrees that it will attend the site at its earliest possible opportunity following the occurrence and ensure that the site or wreckage is not disturbed beyond the extent necessary to extricate the HUMAN REMAINS.

4.3 In the absence of other arrangements acceptable to both parties, the TSB will ensure that the conditions of the occurrence site and whatever is therein are recorded through the best means available before the displacement or removal of the HUMAN REMAINS.

4.4 The MEDICAL EXAMINER will have the responsibility for the retrieval and transportation of the HUMAN REMAINS, for the purposes of identification and subsequent examinations, to a facility provided by a sanitary, health or municipal authority for use as a morgue, or to such other facility as may be acceptable to both parties.

4.5 During the retrieval of the HUMAN REMAINS, the MEDICAL EXAMINER will not disturb the wreckage or other evidence beyond the extent necessary to extricate the HUMAN REMAINS.

4.6 During the recovery of the wreckage and other evidence, the TSB will not disturb the HUMAN REMAINS without the agreement of the MEDICAL EXAMINER.

4.7 The MEDICAL EXAMINER will have the responsibility for the identification of the HUMAN REMAINS and the TSB will provide the MEDICAL EXAMINER with any available information useful to the identification process.

4.8 The TSB will assist the MEDICAL EXAMINER as much as possible with the retrieval of the HUMAN REMAINS and will provide direct assistance or expertise at its disposal, when requested.

4.9 Where a FATAL ACCIDENT is not investigated by the TSB, the TSB will, on request by the MEDICAL EXAMINER, and to the extent practicable:

(a) provide technical assistance including any relevant records; and

(b) attend the site.

5. ACCESS TO INFORMATION

5.1 The MEDICAL EXAMINER will coordinate with the police regarding notification of the next-of-kin of a deceased person. The MEDICAL EXAMINER will inform the TSB when such notification has been completed.

5.2 Subject to 5.3, 5.6 and 5.7, the parties will provide to one another, on an informal and continuing basis, complete information concerning the investigation of a FATAL ACCIDENT.

5.3 To enable the parties to carry out their investigative and administrative duties, each of the parties shall be entitled to request, from the other, personal information(including personal health information) related to persons involved in the FATAL ACCIDENT as it becomes available. The parties agree that requests for personal information shall be set out in writing and shall include the following:

(a) the exact nature and extent of the personal information being requested; and

(b) a statement that the requesting party believes, on reasonable grounds, that the personal information being requested is relevant to and required for its investigation or other duties under the CTAISB Act or the FIA, whichever is applicable to it, and that it has lawful authority to request and obtain such information.

Upon receipt of a written request containing the foregoing information and statements, the party receiving the request will, unless it believes on reasonable grounds that the party requesting the personal information does not have lawful authority to request it or that it does not have lawful authority to provide it, deliver the personal information requested to the other party.

5.4 The TSB will provide the MEDICAL EXAMINER, on a confidential basis, with an interim report, which can be oral or in writing, containing information on the progress and findings of the investigation when significant progress has been made therein.

5.5 The TSB recognizes that the information provided to the MEDICAL EXAMINER may, subject to 5.6, be used during a MEDICAL EXAMINER's inquiry or investigation, or for the purposes of an inquest directed under the *FIA*.

5.6 The parties agree that the MEDICAL EXAMINER will recognize the privilege status of the information referred to in sections 24, 25, 28 and 30 of the *CTAISB Act* and will use the information only in accordance with those provisions.

5.7 The parties will coordinate the release of information to the public, as appropriate and in accordance with all relevant legislation to which the parties are subject.

6. PROTOCOL FOR CONDUCTING AUTOPSIES AND OTHER POST MORTEM EXAMINATIONS

6.1 Recognizing the prime importance of specialized autopsies and post mortem examinations in the investigation of FATAL ACCIDENTS, the parties will ensure that such examinations are performed in accordance with the standards spelled out in the APPENDIX.

6.2 Subject to section 7, the MEDICAL EXAMINER will have the responsibility for the performance of any autopsies during the investigation of a FATAL ACCIDENT, following consultation with the TSB as to the type, number and scope of examinations and autopsies required, given the nature of the occurrence.

6.3 In the event of a major FATAL ACCIDENT resulting in autopsy and other post mortem examination requirements exceeding the means, facilities or staffing resources of the Province of Manitoba, the parties will contract with other sources, as agreed upon, for the performance of the autopsies or other post mortem examinations.

6.4 The TSB may attend any part of an autopsy or other post mortem examination; but, unless otherwise agreed, no records, other than the provincial autopsy records, will be established.

6.5 Upon completing any autopsy or post mortem examination or making significant progress therein, the MEDICAL EXAMINER will, on a confidential basis and subject to any applicable statutory restrictions, provide a report on the findings and conclusions to the TSB Investigator-in-charge.

7. COSTS

7.1 Each party agrees to pay the cost of services provided by or through the other where the services are in excess of those normally required by the other party for the purpose of carrying out its own investigation functions.

7.2 The services to be provided and the amount to be paid for services referred to in subsection 7.1 will be discussed and agreed upon by the parties before such services are rendered.

8. INQUEST/INQUIRY PROCESS

8.1 (a) The MEDICAL EXAMINER will notify the TSB, as soon as practicable, if Manitoba's Chief Medical Examiner directs an inquest under the *FIA*.

(b) The TSB will notify the MEDICAL EXAMINER, as soon as practicable, if the TSB intends to conduct a public inquiry.

8.2 Upon completion of an investigation, the TSB will provide the MEDICAL EXAMINER with a final report in writing on its findings and recommendations.

8.3 Upon the MEDICAL EXAMINER receiving a copy of the presiding provincial judge's written report in connection with an inquest; the MEDICAL EXAMINER will provide the TSB with a copy of the written report and any recommendations.

9. DISSEMINATION OF INFORMATION

9.1 Manitoba will ensure that this Memorandum is disseminated to all MEDICAL EXAMINERS, police forces and police services within the Province of Manitoba.

9.2 The TSB will ensure that this Memorandum is disseminated to all TSB investigation staff located in the Province of Manitoba.

10. COMMUNICATIONS

10.1 Except as may be otherwise expressly set out in this Memorandum, all communications by the TSB with Manitoba concerning FATAL ACCIDENTS will be directed to the Office of the MEDICAL EXAMINER.

10.2 Except as may be otherwise expressly set out in this Memorandum, all communications by Manitoba with the TSB concerning FATAL ACCIDENTS will be directed to the Regional Manager of the TSB.

11. RESOLUTION OF ISSUES

11.1 In the event that an issue arising out of this Memorandum cannot be resolved at the staff level, it will be referred to the Minister of Justice for Manitoba and the Chairperson of the TSB, or their respective delegate(s), for resolution.

12. CONSULTATION

12.1 Unless otherwise agreed, the parties will meet annually to discuss their working relationship, investigations in progress and any need to amend this Memorandum or the APPENDIX.

13. APPENDIX

13.1 The APPENDIX will be initialled by each of the parties at the time of signing the Memorandum.

14. AMENDMENTS

14.1 Proposals for changes to either the Memorandum or the APPENDIX may be made at any time by either party. Amendments agreed upon shall be in writing and signed by both parties.

15. TERMINATION

15.1 Either party may terminate this Memorandum on a written three-month notice to the other.

16. NON-BINDING EFFECT

16.1 It is understood by the parties that this Memorandum is an expression of the parties' mutual intent and is executed as a matter of convenience to ensure that their practices and procedures are consistent and compatible. While the parties intend to cooperate fully with respect to the subject matter hereof, nothing in this Memorandum is, or is intended to be, binding. This Memorandum does not affect, amend, limit, increase or in any other way change, any legal duties, powers or obligations of the parties.

IN WITNESS WHEREOF the parties hereto have executed this Memorandum of Understanding

The Government of Manitoba	Canadian Transportation Accident Investigation and Safety Board
Minister of Justice	Chairperson
City of Winnipeg, Manitoba	City of Gatineau, Quebec
_____/_____/_____ y m d	_____/_____/_____ y m d

This Appendix forms part of a Memorandum of Understanding between The Government of Manitoba, as represented by the Minister of Justice (“Manitoba”), and the Canadian Transportation Accident Investigation and Safety Board, as represented by its Chairperson (the “TSB”).

A-P-P-E-N-D-I-X

A) POST MORTEM REQUIREMENTS

I. INTRODUCTION

The parties recognize that the investigation of fatal transportation occurrences involves some shared responsibilities and more specifically requires the performance of certain post mortem work in order to make findings as to the causes and contributing factors of such occurrences. It is also recognized that the TSB has neither pathological nor toxicological facilities and therefore relies on provincial organizations and personnel to accomplish work in this area. However, the TSB has other unique facilities and its personnel have accrued experience in operational and investigative aspects of transportation occurrence analysis.

Therefore, it is in the interest of both parties to produce, document, and share information and analyses regarding the causal and survival aspects of such occurrences and to agree that all transportation post mortem examinations will be performed in accordance with the following standards or recommendations.

II. SCOPE OF POST MORTEM ACTIVITIES

Physiological and pathological conditions may influence performance of crewmembers or those in safety sensitive positions, through incapacitation or sudden death. Information on external causal events may also be reflected in human remains. Post mortem procedures must therefore be in place to screen for a wide variety of physical conditions and also to detect and document information on structural or other external factors.

Similarly there exists a need to define conditions responsible for lack of survival of crew and passengers. Information on restraint systems function and post-occurrence environment habitation factors are critical in survival analysis, as is information as to the efficiency of crash fire rescue services. Finally it is also necessary to perform work to detect a wide variety of drugs, metabolites and environmental toxins which could indicate disease or degrade performance. In the light of these requirements, the following scope of post mortem work is required:

1. Identification of remains

The identification of the deceased person is of prime importance for a variety of reasons including the determination of medical fitness for duty of those individuals in safety sensitive positions. Where pre-occurrence position is known, identification of victims also supports the analysis of deceleration and impact kinetics and factors peculiar to locations within the wreckage. Post mortem work will also reveal which, if any, remains may not be of human origin.

2. Detection of factors affecting cause and survivability

The presence of pre-existing disease may indicate causal or contributory factors capable of inducing subtle incapacitation or sudden death or accidental illness. Ante-mortem performance may also be influenced by the presence of intoxication from ethanol or environmental contaminants such as carbon monoxide, or from the use of illicit, over-the-counter or a wide variety of prescription drugs.

3. Determination of sequence and impact kinematics

It is important to determine not only the presence of events, but also their sequence in the occurrence scenario. Trauma may occur throughout an occurrence sequence and have differing significance depending on whether it was, for example, sustained due to an en route act of terrorism; from failure of a restraint system; from impact with flying baggage or improperly secured items; or due to impact with or crushing from the cabin structure. A fire on board a moving vessel, train or aircraft might result in death due to the inhalation of products of combustion without, or prior to, impact trauma. If such trauma was deemed non-survivable, the inhalation of products of combustion would be evidence of the occurrence of a possibly causal fire prior to impact. Remains may also be altered by a variety of post-impact events and such artifactual conditions need to be documented to avoid confounding the occurrence analysis.

III. POST MORTEM EXAMINATION PROCEDURES

In all likelihood, any currently used current post mortem examination procedure approved by the province or territory will be acceptable as long as the peculiarities of transportation occurrences and investigations are borne in mind. It is also recognized that changes in routine procedures may result in an increased error rate. This would be especially so in the event of a mass casualty situation. It is further noted that the collected remains may be insufficient for all the procedures and analyses desired and that local resources may require augmentation.

Detailed examination and recording of findings in a written report and labelled and scaled drawings/photographs and x-rays will be required. The routine procedure shall also include the gathering of all information needed for identification, examination of all body cavities and major organs, description of injuries sustained and if possible, their sequence. Organs shall be weighed and measured. Pre-existing disease capable of causing incapacitation or sudden death shall be thoroughly investigated and documented.

Specific samples shall be submitted for toxicological analyses to the provincial laboratories normally used for Medical Examiners or forensic work. From time to time, the Transportation Safety Board may request samples be taken for additional laboratory work. With prior consent, the TSB is prepared to compensate for costs incurred in performing work considered beyond the normal scope of duties.

IV. SPECIFIC ELEMENTS OF POST MORTEM WORK

1. Provision of information from the occurrence scene

It is recognized that the pathologist is at a decided disadvantage in responding to TSB requirements in performing autopsies of transportation occurrence victims without full knowledge of the circumstances of the occurrence. To provide such information, the TSB

will endeavour to convey information regarding the occurrence scenario and site prior to the commencement of autopsies. Any findings subsequently deemed relevant will be conveyed as soon as possible.

2. Autopsy

A standard post mortem examination of a transportation occurrence comprises a variety of activities including:

a) Clothing, equipment and wreckage

Examination and documentation of clothing and personal survival equipment such as personal flotation devices must be performed. Items shall be evaluated for appropriateness for their task and their influence on survivability, as well as for any indications of the manner and cause of death. Articles such as parts of the seat belt, embedded wreckage or information on terrorist device may be sent to the pathologist and shall be evaluated and brought to the attention of the Transportation Safety Board and other authorities.

b) Gross procedures

i. External examination

Signs of pre-existing disease, signs of trauma induced in the occurrence including physical injuries such as lacerations, contusions, amputations, burns, chemical and corrosive injuries, and injuries reflecting the ambient environment including exposures to a wide variety of dangerous commodities, immersion, freezing, etc. shall be noted and documented with diagrams and photographs.

ii. Internal examination

The contents of all body cavities shall be examined to determine the appearance of major organs and the existence of pre-existing causal and contributory pathology and injuries resulting from the occurrence and evidence of transient survival. Both internal and external examination shall also delineate artifactual pathology to avoid confusion with findings of causal significance. The documentation of findings with photographs and labelled drawings is extremely important.

c) Histology

Additional post mortem work shall include microscopic examination of selected tissue specimens from major organ systems. Evidence of conditions capable of affecting performance by altering perception, cognition, or psychomotor control, or causing pain, incapacitating illness or even sudden death, might only be seen with the application of special stains and magnification.

d) Radiographs

Radiographs are essential to document evidence of attempts at control, pre-existing skeletal deformities or orthopaedic work, maturation, spinal injuries and the exact nature of other fractures sustained in the occurrence. Specific fractures might also reveal injury patterns occurring as a result of deficiencies in restraints or vehicle design. Radiographs

will be taken for the above noted reasons. Reports of findings and analysis will be made available to the TSB and copies of the films may be requested.

e) Toxicology

Toxicological analyses are required to detect the presence of ethanol, over-the-counter, prescription and illicit drugs and metabolites, environmental contaminants and fire byproducts such as carbon monoxide and cyanide, exposure to occupationally encountered substances including dangerous commodities, agriculturally used herbicides and pesticides, etc. Therefore, adequate tissue and fluid specimens from the deceased shall be obtained at autopsy to support such analyses. Careful attention shall be paid to the documentation of method of sampling, sites, amount, preservation, storage and custody. In addition to specimens routinely collected such as blood, urine and liver, others such as vitreous humour, bile, bone marrow and tissues from major organs including skeletal muscle shall be preserved for possible analysis.

f) Interpretation of injury patterns

A wide variety of control or passenger environment design deficiencies may influence both occurrence cause and survivability. These may be determined through the analysis of patterns of injury. The pathologist shall use all of the information gathered in the previously noted procedures, to deduce the significance of the injuries detected. For example, restraint systems may leave evidence of their efficacy or lack thereof, in the form of strap marks or internal injury if improperly fitted. Flail injuries may occur when the limbs or the head of properly restrained victims impacts on improperly placed structures within their strike zone. Direction and the magnitude of decelerative forces may be seen through the similarity of injuries to co-located victims. Detonations, whether by failure of a pressurized vessel, a pipeline or as an act of terrorism will provide a variety of findings including blunt or penetrating injuries produced by objects propelled by a blast wave.

B) QUALITY ASSURANCE

1. Pathology

The TSB may, from time to time, require consultation with the Medical Examiner concerning the results of pathological examinations. The TSB will also be advised in a timely fashion if the diagnosis or any pathological finding or interpretation made by a regional pathologist is altered after submission to the TSB.

2. Toxicology

In lieu of splitting samples at the time of autopsy for submission to an independent laboratory, the TSB will rely on provincial laboratory toxicology findings, The TSB requests that the scope of toxicology work performed on samples submitted from transportation occurrence cases be sufficient to detect drugs or toxins capable of affecting performance, drugs and metabolites whose presence is evidence of treatment of medical or self diagnosed conditions and compounds capable of influencing survival. Written reports of results and methods used shall be provided to the Medical Review Officer of the TSB in a timely fashion to ensure appropriate use of the interpretation of findings in the investigation.

The TSB also requests that provincial toxicology laboratories submit a written report of standard laboratory procedures and methods and notify the TSB of changes which may occur from time to time. The TSB may also require, from time to time, consultations concerning the results of toxicological examinations.

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Appendix 7 to Chapter 2

SAMPLE MOU WITH A CIVIL AVIATION AUTHORITY

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE CANADIAN TRANSPORTATION ACCIDENT INVESTIGATION AND SAFETY BOARD ("TSB")

AND

TRANSPORT CANADA ("TC")

RESPECTING THE COORDINATION OF ACTIVITIES WITH REGARD TO TRANSPORTATION OCCURRENCES

1.0 PURPOSE

1.1 The purpose of this Memorandum of Understanding ("MOU") is to provide for the coordination of the activities of TC and TSB with respect to transportation occurrences, as contemplated by section 17 of the *Canadian Transportation Accident Investigation and Safety Board Act*.

2.0 PRINCIPLES

2.1 TSB and TC recognize the desirability of cooperation through:
- (a) positive working relationships;
- (b) the effective and efficient exchange of information and data;
- (c) clear and open communication;
- (d) respect for the mandate and responsibilities of each organization; and
- (e) the prompt resolution of any conflicts which arise, including by referring them to more senior levels within each organization, including where appropriate or required to the Minister of Transport and the Chairman of the TSB.

3.0 AUTHORITIES AND RESPONSIBILITIES

3.1 The Chairman of TSB is responsible for the administration of the *Canadian Transportation Accident Investigation and Safety Board Act, R.S.C.* (CTAISB Act).

3.2 For the purpose of this document, the Minister of Transport is responsible for the administration of:
- (a) the *Aeronautics Act*, R.S.C. 1985, C. A-2 (as amended);
- (b) the *Canada Shipping Act*;

(c) the *Railway Safety Act*; and
(d) the *Transportation of Dangerous Goods Act, 1992*.

3.3 The TSB is an independent body with the mandate to advance transportation safety by conducting independent investigations of selected occurrences in the aviation, rail and marine modes, in order to make findings as to their causes and contributing factors, to identify safety deficiencies, to make recommendations to eliminate or reduce such safety deficiencies, and by reporting publicly on its investigations and its findings.

3.4 Transport Canada delivers various programmes and services to regulate and oversee transportation safety and security.

4.0 NOTIFICATION OF OCCURRENCES

4.1 The party first informed of an occurrence will notify the other party as soon as practicable, in accordance with the procedure set out in Section 2 of the Schedule to this MOU.

5.0 NOTICE OF SIGNIFICANT STUDIES AND OTHER INVESTIGATIONS

5.1 Each party will advise the other of significant studies or investigations they plan to conduct that may be of interest to the other.

6.0 INTERNATIONAL RELATIONS

6.1 Both parties will work cooperatively to develop coordinated Canadian positions as well as to coordinate their representation and participation at international meetings and events, such as meetings of IMO and ICAO.

7.0 MEDIA RELATIONS

7.1 The parties acknowledge that the TSB is to be the official spokesperson regarding any accident investigation that the TSB undertakes.

7.2 Each party may respond to requests for information from the media concerning its mandate and activities. Each party will endeavor to provide notice and details to the other party in advance of the release of formal communiques or press releases, which may be of interest to, or impact on, the mandate or activities of the other party.

8.0 COST SHARING AND COST RECOVERY

8.1 Except as otherwise agreed to in advance, normal provision of services by one party to the other will be without charge.

8.2 In instances where one party requests that the other conduct special projects or significant studies, or provide other services, costs incurred will be reimbursed in accordance with Treasury Board Policies.

9.0 CONSULTATION

9.1 Each party will consult with and involve the other on matters which may be of interest, including regulatory changes or initiatives. Each party will endeavor to accommodate the requirements of

the other party with respect to regulatory development. Such involvement shall include where appropriate, the provision of technical information and participation in consultations with industry during the development of regulatory proposals.

10.0 REVIEW

10.1 This MOU and its implementation will be reviewed by the parties annually or at the request of either party.

11.0 SCHEDULE

11.1 The attached Schedule forms part of this MOU and may be amended from time to time on the written agreement of the Assistant Deputy Minister, Safety and Security, Transport Canada and the Executive Director of the TSB.

12.0 AMENDMENTS AND TERMINATION

12.1 This MOU may be amended in writing by the written agreement of the parties and may be terminated by either party on 180 days written notice.

The Canadian Transportation Accident Investigation and Safety Board	Transport Canada
_____	_____
Chairperson	Minister of Transport
Date signed: _____	Date signed: _____

SCHEDULE

1.0 PURPOSE

1.1 The purpose of this schedule is to outline the specific responsibilities of TC and the TSB regarding the implementation of the Memorandum of Understanding (MOU).

2.0 NOTIFICATION OF OCCURRENCES

2.1 For immediate notification of reportable occurrences, as defined in the TSB Regulations:

(a) TC, Civil Aviation will notify the appropriate TSB office of any reportable aviation occurrence as soon as practicable.

(b) The TSB will notify the Civil Aviation Contingency Operations (CACO) Centre of any aviation occurrence as soon as practicable.

(c) For marine occurrences, initial notifications are not required from either party as occurrence notifications are provided to both parties by the Department of Fisheries and Oceans (DFO), Canadian Coast Guard (CCG). Shall TC or TSB obtain initial notification from another source, outside DFO/CCG, they will contact the other. (TC's contact point is CANUTEC).

(d) TC, Rail Safety will notify the appropriate TSB office of any reportable railway occurrence as soon as practicable

(e) The TSB will notify CANUTEC of any railway occurrence as soon as practicable.

2.2 Formal notification of TSB investigations:

(a) The TSB will inform TC within 48 hours of learning of an occurrence what action the TSB intends to take, including the class of investigation. This information shall normally be provided in the TSB Daily Notification Logs.

(b) The TSB will report aviation occurrences, indicating aircraft type and registration, location, date and time of the occurrence, number of injuries and fatalities, particulars relating to involvement of dangerous goods, brief description of the circumstances and the action planned by the TSB.

(c) The TSB will report rail occurrences indicating the train number, subdivision name and mileage, date and time of the occurrence, number of injuries and fatalities, particulars relating to involvement of dangerous goods, brief description of the circumstances and the action planned by the TSB.

(d) The TSB will report marine occurrences, indicating the name, type, flag, gross tonnage and cargo of the vessel, location, date and time of the occurrence, number of injuries and fatalities, particulars relating to involvement of dangerous goods, the degree of damage and pollution, a brief description of the circumstances and the action planned by the TSB.

2.3 If TC believes an investigation is required of an occurrence to determine findings as to causes and contributing factors, where the TSB has decided not to investigate, TC may request that the TSB conduct an investigation.

2.4 If TC conducts an occurrence investigation, within its legislative authority, it will inform the TSB.

2.5 Where the TSB is assessing the need to conduct an investigation into an occurrence, TC may decide to conduct its own investigation where it is empowered to do so. TC will inform the TSB of its decision to conduct an investigation, as soon as practicable.

3.0 COORDINATION OF INVESTIGATIVE ACTIVITIES

3.1 With respect to occurrences that the TSB is investigating, TC will make available on request as soon as practicable, subject to any Act of Parliament and any agreements with other government departments or agencies, the information contained in their files, libraries, reporting systems and databases.

3.2 In the event TC is investigating the same occurrence as the TSB, TC and the TSB will ensure that each other's mandate is respected.

3.3 Shall TC send a representative to the site of an occurrence in order to evaluate TC's responsibilities or to determine if any immediate corrective or remedial measures are required, that representative will endeavor to make contact with any TSB investigator on site.

3.4 In any activity undertaken by TC, the interests of the TSB with regard to evidence preservation will be respected. However, this will not be an impediment to TC taking whatever action is deemed necessary in fulfillment of their obligations relating to immediate corrective action or remedial measures.

4.0 MINISTER'S OBSERVER

4.1 It is TC's policy to appoint a Minister's Observer upon being notified by the TSB that it is investigating an occurrence. TC will provide the name of the Minister's Observer to the TSB as soon as practicable.

4.2 The Minister's Observer will obtain timely information relevant to the Minister's responsibilities and coordinate TC involvement and resources required for the investigation in accordance with the TC Minister's Observer Manual of Policies and Procedures.

4.3 If TC does not designate a Minister's Observer, the Department may appoint a Coordinator to act as a point of contact with the TSB for the purpose of exchanging information, subject to the same restrictions as those of the Minister's Observer.

4.4 The TSB will provide the Minister's Observer or, where an Observer is not designated, TC's Coordinator with a summary of factual information derived from any type of recorder in order to convey relevant safety concerns to TC, as soon as practicable, for the purpose of conducting risk assessments and/or for overseeing safety. This information will be used and treated in accordance with procedures set out in TC's Minister's Observer Manual of Policies and under the requirements of the Privacy Act, the Access to Information Act and the CTAISB Act.

5.0 EXCHANGE OF SERVICES DURING INVESTIGATIONS

5.1 TC will facilitate and support the investigation of transportation occurrences, particularly at remote sites, by providing living and office accommodation, transportation services, removal equipment, accident site surveys, dangerous goods detection equipment, etc., to the extent practical and feasible, within available resources, and when owned and operated by TC.

5.2 TSB will facilitate and support TC's Minister's Observer role during the investigation of occurrences by providing protective equipment and clothing, where TC cannot immediately obtain protective equipment or clothing that is compliant with TSB requirements. Equipment provided is such cases must meet or exceed TC's requirements under the Canada Labour Code, Part II.

6.0 INTERNATIONAL RELATIONS

6.1 The roles of the TSB and TC will be respected in assigning representatives to ICAO and other international meetings, task forces and other working groups involving transportation safety matters. Prior to attendance, the TSB and TC will consult and agree on appropriate representation, while recognizing that for ICAO Accident Investigation Group divisional meetings and for Flight Recorder Panel meetings, the official technical expert will normally come from the TSB, in coordination with TC.

6.2 TC will provide International Civil Aviation Organization (ICAO) coordination services to other departments and agencies. The Canadian position involving aviation occurrence investigations will be that of the TSB while the Canadian position regarding on-board recorders will take into consideration the views or proposals of the TSB.

6.3 Each party will inform the other of an occurrence outside of Canada, as soon as practicable. These include occurrences involving:

- Canadian registered and/or built ship, or component thereof, operated by a foreign or Canadian operator;
- Canadian registered and/or manufactured aircraft, or component thereof, operated by a foreign or Canadian operator; and
- Canadian owned and/or manufactured railway rolling stock.

6.4 Under ICAO Annex 13, the responsibility for appointing a Canadian Accredited Representative to an investigation of an aviation occurrence outside Canada conducted by another state lies with the TSB. The decision to provide a TC Advisor to the Canadian Accredited Representative is at the discretion of TC, Safety and Security. If the TSB decides not to assign an Accredited Representative, TC may assign someone to that position.

6.5 In fulfilling the obligations of IMO Resolution A.449(XI), the Assistant Deputy Minister, Safety and Security, or his delegate, as the Head of the Canadian Delegation to IMO's General Assembly sessions and the elected Council's bi-annual sessions, is the Canadian focal point for

communication with the Secretary-General of IMO. The TSB may name a representative or submit documentation to IMO Technical Committees with respect to marine investigation activities related to the mandate of the TSB, in coordination with the Head of the Canadian Delegation or his delegate.

6.6 TC, as the Head of the Canadian Delegation will, with the Department of Foreign Affairs and International Trade, develop the Canadian position on IMO applicable sessional items in coordination with the TSB. The TSB will be responsible for the reporting of occurrences and the submission of reports, in accordance with Resolution A849(20) and A884(21) and MSC Circular 827 in conformity with SOLAS 74 Chapter 1 and MARPOL 73/78 Article 12.

The Canadian Transportation Accident Investigation and Safety Board	Transport Canada
_____	_____
Executive Director	Deputy Minister, Safety and Security
Date signed: _____	Date signed: _____

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Appendix 8 to Chapter 2

CHECKLIST ON ASSISTANCE TO INVESTIGATIONS

INVESTIGATION AUTHORITY READINESS REQUIREMENTS

1. Is there State legislation that establishes an independent accident investigation authority responsible for the conduct of safety investigations?

   - **If not**, the State shall establish an independent accident investigation authority that is separate from the civil aviation authority or legal authority; that has rights, responsibilities, suitable statutory powers to conduct the investigation; and that has the required financial, human and technical resources. As an alternative, the State could establish or join an existing regional accident investigation organization.

2. Is there State legislation that specifies the powers of the accident investigation authority and how investigations are conducted?

   - **If not**, the State shall direct that the investigation be conducted in accordance with Annex 13 and the *Manual of Aircraft Accident and Incident Investigation* (Doc 9756).

3. Does the accident investigation authority have State policies, plans, standards, procedures and checklists for the conduct of accident/incident investigations?

   - **If not**, the State shall use some or all of the provisions in the *Manual of Aircraft Accident and Incident Investigation* (Doc 9756) and/or in the documents used by other accident investigation authorities.

4. Does the accident investigation authority have sufficient technical and human resources with the competencies required to conduct a credible investigation?

   - **If not**, the State shall have plans to acquire equipment and human resources from, in part, other accident investigation authorities, regional accident investigation organizations, national government departments and authorities, aircraft operators and manufacturers.

5. Does the State legislation provide for immediate and unrestricted access to all relevant evidence without requiring prior consent from judicial bodies or other authorities?

   - **If not**, the accident investigation authority shall establish a documented agreement with judicial/police departments, an agreement that ensures the data collection and custody needs of both the accident investigation authority and the judicial/police authorities.

6. Does the State legislation specify the procedures to be followed in order to keep accident/incident investigations separate from judicial or administrative proceedings?

   - **If not**, the accident investigation authority shall establish documented agreements with judicial, police, and other departments, agreements that ensure the separation of the safety investigation from other investigations.

7. Do the State legislation and regulations specify the protection of certain documents and information obtained in the course of an accident/incident investigation from public disclosure?

   - **If not**, in the short term, the accident investigation authority shall document the State's commitment to achieve the provisions of Annex 13 regarding the "Non-disclosure of records" and, in the long term, to adjust its laws, regulations and policies to protect accident and incident records in compliance with paragraph 5.12 of Annex 13.

8. Does the State accident investigation authority have a communications policy/plan and procedures to notify and then to deal with the involved States, judicial/police authorities, departments, operators, the media and many other parties that have an interest in the investigation?

   - **If not**, the accident investigation authority shall enter into agreements with these entities to ensure that communications are coordinated and timely.

9. Does the accident investigation authority have a need for advice on the organization and management of the investigation?

   - **If yes**, the accident investigation authority shall acquire such expertise from other accident investigation authorities or from a safety consultant with the required expertise.

10. Does the State have arrangements to ensure entry without delay into their territories on a temporary basis of qualified personnel required for accident investigation?

    - **If not**, the accident investigation authority shall establish a process and/or agreement with the State department(s) responsible for such facilitation matters based on the provisions of Annex 9, Chapter 8, Part B.

FIELD PHASE INVESTIGATION ASSISTANCE

1. Does the State investigation authority have regulations and procedures to ensure that all documents, records, recordings and other evidence associated with the flight are secured and placed in safe keeping until further instructions are received from the accident investigation authority?

   - **If not**, the accident investigation authority, without delay, shall notify all the involved entities to secure these types of evidence.

2. Does the accident investigation authority have enough investigators with adequate skills and experience to manage and conduct a major investigation?

   - **If not**, the State shall contact the States involved in the investigation and other States to acquire additional investigators with specific or general skills and experience.

3. Does the accident investigation authority have a communication policy and plan for the investigation and have procedures regarding the release of investigation information, including a skilled spokesperson?

   - **If not**, the accident investigation authority shall solicit advice and support from other government departments and/or the States involved in the investigation.

4. Do all the investigators assigned to the investigation have the required training, skills, knowledge and equipment for the conduct of investigation operations at the accident site, in part including, a field-investigation kit, passport, protective inoculations, clothing, supplies, etc.?

- **If not**, the accident investigation authority shall limit the activities of untrained, ill-equipped investigators to operations in safe areas.

5. Does the accident investigation authority have procedures with operators to identify hazardous materials on the crash site, as provisioned in Annex 13, subparagraph 4.2 m)?

   - **If not**, the accident investigation authority shall, without delay, contact the involved operator to acquire that information and to solicit advice and support from other government departments and/or the States involved in the investigation.

6. Are there means of transportation to/from the accident site and adequate equipment facilities in the immediate vicinity of the accident site?

   - **If not**, the accident investigation authority shall seek assistance from other State civil and military organizations to provide facilities, equipment and additional personnel.

7. Does the accident investigation authority have access to all the facilities required to read out flight recorders?

   - **If not**, the accident investigation authority shall acquire the needed expertise and facilities from the States involved in the accident investigation, other States or a commercial engineering company.

8. Does the accident investigation authority have ready access to medical expertise to carry out medical and pathological examinations?

   - **If not**, the accident investigation authority shall establish agreement(s) with a coroner/medical examiner to provide these services.

9. Does the accident investigation authority have the required knowledge and capacity to guard and protect the accident scene?

   - **If not**, the accident investigation authority shall establish working agreements with the national/local police or the military to provide security resources.

10. Does the accident investigation authority have the required knowledge and capacity to establish and maintain the safety of investigation operations at a hazardous site?

    - **If not**, the accident investigation authority shall establish working agreements with the military, the national/local police or firefighters, crash rescue responders, other government departments or commercial firms who have the required certification/expertise.

11. Does the accident investigation authority have processes and facilities for collecting, identifying, cataloguing, storing and safe-guarding evidence acquired by the investigation?

    - **If not**, the accident investigation authority shall establish working agreements with government departments, police and/or other State investigation authorities to obtain administrative resources for this function, including advice, expertise, processes and database systems.

POST-FIELD PHASE INVESTIGATION ASSISTANCE

1. Does the accident investigation authority have the expertise and facilities for the detailed examination of systems, parts or components?

- **If not**, the accident investigation authority shall acquire the needed expertise and resources from government departments, States involved in the accident investigation, other States, commercial engineering companies and/or the relevant manufacturer.

2. Does the accident investigation authority have appropriate facilities for additional specialized examinations and research, such as numerical computation, spectral analysis?

   - **If not**, the accident investigation authority shall acquire the needed expertise and resources from government departments, States involved in the accident investigation, other States and commercial engineering companies.

3. Does the accident investigation authority have a methodology, processes and other tools to analyse factual information and to determine safety issues, causes and contributing factors?

   - **If not**, the accident investigation authority shall acquire the needed expertise and resources from States involved in the accident investigation, other State investigation authorities and/or safety consultation firms.

4. Does the accident investigation authority have all the expertise for writing reports and safety recommendations?

   - **If not**, the accident investigation authority shall acquire the needed expertise and resources from States involved in the accident investigation and/or other State investigation authorities and/or safety consultation firms.

5. Does the accident investigation authority have investigators who are skilled in specialized areas involved in the accident investigation, such as interviewing, human factors, management factors, safety deficiency analysis, helicopter operations, airports, air traffic control, general aviation operations, weather analysis, survival factors and taking fluid samples?

   - **If not**, the accident investigation authority shall acquire the needed expertise and resources from States involved in the accident investigation, other States and service providers.

POSSIBLE OBSTACLES TO INVESTIGATIONS

1. Has the State responsible for the investigation determined which organization(s) is (are) responsible for communicating information relating to an accident/incident and to the investigation?

2. Has the State responsible for the investigation established policies and/or procedures regarding the release and/or use of investigation information?

3. Are there organized protocols and processes established for communication between the various parties involved in the occurrence investigation?

4. Has a procedure been set up or contacts been made to facilitate the arrival of assisting investigators?

5. Are there any specific local constraints, such as geographical constraints, that might hamper the success of the assistance provided by another State?

6. Is there rapid transportation available to reach the accident site and are suitable accommodations available near the accident site, or will it be necessary to call upon a third party to make these arrangements?

7. Are there any provisions under national laws or regulations that prohibit accredited representatives and their advisers from accessing the accident site or gaining access to any data relevant to the investigation, as provisioned in Annex 13, paragraphs 5.12 and 5.25?

8. Are there any provisions under national laws or regulations that allow for the release of sensitive information provisioned in Annex 13, paragraph 5.12?

9. Are there any provisions under national laws or regulations that prohibit sending or carrying aircraft parts or components abroad for examination?

10. Are there any provisions under national laws or regulations that limit the entitlement of a foreign technical expert, as provisioned in Annex 13, paragraph 5.27?

11. Are there any requirements for having translation services for foreign investigators?

Appendix 9 to Chapter 2

MODEL DELEGATION AGREEMENT IN RESPECT OF AIRCRAFT ACCIDENT AND SERIOUS INCIDENT INVESTIGATION

AGREEMENT BETWEEN

……..... (*Agency/Authority)*

of

…… *(State)*

AND

……..... (*Agency/Authority)*

of

…… *(State)*

REGARDING DELEGATION OF INVESTIGATION

IN RESPECT OF

AIRCRAFT ACCIDENT/SERIOUS INCIDENT INVOLVING

MAKE/MODEL, REGISTRATION: XX-XXX

XXX AIRLINES, FLIGHT XX

1. DELEGATION

1.1 An accident has occurred in the territory of …….. *(State)* on …… *(date)* involving XXX Airlines Flight XXX, which originated in …… *(departure State)*.

1.2 This agreement expresses the delegation in ……..……. *(whole/part)* of the investigation of the above-mentioned accident by the ……. *(Agency/Authority)* of …… *(State)* to the ……. *(Agency/Authority)* of …… *(State)*, hereafter referred to as the Parties to this agreement.

1.3 It is recognized that both …… *(State)*, and …… *(State)*, are parties to the Convention on International Civil Aviation (The Chicago Convention) and that they are therefore bound by the Standards contained in Annex 13 — *Aircraft Accident and Incident Investigation* to the Chicago Convention.

Note.- Both States shall advise each other of their respective existing differences that have been filed or that will be filed against the Standards of Annex 13.

1.4 Both parties to this agreement are authorized by their respective Governments to act as the national authority representing ……..*(State)* and ……..……..*(State)* in respect of aircraft accident and serious incident investigation matters.

1.5 This agreement is in accordance with Annex 13 to the Chicago Convention, Standard 5.1, which states "The State of Occurrence shall institute an investigation into the circumstances of the accident and be responsible for the conduct of the investigation, but it may delegate the whole or any part of the conducting of such investigation to another State or a regional accident investigation organization by mutual arrangement and consent. In any event, the State of Occurrence shall use every means to facilitate the investigation." (Standard 5.1.2 of Annex 13 refers to delegation of investigation of serious incidents.)

2. TERMINOLOGY

2.1 The words and phrases used in this document have the same meaning as that ascribed to them in Annex 13 — *Aircraft Accident and Incident Investigation*.

3. THE PURPOSE OF INVESTIGATIONS

3.1 The sole objective of investigating an accident or incident in accordance with Annex 13 is for the prevention of accidents and incidents. It is not the purpose of such an investigation to apportion blame or liability.

4. CODE OF CONDUCT

4.1 This agreement serves to foster cooperation and mutual assistance between the parties in implementing the provisions of Annex 13. Each party shall strive to overcome difficulties that may arise due to differences in languages, national cultures, legislative systems or geographic locations.

5. PARTICIPATION BY STATES AND OTHER ENTITIES

5.1 In accordance with Annex 13, Standard 5.18, the State of Registry, the State of the Operator, the State of Design and the State of Manufacture shall each be entitled to appoint an accredited representative to participate in the investigation. Additionally, in accordance with Annex 13, Standard 5.23, any State which on request provides information, facilities or experts to the State conducting the investigation shall be entitled to appoint an accredited representative to participate in the investigation.

5.2 In addition to the States referred to in 5.1 above, any other States or entities invited by the ……. *(Agency/Authority)* of …… *(State)* to participate in the investigation will be accorded rights of participation in accordance with Annex 13.

6. PROGRESS OF THE INVESTIGATION

6.1 The two parties agree to work together to ensure that a competent investigation is conducted in accordance with the procedures and intent of Annex 13.

6.2 Either party may request information on the progress of the investigation being carried out by the other party. All possible efforts will be made to provide the requested information. In accordance with the relevant laws of the respective States, any such information provided shall be treated with at least the same rules with respect to confidentiality as those to which the providing party is bound.

6.3 It is recognized that ……. *(agency/authority to whom the whole investigation has been delegated)* is responsible for the conduct of the whole investigation, including the issuance of the Final Report and the ADREP reporting.

(or when only part of an investigation has been delegated)

6.3 It is recognized that ……. *(agency/authority to whom only a part of the investigation has been delegated)* is delegated as being responsible for the conduct of *(specify the part(s) being delegated)* of the investigation, including a report on its findings to the investigator-in-charge. Notwithstanding this delegation, ultimate responsibility for the conduct of the investigation remains with …… *(State of Occurrence)*, including the issuance of the Final Report and the ADREP reporting.

7. COORDINATION

7.1 The contact person in ……. *(Agency/Authority)* of …… (State) for the implementation of this agreement is:

……..…….. (*Title*)
……..…….. *(Agency/Authority)*
……..…….. *(Address)*

Tel.: …….. *(Office)* …….. *(Mobile)*
Fax:……..
E-mail: ……..

7.2 The contact person in …… *(Agency/Authority)* of …… *(State)* for the implementation of this agreement is:

……..…….. (*Title*)
……..…….. (*Agency/Authority*)
……..…….. (*Address*)

Tel.:…….. (*Office*) …….. (*Mobile*)
Fax:……..
E-mail: ……..

8. ENTRY INTO FORCE AND TERMINATION

8.1 This agreement will come into effect on the date of signing by the parties to this agreement.

8.2 This agreement may be terminated by mutual consent of the parties.

Signed at …… on ……

in the …… *(State)* and …….. *(State)* languages.

……	……
(Title)	*(Title)*
..…….. *(Agency/Authority)*	..…….. *(Agency/Authority)*
…… *(State)*	…… *(State)*

Chapter 3

PLANNING THE INVESTIGATION

3.1 ACCIDENT INVESTIGATION MANAGEMENT

3.1.1 This section provides a synopsis of the planning for management of the investigation. Detailed information on the Investigation Management System can be found in ARCM Procedures and checklists for aircraft accidents and incidents investigation.

3.1.2 It is essential that the magnitude of the tasks and the scope of the investigation be assessed at an early stage so that the size of the investigation team can be planned and the appropriate resources and expertise can be acquired for the investigation. To achieve its purpose, an investigation must be properly organized, carried out, coordinated and supervised by qualified technical personnel. The investigation plan must recognize that the investigator-in-charge is directly responsible for organizing the investigation team, for assigning responsibilities to the team members and for managing the progress of the investigation. The investigation plan shall also include detailed investigation checklists.

3.1.3 In a major accident investigation, a substantial team of investigators, set up in specialized groups, is necessary to properly cover all aspects of the investigation. In some investigations, the apparent causes/contributing factors may become evident early in the investigation. In such situations, the subsequent, prime investigation effort may then be effectively channelled to good effect into relatively narrow but specialized areas. Nevertheless, it will still be necessary to investigate all factors that might have contributed to the accident and to eliminate those factors that did not. Whether or not the causes are apparent, the investigation shall determine any underlying systemic factors that may have contributed to the accident as well as any non-causal deficiencies that could contribute to future accidents.

3.1.4 In the case of incidents and non-major accidents, the investigation effort in terms of manpower and resources required may be proportionately smaller. The functions are still the same but the work is undertaken by one or two investigators or, alternatively, by an investigator and a specialist qualified in a particular aspect that requires expert examination. Even in small investigations, pre-investigation planning is essential and the degree of individual effort and diligence in accurately recording the facts and developing the analysis and conclusions must be of the same high standards as for major accident investigations.

3.2 THE INVESTIGATION MANAGEMENT SYSTEM

3.2.1 This section provides a synopsis of the Investigation Management System.

3.2.2 In the case of an accident investigation involving a large or complex aircraft, a large team of investigators is usually required to conduct the investigation in the most effective and expeditious way. The effective management of a major investigation requires a management system based on a comprehensive plan, checklists, and a method and flow charts to track the progress of the investigation. In effect, a major investigation is a project that must be managed. This section of the manual presents one such project management system, entitled the “Investigation Management System”. This system divides the investigation activities into functional events. Each event is numbered with a corresponding descriptive phrase. The list of Investigation Management System events is contained in Part II of this manual.

3.2.3 To assist in the management of the investigation and the monitoring of the workload, each event shall be assigned to a group within the investigation team. These assignments shall be documented. An example of the investigation event task-assignment chart is contained in ARCM Procedures and checklists for aircraft accidents and incidents investigation.

3.2.4 The Investigation Management System flow chart, which consists of a set of events, shall be completed sequentially in the course of an investigation. The flow chart allows the investigators to ensure that the essential sequence of events is followed and, as well, provides an up-to-date picture of what has been completed to date. An example of the Investigation Management System event flow chart is contained in ARCM Procedures and checklists for aircraft accidents and incidents investigation.

3.2.5 A checklist is provided for each Investigation Management System event. The checklists may differ somewhat from one State to another due to local conditions and procedures. The checklists shall be reviewed to ensure that the tasks are appropriate to the organization and conduct of accident investigations and are in line with the procedures of the State. The breakdown of activities and tasks into checklists allows the investigator-in-charge to clearly indicate what is to be accomplished by the investigators and by the groups during an investigation.

3.2.6 Use of the task-assignment flow chart, the event flow chart and checklists also allows the investigator-in-charge to provide direction and guidance to persons who are participating in an investigation for the first time and who may require specific advice. The checklists, aside from being part of the Investigation Management System, provide for some order in what is sometimes a confusing situation. The Investigations Management System event checklist is contained in ARCM Procedures and checklists for aircraft accidents and incidents investigation.

3.2.7 The investigation team members shall be familiar with the Investigation Management System. The group chairpersons must be knowledgeable about this system and the tasks that their groups will be required to carry out. Group chairpersons shall be well aware that the tasks listed for each event may not be complete and that particular circumstances may require additional tasks. When using the checklists, it is desirable that the investigators make notes of the date of completion of each task. They shall also make notes when further action is required and note things of significance associated with a particular task. Regardless of how much planning goes into the provision of this type of checklist, there will be cases in which the outlined tasks have to be adapted to the special circumstances of the investigation.

3.2.8 The event flow chart and the checklists provide tools for the group chairpersons to organize the work of their groups. The flow chart also provides the investigator-in-charge with a tool to monitor progress. At the daily progress meetings, the investigators shall report the particular tasks in their checklists that have been completed since their last report, and the investigator-in-charge shall note the progress on the event flow chart. Another advantage of using this chart is the ease with which progress of the investigation can be reported to the headquarters office from the investigation site.

3.2.9 The Investigation Management System is one of the tools that an investigator shall be called upon to use. The effectiveness of the Investigation Management System is directly related to the adherence to the flow chart and the checklists. An investigator likely to be appointed investigator-in-charge or group chairperson in a major investigation shall be familiar with this system prior to attempting to use it in the field.

3.3 LIAISON WITH OTHER AUTHORITIES

3.3.1 The readiness of the State accident investigation authority will benefit from establishing working arrangements and/or memoranda of understanding with authorities that have first-responder responsibilities (such as police, firefighters and search and rescue), with organizations that may become involved in or that might provide support to the safety investigation (such as government departments and the military) and with other authorities that have

investigation mandates related to the aircraft accident or incident (such as judiciaries, police, coroners, and the civil aviation authority). Of importance is that emergency plans are in place. Specifically, the accident investigation authority must be aware of the mandates and emergency plans of local authorities, and the local authorities must be aware of the mandates, authorities and plans of the investigation authority. (Chapter 2 of this manual contains more information on the issues of establishing relationships with national and local authorities.)

3.3.2 Cooperation with the police can usually be obtained through liaison with police headquarters. Suitable items can then be included in the police training syllabus and the official police handbook to ensure that members of the police force are informed, in advance, of what is expected of them in the event of an aircraft accident.

3.3.3 Cooperation with air traffic services providers and airport authorities is important, in particular because these entities are usually the first to become aware of and respond to occurrences on or adjacent to airports. The *Airport Services Manual* (Doc 9137), Part 7 — *Airport Emergency Planning* and the airport emergency plan identify and set forth the procedures for coordinating the response of different airport agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to the emergency.

3.3.4 Victim identification is usually the responsibility of the coroner's office, the police department and the disaster victim identification team. Medical personnel, such as pathologists and forensic dentists, shall be aware of what is expected of them in the event of an aircraft accident.

3.3.5 Notification of next of kin is a sensitive task that must be planned and undertaken with great care in order to avoid anomalies, such as multiple or erroneous notifications. In many States, the notification of next of kin is a police task.

3.3.6 The accident investigation authority may have to rely on assistance from other civil and military organizations to provide facilities, equipment and additional manpower, i.e. helicopters, heavy lifting and moving gear, metal detectors, Geiger counters, communication equipment and divers. It is important that heavy salvage equipment, such as cranes, bulldozers or lifting helicopters, are readily available. When an extensive wreckage plot is required, it may also be necessary to obtain the services of professional surveyors through liaison with appropriate government agencies. In some cases, a full-scale expedition may have to be mounted to reach the occurrence site, requiring additional transportation, food, lodging and/or other services.

3.4 COOPERATION WITH THE MEDIA

3.4.1 Most major accidents generate a high degree of interest from both the public and the media, and a good rapport with the media is usually an asset to the investigation. It may be necessary to enlist the cooperation of the local media to withhold precise details of the location of an aircraft accident until adequate crowd-control measures can be implemented. It may also be necessary to enlist their aid in obtaining further information about the local area and the names of possible witnesses or when seeking the public's assistance in recovering missing pieces of the wreckage.

3.4.2 Policies shall be adopted regarding the release of information to the media about the accident or the progress of the investigation. To promote dissemination of factual information and to minimize speculation and rumours about the accident, the media shall be provided, on a regular basis, with all those facts which can be released without prejudice to the investigation. For this reason, the accident investigation authority shall consider establishing a single point of contact for media inquiries. This contact is usually the investigator-in-charge or a designate. The media contact, in consultation with the accredited representatives, shall provide non-prejudicial facts and circumstances to the media. Nevertheless, it is necessary to ensure that the needs of the media do not interfere with the proper conduct of the investigation.

3.4.3 Other organizations involved or affected by the accident (such as airlines, airport authorities, emergency

services and aircraft manufacturers) may also be required to release information to the media, and such efforts shall be coordinated, to the extent possible, amongst the organizations and agencies involved.

3.4.4 The accident investigation authorities and the accredited representatives and their advisers participating in an investigation shall not give the media or the public access to any documents obtained during the investigation without the express consent of the State conducting the investigation. The release of such information by a participating State, without the consent of the State conducting the investigation, would undermine the mutual confidence and cooperation amongst the States involved and must therefore be avoided.

3.5 SECURING OF RECORDS, RECORDINGS AND SAMPLES

Regulations and procedures shall be in place to ensure that, in the event of an accident, all air traffic services communication recordings and documents deemed to be associated with the flight are secured and placed in safe keeping until further instructions are received from the accident investigation authority. Prior arrangements shall also be made to immediately obtain and place in safe keeping all of the aircraft operator's documentation associated with the aircraft, the flight crew and the flight operation. Arrangements shall be made with the aviation meteorology authorities to obtain a special weather report as soon as they become aware of an aircraft accident. Similar arrangements shall be made with fuel companies to obtain fuel samples from stocks or refuelling points.

3.6 REMOVAL OF DISABLED AIRCRAFT

Detailed information concerning planning, equipment and procedures for the removal of disabled aircraft at airports is contained in the *Airport Services Manual* (Doc 9137), Part 5 — *Removal of Disabled Aircraft*.

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Chapter 4

NOTIFICATION OF ACCIDENTS AND INCIDENTS

4.1 GENERAL

Immediate notification of accidents and incidents to the accident investigation authority is essential because the proper conduct of an investigation requires the prompt arrival of investigators at the accident site. Any delay in their arrival may well result in the deterioration or disappearance of essential evidence due to theft, displacement or improper handling of the wreckage, adverse weather, corrosion of the wreckage, obliteration of ground scars or contamination of witness accounts through discussion among themselves.

4.2 NOTIFICATION WITHIN A STATE

4.2.1 ARCM member State regulations shall provide for the accident investigation authority to be immediately notified of any accident or incident in its territory. Since accident investigation procedures differ from one State to another, it is not possible to define in detail a standard procedure for the notification of accidents and incidents. However, the following points may serve as a basis for the establishment of a timely notification procedure.

4.2.2 The first persons to know about an accident are any survivors or witnesses. Surviving crew members are likely to know what immediate actions to take, and witnesses or surviving passengers will usually inform the local police, the airport authorities or military personnel, who shall immediately notify the accident investigation authority in accordance with a prearranged procedure. Sometimes air traffic services personnel are the first to know that an accident or incident has occurred and they will initiate the notification procedure.

4.2.3 The notification procedure shall be simple and effective, using the most rapid means of communication (telephone, facsimile or electronic mail). A list of State authorities to be notified shall be available at all air traffic services facilities, airport authorities and police departments. The list shall be arranged in order of priority and shall include the names and telephone numbers of the appropriate authorities and their alternates, if appropriate. A record shall be kept of the persons and organizations notified.

4.2.4 More than one local authority may be responsible for alerting other authorities of an accident or incident. For instance, local airport personnel are usually required to notify the accident investigation authority and the local police. The local police are usually also required to notify the accident investigation authority, as well as the judicial authorities. A check system shall be established to ensure that each of the appropriate authorities has been notified.

4.2.5 In the case of reportable incidents, notification to the accident investigation authority is usually initiated by air traffic services or the aircraft operator.

4.2.6 The accident investigation authority shall be organized in such a way that accident or incident notifications are received and acted upon on a 24-hour basis.

4.3 RESPONSIBILITIES OF THE AIG AUTHORITY OF STATE AS THE STATE OF OCCURRENCE

4.3.1 ARCM AIG State Regulation, Chapter 4, contains provisions for the notification of accidents and serious

incidents.

4.3.2 When an accident or serious incident occurs in the national territory to an aircraft registered in another Contracting State, the AIG Authority of State in which the accident or serious incident occurred (State of Occurrence) shall send a notification with a minimum of delay to the State of Registry, the State of the Operator, the State of Design and the State of Manufacture of the aircraft.

4.3.3 When the AIG Authority of State as the State of Occurrence is not aware of a serious incident, the State of Registry or the State of the Operator, as appropriate, shall forward a notification of such an incident to the State of Design, the State of Manufacture and the State of Occurrence.

4.3.4 When an accident or serious incident occurs in the territory of the State in which the aircraft is registered (State of Registry), in a non-Contracting State, or outside the territory of any State, then the State of Registry shall send a notification with a minimum of delay to the State of the Operator, the State of Design and the State of Manufacture of the aircraft.

4.3.5 For accidents or serious incidents involving aircraft of a maximum certificated take-off mass of over 2 250 kg or a turbojet-powered aeroplane, the notification shall also be sent to ICAO and to the ARCM, all events regardless of weight (mass) of the aircraft.

4.3.6 The AIG Authority of State of Occurrence shall also notify States which have a special interest in an accident by virtue of fatalities or serious injuries to its citizens. Those States shall be permitted by the State conducting the investigation to appoint an expert who shall be entitled to visit the scene of the accident, to have access to the relevant factual information approved for public release by the State conducting the investigation and information on the progress of the investigation, and to receive a copy of the Final Report. This will not preclude the State from also assisting in the identification of the victims and in meetings with survivors from that State.

4.3.7 The State of Occurrence may also wish to send a notification to those States which may be requested to provide information to the investigation authority conducting the investigation, i.e. the State(s) whose air traffic services had the aircraft under control prior to the accident or serious incident.

4.3.8 Each State shall have appropriate regulations and procedures in place to ensure that its accident investigation authority sends the notification to the accident investigation authorities of the other States concerned with a minimum of delay. Instructions regarding the preparation and dispatch of notifications shall be readily available to the investigator(s) on call.

4.3.9 The accident investigation authority shall be organized in such a way that accident investigators are available on a 24-hour basis. This will reduce notification delays and will allow the investigation to begin promptly.

4.3.10 Where possible, the notification shall be addressed to the accident investigation authorities in the State of Registry, the State of the Operator, the State of Design and the State of Manufacture, as appropriate.

4.4 FORMAT AND CONTENT OF THE NOTIFICATION

4.4.1 The notification shall be in plain language and contain as much of the information in the example at Appendix 1 to Chapter 4 as is available. Its dispatch shall not be delayed due to the lack of complete information. If it has not been possible to provide complete information in the notification, the State of Occurrence shall forward the omitted details as soon as they become available.

4.4.2 Whenever it is possible to do so without causing undue delay, the notification shall be prepared in one of the working languages of ICAO, taking into account the language(s) of the recipients.

4.5 DISPATCH OF THE NOTIFICATION TO OTHER STATES

4.5.1 The notification shall be sent with a minimum of delay and by the most suitable and quickest means available (i.e. telephone, facsimile or electronic mail).

4.5.2 Appendix 2 to Chapter 4 lists the addresses and contact numbers of State accident and incident investigation authorities, as reported to ICAO prior to May 2015. An up-to-date list can be found at the AIG website which is accessible through the ICAO public website.

4.6 RECEIPT OF THE NOTIFICATION

Arrangements shall be made in each State to ensure prompt delivery of accident and incident notifications to the accident investigation authority on a 24-hour basis. If notifications cannot be delivered directly to the accident investigation authority, the number of intermediaries shall be kept to a minimum.

4.7 RESPONSIBILITY OF THE STATE RECEIVING THE NOTIFICATION

4.7.1 The accident investigation authority in each State receiving the notification shall, as soon as possible and usually by the same means of communication:

a) acknowledge receipt of the notification;

b) provide the State of Occurrence with the available relevant information requested;

c) inform the State of Occurrence whether or not it intends to be present at the investigation; and

d) provide the names and titles of the accredited representative and technical advisers and the expected date of their arrival at the accident site or at the headquarters of the accident investigation authority in the State of Occurrence.

4.7.2 Since the State of Registry, the State of the Operator, the State of Design and the State of Manufacture maintain the right to be represented at the investigation, they may, in the case of a delay in the receipt of the notification, supply the above information on their own initiative. If these States consider it unnecessary to be present at the investigation, each State shall so advise the State of Occurrence with a minimum of delay. The attention of the State of Registry, the State of the Operator, the State of Design and the State of Manufacture is drawn to their obligation to appoint accredited representatives, when specifically requested to do so, for accidents involving aircraft over 2 250 kg. Their attention is also drawn to the usefulness of their participation in the investigation and the fact that it is highly desirable that they participate when requested to do so by the State conducting the investigation. In any case, the State of Design and the State of Manufacture shall supply the State conducting the investigation with any information it may request.

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Appendix 1 to Chapter 4

EXAMPLE OF A NOTIFICATION

Information required (see AIG State Regulation, 4.2)	*Example*
a) for accidents the abbreviation ACCID, for serious incidents INCID;	a) ACCID;
b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;	b) Boeing 737-200, United Kingdom, G-AMSW, serial no. 20280;
c) name of owner, operator and hirer, if any, of the aircraft;	c) Derby aviation;
d) qualification of the pilot-in-command, and nationality of crew and passengers;	d) Airline transport licence; crew — British; passengers — British, French, German and others;
e) date and time (local time or UTC) of the accident or serious incident;	e) 7 October 1983 at 1314 hours local time;
f) last point of departure and point of intended landing of the aircraft;	f) London/Heathrow-Perpignan/Riversaltes;
g) position of the aircraft with reference to some easily defined geographical point, and latitude and longitude;[1]	g) 12 km south of Prades, 4233 N, 02-26 W, elevation 2 200 m;
h) number of crew and passengers: aboard, killed and seriously injured; others: killed and seriously injured;[2]	h) 6 crew and 57 passengers aboard, all fatally injured; others: none;
i) description of the accident or serious incident, and the extent of damage to the aircraft so far as it is known;	i) aircraft collided with a mountainside in the Canigou Massif. Aircraft destroyed by post-impact fire;
j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;	j) investigation by the French accident investigation authorities;
k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;	k) mountainous area, difficult access, perpetual snow;
l) identification of the originating authority; and	l) Bureau Enquêtes-Accidents, Paris, France. For additional information, contact Mr. X at (telephone and facsimile numbers and e-mail address); and
m) presence and description of dangerous goods on board the aircraft.	m) bio-hazardous materials in the forward hold.

1. It may be helpful to provide the location of the accident or incident as well as the elevation of the accident site, if it is known.
2. It is useful to first provide the number of persons aboard (crew, passengers) and then the injuries they sustained.

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Appendix 2 to Chapter 4

ADDRESSES OF ACCIDENT INVESTIGATION AUTHORITIES

Note.— A list of current addresses of aircraft accident and incident investigation authorities can be found at the AIG website which is accessible through the ICAO public website (http://www.icao.int/safety/AIA/Pages/default.aspx).

AFGHANISTAN
President of Civil Aviation Operations
Ministry of Civil Aviation and Tourism
Ansari Watt, P.O. Box 165
Kabul
Afghanistan

Tel.: (873) 68-234-1450 / 49
Fax: (873) 68-128-0784

ALBANIA
Ministry of Public Works, Transport and Telecommunication
Directorate General of Civil Aviation
Rruga Muhamet Gjollesha
Parku 1 Delegacionieve
P.O.B. 205, Tirana
Albania

Tel.: (355) 42-251-220
(355) 68-212-1493 (outside office hours)
(355) 42-343-487 (24 hours)
Fax: (355) 42-226232
E-mail: genci.resuli@dgca.gov.al

ALGERIA
Ministère des Transports
Direction de l'Aviation Civile et de la Météorologie
119, rue Didouche Mourad
Alger
Algérie

Tel.: (213) 2 74 06 81 (standard)
(213) 2 74 76 30 (ligne Directeur directe)
Fax: (213) 2 74 76 14
(213) 2 74 76 24

ANDORRA
National Civil Aviation Administration
Département des Transports et de l'Énergie
Ministère de l'Économie
Carrer Prat de la Creu, 62-64
Andorra la Vella
Andorra

Tel.: (376) 875-700
Fax: (376) 861-519

ANGOLA
Direcçao Nacional de Aviação Civil
Rua Miguel de Melo No. 96, 6° Andar
Caixa Postal 569
Luanda
Angola

Tel.: (244) 9232-49760 (Director General)
(244) 9199-11200 / 9299-87740
(24 hours)
Fax: (244) 2 39 05 29

ANTIGUA AND BARBUDA
See Eastern Caribbean States

ARGENTINA
Junta de Investigaciones de Accidentes de Aviación Civil (JIAAC)
Avenida Belgrano 1370 – Piso 11
C1093AAO, Cuidad Autónoma de Buenos Aires
Argentina

Tel.: (54) 11 4382-8890 / 91
Tel./Fax: (54) 11 4317-6704 / 5
(54) 11 4381-6333 (24 hours)
E-mail: info@jiaac.gov.ar
Website: www.jiaac.gov.ar

ARMENIA
Flight Safety Inspection Department
General Department of Civil Aviation
Airport “Zvartnots”
Yerevan-0042
Armenia

Tel.: (374) 10 593 005
Tel./Fax: (374) 10 283 429 (24 hours)
Fax: (374) 10 285 345
E-mail: fsid@aviation.am

ARUBA[1]
Department of Civil Aviation
Sabana Berde 73-B
Oranjestad
Aruba

Tel.: (297) 832665 (general)
(297) 824330 (ext. 258)
(297) 562-4040 (24 hours/7 days mobile)
Fax: (297) 823038
E-mail: dca-aua@setarnet.aw

AUSTRALIA
Australian Transport Safety Bureau (ATSB)
P.O. Box 967, Civic Square
Canberra A.C.T. 2608
Australia

Tel.: (61) 2 6230-4408 (24/7 notifications)
(61) 2 6257-4150 (international liaison)
Fax: (61) 2 6274-6434 (notifications)
(61) 2 6247-3117 (international liaison)
E-mail: atsbasir@atsb.gov.au (notifications)
atsbinfo@atsb.gov.au (international liaison)
Website: http://www.atsb.gov.au

AUSTRIA
Federal Office for Transport
Civil Aviation Safety Investigation Authority
Trauzlgasse 1
A-1210 Vienna
Austria

Tel.: (43) 1 71162-657700 (24 hours)
Fax: (43) 1 71162-6569299
E-mail: fus@bmvit.gv.at
Website: http://versa.bmvit.gv.at

AZERBAIJAN
State Concern of Civil Aviation
Azadlyg, Prospect 11
37000 Baku
Azerbaijan

Tel.: 994 12 93 44 34
Fax: 994 12 98 52 37

BAHAMAS
Air Accident Investigation and Prevention Unit
Civil Aviation Department
Flight Standards Inspectorate
2nd Floor JL Center Building
Blake Road
Nassau, N.P. 00104
Bahamas

Tel.: 1 (242) 377-3445 / 377-7042
1 (242) 421-1384 / 376-1617 (mobile – 24 hours)
Fax: 1 (242) 377-6060
E-mail: aaipu.bcaa@gmail.com
Website: www.aaipu-bcaa.com

BAHRAIN
Assistant Undersecretary for Civil Aviation
Ministry of Transportation
Bahrain International Airport
P.O. Box 586
Bahrain

Tel.: (973) 32 3000 / 1000
Fax: (973) 32 5757

BANGLADESH
Civil Aviation Authority
Flight Safety
Kurmitola
Dhaka 1206
Bangladesh

Tel.: (880) 2 891122
Fax: (880) 2 893322

BARBADOS
Technical Director – Aviation
Air Traffic Services Building
Grantley Adams International Airport
Christ Church
Barbados

Tel.: (246) 428-09309
Fax: (246) 428-2539

BELARUS
Ministry of Transport and Communication
Department of Aviation
Aerodomnaya 4
220007 Minsk
Belarus

Tel.: (375) 172 225 392
(375) 172 225 121 (24 hours)
Fax: (375) 172 227 728
(375) 172 227 954 (24 hours)
E-mail: sac@ivcavia.com

BELGIUM
Air Accident Investigation Unit (Belgium)
Service Public Fédéral Mobilité and Transports
Centre Communications Nord – 2ème étage
Rue du Progrès, 80 – Bte 5
1030 Bruxelles
Belgium

Tel.: (32) 2 277-4499
(32) 476 761-865 (24 hours)
Fax: (32) 2 277-4260
E-mail: luc.blendeman@mobilit.fgov.be
Website: http://www.mobilit.belgium.be

BELIZE
Civil Aviation Department
Belize International Airport
P.O. Box 367
Belize City
Belize

Tel.: (501) 25 2052 / 2014
Fax: (501) 25 2533

BENIN
Direction de l'Aéronautique Civile
B.P. 305
Cotonou
Benin

Tel.: (229) 30 10 98 / 99

BERMUDA[1]
The Director of Civil Aviation
Department of Civil Aviation
2 Kindley Field Road
St. George, GE CX
Bermuda

Tel.: (441) 293-1640
Fax: (441) 293-2417

BHUTAN
The Director
Civil Aviation Division
Ministry of Communication
Royal Government of Bhutan
P.O. Box 291, Thimphu
Bhutan

Tel.: (975) 2 22499
Fax: (975) 2 223639 / 22987

BOLIVIA
Unidad de Investigación y Prevención de Accidentes e incidentes de Aviación Civil de Bolivia (Unidad AIG)
Av. Plácido Molina S/N
Santa Cruz
Bolivia

Tel.: (591) 3 354-6060 / 63 / 64 / 65
(591) 7204-0547 / 7216-7086 (mobile – 24 hours)
Fax: (591) 3 354-6060 / 63 / 64 / 65
E-mail: aig@dgac.gob.bo
Website: www.dgac.gob.bo

BOSNIA AND HERZEGOVINA
Directorate of Civil Aviation – BDDCA
Fehima efendije Čurčića 671000 Sarajevo
Bosnia and Herzegovina

Tel.: (387) 33 251 350
Fax: (387) 33 251 351
E-mail: occurrence@bhdca.gov.ba

BOTSWANA
The Director
Department of Civil Aviation
P.O. Box 250
Gaborone
Botswana

Tel.: (267) 365 5200 / (267) 312 062
Fax: (267) 353 709 / (267) 303 348
E-mail: tmeshesha@gov.bw

BRAZIL
Centro de Investigaçáo e Prevençáo de Acidentes Aeronáuticos – CENIPA
SHIS – QI 05 – Área Especial 12
LAGO SUL
Brasilia – DF – CEP 71615-600
Brasil

Tel.: (55) 61 3364 8800 (only Portuguese)
(55) 61 9994 9554 (24 hours – Spanish and English)
Fax: (55) 61 3365 1004
E-mail: international@cenipa.aer.mil.br
Website: http://www.cenipa.aer.mil.br

BRUNEI DARUSSALAM
Director of Civil Aviation
Ministry of Communications
Brunei International Airport
Bandar Seri Begawan BB2513
Brunei Darussalam

Tel.: (673) 2-330 142
Fax: (673) 2-331 706
E-mail: dca@pso.brunet.bn

BULGARIA
Aircraft Accident Investigation Unit
9, Diakon Ignattii Street
1000 Sofia
Bulgaria

Tel.: (359) 2 940 98 54
(359) 88 960-1255 (mobile)
Fax: (359) 2 940-9828
E-mail: ypetrov@mtitc.government.bg

BURKINA FASO
Direction de l'Aviation Civile
B.P. 1158
Ouagadougou 01
Burkina Faso

Tel.: (226) 30 64 88 / (226) 31 63 32
Fax: (226) 31 45 44

BURUNDI
Chef du Bureau AIG
Aéroport International du Bujumbura
Bujumbura
Burundi

Tel.: (257) 7857-1251 / (257) 7957-1251
Fax: (257) 22-3428
E-mail: evaristeniyungeko@yahoo.fr
eniyungeko@aacb.bi

CAMBODIA
State Secretariat of Civil Aviation
62 Preach Norodom Blvd.
Phnom Penh
Cambodia

Tel.: (855) 12 810-330 / 878-192 / 456-443 (24 hours)
Fax: (855) 23 223-511

CAMEROON
Direction de l'Aviation Civile
Ministére des Transports
Yaoundé
Cameroun

Tel.: (237) 222-22-26-73
Fax: (237) 22-30-33-62

CANADA
Transportation Safety Board of Canada
200 Promenade du Portage
Place du Centre, 4th Floor
Hull, Québec K1A 1K8
Canada

Tel.: (1) 819-994-4252
(1) 819-997-7887 (24 hours)
Fax: (1) 819-953-9586
E-mail: airops@tsb.gc.ca
Website: http://www.tsb.gc.ca

CABO VERDE
Agencia de Aviação Civil – AAC
Av. Cidade de Lisboa, No. 34 CP 371
Cidade da Prala
Ilha de Santiago
Cabo Verde

Tel.: (238) 2 603430
(238) 989-9491 / 993-8396 (24 hours)
Fax: (238) 2 611075
E-mail: dgeral@acivil.gov.cv

CAYMAN ISLANDS[1]
Director of Civil Aviation
P.O. Box 277G
George Town
Grand Cayman
West Indies

Tel.: (1) 345 949-7811
Fax: (1) 345 949-0761

CENTRAL AFRICAN REPUBLIC
Direction Générale de l'Aviation Civile et de la Météorologie
B.P. 941 et 224
Bangui
République Centrafricaine

Tel.: (236) 61 53 16
Fax: (236) 61 49 18

CHAD
Direction de l'Aviation Civile
B.P. 96
N'Djaména
Tchad

Tel.: (235) 516 231

CHILE
Dirección General de Aeronáutica Civil
Miguel Claro 1314
Providencia, Santiago
Chile

Tel.: (56) 2 439-2376
(56) 2 09 138-9949 (Director's mobile)
(56) 2 439-2224 / 2550 (24 hours)
Fax: (56) 2 436-8142
E-mail: dir.dpa@dgac.cl
ccam@dgac.cl

CHINA
Office of Aviation Safety
Civil Aviation Administration of China
155 Dongsi Street West
Beijing 100710
China

Tel.: (86) 10 6409-1908 (business hours)
(86) 10 6401-2907 (24 hours / 7 days)
Fax: (86) 10 6405-2829
E-mail: yf_mao@caac.gov.cn

COLOMBIA
Grupo Investigación de Accidentes
Unidad Administrativa Especial de Aeronáutica Civil
Aeropuerto Internacional
Eldorado Avenida 26 No. 103 -23
Edificio CEA Oficina 204
Bogotá, D.C.
Colombia

Tel.: (57) 1 296-2138 / 2013
(57) 317 517-1162 (mobile – 24 hours)
(57) 317 517-1087 (mobile – 24 hours)
Fax: (57) 1 296-2203
E-mail: investigación.accide@aerocivil.gov.co
Website: http://www.aerocivil.gov.co

COMOROS
Direction Générale de l'Aviation Civile et de la Météorologie
B.P. 72
Moroni
Comores

Tel.: (269) 744 245 / 730 447
Fax: (269) 731 030 / 735 063
E-mail: dgacm@snpt.kn

CONGO
Direction Générale de l'Agence Nationale de l'Aviation Civile
B.P. 128
Brazzaville
Congo

Tel.: (242) 82 40 90
(242) 82 80 61
Fax: (242) 82 40 90

COOK ISLANDS
Department of Civil Aviation
P.O. Box 61
Rarotonga
Cook Islands

Tel.: (682) 22 810
Fax: (682) 28 816

COSTA RICA
Encargado Unidad de Investigaciones Aereas
Dirección General de Aviación Civil
Aeropuerto Int'l Tobias Bolaños
San José
Costa Rica

Tel./Fax: (506) 2 290 0664
E-mail: diegolecr@yahoo.es
dgutierrez@dgac.cr.go

CÔTE D'IVOIRE
Bureau Enquêtes et Analyses des Accidents et Incidents d'Aviation
Route de l'Aéroport FHB d'Abidjan
07 BP 148
Abidjan 07
Côte d'Ivoire

Tel.: (225) 2158-0934
(225) 0707-7346 / 4967-0943 (mobile)
Fax: (225) 2127 6346
E-mail: bea.cotedivoire@gmail.com

CROATIA
Air, Maritime and Railway Traffic Accident Investigation Agency
Ivana Šibla 9-11
10000 Zagreb
Croatia

Tel.: (385) 1 888-6830
(385) 99 807-1304 (24 hours)
Fax: (385) 1 888-6831
E-mail: info@azi.hr
Website: www.azi.hr

CUBA
Dirección de Seguridad Aeronáutica y Operaciones
Instituto de Aeronáutica Civil de Cuba
Calle 23, No. 64 Vedado
Ciudad de la Habana 4
Cuba 10600

Tel.: (53) 7 838-1115
(53) 7 838-1120 / 1132 (24 hours)
Fax: (53) 7 838-4575
(53) 7 834-4553 (24 hours)
E-mail: dsa@iacc.avianet.cu
pedro.colmenero@iacc.avianet.cu
pm@iacc.avianet.cu (24 hours)

CURAÇAO[1]
Directorate of Civil Aviation
Seru Mahuma Z/N
Curaçao

Tel.: (599) 9 839-3319
(599) 9 839-3518 (24 hours)
E-mail: civilair@gov.an
Fax: (599) 9 868-9924

CYPRUS
Cyprus Aircraft Accident and Incident Investigation Board (AAIIB)
28 Ahaiwan Street
P. Code 1424 Nicosia
Cyprus

Tel.: (357) 22-800-208 / 209 / 210 / 211
(357) 9963-3500 (mobile)
(357) 9963-5842 (mobile)
(357) 9969-4034 (mobile)
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E-mail: aaiib@mcw.gov.cy

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Chapter 5

ACTIONS AT THE ACCIDENT SITE

5.1 INITIAL ACTIONS

5.1.1 Local fire and police departments will probably be the first officials to arrive at an aircraft accident site, and it is therefore important to enlist their cooperation to ensure that vital evidence is not lost through interference with the wreckage. Such cooperation is usually best achieved through liaison at the headquarters level, the initial liaison having been effected during the planning associated with the possibility of an aircraft accident. The fire and police departments shall be aware of what is expected of them in the event of an aircraft accident, and plans and arrangements for the following essential tasks shall be in place so that they can be accomplished without delay:

a) notifying the rescue coordination centre;

b) notifying the aircraft accident investigation authority and other authorities as necessary;

c) securing the wreckage from fire hazards and further damage;

d) checking for the presence of dangerous goods, such as radioactive consignments or poisons being carried as freight, and taking appropriate action;

e) placing guards to ensure that the wreckage is not tampered with or disturbed;

f) taking steps to preserve, through photography or other appropriate means, any evidence of a transitory nature, such as ice or soot deposits; and

g) obtaining the names and addresses of all witnesses whose testimony may aid in the investigation of the accident.

5.1.2 Apart from these arrangements, the wreckage shall be left undisturbed until the arrival of the investigation team. It shall be emphasized to the police and rescue services that the bodies of persons killed in an accident involving a large aircraft shall, where practicable, be left *in situ* for examination and recording by the disaster victim identification team, as well as by the investigation team. Similarly, personal belongings shall remain untouched as their location may assist in the identification of the victims. In general, disturbance of the wreckage shall be limited to that necessary to rescue survivors, extinguish fires and protect the public.

5.1.3 The cooperation of airport personnel is normally ensured through an appropriate standing instruction which shall also ensure the safe keeping of air traffic services recordings and documents.

5.2 RESCUE OPERATIONS

5.2.1 The primary concern of the first persons to arrive at the site of an aircraft accident is the rescue and aiding of survivors and the protection of property within the means available. Persons who are involved with the extrication of victims from aircraft wreckage shall, at the earliest opportunity, record their observations regarding the location in the aircraft where the survivors were found and what portions of the wreckage had to be moved during the rescue. If

circumstances permit, the bodies of persons killed in the accident shall be left as found until their location and condition are recorded, photographs are taken and a chart is made indicating their location in the wreckage. If bodies are located outside the wreckage, their location shall be marked by a stake with an identifying number. A corresponding label shall be attached to each body stating where it was found. The careful recording of this data is essential to the identification of bodies and also provides information which may assist in the accident investigation.

5.2.2 In the event that bodies have been removed from the aircraft wreckage before the arrival of investigators, it is important to establish whether or not a record, as set out above, has been maintained. If not, the rescue personnel shall be interviewed in order to establish such a record.

5.2.3 Investigators shall determine if there has been any disturbance of the wreckage during the rescue operations and shall record any such disturbance.

5.2.4 Upon completion of the initial rescue operation, rescue personnel shall exercise as much care as possible to ensure that their movements do not destroy evidence which may be of value to the investigation. For example, once the survivors have been rescued and the fire risk has been eliminated as far as practicable, movement of ambulances and fire vehicles shall not be permitted along the wreckage trail.

5.3 SECURITY

5.3.1 When notified of an accident, the investigator-in-charge shall immediately verify that arrangements have been made to ensure the security of the wreckage. This is usually arranged through the police, but in some cases, military personnel or specially recruited civilians may be employed.

5.3.2 When it is suspected that the aircraft may have carried dangerous cargo such as radioactive consignments, explosives, ammunition, corrosive liquids, liquid or solid poisons or bacterial cultures, special precautions shall be taken to station the guards at a safe distance from the wreckage. This is particularly important if a fire has occurred because it tends to disperse the contaminants. Signs indicating a potentially dangerous area shall be posted until experts have thoroughly evaluated the danger involved.

5.3.3 Upon arrival at the accident site, one of the first tasks of the investigators shall be to review the security arrangements. The guards shall be thoroughly conversant with their duties, which are to:

a) protect the public from the hazards in the wreckage;

b) prevent disturbance of the wreckage (including bodies and contents of the aircraft);

c) protect property;

d) admit to the accident site only persons authorized by the aircraft accident investigation authority; and

e) protect and preserve, where possible, any ground marks made by the aircraft.

5.3.4 Clear and specific instructions shall be given to those guarding the wreckage site on the need for authorized persons to have proper identification. In the case of major investigations, this can be accomplished through the issuance of badges or some form of security pass to all authorized persons. The use of armbands or jackets that show affiliation and duty has also proven to be effective.

5.3.5 If the wreckage has not been scattered, effective security can be achieved by roping off the area (see Figure I-5-1). However, if there is a long wreckage trail, the task of securing the site may be formidable and many guards will be required.

Figure I-5-1. An accident site roped off

5.3.6 The police can be of considerable assistance in liaising with the local population, particularly with regard to locating outlying pieces of wreckage. While persons living in the neighbourhood shall be encouraged to report the discovery of pieces of aircraft wreckage, the importance of leaving these pieces undisturbed shall also be impressed upon them. Collecting outlying pieces of wreckage and arranging them into neat piles alongside the main wreckage are sometimes done with good, but misguided, intentions. With no record of where such pieces were found, their value to the investigation is diminished. Similarly, the removal of pieces of wreckage by souvenir hunters must be prevented.

5.3.7 The wreckage shall be guarded until the investigator-in-charge is satisfied that all evidence at the site has been gathered. The investigator-in-charge shall review the situation periodically and arrange for the progressive release of guards as appropriate.

5.4 SAFETY AT THE ACCIDENT SITE

5.4.1 General

Investigators shall be aware of the potential hazards at an accident site and what precautions to take. For this reason, some States designate a site safety coordinator. The investigator-in-charge or the site safety coordinator shall brief the investigation team on all known and potential hazards and shall establish safety practices. The support of the fire department and the dangerous goods specialists shall be enlisted, as necessary, to evaluate existing and potential hazards and to brief the investigation team, as appropriate. It shall be noted that the role of investigators is to investigate the accident, not to fight fires or remove hazardous materials.

5.4.2 Urban accident sites

Accident hazards in an urban area may include downed power lines, leaking natural gas, propane, heating oil or other flammable liquids or gases, and buildings that have become structurally unsound from fire or impact damage. An evaluation of the hazards by experts may be required before accessing the area or buildings.

5.4.3 Precautions to be taken against fire

There is a high fire risk associated with most aircraft wreckage and precautions shall be taken to ensure the safety of all personnel as well as to protect the wreckage. Firefighting equipment shall be readily available while a high fire risk remains, and there shall be no smoking permitted within the guarded area (see Figure I-5-2). Aircraft batteries shall be disconnected as soon as possible and if aircraft fuel tanks are still intact, they shall be emptied. The quantity of fuel removed from each tank shall be measured and recorded. If there has been a large spillage of fuel, the investigators must control any activity that could increase the possibility of ignition, such as the moving of parts of the wreckage. Care shall be exercised to control possible sources of ignition, such as static electricity. Likewise, the operation of radio or electrical equipment or the use of salvage equipment shall be avoided until the fire risk has been assessed and eliminated.

Figure I-5-2. Firefighters ensuring safety

5.4.4 Precautions to be taken with dangerous cargo

5.4.4.1 The accident investigation authority shall ascertain whether or not dangerous goods were carried aboard the aircraft. A preliminary check of the freight manifest and an inquiry to the operator shall resolve this question. Dangerous goods may include such items as radioactive consignments, explosives, ammunition, corrosive liquids, liquid or solid poisons or bacterial cultures.

5.4.4.2 With increasing frequency, radioactive materials are being carried as aircraft freight. If such materials are carried, steps must immediately be taken to have them removed by qualified personnel before any harm is caused to persons working in close proximity to the wreckage. Limitations on the quantity of radioactive material authorized to be carried on-board an aircraft and the strength of its packaging and shielding will minimize the possibility of container damage in an aircraft accident. As long as the packaging and shielding remain intact, there is likely to be little danger from radiation. However, a post-impact fire could damage the packaging and shielding, and the ensuing heat may cause the radioactive material to change into gaseous form, in which case radiation may spread. In such cases, all participants in the rescue and firefighting operations shall be checked, decontaminated and placed under medical observation, as necessary. No examination of the wreckage shall be initiated until the level of radiation has been measured and the site declared safe.

5.4.4.3 Accidents involving aerial spraying have the potential to expose investigators to hazardous materials in the form of pesticides and insecticides. With a few exceptions, these chemicals are toxic, even in small quantities. At the accident site, personal protective equipment must be used, and face masks equipped with appropriate filters shall be worn.

5.4.5 Wreckage hazards

5.4.5.1 The handling of wreckage is inherently hazardous and requires the use of protective clothing and appropriate equipment. Wreckage may shift, roll over or be suspended in trees and may need to be secured. The moving of large parts of wreckage shall be supervised by investigators and carried out by professional operators using appropriate equipment. This applies in particular when cranes are used. In such instances it is advisable for investigators to remain upwind of the wreckage so as to limit their exposure to soot, dust and other airborne substances. If, for some reason, a part of the wreckage is left suspended, no work shall take place underneath it or nearby, in case the cables and chains shall fail or the wreckage shift.

5.4.5.2 There are many hazards specific to a wreckage such as pressure containers, flares, generators and accumulators. Pressure containers include oxygen bottles, evacuation slide inflation bottles, fire extinguishers and protective breathing equipment. Solid-state chemical oxygen generators can reach temperatures of 400 degrees Celsius when they are activated. All such items shall be rendered safe and removed from the site.

5.4.5.3 Other hazards include:

Tires. Tires may be damaged on impact or in a hard landing and thus could explode at any time. Tires shall be approached from the front or the rear and shall be deflated as soon as possible.

Propellers. Some propellers have feathering springs, and if the hub is cracked, it can come apart forcefully. Investigators shall not attempt to take apart a propeller assembly. Disassembly and inspection is best done at a properly equipped facility.

Batteries. Batteries shall be disconnected and removed from the site. Caution shall be exercised when disconnecting and removing batteries because sparks could ignite spilled fuel and other flammable materials. Also, battery acid is extremely corrosive.

Flammable liquids and gases. Flammable liquids and gases can ignite or explode. The inhalation of fuel vapours or the direct contact of fuel with the skin is harmful. The aircraft shall be defuelled and the amount of fuel removed shall be recorded. Smoking shall not be permitted at the accident site.

Firearms/ammunition. Such items might be aboard the aircraft and shall be removed by experts.

Military and ex-military aircraft and associated equipment. Military aircraft may have ejection seats, armaments, pyrotechnics or munitions. They may also contain exotic or heavy metals, hydrazine or other substances that may be hazardous when burned. Munitions experts shall deactivate and remove such equipment from the accident site.

Recent safety equipment. Other safety equipment is being introduced into civil aircraft, for example, rocket-deployed emergency parachute systems and airbag restraint systems are being installed across a range of aircraft. Often these systems are not clearly marked and may not be marked at all. The armed and unfired rocket of a rocket-deployed recovery parachute system may pose a potential hazard to investigators and rescue personnel.

Depleted uranium. This material is sometimes used in counter-balance weights in larger aircraft. It can be hazardous if the outer protective coating is breached.

Radioactive materials. Such materials may be carried as cargo or used in aircraft components, such as in the engine ice-detection or ignition system of some aircraft.

Soot and insulation materials. Soot and insulation materials are hazardous in confined spaces, such as the cabin or cargo bins. Face masks and eye protection shall be worn when working in such spaces.

5.4.5.4 Composite materials typically consist of carbon/graphite or boron/tungsten and are found in many parts of an aircraft, including the structural skin, control surfaces, access panels, cabin materials, cabin seats, rotor blades and propeller blades. In fact, some aircraft are built entirely of composite materials. Fibreglass is found in soundproofing blankets, cockpit and cabin panels, cargo bin liners and other aircraft furnishings. Composite materials and fibreglass may be hazardous to the eyes, skin and respiratory system, especially if the wreckage has been damaged by fire.

5.4.5.5 When dealing with composites and fibreglass in the wreckage, the following safety precautions apply:

a) when handling these materials, investigators shall avoid the fibre dust by remaining upwind and wearing goggles and face masks;

b) disposable coveralls may be needed and contaminated clothing shall be washed separately;

c) splinters from fractured fibreglass panels and composites may cause injuries and shall be handled with gloves; and

d) if composite and fibreglass materials have been damaged by fire, they shall be sprayed with water or preferably with a fifty-fifty solution of acrylic floor wax and water before handling.

Note.— ICAO Circular 315, Hazards at Accident Sites*, was produced to assist individuals to consider and apply effective occupational safety management practices at accident sites, both to their own activities and to the activities of the teams that they work with, or for which they are responsible. The circular also discusses the nature and variety of occupational hazards and the management of risk associated with exposure to these hazards.*

5.4.6 Biological hazards

5.4.6.1 Accident investigators are at risk of exposure to biological hazards, including blood-borne pathogens such as the human immunodeficiency virus (HIV) and the hepatitis B virus (HBV). Biological hazards may be present in the cockpit and cabin wreckage as well as on the ground where bodies and survivors have lain. Since it is not possible to readily identify contaminated blood and other commingled bodily fluids, it is prudent to take precautions when working around and in the wreckage, when handling the wreckage at the site and when performing off-site examinations and tests on wreckage parts.

5.4.6.2 Precautions must be taken to prevent the viruses from entering mucous membranes (such as the eyes, nose and mouth) or non-intact skin such as open cuts or rashes. The accident site may contain liquid, semi-liquid and dried blood, other bodily fluids, fragmented bones, tissues and internal organs. In the dried state, particles of these substances may become airborne and come into contact with the unprotected eyes, nose and mouth.

5.4.6.3 As part of the investigation-planning process, appropriate precautionary measures shall be taken. Investigators and others who work on-site or carry out off-site examinations and tests of wreckage parts shall take a biological hazard precaution course, and they shall also be inoculated against the hepatitis B virus. The following procedures shall be developed and implemented:

a) a system to maintain records of training and vaccinations;

b) procedures to ensure that the biological hazard area is identified and those precautions are maintained throughout an investigation;

c) procedures for the maintenance of a personal protective equipment inventory;

d) proper methods for donning, removing and disposing of contaminated personal protective equipment;

e) work practices to minimize exposure;

f) procedures for decontaminating investigation equipment and wreckage parts;

g) procedures for shipment of contaminated wreckage parts to off-site examination and test facilities; and

h) procedures to follow when exposure to biological hazards has occurred.

5.4.6.4 General guidelines on personal protective equipment are contained in the appendix to this chapter. A kit containing personal protective equipment shall be made available to each investigator. The kit shall include a full-cover protective suit, several pairs of latex gloves, work gloves, face masks, goggles, shoe covers and protective boots, disinfection chemicals and a biological hazard disposal bag (see Figure I-5-3).

5.4.6.5 Procedures to be followed at the accident site shall include an initial survey for biological hazards in the form of visible blood or other bodily fluids. When there are serious injuries or fatalities, there will often be bodily fluids remaining after the dead and injured are removed. Areas contaminated by spilled blood or bodily fluids shall be identified and roped off and have only one single point of entry/exit. Only persons using personal protective equipment shall be allowed access to the contaminated areas. Any components that are removed from the accident site for examination and testing shall be treated with the same care as exercised at the accident site.

5.4.6.6 Investigators shall always assume that human tissue and bodily fluids are contaminated, and as a minimum precaution, they shall don a face mask and wear latex gloves under their work gloves when examining wreckage known to contain blood or other fluids. The most common contaminated items include all cabin interior materials, i.e. seat belts/shaller harnesses, seat cushions, other upholstery and trim materials, and instrument panels. While wearing personal protective equipment in the biological hazard area, investigators shall not eat, drink or smoke, apply cosmetics, lip balm or sun block, touch the face, eyes, nose or mouth, or handle contact lenses.

5.4.6.7 Biological hazard waste, such as clothing and contaminated personal protective equipment, shall be disposed of. Investigators shall carefully pull off the outer work gloves first, then peel off the latex gloves and drop both pairs into a biological hazard disposal bag. Contaminated personal protective equipment shall **never** be reused. Exposed skin shall be wiped immediately with moist towelettes, and then washed with soap and water or a solution of one part chlorine bleach to ten parts of water. A new bottle of bleach solution shall be mixed every day. Contaminated eyes shall be flushed with fresh water. Special attention shall be given to thorough hand washing after removing latex gloves and before eating, drinking, smoking, or handling contact lenses.

5.4.6.8 Investigators shall be aware that wearing personal protective equipment in hot and humid climates may result in heat stroke unless precautions are taken to minimize heat stress. Thus, before donning personal protective equipment, a litre or more of water shall be consumed. Depending upon the heat and the humidity, and on the amount of physical exertion required, it may be necessary to limit the amount of time that investigators can wear personal protective equipment. Once they have left the biological hazard area, removed and disposed of their personal protective equipment and disinfected their hands, investigators shall rest in the shade and consume at least a litre of water. It may be necessary to have medical personnel assess the condition of investigators who have experienced heat stress.

5.4.6.9 Since it is important to minimize the number of investigators, tools and equipment that could come into direct contact with contaminated materials, only a selected number of investigators shall be assigned to handle wreckage and disassemble components. Other investigators could be assigned to take notes, draw diagrams, take photographs or use the manuals and engineering drawings.

5.4.6.10 Contaminated investigation equipment, such as tools, flashlights and tape measures, shall be cleaned with soap and water, disinfected and allowed to dry. Personnel, when leaving the area, shall place in biological hazard disposal bags any equipment that cannot be readily disinfected. The disposal bags and their contents are usually incinerated at appropriate facilities, such as hospitals.

5.4.7 Psychological stress

An accident may cause serious stress to persons involved in the work at the accident site. In particular, major accidents with a large number of fatalities may induce psychological stress, not only in investigators, but also in persons involved in the search for and identification of bodies. The accident investigation authority shall have procedures and personnel in place to identify and aid those who show symptoms of stress.

5.4.8 Helicopter operations

5.4.8.1 Helicopters are often used to reach accident sites in rugged terrain and remote areas as well as for:

a) travelling to and from the accident site;

b) searching for and removing bodies and wreckage;

c) aerial photography; and

d) flying the flight path of the accident aircraft.

5.4.8.2 All persons associated with helicopter operations shall be briefed on proper safety procedures, including the use of exits, headsets, restraint systems, emergency equipment and, if involved in over-water operations, the flotation gear. The safety briefing shall also address how to approach the helicopter, the main and tail rotor hazards, and the effects of rotor wash.

5.5 ENVIRONMENTAL AND NATURAL HAZARDS

5.5.1 General

Environmental and natural hazards include extreme climate, mountainous terrain, deserts, jungles, swamps, poisonous plants, dangerous animals and insects. In environments such as these, investigators shall work in pairs, carry a first-aid kit and have a means of communication.

Figure I-5-3. Personal protective equipment used when examining wreckage debris

5.5.2 Extreme climate

5.5.2.1 Investigators may be faced with extremes of heat and cold depending on the terrain and the time of year. Investigators expecting to spend a few hours at a remote site could find themselves spending the night if their transportation is unable to return for them. Before departure, the current and forecast weather conditions shall be checked.

5.5.2.2 In *cold weather*, the following precautions shall be taken:

a) wear sufficient protection to prevent frostbite and hypothermia;

b) wear layered clothing that will absorb perspiration;

c) be aware of white-out conditions;

d) disorientation can occur in uniformly bright and white surroundings;

e) wear sunglasses and sun block; and

f) drink liquids to prevent dehydration.

5.5.2.3 In *hot weather*, the following precautions shall be taken:

a) bring sufficient liquids for personal drinking needs;

b) in situations involving high temperatures and humidity, combined with heavy exertion, drink at least half a litre of water or juice per hour;

c) be aware of symptoms of heat stress and heat stroke;

d) wear a wide-brimmed hat and loose-fitting clothing; and

e) wear sun block.

5.5.3 Mountainous terrain

The main concern with working at high elevations is altitude sickness which is characterized by dizziness, headaches, loss of appetite, difficulty sleeping, aches and pains, a pale complexion and loss of energy. Activities shall be paced to conserve energy. If altitude sickness is suspected, the person shall sit or lie down. In severe cases, the person shall descend immediately to a lower altitude. The following precautions are recommended for working in mountainous terrain:

a) limit physical exertion above 8 000 feet above sea level;

b) keep hands free on steep climbs;

c) rest frequently;

d) have oxygen available at high altitudes;

e) drink water or juice often to avoid dehydration;

f) wear sun block, sunglasses and a hat; and

g) seek advice from the local guides who shall, ideally, be accompanying the investigation team.

5.5.4 Deserts, jungles and swamps

If the accident site is located in a desert, jungle or swamp environment, the following safety precautions shall be taken:

Deserts:

a) wear a wide-brimmed hat, loose-fitting clothing, sunglasses, sun block, and goggles;

b) bring plenty of drinking water;

c) limit activities during the heat of the day and set up open-sided sun shelters;

d) employ local drivers; navigating on sand dunes and unmarked roads can be hazardous even in a four-wheel drive vehicle; and

e) ensure that appropriate clothing and shelter suitable for temperature decreases at night are available.

Jungles:

a) secure trouser legs and the tops of boots with rubber bands, strings or duct tape to protect against leeches, insects and crawlers;

b) bring plenty of drinking water;

c) compensate for the heat and humidity by reducing activities; and

d) maintain communications with others in the party.

Swamps:

a) if swamp boats are used as a means of transportation, wear a life jacket and ear plugs;

b) if walking in water, wear chest waders and use a tall walking stick to find level footing and to determine water depth;

c) prevent swamp water from coming into contact with open cuts and sores, since swamp water may be contaminated;

d) avoid travel or work at night;

e) wear clothing that covers the skin and a wide-brimmed hat with a mosquito net; and

f) protect against insects and leeches, as well as snakes, alligators and crocodiles.

5.5.5 Poisonous plants, dangerous animals and insects

5.5.5.1 The danger from plants, animals and insects varies with location, weather, elevation, time of year, etc., and the advice of local experts shall be obtained.

5.5.5.2 Although most wild animals will avoid contact with humans, there are some species that are dangerous, and investigators shall take precautions on the basis of advice from local experts. Poisonous snakes are prevalent in many areas and snake bite serums shall be included in the investigator's first-aid kit.

5.5.5.3 In many areas, mosquitoes transmit malaria and yellow fever. Any protective product that contains "DEET" in a 25 to 30 per cent solution shall be an effective mosquito repellent. Concentrations of "DEET" higher than 30 per cent may, however, irritate the skin. It shall be noted that mosquito repellents of this type contain a solvent that may melt plastics found on cameras, watches, small tools, etc. Anyone working in areas where malaria and yellow fever are prevalent shall take anti-malarial drugs and be inoculated against yellow fever.

5.5.5.4 Ticks, which inhabit fields and forests, may carry bacterial diseases, such as Lyme disease, a bacterial infection caused by the bite of an infected tick. The following precautions shall be taken when working in areas that may be infested with ticks:

a) wear long pants and long sleeves and secure pant legs with duct tape or rubber bands;

b) spray a permethrin-type tick repellent on clothing;

c) use a repellent containing the compound DEET on exposed skin areas, except for the face;

d) check the entire body for ticks daily; and

e) immediately remove ticks from the skin.

5.6 WRECKAGE IN WATER

5.6.1 Locating the wreckage

5.6.1.1 As soon as it has been determined that the wreckage is in water, efforts must be made to obtain the best technical expertise available. Naval authorities, marine salvage services and accident investigation authorities of other States known to have experience in this field shall be consulted. Advice may also be obtained from fishermen and oceanographers whose knowledge of local conditions, such as configuration of lakes, sea beds and local currents, is often extensive. The first step is to ascertain the most probable point of impact based on floating wreckage, witness reports, search and rescue reports and radar recordings. Buoys shall be positioned at the estimated point of impact.

5.6.1.2 If the water is shallow (less than 60 m), search methods using divers can be effective. If the wreckage is located in deeper water, or conditions make it difficult to use divers, use of the following equipment shall be considered (see Figure I-5-4):

a) underwater equipment used to locate the underwater locating devices on the flight recorders;

b) underwater videos and cameras;

c) side-scan sonar equipment; and

d) manned or unmanned submersibles.

5.6.2 Decision to recover the wreckage

5.6.2.1 The circumstances and location of an accident will determine whether salvage of the wreckage is practicable. In most cases, wreckage shall be recovered if it is considered that the evidence it might provide would justify the expense and effort of a salvage operation. If the wreckage is likely to contain evidence significant to air safety, the accident investigation authority must provide the impetus needed to ensure that action is promptly taken to recover the wreckage.

5.6.2.2 There have been several instances where aircraft wreckage has been successfully recovered from deep water. Major parts of the wreckage of an Airbus A330 were located at a depth of 3 900 m in the Atlantic Ocean, the CVR (see Figure I-5-5) was recovered after 23 months; of a Boeing 737 were recovered from approximately 1 000 m in the Red Sea (see Figure I-5-6); and of a Boeing 747 Combi were recovered from approximately 4 500 m in the Indian Ocean (see Figures I-5-7 and I-5-8). Such recoveries necessitated expensive salvage operations lasting several months but the results exceeded expectations, and the evidence obtained from the wreckage established the causes of the accidents.

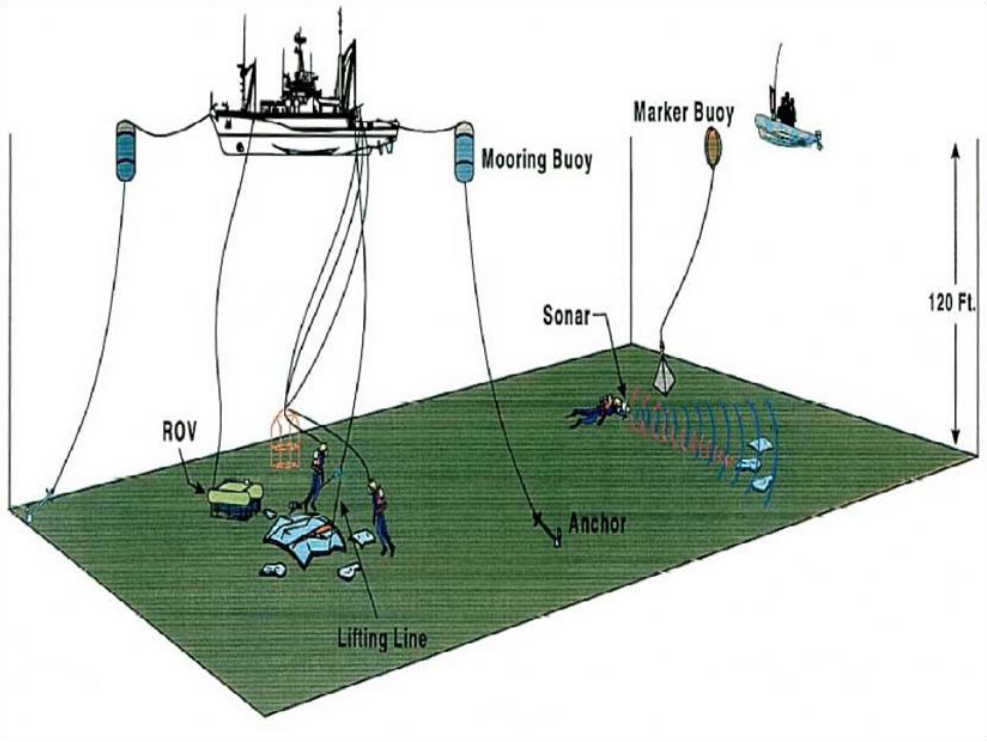

Figure I-5-4. Locating and plotting the wreckage

Figure I-5-5. The flight data recorder (FDR) of an Airbus A330 photographed at a depth of 3 900 m in the Atlantic Ocean (2009 accident)

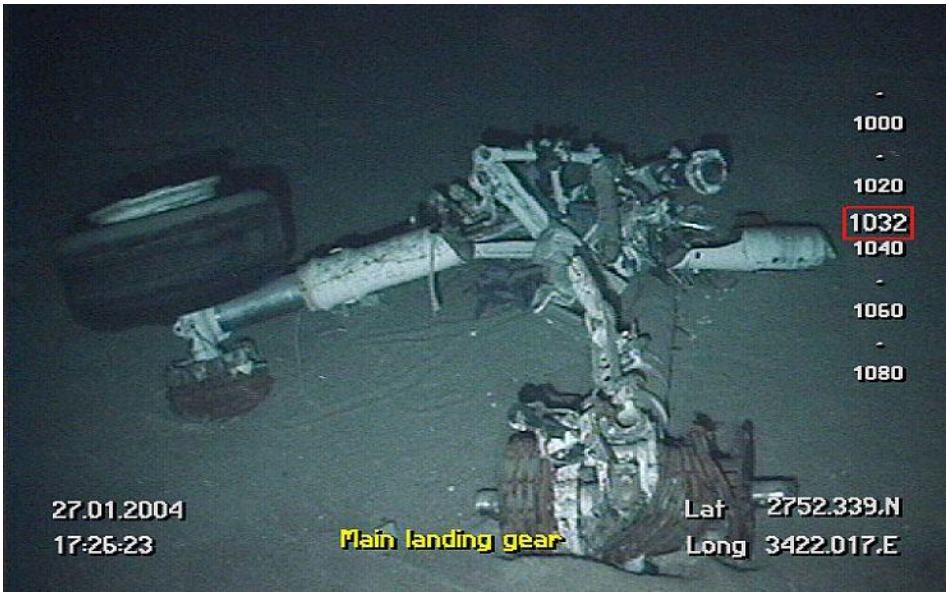

Figure I-5-6. The main landing gear of a Boeing 737 photographed at a depth of 1 000 m in the Red Sea (2004 accident)

Figure I-5-7. The cockpit voice recorder of a Boeing 747 Combi photographed at a depth of approximately 4 500 m in the Indian Ocean (1987 accident)

Figure I-5-8. A remotely operated vehicle (ROV) recovers the cockpit voice recorder at a depth of approximately 4 500 m (1987 accident)

5.6.3 Wreckage distribution

Once the wreckage has been located, a chart plotting the wreckage distribution shall be prepared. In shallow waters, this can be achieved by divers. In deep waters, underwater video cameras from remotely controlled submersibles may be used. The state of the various pieces of wreckage, their connection by cables or pipes, the cutting of these connections for the salvage operations, etc., shall be recorded before lifting the various pieces of wreckage from the bottom. Usually the divers and operators of the remotely operated vehicles will not be experienced in aircraft accident investigation and, therefore, detailed briefings will be necessary. See Figure I-5-9, showing the underwater wreckage cartography of an Airbus A330 at 3 900 m below the surface of the Atlantic Ocean (2009 accident).

5.6.4 Preservation of the wreckage

5.6.4.1 The rates at which various metals react with salt water vary considerably. Magnesium components react quite violently and, unless recovered within the first few days, may be completely dissolved. Aluminium and most other metals are less affected by immersion in salt water. For example, the flight data recorder (FDR) of a DC-9 that was recovered from a depth of 3 500 m showed little corrosion after having been submerged for 12 years (Figure I-5-10 refers). However, corrosion will rapidly accelerate once the component is removed from the water, unless steps are taken to prevent it.

5.6.4.2 Once the wreckage has been recovered, its components shall be thoroughly rinsed with fresh water. It may be convenient to hose the wreckage as it is raised out of the sea prior to it being lowered onto the salvage vessel. Freshwater rinsing does not stop all corrosive action. When large aircraft are involved, it may not be practicable to take further anti-corrosion action on large structural parts. However, all components that require metallurgical examination will require further preservation. The application of a water-displacing fluid will provide additional corrosion protection. Fracture surfaces shall then be given a coat of corrosion preventives such as oil or inhibited lanolin.

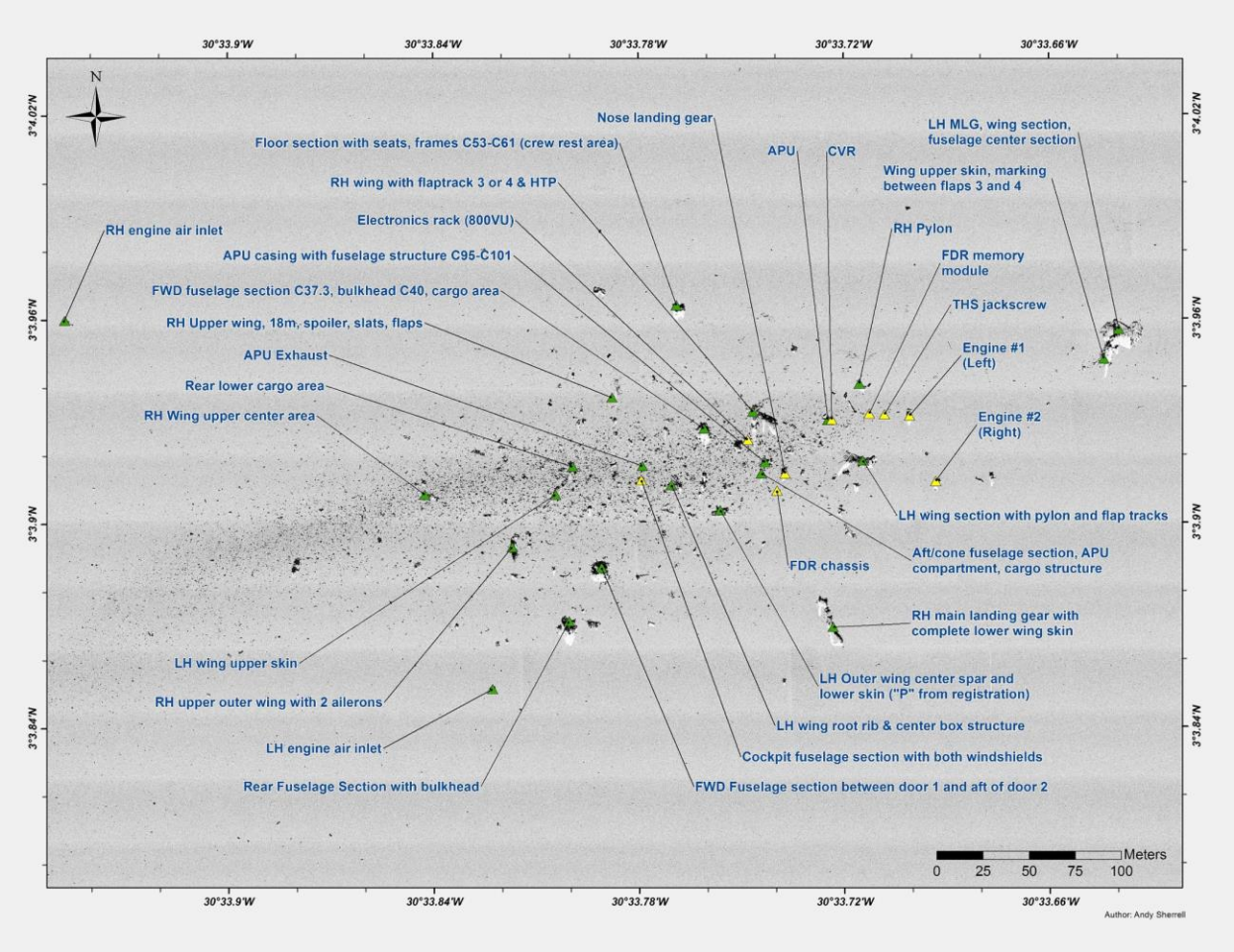

Figure I-5-9. Underwater wreckage cartography

5.6.4.3 When organic deposits, such as soot deposits or stains, require analysis, organic protective substances shall not be used. Freshwater rinsing shall be employed followed by air drying. When the component is completely dry, it shall be sealed in a plastic bag with an inert desiccant such as silica gel.

5.6.4.4 Flight recorders shall not be dried but shall be kept immersed in fresh water until the assigned flight recorder specialist assumes responsibility for them.

5.6.5 Precautionary measures

5.6.5.1 Safety precautions must be taken when recovering the wreckage. In particular, consideration shall be given to deflating tires and pressure containers as early as possible. Corrosion of magnesium wheel assemblies can progress rapidly to the extent that the wheel assemblies become safety hazards. Other pressure containers shall be discharged as soon as their contents have been evaluated.

5.6.5.2 The operation of recovery equipment and the supervision of salvage personnel shall be left to the salvage contractor. If necessary, the investigator shall provide advice on how to attach cables, hooks, etc., to the wreckage to ensure that it is not unnecessarily damaged during the recovery.

Figure I-5-10. The FDR of a DC-9 showed little corrosion after being submerged for 12 years in the Mediterranean Sea (1980 accident)

5.6.5.3 When salvage barges, which are equipped with large machinery, hoists, cables, nets, rigging equipment, etc., are used, investigators shall exercise caution and, in particular, shall remain clear of equipment and sling loads.

5.6.6 Additional guidance

Appendix 2 to this chapter is a document entitled “Guidance on the Underwater Location and Recovery of Aircraft Wreckage and Flight Recorders”, which was prepared by the Aircraft Accident and Incident Investigation Expert Group of the European Civil Aviation Conference (ECAC). The guidance provides an overview of the issues peculiar to underwater location and recovery operations, and of the expertise, procedures and equipment needed to mount an effective response to such an accident. It is intended for use by all who might find it helpful, in Europe and beyond, and in particular of course by aircraft accident investigation authorities who might at any moment find themselves faced with the task of investigating the loss of an aircraft in these very challenging circumstances.[1]

5.7 PLANNING FOR SPECIALIST EXAMINATIONS

5.7.1 General

5.7.1.1 If the investigator-in-charge determines that specialist examination or testing of specific components is required, it shall be borne in mind that the national legislation of some States may forbid the removal of any part of the

1. This ECAC guidance document (without photographs) is published in ICAO Doc 9756 with the kind permission of ECAC. Full copies of this ECAC document can be downloaded from the ECAC website (www.ecac-ceac.org).

wreckage without the agreement of the judicial authorities. For components requiring destructive testing, it may be advisable to obtain written authorization from both the owner of the aircraft and the insurance company.

5.7.1.2 Sometimes it is necessary to send a part, or parts, of a damaged aircraft to another State for technical examination or testing. In accordance with Annex 9 — *Facilitation*, each State concerned shall ensure that the movement of such part, or parts, is effected without delay. The States concerned shall likewise facilitate the return of such part, or parts, to the State conducting the investigation.

5.7.1.3 Specialist examinations may range from a scanning electron microscope examination of a failed part to chemical analysis, systems testing or flight testing. Laboratory examination and testing generally entail the use of specialized equipment not available in the field and often beyond the capability of an aircraft maintenance facility. Consideration shall be given to using the component manufacturer's facilities where specialized equipment and trained personnel are readily available.

5.7.1.4 Laboratory testing shall not be limited to standard tests. In addition to testing for compliance with appropriate specifications, it is sometimes necessary to determine the actual properties of the specimen (such as metal, material, fuel and oil). Occasionally it is necessary to devise special tests that will fully exploit the component's capabilities. A wide range of specialized testing equipment will permit simulation of a variety of malfunctions, the only limitation being the ingenuity of the investigators.

5.7.1.5 When investigators forward failed parts or components for laboratory testing, they shall provide as much information as possible relative to the circumstances contributing to the failure of such parts or components, including their own suspicions. The information provided by the investigator is intended only as a guideline to the specialist who shall, nevertheless, explore all relevant aspects. It is not sufficient for an investigator to forward parts for specialist examination with the innocuous instructions "for testing". The investigator shall provide a detailed history of the part or component, covering such items as:

a) the date it was installed on the aircraft;

b) the total number of service hours;

c) the total number of hours since last overhaul or inspection;

d) previous difficulties reported; and

e) any other pertinent data that might shed light on how and why the part or component failed.

5.7.1.6 In order to preserve evidence, it is essential that failed parts and components requiring specialist examination be extracted from the wreckage with care. Systems, whether mechanical, electrical, hydraulic or pneumatic, shall be removed in sections as large as practicable. Relevant sections shall preferably be dismantled rather than cut. Paint smears, which are often extremely important in collision accidents and in-flight failures, require protection. This also applies to smoke or soot smears.

5.7.2 Practical arrangements

5.7.2.1 The nature of the specialist examination and the type of components and systems to be tested will determine the facility to be chosen. The investigator must be confident that the facility chosen is capable of providing the required examination and testing. Prior arrangements shall be made with the facility as far in advance as practicable so that the facility's management can plan the tests and assign personnel and equipment.

5.7.2.2 When choosing a system and components for specialist examination and testing, it is desirable to include as many components of the system as practicable, e.g. wiring harnesses, relays, control valves and regulators. Tests conducted on a single component will reveal information about the operation of that particular unit only, whereas the problem may actually have been in one of the related components. The most valid test results will be obtained by using as many of the original system components as possible.

5.7.2.3 Each component shall be tagged with its name, part number, serial number and the accident identifier. The investigator shall maintain a listing, descriptive notes and photographs of all components which are to be tested. The components themselves shall be kept in protective storage until ready for shipping.

5.7.2.4 Components shall be packed to minimize damage during transport. Particular care shall be taken to ensure that fracture surfaces are protected by appropriate packing material so that they are not damaged by mating surfaces coming into contact with each other or with other parts.

5.7.2.5 Whenever possible, power plants shall be shipped in their special stands and containers. Other heavy components, such as flight control power-units, stabilizer screw jack assemblies and actuators, shall be packed in protective wrapping and placed in separate wooden containers. Blocks or bracing shall be installed inside the containers to prevent any movement of the component during transport. Smaller and lighter components may be shipped in the same manner with more than one to a box but in a manner which will prevent them from coming into contact with one another. Very light units may be packaged in heavy corrugated pasteboard cartons with sufficient packing material to prevent damage from mishandling during transport. The investigators shall label all boxes and cartons appropriately and shall make an inventory list for each container.

5.7.3 Notes and test results

5.7.3.1 Notes concerning special examinations and testing shall be kept by the facility personnel and the results shall be recorded on the standard forms used by the facility for such work. The investigator supervising the work shall also take notes.

5.7.3.2 Prior to conducting the examinations and tests, the investigator(s) and the facility personnel involved shall be briefed on the type and extent of the tests to be carried out and shall review the test procedures to ensure their adequacy.

5.7.3.3 Any discrepancies found during testing shall be photographed and documented with an explanation as to their bearing on the operation of the system or component. It shall be kept in mind that the tolerances called for in the test procedures may apply only to new or overhauled components and that components which have been in service for some time may have acceptable limits outside these tolerances. If the nature of the discrepancy so warrants, a component shall be disassembled following completion of the tests to ascertain the cause of failure. Photographs shall be taken of the parts prior to and during disassembly and the findings shall be documented.

5.7.3.4 Following completion of the testing, the investigator(s) and facility personnel shall review and discuss the results. When there is agreement that the data gathered present a true and factual picture of the component’s condition and capabilities, the notes and test results shall be reproduced to serve as a record of the examination and testing of the system or component.

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Appendix 1 to Chapter 5

PERSONAL PROTECTIVE EQUIPMENT AGAINST BIOLOGICAL HAZARDS

The following provides general guidelines on the personal protective equipment to be used by accident investigators at the accident site. The protective equipment may also be required when performing off-site examinations and tests on wreckage parts.

Disposable latex gloves. Latex gloves shall be durable even though they are to be worn under work gloves. All latex gloves shall be properly disposed of prior to leaving the accident site.

Work gloves. Work gloves shall be as durable as practical and provide the hand, wrist and forearm with puncture and abrasion protection. Leather, nitrile and kevlar gloves are commonly used. All three types shall be disinfected or properly disposed of prior to leaving the accident site.

*Face mask*s. Face masks shall cover the nose and mouth. Masks come in disposable and reusable configurations and shall be disinfected or properly disposed of prior to leaving the accident site.

Protective goggles. Protective goggles shall enclose the eyes by sealing around the top, bottom and sides. Common safety glasses are not acceptable. Goggles shall be fitted with one-way check valves or vents to prevent fogging and shall be disinfected or properly disposed of prior to leaving the accident site.

Disposable protective suits. Protective suits shall be durable and liquid-resistant and shall fit properly. If possible, they shall have elastic-type hoods and elastic pant cuffs. Duct tape can be used to alter the suits and to patch tears. Protective suits shall be properly disposed of prior to leaving the accident site.

Disposable shoe covers and protective boots. Disposable shoe covers made of polyvinyl chloride (PVC) or butyl rubber are recommended. Leather, rubber or Gortex work boots are also acceptable. Disposable shoe covers and protective boots shall be disinfected or properly disposed of prior to leaving the accident site.

Disinfection chemicals. Two chemical types are commonly used to disinfect personal protective equipment. Rubbing alcohol of 70 per cent strength is effective and is available in towelettes, as well as in large hand towels. The most effective disinfectant solution is a mixture of common household bleach and water, with one part bleach to ten parts of water. Never mix alcohol and bleach.

Biological hazard disposal bags. Biological hazard disposal bags must be used for disposal of contaminated personal protective equipment. The bags are red or orange and are labelled “Biological hazard”. For transport, the disposed material shall be double bagged.

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Appendix 2 to Chapter 5

ECAC GUIDANCE ON UNDERWATER LOCATION AND RECOVERY OF AIRCRAFT WRECKAGE AND FLIGHT RECORDERS

This ECAC guidelines document (without photographs) is published in ICAO Doc 9756 with the kind permission of ECAC. Full copies of this ECAC document can be downloaded from the ECAC website (www.ecac-ceac.org).

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FOREWORD

BY THE CHAIRMAN OF THE AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION EXPERT GROUP OF THE EUROPEAN CIVIL AVIATION CONFERENCE, JURGEN WHYTE (HEAD OF THE IRISH AIR ACCIDENT INVESTIGATION UNIT)

In June 2009 the Aircraft Accident and Incident Investigation Expert Group of the European Civil Aviation Conference (ECAC), with generous support from the Croatian aviation authorities, organised in Dubrovnik a workshop on the challenges associated with investigating accidents in which the aircraft is under water. The preparations for this workshop had begun a few months earlier, and the tragic loss in the mid-Atlantic of Air France 447, only 10 days prior to the workshop, was no more than a deeply unhappy coincidence.

Inevitably however, that accident lent the work of the Expert Group particular purpose and poignancy. The Dubrovnik workshop having focused mainly upon the location and recovery of aircraft wreckage and recorders in relatively shallow waters, it was followed in October 2010 by a second, hosted in Larnaca with equal generosity by the Cypriot aviation authorities, focused upon accidents in deeper waters. Full reports of the workshops, each of which was led by my distinguished predecessor as chairman of the Expert Group Paul-Louis Arslanian, were prepared and made available via the ECAC website.

This guidance distils out the learning shared at and won from the two workshops, which brought together experts from national safety investigation authorities and safety regulators (both European and other), and from providers of the specialised equipment and services needed for accident investigation in the underwater environment. All gave their time and expertise unsparingly and without charge, including in supporting the “live” location and recovery exercises at sea that were an important part of each workshop.

The ECAC Expert Group is immensely grateful to all who organised, participated in and supported the Dubrovnik and Larnaca workshops, and who contributed subsequently to the development of this guidance. Special thanks are owed to the French Bureau d’Enquêtes et d’Analyses pour la sécurité de l’aviation civile, which has taken especial care to ensure that the guidance reflects the learning hard-won from its investigation of the loss of Air France 447, always without compromising the integrity and confidentiality of that extraordinarily challenging mission.

The guidance provides an overview of the issues peculiar to underwater location and recovery operations, and of the expertise, procedures and equipment needed to mount an effective response to such an accident. It is intended for use by all who might find it helpful, in Europe and beyond, and in particular of course by air accident investigation authorities who might at any moment find themselves faced with the task of investigating the loss of an aircraft in these very challenging circumstances.

1. INTRODUCTION

1.1 Any State that has a coastline or internal body of water, or aircraft on its national register flying over international waters, may face the responsibility of having to conduct an investigation into the loss of an aircraft in its territorial waters or on the high seas. Fatal accidents with an underwater dimension occur regularly.

1.2 When an aircraft comes down in water, whether at sea or in a lake or river, the first need — access to the accident site — is problematic in itself. The problems become greater as the water becomes deeper.

1.3 Underwater location and recovery has extremely challenging characteristics, and requires a well-planned and timely response, coordinated amongst many parties.[1] Inadequate preparation or poor management of the initial investigative response has the potential to degenerate into a crisis, and can threaten crucial evidence. That risk increases where the accident site is problematic.

1.4 This guidance was developed following the organisation in 2009/10 of two workshops by ECAC's Expert Group on Aircraft Accident and Incident Investigation. It seeks to provide an overview of issues peculiar to underwater location and recovery operations, and of the expertise, procedures and equipment needed for an effective response. A draft of this guidance was presented and discussed during the 2011 underwater recovery workshop held in Singapore for the Asia Pacific region.

1.5 The guidance considers the preparations needed by States which may have to undertake an underwater location and recovery operation and then the onsite challenges of operations at sea: the working environment, decisions on what to recover, issues specific to location and recovery, and the management of human remains. The guidance also considers ancillary issues, including the costs of underwater operations, and sets out key points for those who may need to undertake operations in this difficult environment.

2. PREPARATION FOR UNDERWATER LOCATION AND RECOVERY OPERATIONS

2.1 Partnerships and Contacts

2.1.1 Safety investigation authorities will not generally be able to conduct an investigation having an underwater dimension without outside assistance. Relationships therefore need to be established in advance with potential partners and sources of assistance.

2.1.2 Within the State of the safety investigation authority, these partners shall include Ministries with responsibilities for matters relating to the sea, the naval service and the diplomatic service. It is especially important to have a procedure to secure rapid access to bathymetric and bathythermographic data, at least for national waters.

2.1.3 Partnership relationships shall also be established with colleagues in other national safety investigation authorities, as well as in relevant foreign military and diplomatic services.

2.1.4 Although advice shall be taken from bodies such as the police, the navy and the coastguard, overall control of the operation shall always be retained by the safety investigation authority. Assistance may usefully be sought from other national investigation authorities which have recent experience of mounting similar operations.

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1. Similar challenges arise when an aircraft comes down in other remote locations, such as desert, jungle, mountainous or arctic regions.

2.1.5 In the context of these contacts abroad, there is merit in establishing commonality in the technical specifications of equipment and software used by regional States, so that such resources may be shared and used with ease when needed.

2.1.6 It is also important to have information about where relevant equipment may be sourced. While it might be possible to borrow some equipment from partners, it may be necessary to enter into hire contracts for sea-going vessels, underwater craft and other specialised or expensive equipment. Contact details for suitable contractors, and an understanding of the kinds of equipment and expertise (for example, in diving) each can offer, shall be part of the standing preparations for a possible underwater operation.

2.1.7 Check-lists for underwater operations are important for planning purposes. But no two accidents are the same and detailed planning will inevitably be event-specific.

2.1.8 Effective equipment and personnel may be expensive but they can reduce overall costs. “Employing an expert is expensive, but not as expensive as employing a non-expert”.

2.2 Hiring Equipment and Vessels

2.2.1 The key factor in the selection of the vessel and its on-board equipment is the nature of the location of the accident site: sea state conditions, probable depth and the seabed environment. Other important factors will be the proximity of the nearest useful port, and the availability of suitable vessels. Safety investigation authorities unused to underwater operations often underestimate the time it can take to get the necessary maritime assets into position to start work.

2.2.2 In considering the suitability of the vessels available, account shall be taken of their capability to perform the required task in the time available, including their fitting out with specialised equipment such as acoustic devices for detecting 37.5 kHz signals and, when necessary, with a hull-mounted multibeam sonar for bathymetry of the seabed. Other considerations will be the vessel’s present location and availability, transit time to the accident site, and the entire charter cost, including provision of equipment, and mobilisation/demobilisation.

2.2.3 Relatively small craft, for use in operations on lakes, rivers and close inshore, are unlikely to be difficult to secure. For operations at sea, it is necessary to know where to find the appropriate kind of larger vessel.

2.2.4 If no suitable State vessels are available an approach to the chartering market may be necessary, and consideration given to issuing a call for tenders or a “Statement of Requirements”. Such a document shall specify the size of the lost aircraft (this will dictate the lifting equipment and deck space needed), the depth of the site, any human remains issues and the expected duration of the operation. Ancillary issues may be the need for a heli-deck and any auditing or certification requirements. The deadline for responses shall be indicated.

2.2.5 Many of the vessels suitable for aircraft salvage are employed in support of the offshore oil and gas sector, notably in the North Sea, the Arabian Gulf, the Gulf of Mexico and off West Africa. Few are designed to support operations in more than 2,000 metres of water and in those cases it may be necessary to charter the vessel and to hire separately the additional equipment. It will be important in those circumstances to establish the compatibility of the vessel and its systems with the equipment being brought aboard, for example in storage, lifting equipment, power supplies, and deck loadings and securings.

2.2.6 Experience shows that the mobilisation of large vessels with deep-water recovery capability can take time. There may be advantage in taking a two-stage approach, first employing a smaller vessel able to reach the location quickly and begin the task of locating the Underwater Locator Beacons (ULBs), pending the arrival of a recovery vessel.

The decision to dispatch the recovery vessel shall only be made once the wreckage has been located, and the delay between its location and the departure of the vessel shall be kept to a minimum. If the wreckage has not been located during the period in which the ULBs can be assumed to be transmitting, it will be necessary to proceed to another phase of location, using sonar equipment, which will normally correspond to different vessel requirements.

2.2.7 As "principal contractor" it is important to be aware of shared responsibilities which may have been assumed, for example for damage which might be done to sub-sea pipelines or other infrastructure during the operation. It is also important to establish that the vessel has the required certification from the Flag State and Classification Society, for example in relation to its safety equipment and maintenance, crew training and certification, pollution insurance, and health and safety management systems.

2.2.8 The BIMCO[2] charter agreement, "Time Charter Party for Offshore Service Vessels" (Supplytime 2005) is a standard contractual model with which ship owners are familiar. The settlement of disputes relating to the contract is subject to the arbitration procedure provided for and defined in Clause 34, Part II of Annex B to the agreement.

2.2.9 Once the vessel has been selected and contracted, it is important that a good working relationship is established and maintained between the investigation team and the captain of the vessel.

2.3 Other Special Equipment

2.3.1 The depth at which the aircraft wreckage and flight recorders are believed to be located will be the primary determinant of the recovery options.

2.3.2 Air diving is feasible at depths up to 40 metres, and saturation diving up to 500 metres. However, for deep water and sustained operations, the use of a Remotely Operated Vehicle (ROV) is generally the best option. These are connected to the parent vessel by an "umbilical" carrying power and navigational and imagery capabilities. They come in many forms and sizes, and may be equipped with one or more "manipulators" for working at the accident site. Use of an ROV permits the whole investigation team to view and exploit in real time the images transmitted from the ROV to the parent vessel. It also facilitates the mapping of the accident site.

2.3.3 A range of ROVs can be deployed in operations at up to 6,000 metres, and certain very specialised (and scarce) ROVs can be used below that depth. The supplier of an ROV can be expected to specify the dynamic positioning capability (e.g. 'DP I' or 'DP II') required of the vessel from which it will be operated. Such a capability is valuable when conducting sea searches, as knowledge of the exact position of the vessel, for example in relation to a search grid, is important and it may provide a stable working platform for operations in up to Force 7 sea state conditions.

2.3.4 Another type of unmanned vessel available for underwater operations is the Autonomous Underwater Vehicle (AUV), which is a 'search' (rather than 'grapple-and-recover') tool. AUVs are not tethered to a parent vessel but are battery-powered and programmed to follow a defined search programme, at the conclusion of which they surface and upload their findings to the control centre. This may be aboard a vessel or in a road vehicle parked at the lake or river side. The preparation and launching of an AUV will typically take only a few hours and its control team may number only three or four. The more sophisticated AUVs have hovering and automated obstacle avoidance capabilities. A number of sensors may be carried by the AUV, including sidescan sonar and cameras.

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2. Baltic and International Maritime Council, an international shipping association representing ship-owners controlling around 65 per cent of the world's tonnage.

3. CHALLENGES AND PRIORITIES ON-SITE

3.1 Working at Sea

3.1.1 Some challenges in operations at sea derive from the length of time which the investigation team may need to be out of physical contact with the shore. For any long voyage, there is a need to give careful thought in advance (even under time pressure) to all of the types of equipment which may be required and to the specialist personnel needed aboard.

3.1.2 Some of the equipment carried to the accident site (such as transponders and hand-held hydrophones) will prove unserviceable, so it is wise to build redundancy into what is carried and have some on-board capability for repair. For operations in water, more robust equipment is generally needed than at first seems likely.

3.1.3 At the accident site, simple manoeuvres (transiting across the search grid, despatching and recovering small craft and divers) takes considerably longer than those accustomed to working in aviation expect. The investigation team needs to be prepared for this.

3.1.4 Working vessels present particular health and safety issues for those not familiar with them. The investigation team shall complete a risk assessment of the working environment in consultation with the vessel's health and safety officer, including the possibility of sea-sickness, with consideration of safe and appropriate medication. The planning process shall include the configuration of accommodation and work spaces.

3.1.5 The noise and movement of the vessel, the confined and less than perfectly clean spaces probably available to the investigation team, the presence of seawater and damp, all make for a working environment which is hostile to individuals and to sensitive electronic equipment such as cameras and computers.

3.1.6 A particular problem in operations at sea is the moment when a large piece of debris is lifted out of the sea and Archimedes' principle is negated. This can lead to a sudden and dangerous increase in load, with potential to damage the wreckage and lose evidence. There may be a need to counter this risk by providing additional tethering to the wreckage (to take any additional loads at key points) and the use of netting is particularly useful. The use of an active 'heave-compensated' crane can help in alleviating load variations on the lift line. The condition of the wreckage shall be recorded before any recovery attempt is made, and likewise any damage sustained during the lift.

3.2 Location

3.2.1 An Underwater Location Beacon (ULB) fitted to an aircraft flight recorder is triggered by immersion in water. It will emit an ultrasonic pulse of 10 milliseconds, at 37.5 kHz and at one-second intervals. The present ICAO requirement is for ULBs ("pingers") to transmit for at least 30 days. They have a nominal audible range of 2 to 5 km, depending on parameters such as depth, water temperature and sea conditions.[3]

3. An ICAO State letter of 4 April 2012 advised that Amendment 36 to ICAO Annex 6 had been adopted by the ICAO Council on 2 March 2012. This amendment includes (i) the extension of the operating period, to a minimum of 90 days, of the underwater locating beacons fitted to flight recorders, and (ii) the introduction of beacons operating for a minimum of 30 days at a frequency of 8.8 kHz, attached to the aircraft, with an increased propagation distance. Amendment 36 will become applicable on 15 November 2012. Both the extended duration ULB and the new low frequency ULB are mandated to be fitted at the earliest practicable date, and no later than 1 January 2018.

3.2.2 There is value in a search operation in deploying the most effective resources as early as possible, to minimise the risk of a protracted search and an even more expensive investigation. It is preferable to undertake a 'passive' acoustic sweep first (while the pingers can be expected to be still transmitting), with an 'active' side-scan sonar search next, taken under less time pressure.

3.2.3 There is benefit in beginning as soon as possible, using a small vessel to find the pinger(s), on the basis of a preliminary review of the 'loss' data such as radar and the Aircraft Communications Addressing and Reporting System (ACARS). The search area may be refined later, as more data become available. The sonar search will begin only after the end of the pinger's transmission period.

3.2.4 The 37.5 kHz frequency is outside the audible spectrum for the human ear. Acoustic hydrophones 'translate' the signal into the audible spectrum, a process which does not exactly reproduce the original emission, which can be 'polluted' by the water environment and thus misprocessed.

3.2.5 ULB signals can be picked up using acoustic hydrophones deployed singly, as a hand-held unit, or in an array (for example, in a flexible tube housing, towed behind and below a vessel). Digitalisation of the ULB signal by on-board software enables the 'listening' for the ULB to be done by a computer, rather than a human.

3.2.6 Such an array may be deployed to good effect even in difficult sea conditions. However in shallow waters the amount of background noise may lead to the signal 'spike', experienced when the 'ping' is detected, not being prominent, and perhaps missed. With such faint signals, difficulties may also be experienced when sounds emitted by the biological environment (e.g. whales) confuse the acoustic devices. Cetacean sound emissions typically take the form of swift 'chirps' over a wide spectrum of frequencies, which could at times be perceived as a short regular pinger signal, after being sampled and processed by acoustic devices.

3.2.7 Towing a hydrophone array at a speed of 4 knots on a search grid of parallel tracks one nautical mile apart will enable forty square miles of sea to be searched in a period of around 10 hours. Use of the vessel's autopilot (if fitted) while following the search grid is valuable in countering the effects of strong crosswinds and crosscurrents. Strong currents may also cause wreckage and recorders to drift from their original location.

3.2.8 Other systems for picking up and locating ULB signals may involve the repeated 'dipping' of a detector below the 'seasonal thermocline' (which separates the noisy mixed surface layer of water from the calm, relatively quiet, deeper water below), at different locations, to generate a triangulated homing point, or the deployment of acoustic listening buoys equipped with GPS and UHF radio.

3.2.9 Military submarine assets, if not set up and crewed by persons trained to search for 37.5 kHz signals, have not been found to be useful. If however the aircraft being sought is equipped with lower frequency ULBs, such as ones operating at 8.8 kHz, the situation would be different, as these can be picked up by many military assets — often the first on site — whether surface vessel or submarine. The nominal audible range of a ULB transmitting at 8.8 kHz could be in excess of 10 kilometres.

3.2.10 For searches in very shallow waters with poor visibility, for example in a river or lake, grapple dragging by surface vessels and the use of metal detectors mounted on inflatable craft are options.

3.3 What to Recover?

3.3.1 The priority targets for the investigation team during the recovery phase shall be flight recorders, aircraft debris/parts (including avionics components which may contain non-volatile memory), any human remains[4] and personal effects. Wreckage observation and mapping are also important. When available, a photographic survey of the accident site enables its original state to be recorded before it is altered by diver or ROV interventions.

3.3.2 It is necessary to select carefully, with opinions from all investigation parties considered, the aircraft debris and parts to be recovered, and to prioritise them, with a view to the overall investigation. The initial analysis of the FDR and CVR may assist in this selection process.

3.3.3 There is a case for recovering only those parts of the aircraft judged to be relevant to the investigation, especially if the aircraft wreckage is very large or fragmented. Divers or ROV operators might be given a 'shopping list' of those parts of the aircraft most desirable to recover, based on preliminary information gathered from recorders, sea bed images and aircraft data (such as manufacturers' drawings, parts catalogues, wiring diagrams and manuals).

3.3.4 It is sometimes more straightforward to recover as much as possible, avoiding the difficulty of finding again particular items which may have been disturbed by underwater currents. The full wreckage may then be examined for its key elements in a more suitable environment. Storing wreckage on land can however pose a challenge, as hangar space is often scarce and in some jurisdictions long-term storage space may not be available.

3.4 Recovery

3.4.1 The recovery of aircraft wreckage is generally accomplished by the parts being rigged to a hoist and lifted by crane out of the water and onto the recovery vessel. Alternatively, the lift might in some cases be achieved by the attachment to the wreckage, by divers, of small 'parachutes', then inflated with compressed air by divers; care is needed to avoid inflatable items being punctured by sharp metallic edges on the wreckage. In at least one recovery operation, sealed buoyant metal tubular fabrications, inserted beneath the aircraft's wings, were used with success.

3.4.2 For ROV operations it may be useful for a steel basket to be lowered to the sea bed, into which debris may be placed by the ROV. Such a basket may also be used for the recovery of human remains, in what shall be a separate operation.

3.4.3 When using an ROV, particularly where the wreckage is spread over a large area of the sea bed, it is important to identify clearly those locations which the ROV has visited. This may be achieved by dropping markers, carried down in the basket referred to in 3.4.2.

3.4.4 Where aircraft wreckage has rested for some time underwater, sediments may accumulate within it, increasing its weight and rendering its recovery more difficult. It may be necessary to remove at least some of this sediment before lifting, for example using suction tools. This possible complication is an argument for recovery action to be taken without unnecessary delay, and not to be paused, once begun.

3.4.5 The internal components of flight recorders recovered from underwater are vulnerable to corrosion, and shall be kept in fresh water for transit and until they are opened. All wreckage recovered shall be rinsed to remove salt water and further anti-corrosion application of specialised products can help in preserving evidence. Access to recovered wreckage shall be limited.

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4. This is especially the case for bodies floating on the surface of the water. Section 3.5 below discusses the recovery of human remains still underwater with or in the aircraft wreckage.

3.4.6 It is important to re-stow all equipment in an orderly fashion after use, including the washing off of salt water, so that it is ready and fit for use on the next occasion.

3.4.7 Chapter 5 of the ICAO “Manual of Aircraft Accident and Incident Investigation” (Doc 9756, Part I) contains guidance on actions at the site of the accident, including dealing with wreckage in water, its preservation, decisions on what to recover, psychological stress and specialist examinations. Chapter 7.4 of ICAO Doc 9962, “Manual on Accident and Incident Investigation Policies and Procedures”, is also useful.

3.5 Human Remains

3.5.1 In recovering an aircraft underwater there is frequently a need to deal with human remains. This poses special technical and psychological challenges beyond those associated with an accident site on land. This highlights the need to be prepared.

3.5.2 Unless autopsy is judged important for the safety investigation, there may be no perceived need for bodies to be recovered from an underwater site. Their recovery must nonetheless be considered, to meet the expectations of relatives and for safety reasons. There may be important legal reasons (such as passenger identification) for the recovery of bodies.

3.5.3 Historically, oceans have been considered an appropriate grave for those who perish at sea. A different view is now generally taken in respect to aircraft accident fatalities, but where bodies have been lost for a prolonged period not all relatives may agree about their recovery. These are delicate issues and need sensitive handling.

3.5.4 In fatal accidents on land, emergency service personnel will typically lead the recovery of bodies. At sea, it is likely that surface recovery of human remains will be conducted by search and rescue services, often military or Coast Guard. However, for human remains at deep water sites, deployment of an ROV may be the only means of gaining access and the ROV operator may be wholly inexperienced in encountering images of human remains. He or she will in that event need careful briefing and management.

3.5.5 The recovery of bodies is an operation that shall not be improvised — material preparation, ample space, and good conditions are crucial. It is important to have available the necessary specialised equipment (such as refrigerated containers, and body bags) and any special expertise.

3.5.6 Medico-psychological support may be needed, to manage the psychological risks related to the recovery of human remains. This can be done through briefings during transit to site, ‘defusing’ moments on board and debriefing during the return transit.

3.5.7 It is important to control access to data, including photographs, relating to human remains. It may be desirable to establish a system to filter photographs of human remains from the general investigation data and store them separately.

3.5.8 In general, personal effects shall be managed on board by police. Safety investigators shall not bear the responsibility of dealing with these effects or of dealing directly with the recovery of human remains and the identification of victims.

4. OTHER ISSUES

4.1 Wreckage Location, and Responsibilities

4.1.1 In some cases of aircraft lost at sea, there have been difficulties in establishing definitively and in a timely manner exactly where the aircraft came down. Possible indicators will include the last radar report and floating wreckage, which may be in national or international waters.

4.1.2 To avoid a dispute which could compromise the investigation, it is advisable for the national investigation authorities concerned (State of (possible) Occurrence and State of Registry) to reach prompt agreement on their respective responsibilities.

4.2 Costs

4.2.1 The costs of investigations increase quickly if the wreckage or flight recorders need to be recovered underwater, and they may exceed the normal budget of the safety investigation authority. It is important that politicians and other decision-makers are apprised of the international obligations which States have in relation to aviation accident investigation.

4.2.2 The costs of hiring specialist vessels and equipment, may be stated as 'mobilisation costs + (daily rate x duration) + demobilisation costs, plus — as a good "rule of thumb" — an additional 20 per cent as a budget for all consumables. It is important to obtain good information in advance about the accident site, and about the capabilities of the vessel intended to be hired, before chartering, and to understand the nature of task before selecting the other tools. The contract ("charter party") with the vessel provider shall be checked for fairness and balance and the charterer shall be aware of his full financial responsibilities for the ship and its crew. Liability issues shall also be considered.

4.2.3 The investigating authority shall be prepared for the possibility that the operation will not be completed quickly. If the site is far out at sea, or the vessel starting from a distant port, even reaching the accident site may take considerable time.

4.2.4 Decision-makers and politicians shall be made aware of the cost and timeline realities, and the investigation authority shall have a procedure for accessing emergency funds.

4.2.5 In many cases the commercial insurance carried on an aircraft may be used by the investigation to defray at least a part of the search and recovery costs. To achieve a successful outcome it is highly recommended that the safety investigation authority approach the aircraft's insurers at an early stage, probably through the insurers' Loss Adjuster.

4.2.6 In other cases, the costs of search and recovery operations have been shared with other parties involved with the aircraft, such as the operator, the manufacturer or the charterer. The level of involvement of these other parties shall be determined by the safety investigation authority.

4.2.7 Alternatively, at least one safety investigation authority has purchased commercial insurance cover against undertaking an operation of this kind. Control of any investigation funded under such insurance shall remain with the safety investigation authority and not be taken over by the insurer. Such an insurance policy might provide for a portion of the total costs to be borne by the claimant (to incentivise the claimant to incur only reasonable costs) and there might also be a deductible sum. The use of a brokerage company could be considered.

4.3 Data Handling

4.3.1 Investigators can be faced with handling large amounts of data, in various formats and locations. Confidentiality issues shall be considered, especially for data related to human remains.

4.3.2 Strict procedures need to be developed, and a means of secure transmission implemented, between the various entities involved in the search. In most cases, a database containing as a minimum pictures, coordinates and descriptions of debris will be needed.

4.3.3 Oceanographic data and sonar imagery pose additional challenges for storage, and video footage of all ROV dives may need to be duplicated in different formats. Having available high-capacity external hard drives (in Terabytes) will allow for the backup of relevant data.

4.3.4 It is recommended that high speed VSAT[5] connections be set up between vessels, using a secured File Transfer Protocol site to exchange data. To reinforce confidentiality, those involved in search and recovery operations are generally invited to sign a non-disclosure agreement.

4.4 Training

4.4.1 Where possible, the investigation authority's more experienced personnel shall be used for underwater operations, given the special challenges they pose. They shall have been trained to handle and monitor such operations, including familiarity with maritime agencies and national navies, participation in workshops and exercises, and involvement in underwater recovery operations. Investigators shall receive training in survival procedures at sea (including helicopter underwater escape) and health and safety issues.

4.5 Ecological Aspects

4.5.1 The loss of an aircraft in water may be followed by the leakage into the water of fuel, oil and other noxious fluids. It may be possible to contain and recover these, in order to avoid ecological harm. In shallow waters it may be feasible to surround the wreckage with special protective curtains or booms during an operation to recover the liquids, and these curtains or booms may then be towed to land. Specialist assistance shall be considered.

4.6 Closing an Investigation

4.6.1 An investigation involving underwater recovery shall document the operations so that other investigation authorities may benefit from the lessons learned. A short report could accompany the safety investigation final report.

4.6.2 A decision to halt an underwater recovery operation shall be the prerogative of the safety investigation authority, made after careful assessment of the possible safety benefits of continuing the operation, set against the expenditure of additional resources.

5. CONCLUSION

5.1 The need to conduct an investigation into the loss of an aircraft in water is a real possibility for any State that has a coastline or internal body of water, or has aircraft on its register which fly over international waters. Given the number of parties that may become involved, the need to select the right equipment and expertise, the potential for spiralling costs, and the challenges posed by operations at sea, any such investigation will require a very well planned and timely response.

5.2 This guidance material provides advice on planning and preparing for such an investigation. It emphasises the importance of establishing in advance useful partnerships and contacts, the value of checklists, the need to identify and source the necessary funding and expertise, and more generally for the investigation authority to have a good understanding of the tools and assets required for successful search and recovery operations.

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5. Very Small Aperture Terminal (VSAT) is a two-way satellite data communication system between a stabilised maritime VSAT antenna set up on a vessel and a satellite in geosynchronous orbit.

5.3 The cost of these operations can be considerable and it is important that decision makers and politicians who control emergency funds are given realistic cost and time estimates, and that consideration has been given to some kind of insurance policy.

5.4 The challenges involved in conducting operations at sea shall not be underestimated. There is often a thin line between success and failure and anything that can be done beforehand, in preparation and planning, will increase the chance of success.

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South American AIG Regional Cooperation Mechanism (ARCM)

ARCM aviation accidents and incidents investigation policies and procedures manual

Approved by South American ARCM General Coordinator and published under his responsibility

First edition
March 2016

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AMENDMENTS

Amendments are published on the ARCM website www.arcm-sam.org.
The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by

Foreword

The purpose of this manual is to ensure that uniform application of the standards and recommended practices of Annex 13 to the Convention and provide information and guidance to the ARCM member States of South America, about accident and incident investigation policies and procedures as well as industry best practices for carrying out investigations.

As the result of the ICAO Universal Safety Oversight Audit Programme (USOAP) audits and audit follow-ups, it was found that a number of States had developed and documented accident and incident investigation policies and procedures, often in the form of a policy and procedures manual.
In those cases, the manuals generally implemented the provisions of Annex 13 — *Aircraft Accident and Incident Investigation* as well as industry best practices and checklists for carrying out investigations. However, the USOAP audits also established that many States lacked this type of Annex 13 implementation tool and detailed guidance for carrying out investigations. The States that lacked such documented policies and procedures were found to have more audit findings than States that had a policy and procedures manual in place.

Chapter 5 of Annex 13 sets recommended practice as part of the responsibility of the State conducting the investigation as follows:

> "5.4.2 **Recommendation**.- *The accident investigation authority should develop documented policies and procedures detailing its accident investigation duties. These should include: organization; planning; investigation; and reporting*."

The guidance provided in this manual is intended for use by those ARCM member States that do not have in place policies and procedures to meet the requirements of Article 26 of the Chicago Convention and the Standards and Recommended Practices (SARPs) of Annex 13 to the Convention. The content of this manual is consistent with, and is organized in accordance with, guidance materials contained in the:

Manual of Aircraft Accident and Incident Investigation (Doc 9756)

Part I — *Organization and Planning*;
Part II — *Procedures and Checklists* (In preparation);
Part III — *Investigation* (In preparation);
Part IV — *Reporting*.

The material contained herein is presented for the benefit of States to use as an implementation tool for the development of a State's policy and procedures manual for accident and incident investigation. Lastly, the material contained in this document is consistent with best international practices, including policies and procedures examined during ICAO USOAP audits. The contents of the manual provide a template for States to modify as necessary to bring their accident investigation documentation in line with Annex 13 provisions and to standardize and harmonize accident investigation processes amongst ARCM Member States.

The purpose of the ARCM is to provide a document that States could use as a template to insert their State-specific material into a core document that contains the essence of the most accepted and appropriate policies and procedures available to ensure compliance with Annex 13 during investigations carried out by all States.

Because this manual deals with both accident and incident investigations and, for reasons of brevity, the term "accident investigation", as used herein, applies equally to "incident investigation".

This manual will be amended periodically as new investigation techniques are developed and updated information becomes available.

Throughout this manual, the use of the male gender should be understood to include male and female persons.

Readers are invited to submit material for possible inclusion in subsequent editions of this manual. This material should be addressed to:

General Coordinator
International Civil Aviation Organization
Av. Víctor Andrés Belaúnde N° 147
Vía Principal N° 102
Edificio Real 4, Piso 4
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San Isidro – Lima 15073, Peru

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GLOSSARY

When the following terms are used in this manual, they have the following meanings:

Accident.- An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

— being in the aircraft, or
— direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
— direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

— adversely affects the structural strength, performance or flight characteristics of the aircraft, and
— would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

c) the aircraft is missing or is completely inaccessible.

Note 1.- For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

Note 2.- An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Note 3.- The type of unmanned aircraft system to be investigated is addressed in 5.1 in Annex 13.

Note 4.- Guidance for the determination of aircraft damage can be found in Attachment G to Annex 13.

Accredited representative.- A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State. Where the State has established an accident investigation authority, the designated accredited representative would normally be from that authority.

Adviser.- A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

Aircraft.- Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Audit.- A systematic and objective review of a State's aviation framework to verify compliance with the provisions of the Chicago Convention or national regulation, conformance with or adherence to Standard and Recommended Practices (SARPs), procedures and good aviation safety practices.

Causes.- Actions, omissions, events, conditions, or a combination thereof, which led to the accident or incident. The identification of causes does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

Civil aviation authority.- The governmental entity or entities however titled, that are directly responsible for the regulation of all aspects of civil air transport, technical (i.e. air navigation and aviation safety) and economic (i.e. the commercial aspects of air transport).

Flight recorder.- Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Note.- See Annex 6, Parts I, II and III, for specifications relating to flight recorders.

General aviation operation.- An aircraft operation other than a commercial air transport operation or an aerial work operation.

Incident.- An occurrence, other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operation.

Note.- The types of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in Attachment C to Annex 13.

Investigation.- A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and/or contributing factors and, when appropriate, the making of safety recommendations.

Investigator-in-charge.- A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Note.- Nothing in the above definition is intended to preclude the functions of an investigator-in-charge being assigned to a commission or other body.

Maximum mass.- Maximum certificated take-off mass.

Operator.- A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Preliminary Report.- The communication used for the prompt dissemination of data obtained during the early stages of the investigation.

Safety recommendation.- A proposal of an accident investigation authority based on information derived from an investigation, made with the intention of preventing accidents or incidents and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident. In

addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies.

Serious incident.- An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

Note 1.- The difference between an accident and a serious incident lies only in the result.

Note 2.- Examples of serious incidents can be found in Attachment C to Annex 13.

State of Design.- The State having jurisdiction over the organization responsible for the type design.

State of Manufacture.- The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

State of Occurrence.- The State in the territory of which an accident or incident occurs.

State of the Operator.- The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

State of Registry.- The State on whose register the aircraft is entered.

Note.- In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport *(Doc 9587).*

State safety programme.- An integrated set of regulations and activities aimed at improving safety.

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LIST OF ACRONYMS

ADREP	Accident/Incident Data Reporting System
AIG/08	Accident Investigation and Prevention (AIG) Divisional Meeting (2008)
ATC	Air traffic control
ATS	Air traffic services
CAA	Civil aviation authority
ECCAIRS	European Co-ordination Centre for Aviation Incident Reporting System
ICAO	International Civil Aviation Organization
IDP	Individual development plan
IIC	Investigator-in-charge
ISASI	International Society of Air Safety Investigators
MOU	Memorandum of Understanding
OJT	On-the-job training
RAIO	Regional accident and incident investigation organization
SARPs	Standards and Recommended Practices
SDCPS	Safety data collection and processing systems
SSP	State safety programme
TCB	Technical Co-operation Bureau
USOAP	Universal Safety Oversight Audit Programme

ORGANIZATION

Chapter 1

INTRODUCTION

1.1 General

This manual contains the AIG Authority policies and procedures in a framework of AIG regional cooperation mechanism (ARCM) for the investigation of civil aircraft accidents and incidents that occur in the territory of the State. This manual also contains policies and procedures for AIG Authority and other State organizations' participation in investigations of accidents and incidents that occur outside of territory of the State, but involving State interests, including State-operated, -registered, -designed, -manufactured aircraft. An organizational chart of the AIG Authority is contained in Chapter 3 of this manual.

The policies and procedures contained herein are in conformity with international standards and best practices.

Note: The contents of this model manual are written based on the assumption that State has in place legislation, regulations, policies, and procedures that are in full compliance with ICAO requirements (SARPs). If State has "differences" between ICAO requirements, in accordance with Article 38 of the Convention, it must notify ICAO of such differences. Moreover, the policy and procedures manual developed by use of this model manual will need to clearly illustrate what provisions in the manual differ from ICAO requirements, as well as any plans to bring State provisions in line with ICAO requirements.

The manual was developed using the SARPs and guidance material promulgated by ICAO, as well as materials and best practices of some States.

The provisions of this manual are binding on the actions of the AIG Authority, including its investigators and management personnel. The provisions of the manual are also binding on any other State government and aviation industry organizations and personnel, and other personnel and organizations from outside of State that participate in the AIG Authority-led investigations.

Note: Since investigations vary in complexity, a document of this kind cannot cover all eventualities. The more common techniques and processes however, have been included. Although this manual will be of use for experienced and inexperienced investigators alike, it is not a substitute for investigation training and experience, as well as common sense.

Note: Because this manual deals with investigations of accidents, serious incidents, and incidents and, for reasons of brevity, the terms "accidents," "investigations, and "accident investigation", as used herein, apply equally to the investigation of accidents, serious incidents, and incidents.

1.2 State Safety Programme

In compliance with provisions of Attachment F to Annex 13, ICAO Member States are required to implement and maintain a State Safety Programme (SSP). An SSP is a management system for the management of safety by the State. The implementation of an SSP is commensurate with the size and

complexity of the State's aviation system, and may require coordination among multiple authorities responsible for individual element functions in the State.

The SSP framework contemplates four components and eleven elements. The first component is "State safety policy and objectives" and its third element is "accident and incident investigation".

A State, or a regional grouping of States, must establish an independent accident and incident investigation process, the sole objective of which is the prevention of accidents and incidents, and not the apportioning of blame or liability. Such investigations are in support of the management of safety in the State. In the operation of the SSP, the State maintains the independence of the accident and incident investigation authority from other State aviation organizations.

The AIG Authority has developed this manual as part of its efforts in support of State to implement and maintain its SSP.

1.3 Background documents

The following ICAO documents provide additional information and guidance on related subjects:

— Annex 13 — *Aircraft Accident and Incident Investigation*, Tenth Edition, July 2010, incorporating Amendment 13

— *Manual of Aircraft Accident and Incident Investigation* (Doc 9756):

Part I — *Organization and Planning;*

Part II — *Procedures and Checklists* (In preparation);

Part III — *Investigation* (In preparation);

Part IV — *Reporting.*

— *Human Factors Training Manual* (Doc 9683)

— *Manual of Civil Aviation Medicine* (Doc 8984)

— *Safety Management Manual (SMM)* (Doc 9859)

— *Airport Services Manual*, Part 5 — *Removal of Disabled Aircraft* (Doc 9137)

— *Guidance on Assistance to Aircraft Accident Victims and their Families* (Circ 285)

— *Training Guidelines for Aircraft Accident Investigators* (Circ 298)

— *Hazards at Aircraft Accident Sites* (Circ 315)

1.4 Definitions and abbreviations

The definitions and abbreviations used in this manual are contained in the glossary and list of acronyms.

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Chapter 2

LEGISLATIVE REQUIREMENTS

2.1 ICAO requirements

Article 26 of the Convention on International Civil Aviation specifies that it is incumbent on a State in which an aircraft accident occurs to institute an inquiry into the circumstances of the accident. This obligation can only be met when appropriate legislation is in place. Such legislation must establish an accident investigation authority (or commission, board or other body) for the investigation of aircraft accidents. Annex 13 to the Convention, Aircraft Accident and Incident Investigation, contains SARPs for the investigation of accidents and incidents in ICAO Member States. Legislation and regulations are in place in State to address these international requirements.

2.2 The requirements in *[Name of State)*

2.2.1 General

The State has adopted legislation, regulations, policies and procedures that meet the requirements of ICAO for accident and incident investigation. The State has no need to forward "differences" to ICAO, in accordance with Article 38 of the Convention.

2.2.2 Legislation in the State

Note: This portion of the manual shall include a summary of relevant State legislation, which provides the legislative basis for the policies and procedures contained in the manual, and which illustrates the State's commitment to comply with the Chicago Convention, particularly Article 26 of the Convention, and the SARPs contained in Annex 13 to the Convention. It also shall include, but is not limited to, a summary of the legislation, which:

a) created the accident and incident investigation authority;

b) provided it with the responsibilities and authorities (including funding) regarding civil aviation accident and incident investigation on behalf of the State; and

c) authorizes the publication of Government regulations regarding investigations of accidents and incidents.

The full legislation shall be contained in an Appendix to the manual. An example of possible text is presented below.

The legislative basis for the policies and procedures contained in this manual are codified in *[Aviation Act, or other name of the relevant legislation, including the date the legislation was enacted]*. A copy of the *[Act or other name]* is contained in Appendix A. The *[Act or other name]* establishes the AIG Authority and provides its responsibilities and authorities for the investigation of aircraft accidents and incidents to be conducted in accordance with Article 26 of the Chicago Convention and Annex 13 to the Convention. The *[Act or other name]* specifies that provisions regarding investigations will be further regulated by government regulations.

2.2.3 Regulations in the State

Note: This portion of the manual shall include a summary of relevant regulations, sometimes referred to as "operating regulations" published by the government regarding accident and incident investigations. The regulations shall address, at a minimum, the national requirements emanating from the legislation

pertaining to accident and incident investigation and shall provide for standardized investigation processes in conformance with the SARPs contained in Annex 13, as well as guidance contained in the Manual of Aircraft Accident and Incident Investigation, parts I, II, III, and IV (Doc 9756). Some States promulgate regulations regarding accident and incident investigation virtually verbatim to the SARPs contained in Annex 13 and Doc 9756. Promulgation of regulations may take on different forms, depending on the preferences of various States. In some cases, regulations are promulgated and published by Presidential Decree, or similar government action. In other cases, the regulations may be promulgated by the independent investigation authority, after appropriate vetting within the government. Regardless of the means of promulgation, the regulations need to ensure satisfactory compliance with Annex 13 to the Convention and other ICAO guidance materials. The full regulations shall be contained in an Appendix to the manual. An example of possible text is presented below.

The regulatory basis for the policies and procedures contained in this manual are codified in *[Name or title of regulations pertaining to accident and incident investigation, as well as the date of enactment]*. The regulations are consistent with the provisions of Annex 13 to the Chicago Convention and other ICAO documents regarding accident and incident investigation, including the *Manual of Aircraft Accident and Incident Investigation, parts I, II, II, and IV (Doc 9756).* A copy of the regulations is contained in Appendix B.

2.3 Policy matters and manual amendments

It is the policy of the AIG Authority to conduct its business in accordance with ICAO SARPs, particularly those contained in Annex 13 and the *Manual of Aircraft Accident and Incident Investigation, Parts I, II, II, and IV (Doc 9756)*. It is also the policy of the AIG Authority to conduct its business in accordance with the relevant laws and regulations of the State.

The laws and regulations are supplemented by this manual, which contains the policies and procedures of the AIG Authority for the conduct of an investigation in the State or outside of the State, when the State interests or responsibilities apply.

The head or chief of the AIG Authority will appoint a staff member to monitor any amendments to ICAO SARPs or other ICAO documents to ensure that relevant State laws, regulations, policies, and procedures are amended as necessary. If for some reason, State laws, regulations, or policies and procedures do not meet the intent of ICAO requirements, the *[Head/Chief]* of the AIG Authority will ensure that ICAO is notified in a timely manner of such differences, in accordance with Article 38 of the Chicago Convention.

The head or chief of the AIG Authority will also appoint an appropriate staff member to review this manual on a periodic basis and to prepare amendments, as necessary, to ensure its currency and consistency with the standards and best practices of the international aviation community. That staff member will also ensure that any differences between State and ICAO requirements are notified to ICAO, pending possible amendment of State laws, regulations, and policies and procedures, to resolve such differences.

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Chapter 3

INVESTIGATION OBJECTIVE AND INDEPENDENCE

3.1 ICAO requirements

According to ICAO Annex 13, an accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. It must also be able to conduct investigations in an independent manner that precludes interference from outside pressures. The following references are relevant:

- ICAO Annex 13, Chapter 3, paragraph 3.1 - Objective of the investigation:

  "The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability."

- ICAO Annex 13, Chapter 5, paragraph 5.4:

  "The accident investigation authority shall have independence in the conduct of the investigation and have unrestricted authority over its conduct…."

- ICAO Annex 13, Chapter 5, paragraph 5.4.1:

  "Any investigation conducted under the provisions of this Annex shall be separate from any judicial or administrative proceedings to apportion blame or liability.

  Note 1.- Separation can be achieved by having the Annex 13 investigation being carried out by State accident investigation authority experts, and any judicial or administrative proceedings being conducted by other appropriate experts. Coordination, as per 5.10, between the two processes would likely be required at the accident site and in the gathering of factual information, with due consideration to provisions of 5.12."

- In accordance with ICAO Annex 13, Chapter 5, paragraph 5.3:

  "A State should ensure that any investigations conducted under the provisions of this Annex have unrestricted access to all evidential material without delay and are not impeded by administrative or judicial investigations or proceedings.

  Note.- The intent of this recommended practice may be achieved through legislation, protocols, or agreements between the accident investigation authorities and the judicial authorities."

ICAO *Manual of Aircraft Accident and Incident Investigation,* Part I — *Organization and Planning* (Doc 9756), in part, states the following:

> *"The accident investigation authority must be strictly objective and totally impartial and must also be perceived to be so. It should be established in such a way that it can withstand political or other interference or pressure. Many States have achieved this objective by setting up their accident and incident investigation organization as an independent statutory body or by establishing an accident investigation authority that is separate from the civil aviation administration. In these States, the accident investigation authority reports direct to Congress, Parliament or a ministerial level of government."*
>
> *"In many States it may not be practical to establish a permanent accident investigation authority. These States generally appoint a separate accident investigation commission... It is essential that such a commission report direct to a ministerial level of government so that*

the findings and safety recommendations of the investigation are not diluted during passage through regular administrative channels."

3.2 Independence

Maintaining independence in the conduct of investigations will result in enhancing the credibility of the AIG Authority and its ability to avoid situations that have the potential to create conflicts of interest. Maintaining independence of the investigation function is equally important for accident and incident investigations.

The intent of "independence" is that the AIG Authority shall be functionally independent, in particular of the national civil aviation authorities responsible for airworthiness, certification, flight operation, maintenance, licensing, air traffic control or airport operation and, in general, of any other party whose interests could conflict with the task entrusted to the investigation authority.

"Independence" does not mean that the AIG Authority would not be administratively supervised and accountable to a governmental minister or ministry (or parliament) for its finances, administration, policies and working methods (which shall be transparent).

3.3 The requirements in State

This section of the manual will need to be tailored to the specifics of the language contained in the State legislation and regulations. Suggested text is offered below.

The State legislation, regulations, policies, and procedures are consistent with and reinforce the provisions of ICAO Annex 13 regarding the objective and independence of the investigation.

The requirements of AIG Authority are contained in *[Legislation, regulations]* for the independence and objectivity of investigations, as follows:

a) Ensure the establishment of an adequately funded, professionally trained, independent and impartial aircraft accident investigative body in State;

b) Ensure the independence of all investigations into aircraft accidents and incidents that are carried out in State, from political or other interference or pressure; and

c) Promote the use of a common set of regulations compliant with the provisions of Annex 13 – *Aircraft Accident and Incident Investigation*, including regulations for the protection of safety data with the purpose of accident prevention and not the assignment of blame.

3.4 Organizational Chart of the AIG Authority

[[In this part of the manual, it is appropriate to insert the organizational chart for the investigation authority, along with any narrative necessary to explain the organizational structure. The chart shall reflect the independence of the authority and the details of the management and reporting functions. Figures 1 and 2 below illustrate how many States organize their accident investigation authorities to meet the "independence" requirements of Annex 13. Figure 1 is a complex organization with a politically appointed Chairman and Board Members, who normally are not investigators. Figure 2 is a more streamlined organization that does not have a Board. Such an organization is most often led by an experienced investigator as the senior official. It shall be noted that the reporting requirements in both cases are administrative only to the Parliament, Congress, or designated Minister and the organizations are fully separate from any regulatory/safety oversight authorities and from judicial authorities.]]

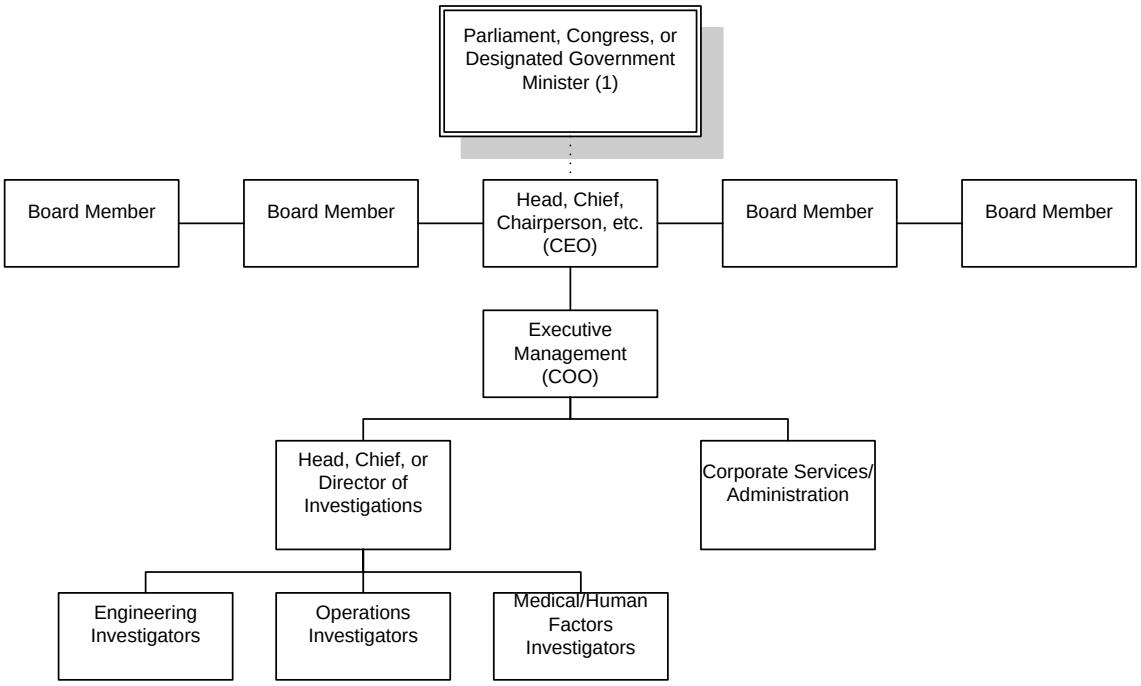

Figure 1

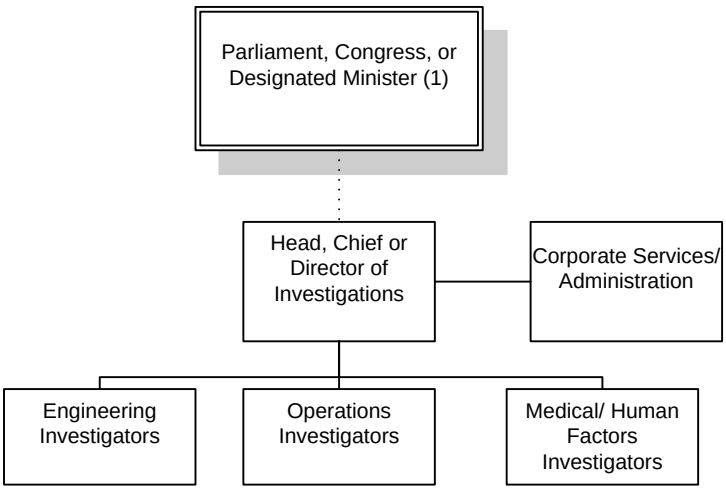

Figure 2

(1) The investigation authority shall not report to the same Minister responsible for the regulation and safety oversight of civil aviation in the State.

3.5 Summary

It is the policy of the AIG Authority and its investigation teams to meet the requirements specific to this chapter to ensure that the sole purpose of investigations is to prevent future accidents. Any judicial or administrative proceedings to apportion blame or liability shall be separate from the AIG Authority investigations. The AIG Authority and its investigation teams shall have functional independence in the conduct of an investigation and unrestricted authority over its conduct, with the intent that any appointed investigation team can withstand interference or pressure from any source.

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PLANNING

Chapter 4

PLANNING AND PREPARATION FOR INVESTIGATION

4.1 General

In order to conduct proper investigations, the managers and investigators of the AIG Authority must be fully prepared and must have a plan of action before an accident or incident occurs. Pre-investigation planning and preparedness involves several elements, including a plan for selection and staffing of the key positions on an investigation team. Other considerations include Memoranda of Understanding (MOU) with other State government and aviation industry organizations, as well as aircraft accident investigation authorities in other States, as a means to obtain assistance in the form of qualified investigators and facilities when required. It is also important to have temporary arrangements in place for the secondment of additional staff from other State government and industry organizations under some circumstances. Lastly, it is important to provide adequate training of personnel, and to provide the appointed investigators with necessary tools and investigation equipment and personal protective equipment in order to meet health and safety requirements.

Proper planning and preparedness are essential in facilitating the prompt arrival of investigators at an accident site and have considerable bearing on the efficiency of the investigation.

4.2 The selection and appointment of investigators

Attention is drawn to ICAO Circular 298, *Training Guidelines for Aircraft Accident Investigators,* Chapter 2, *Background Experience for Investigators,* which states, in part, *"Aircraft accident investigation is a specialized task which should only be undertaken by qualified investigations.....Potential accident investigators must have considerable practical experience in aviation as a foundation on which to build their investigative skills…."* It is the policy of the AIG Authority to follow the guidance contained in ICAO Circular 298 regarding selection and appointment of investigators.

The investigation personnel of the AIG Authority are issued government credentials, which specify the legislative and regulatory basis for their authorities and responsibilities. The credentials contain the investigators' photograph and provide the legal basis for their work during investigations of accidents and incidents.

The AIG Authority has agreements with the aircraft accident and incident investigation authorities in other States to call upon other experts for assistance on very short notice and without having to establish the formal agreement and arrangements at the time of the need of such assistance. Appendix C contains copies of current MOUs.

As part of its management plan, AIG Authority maintains a list of qualified investigators, which are appointed to key positions. Also, AIG Authority will ensure that suitable arrangements can be made on short notice to enlist the necessary support staff from other organizations with in State.

The use of outside expertise is accomplished by written contracts and/or MOUs, which includes provisions to ensure that the seconded individuals are relieved of their regular duties during the course of

the investigation. Their independence and objectivity in the investigation work is essential, and it is important to ensure there are no real or perceived conflicts of interest on the part of seconded individuals. Seconded investigators will be given proper credentials and will sign written agreements to comply with State laws, regulations, policies, and procedures, and to demonstrate their independence and objectivity, and that there are no conflicts of interest during the period of the secondment.

Each investigator, as well as outside personnel used on a temporary basis, must be fully aware of their duties and responsibilities.

4.3 Investigator training

It is the policy of the AIG Authority to provide appropriate training of investigators consistent with international standards and best practices. In particular the AIG Authority will follow guidance provided in ICAO Circular 298, Chapters 3 and 4, which contains detailed information regarding the training of investigators broken into four phases:

a) Initial training;

b) On-the-job training;

c) Basic accident investigation courses; and

d) Advanced accident investigation courses and additional training.

ICAO Circular 298 also urges that recurrent training on an annual or similar basis be required to maintain the proficiency and effectiveness of investigator staff.

One means to determine and manage training needs, as well as monitor and evaluate the training needs and outcomes of training of AIG Authority staff, is through the use of an Individual Development Plan (IDP). A template for an IDP is contained in Appendix E, which contains the required elements of an investigators' or managers' training program. Based on an individual's job description and his/her background, experience, and training gained in the past, the need for additional training can be determined and monitored with the IDP, which would be completed for each staff member.

Note: The items listed in the template IDP are for reference only. Individual items may be added, deleted, or amended to make the IDP directly applicable to any particular staff member.

Each newly hired person possesses some knowledge, skills, and abilities applicable to the assigned tasks; however, the level from one person to another varies. For example, two highly qualified operations investigators could possess extensive flight operations background; however, one may only have limited incident investigation experience, while the other may have considerable major accident investigation experience. Further, investigators require different levels of knowledge, skills, and abilities, depending on the investigation roles to which they may be assigned. The IDP is an excellent tool for identifying and managing these variables.

The IDP contains the basic requirements of knowledge, skills, and abilities that each person either must possess when hired, or must gain through a structured training program. The IDP also provides a tool to manage and plan each person's training, including a means to project an annual training budget. Further, the IDP can be used to document the necessary steps to be taken for a person to be promoted to higher levels of responsibility, such as from Operations Investigator to Investigator-in-charge. The completed IDP for each staff person becomes the training record, which is filed along with supporting materials, such as certificates and other records of training and experience.

4.4 Investigator equipment

As part of its management plan, it is the policy of the AIG Authority to properly equip its managers and investigators in accordance with ICAO guidance material and international best practices.

Attention is drawn to ICAO *Manual of Aircraft Accident and Incident Investigation, Part I (Doc 9756),* Chapter 2, which states, in part, *"Accident investigators should have their investigation field kits and essential personal items packed and ready so they can proceed without delay to the accident site…."* An Appendix to Chapter 2 of Doc 9756 contains guidance for an investigation field kit.

Attention is also drawn to ICAO *Manual of Aircraft Accident and Incident Investigation, Part I (Doc 9756),* Chapter 5, paragraphs 5.4 and 5.5, and the Appendix to Chapter 5, *Personal Protective Equipment against Biological Hazards,* regarding safety at the accident site and environmental and natural hazards.

The AIG Authority will ensure that there is a periodic review of the technical investigation equipment to be used by the investigators at an accident site. The equipment could include cameras, notebook computers, mobile telephones, tools, etc. Specialized equipment may need to be stored at the office or may have to be purchased as needed.

The technical investigation field kits and essential personal protective equipment items will be packed and ready so that the investigators can proceed, without delay, to the accident site. Advance consideration will also be given to such details as inoculations, passport requirements and travel facilities of accident investigators.

4.5 Health and safety at an accident site

ICAO Circular 315, *Hazards at Aircraft Accident Sites,* contains detailed guidance on managing occupational health risks in aircraft accident investigation, including the various categories of hazards associated with accident and incident investigation. The AIG Authority will use the generic operational safety planning guide contained in Chapter 4 of Circular 315, as well as the operational safety plan/site assessment tool contained in Appendix A to Chapter 4, and the personal protective equipment guide contained in Appendix B to Chapter 4.

Investigators shall be aware of the potential hazards at an accident site and what precautions to take. For this reason, AIG Authority will designate a staff member (or an appropriate person or persons from another organization) as the "accident site safety and security coordinator" with the responsibility for accident site safety and security matters, and to oversee the personal protective equipment and its use. The IIC or the designated accident site safety and security coordinator will brief the investigation team on all known and potential hazards and will establish appropriate safety practices. The accident site safety and security coordinator will also ensure that the provisions of this manual and other ICAO guidance material regarding health and safety of investigators during the course of investigations are complied with.

Note: If a specific accident site safety coordinator is not designated, another investigator, such as the IIC, Chairperson of the Structures Group or another responsible person, will assume the duties of ensuring proper site safety and security.

The support of fire department and dangerous goods specialists will be enlisted, as necessary, to evaluate known and/or potential hazards, and to brief the investigation team, as appropriate.

Investigators who work amongst wreckage will be given a valid anti-tetanus serum inoculation and hepatitis immunization, as well as the necessary personal protective equipment against biological hazards, such as blood-borne pathogens. Records of inoculations will be maintained for each investigator.

It is the policy of the AIG Authority to provide all investigators with initial and recurrent training on biological hazard protective equipment and procedures. Records of such training will be maintained for each investigator.

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INVESTIGATION

Chapter 5

INITIAL NOTIFICATION AND RESPONSE

5.1 General

This chapter contains policies and procedures pertaining to:

a) Reporting requirements;

b) Initial notification and reporting of aircraft accidents and incidents to civil aircraft that occur in one State*;*

c) Responses to initial notifications from other States regarding accidents and incidents that occur outside the State but involving interests of State; and

d) Delegation in whole or in part of investigations.

Note: It is the policy of State and AIG Authority to comply with the provisions of ICAO Annex 13, Chapter 4 – Notifications, regarding accidents and incidents occurring in State. Therefore, not all of the details contained in ICAO Annex 13, Chapter 4 are repeated herein.

5.2 Reporting requirements

The following checklist is from ICAO Annex 13, Attachment B. It specifies the various reporting requirements for different types of accidents and serious incidents. It is the responsibility of AIG Authority on behalf of State to comply with the notification and reporting requirements of ICAO Annex 13 (Chapters 4, 6 and 7). All notifications and reports are forwarded in an ICAO working language. If possible, notifications and reports shall also be in English, when another working language was used.

REPORTING CHECKLIST			
Notification—Accidents and Serious Incidents			
From	**For**	**Send to**	*Annex 13 reference*
State of Occurrence	International occurrences – All aircraft	State of Registry State of the Operator State of Design State of Manufacture ICAO (When aircraft over 2 250 kg or turbojet-powered aeroplane)	4.1
State of Registry	Domestic and other occurrences – All aircraft	State of the Operator State of Design State of Manufacture ICAO (When aircraft over 2 250 kg or turbojet-powered aeroplane)	4.8

A list of addresses of aircraft accident investigation authorities can be found in the *ICAO Manual of Aircraft Accident and Incident Investigation, Part I – Organization and Planning (Doc 9756)* and on the ICAO FSIX website. (Chapters 10 and 11 of this manual contain additional reporting requirements.)

A list of "serious incidents" requiring notification is contained in Appendix D of this manual (reference Annex 13, Attachment C).

5.3 Notification procedures

The AIG Authority will maintain a 24-hour a day Duty Officer to receive notifications of accidents and incidents. The Duty Officer will use modern communications equipment for notifications from within State and to from other States. There will be a backup system to the Duty Officer in case he/she cannot be contacted for notifications.

The AIG Authority will ensure that up-to-date contact and address information for reporting of accidents and incidents to the AIG Authority is available to the relevant aviation organizations and personnel within State and to other States through ICAO by use of the ICAO website *(list of addresses for aircraft accident investigation authorities)*, as well as listed in the ICAO *Manual of Aircraft Accident and Incident Investigation* (Doc 9756), *Part I, Chapter 4, Appendix 2.* The 24-hour contact information for the AIG Authority will also be published on the AIG Authority internet website for the benefit of the international aviation community.

Upon receiving a notification of an accident or incident in State, the Duty Officer will alert AIG Authority management and appropriate investigation team members. The team members must prepare for immediate departure to the accident site. The Duty Officer will coordinate the notification of other State government agencies and relevant organizations, such as search and rescue, police, etc. and other involved States, such as the State of Registry, Operator, Design, and/or Manufacturer, in accordance with Annex 13, Chapter 4, *Notification*. Notification and reporting to ICAO are also addressed in Chapter 11 of this manual.

The initial (and the amended initial) notification to other States and ICAO shall contain the following general information, if available:

a) for accidents the indentifying abbreviation ACCID, for serious incidents INCID:

b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;

c) name of owner, operator and hirer, if any, of the aircraft;

d) qualification of the pilot-in-command, and nationality of crew and passengers;

e) date and time (local time or UTC) of the accident or serious incident;

f) last point of departure and point of intended landing of the aircraft;

g) position of the aircraft with reference to some easily defined geographical point, and latitude and longitude;

h) number of crew and passengers; number aboard, number killed, and number seriously injured; others, killed and seriously injured;

i) description of the accident or serious incident and the extent of damage to the aircraft, so far as is known;

j) an indication of to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;

k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;

l) identification of the originating organization and means to contact the investigator-in-charge at any time; and

m) presence and description of dangerous goods carried on board the aircraft.

The following is guidance material from the ICAO *Manual of Aircraft Accident and Incident Investigation* (Doc 9756), Part I — *Organization and Planning*, Appendix 1 to Chapter 4. An example of an initial notification to another State follows:

EXAMPLE OF A NOTIFICATION

Information required (see Annex 13, 4.2)	*Example*
a) for accidents the abbreviation ACCID, for serious incidents INCID;	a) ACCID;
b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;	b) Boeing 737-200, United Kingdom, GAMSW, serial no. 20280;
c) name of owner, operator and hirer, if any, of the aircraft;	c) Derby Aviation;
d) qualification of the pilot-in-command;	d) Captain X;
e) date and time (local time or UTC) of the accident or serious incident;	e) 7 October 1983 at 1314 hours local time;
f) last point of departure and point of intended landing of the aircraft;	f) London/Heathrow-Perpignan/Riversaltes;
g) location of the accident or incident with reference to some easily defined geographical point, and latitude and longitude;[1]	g) 12 km south of Prades, 4233 N, 02-26 W, elevation 2 200 m;
h) number of crew and passengers: aboard, killed and seriously injured; others: killed and seriously injured;[2]	h) 6 crew and 57 passengers aboard, all fatally injured; others: none;
i) nature of the accident or serious incident, and the extent of damage to the aircraft so far as it is known;	i) aircraft collided with mountainside in the Canigou Massif. Aircraft destroyed by fire;
j) an indication to what extent the investigation will be conducted or is proposed to be delegated by the State of Occurrence;	j) investigation by the French authorities;
k) physical characteristics of the accident or serious incident area;	k) mountainous area, difficult access, perpetual snow;
l) identification of the originating authority; and	l) Bureau Enquêtes-Accidents, Paris, France. For additional information, contact Mr. X at (telephone and facsimile numbers, and e-mail address).
m) Presence and description of dangerous goods carried on board the aircraft.	

1 It may be helpful to provide the elevation of the accident site, if it is known.

2 It is useful to first provide the number of persons aboard (crew, passengers) and then the injuries they sustained.

5.4 Response to notifications

Upon receipt of an initial notification from another State about an accident or incident that occurred outside of State involving State interests (State-Registered, -Operated, -Designed, or -Manufactured), AIG Authority will respond indicating its intentions to participate in the investigation and the expected travel arrangements of its Accredited Representative and Advisers. If travel to the accident site in the other State is not expected, the other State will be so advised.

Regardless of whether AIG Authority intends to travel to an investigation in another State, AIG Authority will appoint an Accredited Representative, who will gather relevant materials and records related to the flight, crew, or aircraft, or any other material that may be of use to the accident investigation authority in the other State. Such materials will be forwarded to the IIC of the other State in a secure and expeditious manner.

Note: The Accredited Representative for State appointed to assist other States with their investigations shall preferably be a qualified senior investigator from the investigation authority, who understands the international investigation practices, particularly Annex 13, and who will represent the interests of State during investigations led by other States. All Advisors from State from AIG Authority, [CAA], airlines, universities, military, etc. shall be responsive to the leadership of the Accredited Representative.

The following specific requirements of ICAO Annex 13, Chapter 4 are policy provisions of the AIG Authority:

- *As soon as possible after an accident or incident in State, the AIG Authority will forward an accident/incident notification to the other States involved and, when applicable, to ICAO and to the ARCM. AIG Authority will also subsequently dispatch details omitted from the initial notification as well as other known relevant information.*

- The AIG Authority will forward notifications in a timely manner with all available information in clear concise language prepared in one of the ICAO working languages — most often in English.

- The AIG Authority will acknowledge receipt of notifications of accidents and incidents from other States.

- The AIG Authority will provide the State conducting the investigation with, as applicable, any relevant information regarding the flight, crew and aircraft involved in an accident or incident as soon as possible.

- The AIG Authority will notify the State conducting the investigation whether it intends to appoint an accredited representative and, if so, provide the details about travel and other arrangements.

- If the AIG Authority is aware of dangerous goods on board an aircraft that has an accident or incident, the AIG Authority will ensure that it notifies the State conducting the investigation with the details of dangerous goods on board the aircraft with a minimum of delay and by the most suitable and quickest means available.

The AIG Authority will maintain a record of all transmissions of notifications sent, responses received, and any follow up correspondence in a tracking file system linked to each accident/incident file for future reference and follow-up actions.

Note: The State will take into account the provisions of ICAO Circular 285, Guidance on Assistance to Aircraft Accident Victims and their Families, regarding notifications and other matters pertaining to assisting family members of accident victims.

5.5 Delegation of the investigation (in whole or in part)

ICAO Annex 13, paragraphs 5.1 and 5.1.1, provide guidance that the whole or any part of an investigation of an accident or incident may be delegated by the State of Occurrence to another State or to a regional accident and incident investigation organization (RAIO), based on mutual arrangement and consent.

For occurrences in which State is the State of Occurrence, and involving aircraft operated, registered, designed and/or manufactured by other State(s), the AIG Authority may consider delegating the whole or parts of the investigation to an aircraft accident investigation authority in another State or to a ARCM, in order to facilitate a timely investigation. For example, for aircraft component examinations that must be conducted at facilities outside of State, the AIG Authority may delegate the oversight of the examinations to the accident investigation authority in another State. Whenever possible, the facility will not be the manufacturer, in order to avoid a real or perceived conflict of interest. However, there may be times when the only appropriate expertise or tooling will be at the manufacturer's facility, so it will be necessary to ensure investigator supervision of the work. Until the AIG Authority establishes its own flight recorder laboratory, replay and analysis for recorders will be conducted in the facilities of other States with recorder readout capabilities, in accordance with guidance provided in Annex 13, Attachment D, *Guidelines for Flight Recorder Read-out and Analysis."*

Note: Paragraph 5.1 of Annex 13, Note 2, urges that, "When the whole investigation is delegated to another State, such a State is expected to be responsible for the conduct of the investigation, including the issuance of the Final Report and the ADREP reporting. When a part of the investigation is delegated, the State of Occurrence usually retains the responsibility for the conduct of the investigation."

For occurrences over international waters involving in-flight damage or in-flight injuries to occupants of State-registered aircraft that lands in another State, The AIG Authority may delegate the whole or part of the investigation to the other State, or to a regional investigation organization, upon mutual arrangement and consent.

The general spirit of ICAO Annex 13 is cooperation between States during investigations. Hence, timely communications, sharing of information, and sharing of investigative tasks between States using the authority to delegate the whole or part of any investigation fosters such cooperation. It is the policy of the AIG Authority to comply with this spirit of cooperation.

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Chapter 6

INVESTIGATION POLICIES AND PROCEDURES

6.1 General

This chapter of the manual contains general policies and procedures of the AIG Authority that are consistent with the requirements and guidance provided by ICAO, as well as the best practices of the accident investigation agencies in some other States. State laws and regulations pertinent to the AIG Authority and aircraft accident investigation in State provide the legislative and regulatory basis for the policies and procedures contained herein. Many of the following policy and procedural matters are taken directly from ICAO documents and have been accepted by AIG Authority as its own.

It is the policy of the AIG Authority to institute an investigation into the circumstances of all aircraft accidents and incidents falling under the authority and responsibilities entrusted to AIG Authority by the government. Such investigations will be conducted in accordance with the provisions of Annex 13 to the Convention, and State laws and regulations.

It is the policy of the AIG Authority to determine the extent of the investigation and the procedures to be followed in carrying out such an investigation based on the lessons it expects to draw from the investigation for the improvement of safety. The scope and complexity of the investigation and the size and composition of the investigation team shall be influenced by the following factors, among others:

a) injuries, deaths and damage to equipment, third parties and the environment;
b) identified and potential safety issues underlying the occurrence;
c) the likelihood of recurrence, the probability of adverse consequences, and the severity of adverse consequences;
d) accident and incident history related to the type of operation, size and type of aircraft, the operator, manufacturer, regulator, and etc; and
e) actual and potential deviations from industry safety and operational regulations, standards, procedures, and practices.

It is the policy of the AIG Authority to conduct investigations and complete reports for all accidents and incidents, including the type of serious incidents listed in Annex 13, Attachment C. It will also conduct selected investigations of other incidents not listed in Annex 13.

Note: The AIG Authority has an arrangement (MOU) with [the CAA] to be notified of all occurrences (accidents and incidents), including air traffic and mechanical failure incidents, so that the AIG Authority can determine if it will conduct an independent investigation. Most of the incident notifications will be generated by the [CAA] mandatory incident reporting system. See Appendix C.

Upon notification of an occurrence that falls under the jurisdiction of the AIG Authority, the AIG Authority will immediately institute an investigation appointing an IIC and additional experts, as required. The AIG Authority will assure that the appointed experts are comprised of aircraft accident investigation specialists, who have adequate expertise, training, and experience to ensure a thorough investigation.

The AIG Authority will consider calling upon an aircraft accident investigation agency of another State for assistance on the basis of mutual agreements. The AIG Authority may further consider proposing the delegation of the whole investigation or parts thereof to an aircraft accident investigation agency in another State, or a RAIO, shall the circumstances of an occurrence so warrant.

If, during the course of an investigation, AIG Authority becomes aware of, or suspects, unlawful interference (sabotage or other crime) it will immediately notify the appropriate aviation security and police authorities. The AIG Authority will continue the safety investigation, parallel with any judicial investigation, and will complete a final report of the occurrence, in accordance with Annex 13; keeping in mind continued cooperation with the judicial authorities.

If an accident/incident occurrence being investigated by State has an FDR or CVR, or both, the AIG Authority will make immediate arrangements to recover and protect the flight recorders. The AIG Authority will arrange readout of the recorders as soon as practical at an appropriate flight recorder read-out facility. As per Appendix D to Annex 13, it is essential that flight recorders be read-out as early as possible after an accident. Early identification of problem areas can affect the investigation at the accident site where evidence is sometimes transient. Early identification of problem areas may also result in urgent safety recommendations which may be necessary to prevent a similar occurrence.

Shall the recorders sustain damaged in such a way that they cannot readily be readout at the chosen facility, or are of a type that requires additional expertise or equipment (such as Russian-built flight recorders), the AIG Authority will seek expert assistance consistent with the provisions of Annex 13. In some cases, the recorder may need to be taken to the its manufacturer for readout. In such cases the work will normally be supervised by a AIG Authority investigator, or an investigator from another State to ensure that there is no real or perceived conflict of interest.

The AIG Authority shall also consider electronic equipments other than flight recorders, which may contain valuable information related to the accident. Such equipments include satellite navigation units (e.g. GPS, GLONASS) GPWS, TAWS, FMS etc. The analysis of these units can significantly help the investigation, especially in the absence of flight recorders' information. In addition, the AIG Authority shall consider seeking expert assistance from the relevant States of manufacture.

The AIG Authority will complete, publish and publicly release a final report of the investigation in accordance with ICAO Annex 13 requirements, consistent with the complexity and safety issues involved in the occurrence. At any time safety deficiencies are identified during the course of an investigation, the AIG Authority will encourage relevant organizations (airlines, airports, manufacturers, regulators, ICAO, when ICAO documents are involved, etc.) to take immediate safety actions to prevent recurrence. If necessary, the AIG Authority will issue safety recommendations to the organization(s) in a position to take safety action. Chapter 10 of this manual contains further details about the report writing and safety recommendations.

6.2 Rights, authority and obligations of investigators

The AIG Authority investigators have the following rights and authority, which are consistent with State obligations under Annex 13 to the Convention:

- Unhampered access and control over an aircraft accident site and any wreckage thereon.
- Unhampered access and control over all relevant accident/incident investigation materials, evidence, documents, etc, including air traffic service (ATS) recordings and recorders.
- The right to conduct detailed examination and testing of relevant materials/evidence without delay or interference.
- The right and obligation not to disclose certain records for purposes other than accident and incident investigation, unless the appropriate authority for the administration of justice determines that their disclosure outweighs the adverse domestic and international impact such action may have on that or any future investigation. Such records include:

- all statements taken from persons by the investigators during the course of the investigation;
- all communications between persons having been involved in the operation of the aircraft;
- medical or private information of persons involved in the accident or incident;
- cockpit voice recordings and transcripts from such recordings;
- recordings and transcriptions of recordings of air traffic control units;
- cockpit airborne image recordings and any part or transcripts from such recordings;
- opinions expressed in the analysis of information, including flight recorder information; and
- any record not relevant for analysis of the accident or incident.

6.3 Investigation operations

The AIG Authority personnel and the investigators have the following rights, authority, and obligations:

- Call on the services of local police or other authorized persons to ensure protection of the aircraft accident site, including the aircraft and its contents, until such time as the AIG Authority and the appointed investigators are able to directly take over custody and security of the aircraft and its contents.

- Ensure that the aircraft, its contents, and other relevant evidence remain undisturbed, to the extent possible, until arrival and inspection by an accredited representative, if requested to do so.

Note: Nothing in this provision precludes the AIG Authority from instituting an investigation, and if for unforeseen reasons, the aircraft, etc. must be moved or otherwise disturbed pending the arrival of an accredited representative, the activities involved will be documented by photographs and other appropriate means.

- Ensure, in the event of an occurrence to be investigated that all ATS communications recordings, radar data, and documents associated with the flight are secured for safekeeping.

- Permit accredited representatives of the following States to participate in any investigation:
  - the State of Registry
  - the State of the Operator
  - the State of Design
  - the State of Manufacture
  - any other State that on request provides information, facilities or experts.

- Permit advisers assisting accredited representatives to participate in an investigation to the extent necessary in order to make the participation by the accredited representatives effective.

- Permit participation of an expert (within the provisions of ICAO Annex 13, paragraph 5.27) from States having suffered fatalities or serious injuries to their citizens. Such expert will be permitted to:

  a) visit the scene of the accident;
  b) have access to the relevant factual information, which is approved for public release and information on the progress of the investigation; and
  c) receive a copy of the Final Report.

Note: Experts appointed under the provisions of Annex13, paragraph 5.27, are not permitted to participate in the actual investigation; rather, they are provided limited access (cited above) related to the circumstances pertaining to the death or injury of citizens from their State(s).

- Entitle accredited representatives under the control of the IIC to participate in all aspects of the investigation, in particular:
  - to visit the scene of the accident
  - to examine the wreckage
  - to obtain witness information and suggest areas of questioning
  - to have full access to all relevant evidence as soon as possible
  - to receive copies of all pertinent documents
  - to participate in read-outs of recorded media
  - to participate in off-scene investigative activities, such as component examinations, technical briefings, tests and simulations
  - to participate in investigation progress meetings including deliberations related to analysis, findings, causes and safety recommendations
  - to make submissions in respect of the various elements of the investigation

- Invite participation of the operator in the investigation, when neither the State of Registry nor State of the Operator appoints an accredited representative.

- Invite participation of the manufacturer(s) (type design and/or final assembly of the aircraft) in the investigation, when neither the State of Design nor the State of Manufacturer appoints an accredited Representative.

- Call on the best technical expertise available from any source to supplement its investigative staff, shall the need arise.

- Protect evidence and maintain custody of the aircraft and its contents for a period of time necessary to conduct the investigation, including protection from further damage, access by unauthorized persons, pilfering or deterioration. See Appendix F for detailed procedures.

- Photograph and document evidence of a transitory nature by appropriate means to preclude loss of evidence.

- Test and examine aircraft components, possibly causing damage to the components as part of the tests and examinations.

- Coordinate between the AIG Authority and judicial authorities to ensure that the sole purpose of the investigation is for accident prevention purposes, and to ensure that any judicial or administrative proceedings to apportion blame or liability are separate from the ICAO Annex 13 investigation.

- Ensure that autopsy examinations, as well as toxicological tests, are carried out for crewmembers and passengers for medical investigation purposes. Medical examinations also will be carried out on surviving flight crew, passengers, and aviation personnel involved in the occurrence, such as air traffic controllers, if deemed necessary by the IIC.

- For investigations being conducted by other States, provide the State conducting the investigation with:
  - (in all cases) all relevant information requested by that State

- (in all cases) information about an aircraft that prior to the occurrence of an accident or incident has used or normally would use the facilities or services of State. For example, flightcrew and aircraft maintenance records, ATS recordings, meteorological information, etc. related to the occurrence will be provided to the State conducting the investigation..

- Appoint an accredited representative from the AIG Authority in the case of an accident to an aircraft of a maximum mass of over 2,250 kg, when specifically requested to do so by the State conducting the investigation.

Note: Such an appointment does not necessarily require that the AIG Authority accredited representative travel to the accident site; however, the accredited representative is required to fulfill the obligations contained in ICAO Annex 13, by providing whatever assistance is required.

- Prevent disclosure of information by the accredited representative appointed by the AIG Authority and by State advisers to him/her on the progress and findings of an investigation, without the express consent of the State conducting the investigation.

Note 1. Because the responsibility for release of information on the progress and findings of the investigation rests with the State conducting the investigation, the AIG Authority will ensure that its staff and any advisers from State abide by this requirement.

Note 2. Nothing in this requirement precludes, or shall delay, the release of information for the purpose of accident prevention (issuance of safety recommendations); however, such release will be coordinated with the State conducting the investigation.

- For accidents involving death or serious injury to State citizens that occur in other States, the State will appoint an expert, possibly from the AIG Authority, in accordance with the provisions of ICAO Annex 13, paragraph 5.27, to:

  a) visit the scene of the accident;
  b) have access to the relevant factual information, which is approved for public release and information on the progress of the investigation; and
  c) receive a copy of the Final Report.

- Reopen an investigation if new and significant evidence becomes available, or if significant errors were made in the original analyses that would compromise the findings.

- Make public the facts, conditions, and circumstances during the course of an investigation with the view toward informing the traveling public and prevention of future occurrences.

- Identify safety deficiencies during the course of investigations and in the final report of the investigation with the view toward promoting safety actions by addressing the recommendations to appropriate authorities, agencies, and organizations charged with aviation safety.

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Chapter 7

ACTIONS AT THE ACCIDENT SITE

7.1 General guidance and procedures

7.1.1 Liaison with other authorities

The AIG Authority has agreements (MOUs) with other agencies and authorities in State to prepare for the eventuality of an aircraft accident (See Appendix C). Detailed information concerning the role and responsibility of each agency, for each type of emergency, is contained in the ICAO *Airport Services Manual*, Part 7 - *Airport Emergency Planning* (Doc 9137). Although that manual deals primarily with accidents at or near an airport, the role and responsibility of each agency outlined therein may also apply to other accidents.

Victim identification is the responsibility of the coroner and medical officials, the police department and the disaster victim identification team. Medical personnel, such as pathologists and forensic dentists, shall be aware of what is expected of them in the event of an aircraft accident, including autopsies and toxicology examinations. The AIG Authority has coordinated its needs in advance with the medical specialists in order to facilitate these arrangements.

Notification of next of kin is a sensitive task that must be planned and undertaken with great care in order to avoid anomalies, such as multiple or erroneous notifications. In State, the notification of next of kin is a *[police or medical examiner]* task. ICAO Circular 285, *Guidance on Assistance to Aircraft Accident Victims and their Families, provides further guidance in this regard.*

Although it is recognized that the circumstances surrounding each accident are different, the importance of proper planning and establishing good liaison with other authorities, particularly the police, the fire department and the search and rescue services, cannot be overemphasized.

The AIG Authority will likely have to rely on assistance from other civil and military organizations to provide facilities, equipment and additional personnel, i.e. helicopters, heavy lifting and moving gear, metal detectors, communication equipment, and divers. It is important that heavy salvage equipment, such as cranes, bulldozers, or lifting helicopters, are readily available. In some cases, a full-scale expedition may have to be mounted, requiring additional transportation, food, lodging, etc.

7.1.2 Initial actions at the accident site

Local fire department and the police will probably be the first authorities to arrive at an aircraft accident site. It is therefore important to enlist the cooperation of these authorities in order to ensure security and control of accident sites and cooperation during investigations. It is essential that vital evidence is not lost through interference with the aircraft wreckage in the early phases of an investigation. The fire department and the police shall be aware of what is expected of them in the event of an aircraft accident. The AIG Authority has coordinated its needs in advance with relevant search and rescue organizations. Plans and arrangements for the following essential tasks are in place so that they can be accomplished without delay:

a) Notification to the rescue coordination center (Annex 12 refers);

b) Notification to AIG Authority and other authorities, as necessary;

c) Securing the aircraft wreckage from fire hazards and further damage;

d) Checking for the presence of dangerous goods, such as radioactive consignments or poisons being carried as freight, and taking appropriate protective action;

e) Placing guards to ensure that the aircraft wreckage is not tampered with or disturbed;

f) Taking steps to preserve, through photography or other appropriate means, any evidence of a transitory nature, such as ice, snow or soot deposits; and

g) Obtaining the names and addresses of all witnesses whose testimony may aid in the investigation of the accident.

Apart from these arrangements, the wreckage will be left undisturbed, to the extent possible, until the arrival of the investigation team. It has been emphasized to the police and the rescue services that the bodies of persons killed in an accident involving a large aircraft will, where practicable, be left in situ for examination and recording by the police disaster victim identification team. There may also be times when, for crash worthiness/survival investigation purposes, it may be appropriate for the deceased to be left in situ until viewed and documented by the AIG Authority investigation team. Similarly, personal belongings will remain untouched as their location may assist in the identification of the victims. In general, disturbance of the wreckage will be limited to that necessary to rescue survivors, extinguish fires and protect the public.

7.2 Rescue operations

The primary concern of the first persons to arrive at the site of an aircraft accident is the rescue and aiding of survivors and the protection of property within the means available. Persons who are involved with the extrication of victims from aircraft wreckage will, at the earliest opportunity, record their observations regarding the location in the aircraft where the survivors were found and what portions of the wreckage had to be moved during the rescue.

If circumstances permit, the bodies of persons killed in the accident will be left as found until their location and condition are recorded, photographs are taken and a chart is made indicating their location in the wreckage. If bodies are located outside the wreckage, their location will be marked by a stake with an identifying number. A corresponding label will be attached to each body stating where it was found. The careful recording of these data is essential to the identification of bodies and also provides information which may assist in the accident investigation.

In the event that bodies have been removed from the aircraft wreckage before the arrival of the aircraft accident investigators, it is important to establish whether or not a record, as set out above, has been maintained. If not, the rescue personnel will be interviewed in order to establish such a record.

The AIG Authority investigators will determine if there has been any disturbance of the wreckage during the rescue operations and will record any such disturbance.

Upon completion of the initial rescue operation, rescue personnel shall exercise as much care as possible to ensure that their movements do not destroy evidence, which may be of value to the investigation. For example, once the survivors have been rescued and the fire risk has been eliminated as far as practicable, movement of ambulances and fire vehicles shall not be permitted along the wreckage trail.

7.3 Security at the accident site

When notified of an accident, the IIC or the designated accident site safety and security coordinator will immediately verify that arrangements have been made to ensure the security of the wreckage. This is

usually arranged through the police, but in some cases, military personnel or specially recruited civilians may be employed.

Before investigation work commences at the accident site, the cargo manifest must be checked to ensure there are no hazardous materials in the consigned cargo.

When it is suspected that the aircraft may have carried dangerous cargo such as radioactive consignments, explosives, ammunition, corrosive liquids, liquid or solid poisons or bacterial cultures, special precautions will be taken to station the guards at a safe distance from the wreckage. This is particularly important if a fire has occurred because it tends to disperse the contaminants. Signs indicating a potentially dangerous area will be posted until experts, in consultation with the designated AIG Authority site safety and security coordinator have thoroughly evaluated the danger involved.

Upon arrival at the accident site, one of the first tasks of the investigators is to review the security arrangements. The guards shall be thoroughly conversant with their duties, which are to:

a) protect the public from the hazards in the wreckage;

b) prevent disturbance of the wreckage (including bodies and contents of the aircraft);

c) protect property; and

d) admit to the accident site only persons authorized by AIG Authority; and protect and preserve, where possible, any ground marks made by the aircraft.

Clear and specific instructions will be given by the AIG Authority IIC or accident site safety and security coordinator to those guarding the wreckage site on the need for authorized persons to have proper identification. In the case of major investigations, this will be accomplished through the issuance of photographic identification badges or some form of security pass to all authorized persons. The use of armbands or jackets that show affiliation and duty has also proven to be effective.

If the wreckage has not been scattered, effective security can be achieved by roping off the area. However, if there is a long wreckage trail, the task of securing the site may be formidable and many guards will be required in a wide perimeter.

The police can be of considerable assistance in liaising with the local population, particularly with regard to locating outlying pieces of wreckage. While persons living in the neighborhood will be encouraged to report the discovery of pieces of aircraft wreckage, the importance of leaving these pieces undisturbed will also be impressed upon them. Collecting outlying pieces of aircraft wreckage and arranging them into neat piles alongside the main wreckage are sometimes done with good, but misguided, intentions. With no record of where such pieces were found, their value to the investigation is diminished. Similarly, the removal of pieces of aircraft wreckage by souvenir hunters must be prevented.

The aircraft wreckage will be guarded until the IIC is satisfied that all evidence at the site has been gathered. The IIC will review the situation periodically and arrange for the progressive release of guards as appropriate.

With regard to paragraphs 4.4 and 4.5 of this manual, consideration shall be made at all times by the IIC for the protection of investigators at the accident site (reference ICAO *Hazards at Aircraft Accident Sites* (Circ 315)).

7.4 Wreckage in the water

7.4.1 Initial actions

As soon as it has been determined that the wreckage is in water, efforts must be made to obtain the best technical expertise available. The AIG Authority will call upon the services of the military and other agencies and resources with specialized expertise from outside of State to ensure that the aircraft wreckage underwater is found and recovered as necessary in a timely manner. As part of its contingency planning for an accident in the water, the AIG Authority has pre-arranged agreements (MOUs) with relevant organizations and other States to obtain the necessary specialized assistance. (See Appendix C)

Note: Experience has shown that the search for and the recovery of the aircraft wreckage under water is a specialized task requiring experienced personnel and specialized equipment. Specialized agencies will be consulted early to avoid unnecessary delays in locating and recovery of the flight recorders and the aircraft wreckage from under water.

If the water is shallow (less than 60 m), divers can be effective for search and recovery of wreckage; however, mapping of the wreckage using side-scanning sonar may need to be used to ensure the safety of the divers. If the wreckage is located in deeper water, or conditions make it difficult to use divers, use of the following equipment may be considered:

- underwater equipment used to locate the underwater locating beacons (ULB) on the flight recorders
- underwater videos and cameras
- side-scan sonar equipment
- manned or unmanned submersibles (remotely operated vehicles (ROVs).

7.4.2 Decision to recover the aircraft wreckage

The circumstances and location of an accident will determine whether salvage of the aircraft wreckage is practicable and necessary. In most cases, the aircraft wreckage shall be recovered, if it is considered that the evidence it might provide would justify the expense and effort of a salvage operation. If the aircraft wreckage is likely to contain evidence significant to air safety, the AIG Authority will provide the impetus needed to ensure that action is promptly taken to recover the aircraft wreckage. Such action includes obtaining the necessary funding and specialized equipment and personnel for the tasks.

Note: The AIG Authority has established contingency plans with the government to obtain immediate supplemental funding to begin a search and recovery operation for wreckage underwater.

There have been several instances where aircraft wreckage has been successfully recovered from deep water. Such recoveries necessitated expensive salvage operations lasting several months, but the results exceeded expectations, and the evidence obtained from the aircraft wreckage established the causes and contributing factors of the accidents and led to accident prevention measures.

7.4.3 Aircraft wreckage distribution

Once the aircraft wreckage has been located, a chart plotting the wreckage distribution will be prepared. In shallow waters, divers can achieve this. In deep waters, side-scan sonar and underwater video cameras from remotely operated submersibles may be used. The state of the various pieces of aircraft wreckage, their connection by cables or tubes, the cutting of these connections for the salvage operations, etc., will be recorded before lifting the various pieces of aircraft wreckage from the bottom. Usually the divers will not be experienced in aircraft accident investigation and, therefore, detailed briefings will be necessary.

7.4.4 Preservation of the aircraft wreckage

The rates at which various metals react with salt water vary considerably. Magnesium components react quite violently and, unless recovered within the first few days, may be completely dissolved. Aluminum and most other metals are less affected by immersion in salt water. However, corrosion will rapidly accelerate once the component is removed from the water, unless steps are taken to prevent it.

Once the aircraft wreckage has been recovered, the components will be thoroughly rinsed with fresh water. It may be convenient to hose the aircraft wreckage as it is raised out of the sea prior to it being lowered onto the salvage vessel. Freshwater rinsing does not stop all corrosive action. When large aircraft are involved, it may not be practicable to take further anti-corrosion action on large structural parts. However, all components that require metallurgical examination will require further preservation. The application of a water-displacing fluid will provide additional corrosion protection; fracture surfaces will then be given a coat of corrosion preventives such as oil or inhibited lanolin.

When organic deposits, such as soot deposits or stains, require analysis, organic protective substances will not be used. Freshwater rinsing will be employed followed by air drying. When the component is completely dry, it will be sealed in a plastic bag with an inert desiccant such as silica gel.

Flight recorders will not be dried, but will be kept immersed in fresh water until the assigned flight recorder specialist assumes responsibility for them. The AIG Authority will never permit flight recorders that have been submerged in water to dry out before reaching the recorder laboratory in order to prevent damage to the recording media.

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Chapter 8

ORGANIZATION AND MANAGEMENT OF THE INVESTIGATION

8.1 General

To achieve its purpose, an investigation must be properly planned and managed. The main parts of an investigation must be planned so that the members of an investigation team are aware of their various tasks and have the appropriate qualifications to perform them. The plan must also recognize that these tasks will be coordinated by the IIC, who is the leader of the team.

When a large aircraft is involved, a sizeable team of investigators, set up in specialized groups, is necessary to properly cover all aspects of the investigation. In some investigations, the areas on which the investigation shall focus will become evident at an early stage, and the main investigation effort can then be effectively channeled into these relatively specialized areas. Nevertheless, it is still essential that investigators progress systematically through all aspects of the accident. Whether or not the causes of an accident are apparent, the investigation will determine any underlying systemic factors that may have contributed to the accident or its aftermath as well as any non-causal deficiencies that could contribute to future accidents or their aftermath.

In the case of accidents involving small aircraft, the investigation effort is proportionately smaller. The functions are still the same, but the work is undertaken by one or two investigators or, alternatively, by an investigator and a specialist qualified in a particular aspect that requires expert examination. Again, it is stressed that even when small aircraft are involved, pre-investigation planning and use of investigation checklists are essential.

8.2 The investigation management system

An accident investigation involving a large or complex aircraft will require a large team of investigators in order to conduct the investigation in the most effective and expeditious way. The effective utilization of the available investigators in a major investigation can be achieved by using an "investigation management system" *(Reference ICAO Manual of Aircraft Accident and Incident Investigation, Part II, (Doc 9756) Chapter 5).* The investigation management system divides the investigation activities into functional areas, each of which can be assigned to a group within the investigation team. Each investigation group will have as many members as are necessary to examine the particular circumstances of the accident.

After the initial visit and walk through of the accident site, the first management action to be taken by the IIC is to convene an "Organizational Meeting." At the organizational meeting, the IIC will identify all participants, who will be assigned to the team, and he/she will excuse others, such as news media, lawyers, insurers, who will not be permitted to be part of the team.

The primary purpose of the organizational meeting is to describe the rules, policies and procedures of the investigation and to organize the team into the specific groups responsible for various aspects of the investigation.

Note: Attention must be paid to the need to facilitate entry of accredited representatives and advisers from other States involved in the investigation. To this end, the State of occurrence of the accident must

not require any other travel document than a passport of qualified personnel designated or appointed by other States to participate in the investigation. In this connection, reference is to be made to Annex 9 – Facilitation, Chapter 8, Section B.

Note: Organizational meetings will be convened by the AIG Authority IIC for both large and small investigations as part of the investigation management system.

Note: If properly planned and organized, the organizational meeting shall take less than one hour so that the investigation groups can then begin their important work.

At the organizational meeting, the IIC will discuss the rights, obligations, and responsibilities of the investigators. The IIC will also discuss the policies and procedures contained in this manual and will make available a copy of this manual for review by all participants to ensure they understand their roles, tasks, and duties. Then the IIC will organize the investigators into groups led by senior investigators.

An attendance roster will be circulated for all participants to sign. Signing the attendance roster confirms that the person signing has read, understood, and will comply with the *[Name of investigation Authority]* legislation, regulations, policies and procedures during the course of the investigation. Administrative personnel will be assigned to ensure all participants sign the attendance roster for each team meeting.

Note: Use of interpreters is important during team meetings, even though all participants appear to fully understand the language being used (most often English) during the meetings. Those persons, for whom English is not the first language, may have difficulty with complex issues.

Depending on the magnitude and circumstances of the accident, there may be from two to ten groups formed for various technical investigation areas.

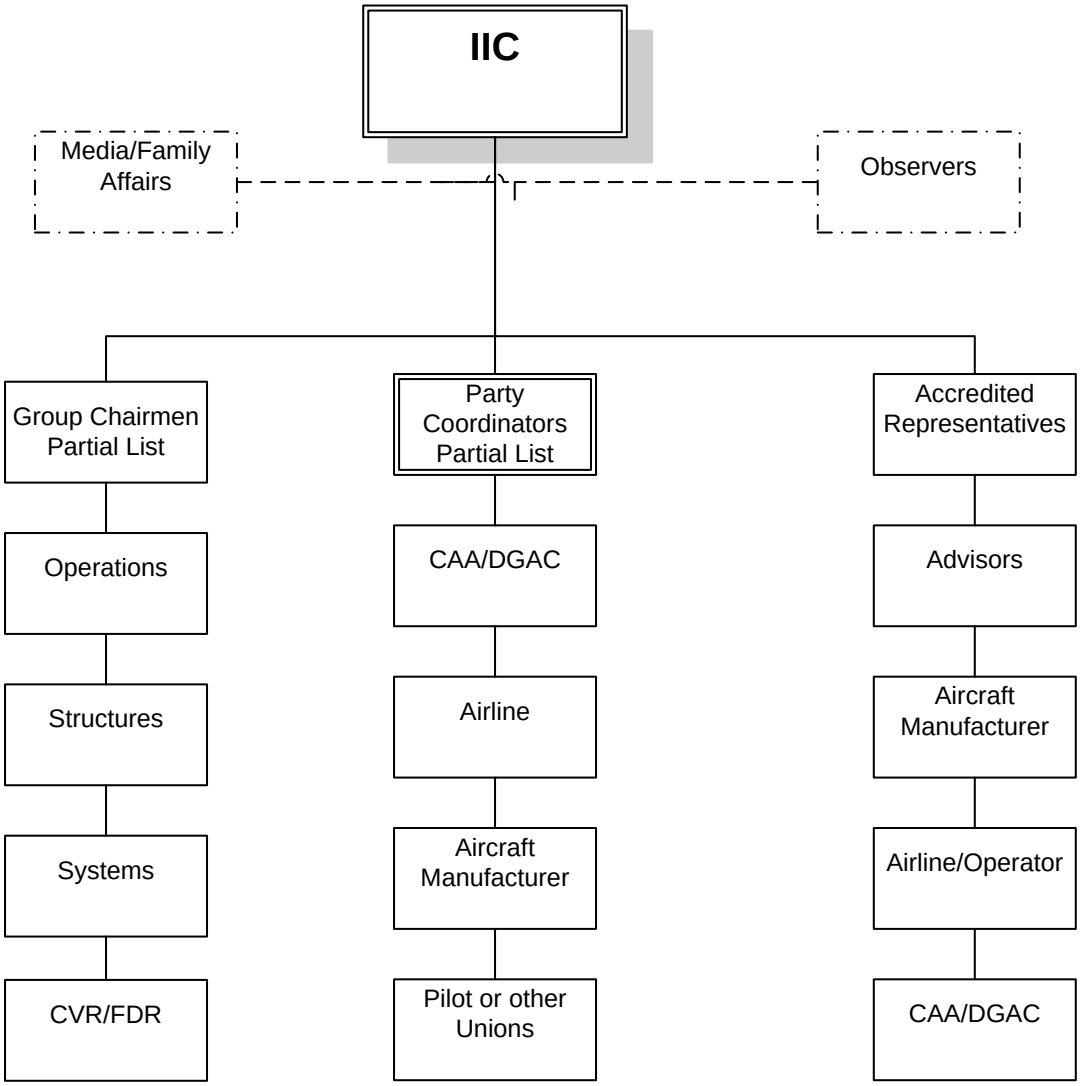

Figure 1. Example of how the investigation team may be organized, depending on the nature of the accident.

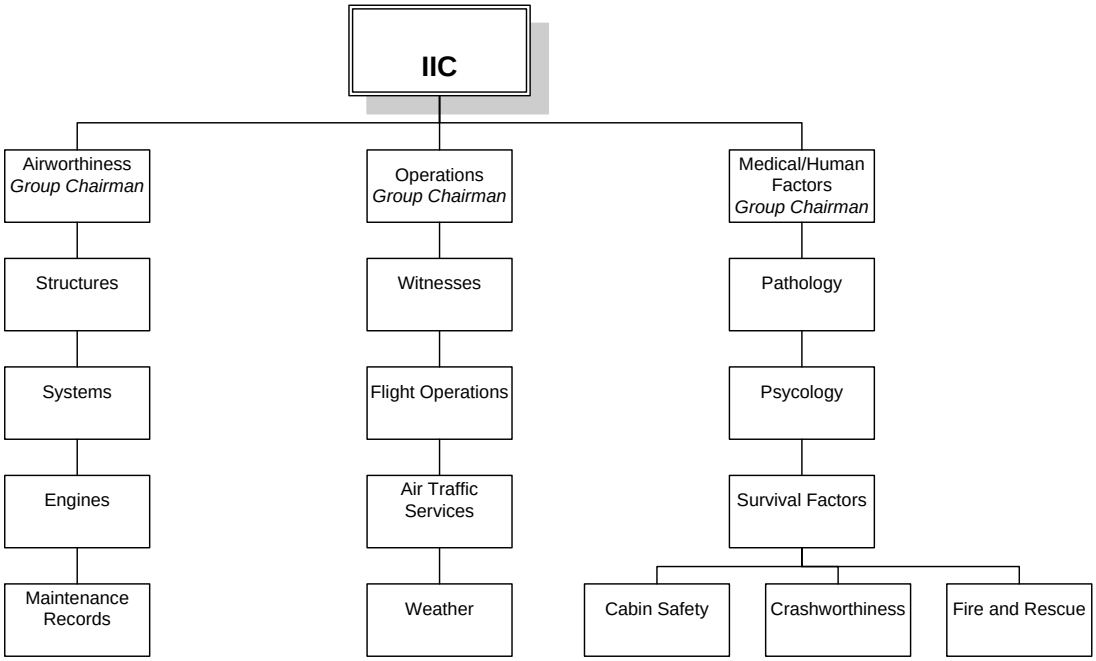

Figure 2. Investigation team Organization – Example A

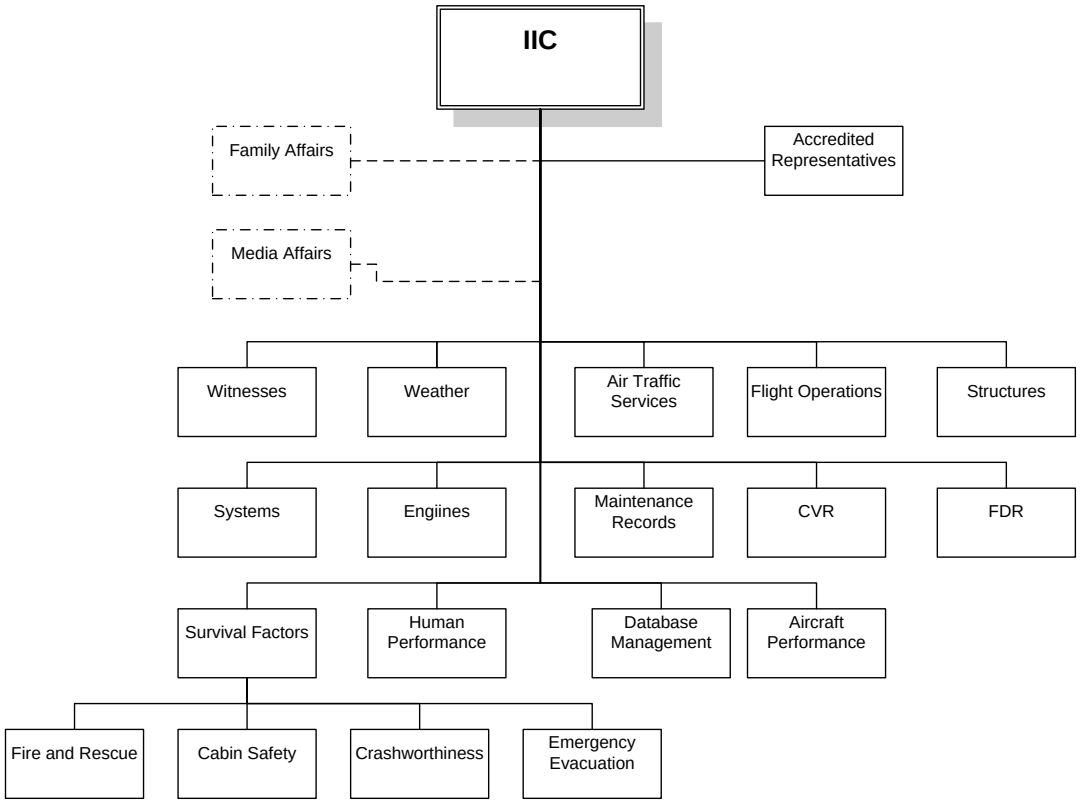

Figure 3. Investigation team Organization – Example B

The investigation group chairpersons are senior investigators, each responsible for a specific group. The members of the investigation groups will include specialists from the AIG Authority, the airline, the

[CAA], the aircraft and engine manufacturers, the airport, and employee unions, as appropriate. The groups also may include advisers assigned by the accredited representatives from other States. All members of the group will normally have access to all information uncovered in the course of the investigation and are required to participate in the investigation until the group report is completed.

The investigation groups that might be formed during a major investigation might include: Witnesses, Meteorology/Weather, Air Traffic Services, Aircraft Structures, Aircraft Systems, Powerplants, Maintenance Records, Survival Factors, Human Performance, Aircraft Performance, and Flight Recorders. Other special groups may be formed as the need arises, such as Fire and Explosion, Underwater Recovery, Mockup, etc. The circumstances and complexity of the accident will determine the number and types of groups required.

Note: The ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part II, Chapter 3, Investigation Responsibilities, provides an overview of the typical responsibilities of investigation team members of a major investigation. In addition, Chapter 5, Investigation of Major Accidents, includes information on the Major Accident Investigation Guide, which provides the investigator-in-charge, group chairpersons and other investigator team members with basic major investigation guidelines.

Note: The ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part III, contains detailed guidance on how to conduct specific areas of investigation.

Note: Each of the AIG Authority Group Chairpersons will provide a copy of the relevant guidance materials to his/her group members to review before beginning the investigation.

In all investigations, a coordinator (spokesperson/team leader) from each of the organizations involved (airline, regulator, manufacturer, etc.) is appointed for liaison duties with the IIC, and to oversee the work of the specialists from their organization. The IIC will be the person responsible for communications with the accredited representatives (and their Advisors) from other States participating in the investigation in accordance with ICAO Annex 13.

Accident investigation management can be greatly facilitated if the IIC uses a flow chart with a number of events. Each event has a corresponding descriptive phrase. The flow chart allows the investigators to ensure that the essential sequence of events is followed. ICAO *Manual of Aircraft Accident and Incident Investigation, Part II,* (Doc 9756) contains an "Event Checklist" specifically intended to aid accident investigation management by documenting the various stages of the investigation. This checklist will be used as a tool to manage the various investigation steps to be taken to complete the investigation. It is a tool only and must be supplemented by other materials.

Each event checklist will be used in conjunction with the Major Accident Investigation Guide contained in ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756), Part II; and the specific investigation task materials (checklists) contained in ICAO *Manual of Aircraft Accident and Incident Investigation, Part III,* (Doc 9756) and tailored to the particular accident circumstances. Since the investigation tasks may differ due to the circumstances of the accident, the checklists will be reviewed to ensure that the tasks are appropriate to the organization and conduct of the accident investigation. Arranging the activities and tasks into checklists allows the IIC to clearly indicate what has been accomplished and what is to be accomplished by the investigators and the various groups during the investigation. It also makes it easier for the IIC to provide direction and guidance to those persons who are participating in an investigation for the first time and who may require specific advice. The checklists, aside from being part of the investigation management system, establish some order in what is often a confusing situation.

The group chairpersons are responsible for completing the investigation tasks using their relevant checklists in order to fulfill their various tasks. Therefore, the group chairpersons must be knowledgeable

about the investigation management system and the tasks their groups will be required to carry out. They shall be well aware that the outlined tasks are not necessarily exhaustive and that particular circumstances may warrant revision of tasks. When using the checklists, it is desirable that the investigators take note of the completion date of each task, any further action required or anything of significance associated with a particular task. Regardless of how much planning goes into the preparation of the checklists, there will inevitably be cases in which the outlined tasks will have to be adapted to the particular circumstances of the investigation.

The checklists help the group chairpersons organize the work of their groups, and provide the IIC with a tool to monitor progress. At the daily progress meetings, the investigators will report which tasks on their checklists have been completed since their last report, and the IIC will record that progress on the flow chart. The advantage of this system is the ease with which the progress of the investigation can be reported to headquarters from the accident site and the fact that the flow chart at headquarters can be updated to reflect the current status of the investigation.

The investigation management system is one of the fundamental tools to be used in a major investigation, and an investigator who is likely to be appointed IIC or group chairperson of a major investigation will be familiar with this system prior to attempting to use it in the field. The effectiveness of the system is directly related to how well each investigator adheres to the flow chart and the checklists.

It is the policy of the AIG Authority to use the investigation management system during conduct of its investigations.

8.3 Progress meetings

The investigation management system incorporates the use of a daily progress meeting of the investigation team. The primary purpose of progress meetings is for all team members to participate in the daily reports of the various groups and for all team members to be aware of findings of other groups and to plan future activities. It also builds the "team concept," which is essential for a major accident investigation to be successful. Further, the program meetings provide the IIC the opportunity to oversee the progress and findings of the investigation and to provide leadership and guidance as necessary.

Note: Progress meetings will be held whether the number of investigation team members is small (3 to 5 persons) and may be held in an informal setting, such as in a vehicle at the accident site, or similar location. Large progress meetings (10 to 100 persons) will be held in a more formal setting, such as a large room at a hotel or similar location. Holding such meetings is part of the investigation management system.

The typical format for a progress meeting would be for the IIC to make a general opening statement and to bring the team up to date on developments outside of the team, such as review of maintenance records , reports from flight recorder readouts, and other investigation activities being conducted away from the accident site. If new investigators join the team, they will be given the rules, policies, and procedures and assigned to the appropriate group.

Then the IIC will request that each group chairperson give a brief report. The format of group chairperson reports will be:

- What we did today
- What we found today
- What we plan to do tomorrow
- Any questions, comments, or suggestions?

Group reports will be short and concise. Relevant documents, such as weather reports or similar data, will be distributed to other participants and do not have to be read at the progress meeting. Reports and questions will be restricted to factual information. This is not the place to begin to speculate or analyze the causes of the accident. If the progress meeting is organized and managed properly, it shall not take more than one hour.

Note: When participants have different first languages, the use of interpreters is essential for all persons to gain the full benefit of the progress meeting reports, so they can understand the information to pass on to their superiors and to develop accident prevention measures. In some cases, it would be appropriate for the Group Chairpersons to provide advance hard copies of their briefing notes for participants to follow during those oral briefings.

Following the progress meeting, the IIC will report findings and progress to his/her superiors and will prepare for possible media and family briefings.

8.4 Cooperation with the media

All major aircraft accidents and most small accidents generate a high degree of interest from the public and the media. A good rapport with the media is usually an asset to the investigation. It may be necessary to enlist the cooperation of the local media to withhold precise details of the location of an aircraft accident until adequate crowd-control measures can be implemented. It may also be necessary to enlist the aid of the media in obtaining further information about the local area, the names of possible witnesses or when seeking the public's assistance in recovering missing pieces of the aircraft wreckage.

To promote dissemination of factual information and to minimize speculation and rumors about the accident, the AIG Authority will provide the media, on a regular basis, with details of the progress of the investigation and facts that can be released without prejudice to the investigation. For this reason, the IIC and the AIG Authority will establish a single point of contact for media inquiries. This contact will usually be the IIC or a person designated by the AIG Authority *[Head/Chief]* or the IIC. The IIC, in consultation with the accredited representatives, will provide non-prejudicial facts and circumstances to the media. Nevertheless, it is necessary to ensure that the needs of the media do not interfere with the proper conduct of the investigation. The media will be informed that a preliminary (factual) report will be released about 30 days after the accident.

Other agencies and organizations involved or affected by the accident (such as airlines, airport authorities, emergency services, and aircraft manufacturers) may also feel a need to release information to the media about their involvement, and such efforts will be coordinated, to the extent possible, among the agencies and organizations involved. Nonetheless, the AIG Authority is the primary point of contact and the only organization permitted to release information on the progress and findings of the investigation.

For accident investigations outside State and conducted by other States, the AIG Authority-appointed accredited representative and his/her advisers participating in the investigation shall not give the media or the public access to any information or documents obtained during the investigation without the express consent of the State conducting the investigation. The release of such information by the AIG Authority or other State officials, without the consent of the State conducting the investigation, would undermine the mutual confidence and cooperation among the States involved and must therefore be avoided.

8.5 Dealing with families of accident victims

ICAO Circular 285, *Guidance on Assistance to Aircraft Accident Victims and their Families,* contains internationally accepted guidance and practices for States to follow when dealing with aircraft accident victims and their families.

Victims and their families are not permitted to participate in the investigation; however, Annex 13, paragraph 5.27, *Participation of States having Suffered Fatalities or Serious Injuries to its Citizens,* provides certain rights and entitlements to States, which have a special interest in an accident by virtue of fatalities or serious injuries to its citizens. Specifically, such States, upon making a request to do so, are permitted to appoint an "expert," who shall be entitled to:

a) visit the scene of an accident;
b) have access to the relevant factual information, which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
c) receive a copy of the final report.

This will not preclude the State from also assisting in the identification of victims and in meeting with survivors from that State.

These provisions do not permit the appointed expert to actively participate in the investigation.

Note: For accidents that occur outside ARCM State that involve State citizens, it may be necessary for State to send experts to assist another State with the identification of victims. This task is not directly related to accident investigation and does not fall under the mandate of the AIG Authority. Although the AIG Authority may not be required to provide an expert(s) for this task, the AIG Authority will encourage the relevant State foreign affairs authorities and personnel to provide such assistance, normally through the State Embassy in the other State.

Annex 9, *Facilitation,* Chapter 8, Section I, *Assistance to aircraft accident victims and their families,* contains SARPs related to States' obligations to facilitate entry into their territory on a temporary basis of family members of victims of aircraft accidents. State will extend all necessary assistance, such as issuing emergency travel documents, arranging transport, and clearing customs for families of aircraft accident victims.

[[Note: Some States have legislation specifically dealing with the handling of families and aircraft accident victims. This section of the manual shall be tailored to be consistent with such requirements. If there are no formal requirements in the State, the manual shall address, in general, how the families and victims will be dealt with, in order to comply with ICAO requirements in this regard. Suggested text is provided below.]]

The general responsibilities for dealing with the families and aircraft accident victims lie with the airline, which shall have in place a plan for dealing with families and victims of aircraft accidents. However, the State of Occurrence shall provide oversight of such activities. Therefore, the AIG Authority will establish liaison with relevant family members, or their representatives, to facilitate the provision of briefings on the investigation findings and the progress of the investigation, and to facilitate the necessary access for other States' experts, in accordance with the provisions of ICAO Annex 13, paragraph 5.27, and ICAO Circular 285.

8.6 Securing the records, samples and recordings

The AIG Authority procedures require that, in the event of an accident, all air traffic services communication recordings and documents deemed to be associated with the flight, and aviation meteorology data, to be secured and placed in protective custody. The AIG Authority has agreements (MOUs) with the relevant organizations to fulfill this requirement (See Appendix C). Further instructions are in place, which require that the aircraft operator's documentation associated with the aircraft, the flight crew and the flight operation is placed in safekeeping.

8.7 Removal of aircraft wreckage

Detailed information concerning planning, equipment and procedures for the removal of disabled aircraft at airports is contained in the *Airport Services Manual*, Part 5 - *Removal of Disabled Aircraft* (Doc 9137).

8.8 Release of the aircraft wreckage

The aircraft wreckage will remain under the custody of the *AIG Authority* until such time as it will be released back to the owner of the aircraft, or the owner's representative (insurance company). In many cases, the aircraft wreckage will be released in increments, depending on the needs of the investigators for testing of selected components.

For accidents in State involving aircraft registered and operated by other States, the AIG Authority will facilitate the release from custody of the aircraft, its contents, or parts thereof, as soon as they are not required for the investigation, to person(s) duly designated by the State of Registry or State of the Operator. This provision is particularly important when occurrences involve minimal damage to an aircraft that needs to be repaired and returned to service.

Portions of the aircraft wreckage may be released, or the entire aircraft wreckage may be released, using aircraft wreckage and parts release form (Appendix F) that includes the name and organizational information of the IIC and the owner of the aircraft or the owner's authorized representative. The release form will include the identifying information on the accident and the aircraft.

If the entire aircraft wreckage is to be released, the IIC will sign the aircraft wreckage and parts release form and he/she will obtain a signature from the owner of the aircraft, or owner's representative, who accepts the aircraft wreckage. If only portions of the aircraft wreckage are being released, the aircraft wreckage and parts release form will list the components being released and any components being retained for further examination, along with the appropriate signatures verifying the release and retention of parts. Each time a portion of the aircraft wreckage is released, an additional aircraft wreckage and parts release form will be completed to document the transfer.

Note: The AIG Authority IIC will obtain full concurrence with all parties, including police involved in the investigation about the decision to release aircraft wreckage, before it is turned over to the owner of the aircraft or the owner's representative. The IIC will also coordinate his/her decision with AIG Authority management personnel.

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Chapter 9

TESTS AND COMPONENT EXAMINATIONS

9.1 Laboratory testing of aircraft systems and components

In many cases, specialist examinations or testing of specific components will be required. The AIG Authority will follow the same policies and procedures for tests and component examinations as used for the accident site phase of the investigation. The ICAO *Manual of Aircraft Accident and Incident Investigation Part I*, (Doc 9756), section 5.7, contains guidance on planning specialists' off-site examinations of components.

Specialist examinations may range from a scanning electron microscope (SEM) examination of a failed part to chemical analysis, aircraft systems testing or flight testing. Laboratory examination and testing generally entail the use of specialized equipment not available at the accident site and are often beyond the capability of an aircraft maintenance facility. Consideration will be given to using the component manufacturer's facilities where specialized equipment and trained personnel are readily available. However, this will require close supervision by the AIG Authority investigators, or by investigators designated by the AIG Authority to ensure that there is no real or perceived conflict of interest. All activities, particularly disassembly and testing phases, will be documented and photographed for evidence purposes.

Specialist examinations may also be needed to conduct the readout and decoding of information from other electronic devices, such as satellite navigation equipment (e.g. GPS, GLONASS), GPWS, TAWS, FMS, etc.

Laboratory testing will not be limited to standard tests. In addition to testing for compliance with appropriate specifications, it may sometimes be necessary to determine the actual properties of the specimen (such as metal, material, fuel and oil). Occasionally it is necessary to devise special tests that will fully exploit the components capabilities. A wide range of specialized testing equipment will permit simulation of a variety of malfunctions.

When investigators send failed parts or components for laboratory testing, they will provide as much information as possible relative to the circumstances contributing to the failure of such parts or components, including their own suspicions. The information provided by the investigator is intended only as a guideline to the specialist who will, nevertheless, explore all relevant aspects. It is not sufficient for an investigator to send parts for specialist examination with the innocuous instructions "for testing". The investigator will provide a detailed history of the part or component, covering such items as:

- the date it was installed on the aircraft
- the total number of service hours
- the total number of hours since last overhaul or inspection
- previous difficulties reported
- any other pertinent data that might shed light on how and why the part or component failed.

Note: If not accompanied by a AIG Authority investigator, arrangements will be made for supervision by an investigator from the State where the testing is to take place, or an investigator from another State, or properly designated independent person.

In order to preserve evidence, it is essential that failed parts and components requiring specialist examination be extracted from the wreckage with care. Consultation with aircraft manufactures' and airlines' experts will be made to ensure proper decisions. Aircraft systems, whether mechanical, electrical, hydraulic or pneumatic, will be removed in sections as large as practicable. Relevant sections will preferably be dismantled rather than cut. Paint smears, which are often extremely important in collision accidents and inflight failures, require protection. This also applies to smoke or soot smears.

9.2 Practical arrangements

The nature of the specialist examinations and the type of components and systems to be tested will determine the facility to be chosen. The investigator must be confident that the facility chosen is capable of providing the required examination and testing. Prior arrangements will be made with the facility as far in advance as practicable so that the management of the facility can plan the tests and assign personnel and equipment.

When choosing a system and components for specialist examination and testing, it is desirable to include as many components of the system as practicable, e.g. wiring harnesses, relays, control valves and regulators. Tests conducted on a single component will reveal information about the operation of that particular unit only, whereas the problem may actually have been in one of the related components. The most valid test results will be obtained by using as many of the original system components as possible.

Each component will be tagged with its name, part number, serial number and the accident identifier. The investigator will maintain a listing, descriptive notes and photographs of all components, which are to be tested; the components themselves will be kept in protective storage until ready for shipping.

Components will be packed to minimize damage during transport. Particular care will be taken to ensure that fracture surfaces are protected by appropriate packing material so that mating surfaces coming into contact with each other or with other parts does not damage them.

Whenever possible, powerplants will be shipped in their special stands and containers. Other heavy components, such as flight control power units, stabilizer screw jack assemblies and actuators, will be packed in protective wrapping and placed in separate wooden containers. Blocks or bracing will be installed inside the containers to prevent any movement of the component during transport. Smaller and lighter components will shipped in the same manner with more than one to a box but in a manner, which will prevent them from coming into contact with one another. Very light units will packed in heavy corrugated pasteboard cartons with sufficient packing material to prevent damage from mishandling during transport. The investigators will label all boxes and cartons appropriately and will make an inventory list for each container.

Sometimes it will be necessary to send a part, or parts, of a damaged aircraft to another State for technical examination or testing. In accordance with ICAO Annex 9 - *Facilitation*, Chapter 8, Section B, each State concerned shall ensure that the movement of such part, or parts, is effected without delay. The States concerned shall likewise facilitate the return of such part, or parts, to the State conducting the investigation.

9.3 Notes and test results

Prior to conducting the examinations and tests, the investigator(s) and the facility personnel involved will be briefed on the type and extent of the tests to be carried out and will review the test procedures to ensure their adequacy. Basically, a written test plan will be prepared and agreed to by all participants,

before proceeding with any testing. The test plan becomes a written record of the planning and conduct of the component investigation.

Note: A good technique for developing a test plan is to ask the manufacturer of the component to prepare a draft test plan protocol, which will then be reviewed and agreed upon by all participants in the examination. However, the final decision on the test plan rests with the AIG Authority.

Any discrepancies found during testing will be photographed and documented with an explanation as to their bearing on the operation of the system or component. It shall be kept in mind that the tolerances called for in the test procedures may only apply to new or overhauled components and that components which have been in service for some time may have acceptable limits outside these tolerances. If the nature of the discrepancy so warrants, a component will be disassembled following completion of the tests to ascertain the cause of failure. Photographs will be taken of the parts prior to and during disassembly, and the findings will be documented in writing.

Consideration will be given to x-raying components before disassembly if the position of springs or contacts etc could be lost during the disassembly.

Off scene tests and examinations will be completed under the same rules and procedures for the on scene phase, which excludes non-technical personnel. However, in some cases, other personnel not part of the investigation team may be ordered to participate or observe by a judge. In such cases, investigators must ensure that they do not discuss their opinions, or make comment of findings or analysis in the presence of these non-technical third parties.

If insurance loss assessors or other parties, who are not part of the investigation team, have been approved to attend and observe the disassembly, the investigator and test facility personnel must take extreme care. Findings and analyses will not be discussed in the presence of non-investigation personnel, because they may use such information inappropriately.

Following completion of the testing, the investigator(s) and facility personnel will review and discuss the results. When there is agreement that the data gathered present a true and factual picture of the components condition and capabilities, the notes and test results will be reproduced into field notes to serve as a record of the examination and testing of the system or component.

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REPORTING

Chapter 10

WRITING THE FINAL REPORT AND MAKING SAFETY RECOMMENDATIONS

10.1 General

The AIG Authority will issue a final report for all investigations. The format and content of the final report will be in accordance with guidance contained in the Appendix to Annex 13 and in the *ICAO Manual of Aircraft Accident and Incident Investigation, Part IV, Reporting* (Doc 9756). The circumstances of an occurrence and the safety issues involved will determine the size and scope of the final report. For all occurrences involving aircraft registered, operated, designed, or manufactured outside State full adherence to the ICAO format will be maintained. In accordance with Annex 13, the report will be clear and concise.

It is the policy of the AIG Authority to complete and to make the final report publically available as soon as possible. The final report will be made public and posted on the AIG Authority internet web site, as well as a hard copy sent to all States involved and ICAO, as per Annex 13 provisions.

After the completion of the field phase of the investigation, the AIG Authority will ensure that the IIC develops a report completion schedule that includes target dates for completion of the final report. Target dates will be consistent with the complexity of the safety issues involved in the occurrence.

The general target date for completion of "small" occurrence investigations with minimal safety issues is not more than six months from the date of the occurrence. The target date for completion of major occurrences with complex safety issues is usually twelve months, or as soon as possible.

If for some reason the final report cannot be made publically available within twelve months, the AIG Authority will make an interim statement publically available on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised. The AIG Authority will also make publically available interim reports and/or safety recommendations, at any time deemed necessary to highlight any safety issues that may be of interest to other States and/or organizations.

10.2 Group reports

10.2.1 Field notes

Each investigation group completes "Field notes" during the field phase of the investigation and for all component examinations and test work. Field notes will be completed in the same format as factual reports *(see 10.2.2 below)*. At the completion of the field notes, each member of the group will sign them signifying their agreement with the content, accuracy, and completeness. If any of the group members did not take part in some portion of the fact-finding, this aspect will be noted under his/her signature. Similarly, if differences cannot be resolved between a group member and the group chairperson, the substance of the disagreement will be stated in the field notes under the signature.

10.2.2 Factual reports

Factual reports are derived from the field notes and enhanced with follow-up investigation work.

In consultation with the group members, the AIG Authority group chairperson is responsible for scrutinizing the evidence gathered in relation to the tasks assigned to the group, and for drafting a group report, which presents all the facts relevant to the activities of the group. The group factual report may also include attachments to the report (maps, charts, or other documents) that support the written record of the investigation. Referred to as the "group factual report," the draft will be shared with other specialists, who participated in this phase of the investigation, as well as accredited representatives and their advisers participating in the investigation. This consultation is for the purpose of ensuring completeness and accuracy, hereafter referred to as "technical review." *(See 10.3 below)* After consultation and revision of the group factual reports, copies will be provided to all organizations and specialists, who participated in the investigation and for transparency of the factual information, the reports preferable will be made public, by means of an Internet web site.

A group factual report will be presented in the following format:

Flight Operations Group Factual Report (or field notes)

(Date)

A. Accident: XXXX (identifying code number assigned by [Name of investigation authority])
Location: XXXX [City, State, Country]
Date/Time: XXXX
Aircraft: XXXX [Make, model, registration]

B. Group Members
XXXX Group Chairperson
XXXX Airline Specialist
XXXX [CAA] Specialist
XXXX Manufacturer Specialist

C. Summary

This section will provide a synopsis of the occurrence, such as flight number, takeoff time, accident time (if known), number of persons on board, injuries, etc. This section also will contain a brief synopsis of the scope of the group's work. The terms of reference for the group and sub-groups and brief details of the time and location of investigation activities will also be recorded in this section. For example, "the Flight Operations Group interviewed the pilots, reviewed records, and conducted simulator work." And "the Aircraft Systems Group documented the aircraft components on scene, removed some parts, and conducted component examinations at the facilities of the manufacturer."

D. Details of Investigation

The facts, conditions and circumstances established by the group and investigation findings (factual) will be presented under appropriate headings describing the areas investigated. For example, in the case of the Flight Operations Group, headings would include crew histories, flight planning, dispatch and aircraft mass and balance. All the relevant facts, whether or not considered significant to the findings of the group, shall be included. Relevant documentation will be attached to the group report.

In some cases, after completion of the group factual report, new investigative activities may require addenda to document unforeseen or other follow up investigative activities. The addenda will follow the same format as the group factual report.

10.3 Technical review

Once the investigation is complete and all group reports and other factual data are available, the AIG Authority will convene a technical review meeting at which all of the factual materials collected during the investigation will be reviewed one last time, before the writing of the final report is initiated. Accredited representatives and their advisers, and other parties that participated in the investigation have one more opportunity to ensure that the factual record of the investigation is complete, objective, and accurate. The IIC will attempt to achieve full concurrence with all of the factual material before moving to the final report writing phase.

In some smaller accidents cases, the technical review meetings could be held by conference call or by email and correspondence. However, for major airline accidents with complex safety issues, a full technical review meeting will be convened.

At the completion of the technical review, if full concurrence about the factual data collected cannot be reached, the investigation may need to be re-opened to resolve disagreements. Any unresolved differences will be noted in the factual record of the investigation.

10.4 Format of the final report

10.4.1 General

All AIG Authority accident and incident reports will contain the following reference to the objective of the investigation in the Introduction or Foreword:

"In accordance with Annex 13 to the Convention on International Civil Aviation, it is not the purpose of aircraft accident and incident investigation to apportion blame or liability. The sole objective of the investigation and the Final Report is the prevention of accidents and incidents. (Reference: ICAO Annex 13, Chapter 3, paragraph 3.1.)"

Appendix 1 of ICAO Annex 13 contains the general format for the final report. Furthermore, detailed guidance regarding the format and content of the final report is contained in ICAO *Manual of Aircraft Accident Investigation, Part IV, Reporting,* (Doc 9756), Appendix 1 to Chapter 1. The ICAO format and guidance will be followed for most AIG Authority final reports. For some incidents and non-major accidents, the format of the report may differ, as all of the Annex 13 headings may not be applicable. *ICAO Manual on Aircraft Accident and Incident Investigation, Part IV – Reporting* (Doc 9756) contains detailed guidance on the subjects for each section of the final report, as well as guidance for the completion of the final report. Those reference materials are not repeated herein.

10.4.2 Chapters 1 and 2 of the Final Report

The AIG Authority will follow the ICAO format for Chapters 1 and 2 of the final report. Chapter 1, *Factual Information,* will contain a comprehensive record of the facts, conditions, and circumstances established in the investigation. Chapter 2, *Analysis,* will contain the significance of the relevant facts and circumstances that contributed to the accident or incident. This portion of the report will also contain the identification of safety deficiencies uncovered during the investigation, regardless of whether those deficiencies contributed to the accident. Supporting documents that are required to support the facts, analysis, conclusions, and recommendations will be included in appendices to the final report.

10.4.3 Chapter 3 of the Final Report — Conclusions

[[Note: The format for Chapter 3 varies somewhat for different States, depending on their specific laws, policies, and procedures. Annex 13, paragraph 6.1 acknowledges that the format may be adapted to the circumstances of the accident or incident. For example, States may use "causes" or "contributing factors," or both, in the Chapter 3 of the final report. Some States specify "probable causes," while a few other States merely list findings in Chapter 3, linking them as causal or contributory to the accident. All of these formats are consistent with the guidance contained in Annex 13 and ICAO Manual of Aircraft Accident and Incident Investigation, Part IV – Reporting (Doc 9756). *Consequently, the following suggested language may require modification by States to bring the language in the policy and procedures manual in line with their specific requirements.]]*

The *AIG Authority will include in Chapter 3 of the final report a list of findings, [causes, and/or contributing factors]. The AIG Authority will include both the immediate and the deeper systemic causes in the final report. The AIG Authority* uses the guidance provided in ICAO *Manual of Aircraft Accident Investigation, Part IV, Reporting,* (Doc 9756), Chapter 1, Table 1-3, *Example of causal statements,* and Appendix 2 to Chapter 1, *Report Writing Conventions,* in the formation of its findings, causes, and contributing factors. The AIG Authority will also include the following statement at the appropriate location in Chapter 3: "*The identification of causes does not imply assignment of fault or the determination of administrative, civil, or criminal liability."*

10.4.4 Chapter 4 of the Final Report — Safety Recommendations

[[Note: The format for Chapter 4 varies somewhat for different States, depending on their internal policies and procedures. Some States break Chapter 4 into two parts: "Safety Actions Taken" and "Safety Actions Required." Safety actions taken may result from formal safety recommendations issued during the course of the investigation or as the result of corrective actions taken by the airline, manufacturer, [CAA], etc. without the issuance of formal safety recommendations. Both actions will be recorded in Chapter 4 as suggested in the following text.]]

The AIG Authority will include in Chapter 4 of the final report both safety recommendations made for the purpose of accident prevention, as well as any safety (corrective) actions taken during the course of the investigation. The AIG Authority will use the guidance provided in ICAO *Manual of Aircraft Accident Investigation, Part IV, Reporting,* (Doc 9756), Chapter 1, in the formation of safety recommendations issued during the course of the investigation and in its final reports. *(See 10.8 for further details on safety recommendations.)*

10.5 Consultation

The AIG Authority will follow the consultation provisions of ICAO Annex 13, Chapter 6. A confidential draft final report will be forwarded to all States that participated in the investigation requesting their substantive and relevant comments. The States include:

a) the State that instituted the investigation;
b) the State of Registry;
c) the State of the Operator;
d) the State of Design; and
e) the State of Manufacture; and
f) any State that participated in the investigation.

In order to obtain substantive technical consultation on the draft final report, the AIG Authority will send, through the State of the Operator, a copy of the draft final report to the operator to enable the operator to submit comments. Similarly, the AIG Authority will send, through the State of Design, and State of Manufacture, a copy of the confidential draft final report to enable them to submit comments.

The letter of transmittal for the confidential draft final report will also request each recipient to notify the AIG Authority of any interim safety actions taken, or safety actions underway, that can be included in the final report. Comments shall be received within sixty days or less, unless a mutually agreed delay is granted. If the comments from another State are accepted, the draft final report will be amended. If the AIG Authority does not agree with the comments, in part or in whole, then the comments from that State will be appended to the final report, unless that State elects not to have their comments appended.

The confidential draft final report will also be forwarded to the key parties in State (airline, *[CAA]*, aircraft manufacturer, etc.) that participated in the investigation in order to obtain their substantive and relevant comments. The same procedures for timing of receipt of comments and handling of the comments as specified in ICAO Annex 13, Chapter 6 will be followed for the parties from State.

Note: The [Investigator Authority] will include proposed safety recommendations in the draft Final Report, inviting comments from recipients.

10.6 Recipients of the Final Report

The AIG Authority will forward with minimum delay a copy of the final report to:

a) the State that instituted the investigation;
b) the State of Registry;
c) the State of the Operator;
d) the State of Design;
e) the State of Manufacture;
f) any State that participated in the investigation;
g) any State having suffered fatalities or serious injuries to its citizens; and
h) any State that provided relevant information, significant facilities or experts.

10.7 Distribution and publication of Final Reports

Lessons learned during the investigation contained in the final report are important for improving aviation safety. Wide distribution of the final report is essential for the prevention of future occurrences and to inform the general public. Accordingly, the AIG Authority adheres to the requirements of Annex 13 paragraph 6.5 and will make final reports publically available as soon as possible and, if possible, within twelve months.

The AIG Authority will distribute copies of the final report to all States and parties that participated in the investigation, as well as to the families of the victims of the accident when requested. The AIG Authority will also forward copies of the final report to ICAO, when the aircraft involved has a maximum mass of over 5700 kg.

Transparent distribution to the general public assists in maintaining public confidence in the aviation system. The AIG Authority will make the final report available to the general public on its internet web site.

If the final report cannot be made publically available in twelve months, the AIG Authority will make an interim report public on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised.

10.8 Safety recommendations

10.8.1 General

Because the sole objective of accident and incident investigations conducted in accordance with Annex 13 to the Convention, the AIG Authority will recommend in a dated transmittal letter to the appropriate authorities in State, as well as authorities in other States, any prevention action that it considers necessary to be taken promptly to enhance aviation safety. The AIG Authority will address any safety recommendations arising from its investigations in a dated transmittal letter to the accident investigation authorities of other States concerned and, when ICAO documents are involved, to ICAO.

Furthermore, the AIG Authority will encourage that all participants in an investigation that might identify safety deficiencies during the investigation to take appropriate and immediate safety actions to correct identified safety deficiencies, without the need for the issuance of formal safety recommendations.

The AIG Authority investigators will develop information on any safety issues identified, safety actions already taken, and proposals for safety recommendations to be considered for inclusion in the final report. The *ICAO Manual of Aircraft Accident and Incident Investigation, Part IV – Reporting* (Doc 9756) contains detailed guidance on formulating safety recommendations and language for writing safety recommendations.

10.8.2 Follow-up of Safety Recommendations

The AIG Authority has a safety recommendation "tracking system" to ensure follow-up on safety recommendations issued to organizations in State and to other States to determine if safety actions have been taken to satisfy the recommendations, if actions are planned, or the reasons why the recipients are not taking actions. For safety recommendations received from another State, the AIG Authority will inform the proposing State, within ninety days of the transmittal correspondence, of safety actions taken or under consideration, or the reasons why no actions will be taken.

Records of safety recommendation outgoing and incoming follow-up correspondence with State *organizations* and with other States will be maintained as part of the accident investigation files at the AIG Authority.

10.9 Reopening of an Investigation

If, during the course of an investigation, even after the final report has been released, new factual information becomes available, or if the original analyses were determined to be in error, the AIG Authority will reopen the investigation to examine any new evidence or erroneous analyses, using the same procedures for the original investigation. Depending on the results of the reopened investigation, the AIG Authority will correct the factual record of the investigation and publish a revised final report, if necessary.

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Chapter 11

REPORTING TO THE ICAO ADREP DATA SYSTEM

11.1 ADREP Preliminary Reports

When the aircraft involved in an accident is of a maximum mass of over 2250 kg, the AIG Authority will send the Preliminary Report to:

a) The State of Registry or the State of Occurrence, as appropriate;

b) The State of the Operator;

c) The State of Design;

d) The State of Manufacture;

e) Any State that provided relevant information, significant facilities or experts;

f) The International Civil Aviation Organization; and

g) ARCM

When an aircraft involved in an accident has a mass less than 2250 kg and when airworthiness or matters considered being of interest to other States are involved, the AIG Authority will forward the Preliminary Report to:

a) The State of Registry or the State of Occurrence, as appropriate;

b) The State of the Operator;

c) The State of Design;

d) The State of Manufacture;

e) Any State that provided relevant information, significant facilities or experts; and

f) ARCM

The Preliminary Report will be sent within 30 days of the date of the accident. When matters directly affecting safety are involved, the Preliminary Report will be sent as soon as the information is available and by the most suitable and expeditious means available (reference Annex 13, Chapter 7, paragraph 7.4).

When an investigation has been delegated in whole to the State the AIG Authority, will dispatch the ADREP Preliminary Reports to the States involved and ICAO in accordance with Annex 13, Chapter 7, paragraphs 7.1 to 7.4.

11.2 ADREP Accident/Incident Data Reports

When the aircraft involved in an accident is of a maximum mass of over 2250 kg, the AIG Authority will send, as soon as practicable after the investigation, the Accident/Incident Data Report to ICAO and ARCM. Further, the AIG Authority will, upon request, provide other States with pertinent information in addition to that made available in the Accident/Incident Data Report.

When the AIG Authority conducts an investigation into an incident to an aircraft of a maximum mass of over 5700 kg, the AIG Authority will send, as soon as is practicable after the investigation, the Incident Data Report to ICAO and ARCM.

When the investigation has been delegated in whole to the State, the AIG Authority will dispatch the ADREP Accident/Incident Data Reports to the States involved and ICAO in accordance with Annex 13, Chapter 7, Paragraphs 7.5 to 7.7.

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Chapter 12

ACCIDENT PREVENTION MEASURES — ACCIDENT/INCIDENT DATABASE SYSTEM

[[A mandatory incident reporting system is required and a voluntary incident reporting system is recommended by Annex 13, Chapter 8. This chapter shall include the details of the State's incident reporting systems, as well as its policies and procedures for analyses and sharing of data from such systems. Suggested text follows.]]

12.1 Incident reporting systems

In accordance with Annex 13, Chapter 8, State has established a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies. State has also established a voluntary incident reporting system that is non-punitive and affords protection to the sources of the information. State follows the provisions of ICAO Doc 9422, Accident Prevention Manual, which contains detailed guidance related to mandatory and voluntary incident reporting systems.

The information contained in accident and incident investigation reports and in incident reporting database(s) will be analysed to determine any preventive actions required. If during the analyses of data identify safety matters of interest to other States, State will forward such safety information to other States as soon as possible.

Regardless of the source of safety recommendations (accident/incident reports, database analyses, or safety studies), if they will be sent to another State, they will also be transmitted to that State's investigation authority.

12.2 ECCAIRS database, analyses and sharing of data

[[If the State has an accident and incident database and data analysis system compatible with the ICAO ADREP system, that system shall be described in this paragraph. If the State does not have an accident and incident database and analysis system compatible with the ICAO ADREP system, it may consider adopting the European Co-ordination Centre *for Aviation Incident Reporting System (ECCAIRS) program to meet Annex 13 Chapter 8 requirements, as suggested in text below.]]*

ICAO Annex 13, Chapter 8, contains requirements for States to establish and maintain an ICAO ADREP system compatible accident and incident database and to analyse the information in the database to determine any preventive actions required and to inform the appropriate authorities of the results.

As the European Union (EU) has established an accident and incident database, the European Co-ordination Centre for Aviation Incident Reporting System (ECCAIRS), which is fully compatible with the ICAO ADREP system, the AIG Authority has established and will maintain the ECCAIRS database for accident and incident data from the State.

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Appendix A

State Legislation on Aircraft Accident and Incident Investigation

- **Aviation Act of State**

- **[Decree or other Law] of State**

Note: The relevant State legislation that created the independent accident and incident investigation authority, provided its rights, responsibilities and authorities shall be inserted in this appendix. Legislation regarding the funding of the authority shall also be included in this appendix.

Appendix B

AIG Authority Operating Regulations

The operating regulations of the AIG Authority shall be appended here. The regulations shall address, at a minimum, the national requirements emanating from the legislation pertaining to accident and incident investigation and shall provide standardized investigation processes in conformance with the SARPs contained in Annex 13, as well as guidance provided in the Manual of Aircraft Accident and Incident Investigation (Doc 9756).

Appendix C

Agreements/MOUs with Other Organizations

This appendix shall contain copies of MOUs and other agreements regarding assistance and cooperation between the AIG Authority and other organizations within the State, such as judicial authorities, the CAA, emergency response agencies, ATS, etc., as well as between the AIG Authority and other States.

Appendix D

List of Serious Incidents

(Reference Annex 13, Appendix C)

Note: The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.

Controlled flight into terrain only marginally avoided.

Aborted take-offs on a closed or engaged runway, on a taxiway[1] or unassigned runway.

Take-offs from a closed or engaged runway, from a taxiway[1] or unassigned runway.

Landings or attempted landings on a closed or engaged runway, on a taxiway[1] or unassigned runway.

Gross failures to achieve predicted performance during take-off or initial climb.

Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.

Events requiring the emergency use of oxygen by the flight crew.

Aircraft structural failures or engine disintegrations, including uncontained turbine engine failures, not classified as an accident.

Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.

Flight crew incapacitation in flight.

Fuel quantity requiring the declaration of an emergency by the pilot.

Runway incursions classified with severity A. The *Manual on the Prevention of Runway Incursions* (Doc 9870) contains information on the severity classifications.

Take-off or landing incidents. Incidents such as under-shooting, overrunning or running off the side of runways.

System failures, weather phenomena, operations outside the approved flight envelope or other occurrences, which could have caused difficulties controlling the aircraft.

Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.

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[1]. Excluding authorized operations by helicopters.

Appendix E

Individual Development Plan

Individual Development Plan—Aircraft Accident Investigator		
Investigator Name ***Title (Operations/Engineering/ATC/Survival Factors/etc.)*** ***Grade or Position*** ***Supervisor Name***		
Knowledge, Skills, and Experience	**Source /Course**	**Date gained, demonstrated, or scheduled to gain—Remarks (number of years, grades, etc)**
Initial response procedures		
On-call procedures		
Notification of other national authorities and organizations		
Securing of records, recordings and samples		
Accident site jurisdiction and security		
Investigator safety—Biological hazard training and equipment		
Investigator safety, Including psychological stress familiarization		
Recovery of human remains		
Requests for autopsies		
Family assistance		
Investigation procedures		
Authority and responsibilities		
Size and scope of the investigation		
Investigation management (Group Chairman and IIC)—on scene domestic and overseas		
Use of specialists		
Parties to the investigation, accredited representatives, advisers and observers		
Dealing with news media		
Specialty procedures (operations, engineering, human factors, etc.)		

Investigator Name *Title (Operations/Engineering/ATC/Survival Factors/etc.)* *Grade or Position* *Supervisor Name*		
Knowledge, Skills, and Experience	**Source /Course**	**Date gained, demonstrated, or scheduled to gain—Remarks (number of years, grades, etc)**
Report Writing		
Internal and external correspondence		
Specialist field notes and factual reports		
Specialist analysis report		
Safety recommendations		
Final reports		
Technical papers		
Speeches		
Seminar and Meeting Attendance		
ISASI (Member?)		
Flight Safety Foundation		
Seminars related to technical specialty		
ICAO Working Groups		
Regional Working Groups		
Other		
Basic, Advanced, or Specialty Courses Attended and Certificates—After Being Hired		
Name of Course or Institution	***Dates***	***Remarks—Certificates, etc.***
On-the-job-training (minimum of 2 cases)		
Identification of accidents	***Dates***	***Remarks***
OJT—domestic accident		
OJT—domestic accident		
Participation as an observer (OJT) at investigations conducted by other States		
Identification of accidents	***Dates***	***Remarks***
Recurrent Training		
Name of course or Institution	***Dates***	***Remarks--Certificates***

Appendix F

Wreckage and Parts Release Form

AIG Authority Investigation Number

The *AIG Authority* is conducting an investigation into the following aviation safety matter.

Investigation title and/or other description—Aircraft make, model, registration, date of occurrence, etc.

The items listed below are no longer required by the AIG Authority as part of its safety investigation.
Note: It is strongly recommended that components be inspected by authorized personnel where it is intended for them to be returned to operational service.

Item details (Description and Condition)	Date returned

AIG Authority IIC or Delegate

Signature of IIC/Delegate

Name of IIC/Delegate

Date

Please return a signed copy of this form to the above person at the AIG Authority

Phone ( )

Fax ( )

Email

Owner or agent acknowledgement

I accept custody of the listed items.

Owner or Agent's name

Phone ( )

Signature of Owner or Agent

Date

— END —

PROGRAMME OF ACTIVITIES FOR THE AIG REGIONAL COOPERATION MECHANISM (ARCM) OF SOUTH AMERICA YEAR 2016
Advance on compliance to 29 February 2016

Accidents and incidents investigation (AIG)

1. Harmonization of regulations

#	Title of the activity	Outcomes
AIG 1.1	Delivery of working papers that will be presented in the Third Meeting of SAM AIG Authorities (AIG-SAM/3) of the ARCM.	1. Development of working papers by the AIG specialists of Venezuela, Argentina and Peru, with the change proposals to the ARCM training programme, procedures and regulations that will be presented in the Third Meeting of SAM AIG Authorities (AIG-SAM/3) of the ARCM; 2. Development of the working papers by the ARCM TC, related to the planning and organization manual and the manual on accident and incident investigation policies and procedures that complement the current ARCM documents and that will be presented in the Third Meeting of SAM AIG Authorities (AIG-SAM/3) of the ARCM;
AIG 1.2	Revision of working papers that will be presented in the Third Meeting of SAM AIG Authorities (AIG-SAM/3) of the ARCM.	1. Circulation of the working papers among the TC and the task groups for comments and identification of opportunities of improvements and revision for their presentation in the Third Meeting of SAM AIG Authorities (AIG-SAM/3) of the ARCM;
AIG 1.3	Publication of the working papers in the ICAO South American Office web page.	1. Publication of the working papers in the ICAO South American Office webpage for revision and comments by the AIG Authorities of the ARCM States.

2. Activities with multinational groups

#	Title of the activity	Outcomes
AIG 2.1	Creation of the ARCM AIG investigators bank.	1. The sending of the letter to the ARCM States was scheduled, requesting to appoint their investigators that meet the established requirements so that they are part of the ARCM AIG investigation group from 1 to 29 July 2016.

#	Title of the activity	Outcomes
AIG 2.2	Revision of the advance on the AIG not satisfactory PQs of **Argentina**	A virtual meeting was conducted in order to coordinate the revision of all AIG PQs. The review will be held tentatively from 14 to 18 March 2016 using the GoToMeeting application.
AIG 2.3	Revision of the advance on the AIG not satisfactory PQs of **Bolivia**	It will be rescheduled after asking the State.
AIG 2.4	Revision of the advance on the AIG not satisfactory PQs of **Brazil**	Revision scheduled for 1 to 31 March 2016.
AIG 2.5	Revision of the advance on the AIG not satisfactory PQs of **Chile**	Revision scheduled for 1 to 30 April 2016.
AIG 2.6	Revision of the advance on the AIG not satisfactory PQs of **Colombia**	Revision scheduled for 1 to 31 May 2016.
AIG 2.7	Revision of the advance on the AIG not satisfactory PQs of **Ecuador**	113 AIG protocol questions (PQ) corresponding to the total PQ of this area were revised.
AIG 2.8	Revision of the advance on the AIG not satisfactory PQs of **Guyana**	80 AIG not satisfactory protocol questions (PQ) were revised.
AIG 2.9	Revision of the advance on the AIG not satisfactory PQs of **Panama**	61 AIG not satisfactory protocol questions (PQ) were revised.
AIG	Revision of the advance on the	

#	Title of the activity	Outcomes
2.10	AIG not satisfactory PQs of **Paraguay**	Revision scheduled for 1 to 30 September 2016.
AIG 2.11	Revision of the advance on the AIG not satisfactory PQs of **Peru**	Revision scheduled for 1 to 31 October 2016.
AIG 2.12	Revision of the advance on the AIG not satisfactory PQs of **Surinam**	A meeting in situ was carried out on the status of the not satisfactory questions of the AIG protocol.
AIG 2.13	Revision of the advance on the AIG not satisfactory PQs of **Uruguay**	60 not satisfactory protocol questions (PQ) were revised.
AIG 2.14	Revision of the advance on the AIG not satisfactory PQs of **Venezuela**	Revision scheduled for 1 to 31 December 2016.

3. Seminars and instruction activities

#	Title of the activity	Outcomes
AIG 3.1	First ADREP/ECCAIRS systems course under the ARCM framework.	The convening of the first course on the ADREP/ECCAIRS system under the ARCM framework was circulated.
AIG 3.2	First ARCM AIG investigators course.	The convening of the first ARCM AIG investigators course was circulated.
AIG 3.3	Second ADREP/ECCAIRS systems course in the ARCM framework.	Convening scheduled for 9 to 10 June 2016.

4. Meetings

#	Title of the activity	Outcomes
AIG 4.1	Third Meeting of AIG Authorities of South America (AIG-SAM/3)	1. Development of the tasks; 2. Tracking and coordination of the working papers; and 3. Preparation of the Third Meeting of AIG Authorities of South America (AIG-SAM/3)
AIG 4.2	39° Session of the ICAO Assembly	Presentation of a WP on the advance on the AIG Regional Cooperation Mechanism (ARCM) scheduled.

5. Safety data collection and processing systems (SDCPS)

#	Title of the activity	Outcomes
	Accidents and incidents investigation	
AIG 5.1	Delivery of the ARCM SDCPS working paper that will be presented in the Third Meeting of SAM AIG Authorities (AIG-SAM/3).	Development of a working paper by the ARCM TC, related to the ARCM safety data collection and processing systems (SDCPS). Development of the occurrences validation, notification and implementation procedures manual.
AIG 5.2	Revision and discussion of the SDCPS working paper between the TC and the work team.	Circulation of the working paper for comments and identification of improvement opportunities of the developed procedures.
AIG 5.3	SDCPS establishment.	Infrastructure tools and software implementation (JIAAC), performance analysis and testing.
AIG 5.4	Development of the first draft of the ARCM safety report.	Draft development scheduled for 1 to 30 December 2016.

6. WEB page

#	Title of the activity	Outcomes
AIG 6.1	Survey and planning	At this stage the ARCM surveyed all the information and current design standards and web services provisions. Technical Committee members were interviewed in order to identify solutions to the requirements.
AIG 6.2	Design and layout	Functional demos and layouts adaptable to mobile devices were made.
AIG 6.3	Registration and implementation	The domain international registration was made, the housing was configured and the finalized design was stored.

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RÉPUBLIQUE FRANÇAISE

Ministère de l'Ecologie,
du Développement durable
et de l'Energie

BEA
Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

Le Bourget, le 27 janvier 2016

Mr. Franklin Hoyer
Regional Director
ICAO South American Regional Office

Av. Víctor Andrés Belaúnde N° 147
Vía principal N°. 102
Edificio Real 4, Piso 4
Centro Empresarial Real
San Isidro - Lima 15073
Perou

Objet : Participation ARCM

Monsieur le Directeur Régional

Je vous écris en votre qualité de Coordinateur Général de la Coopération Régionale AIG Amérique du Sud,

Je vous félicite pour la mise en place d'un Mécanisme de Coopération dans le domaine des enquêtes sur les accidents d'avions (ARCM) avec un accord conclu par les autorités AIG-SAM Unies.

Je pense que cette coopération est très utile pour promouvoir les meilleures pratiques des enquêtes sur les accidents et contribuer à l'amélioration de la sécurité dans la région sud-américaine.

Le BEA a déjà eu l'occasion de travailler étroitement avec certaines autorités d'enquête d'Amérique du Sud dans le cadre d'enquêtes sur des accidents survenus dans la région. A cette occasion, celles-ci nous ont fait part de leur souhait de voir cette coopération prolongée de préférence dans un cadre élargi à la région sud-américaine.

Une participation du BEA aux activités de l'ARCM, avec un statut d''observateur spécial, pourrait être mutuellement bénéfique.

Dans l'espoir d'une réponse favorable par le Comité exécutif du ARCM, recevez Monsieur le Coordinateur, mes cordiales salutations.

Rémi Jouty
Directeur du BEA

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BEA

Courtesy Translation

Le Bourget, le 27 janvier 2016

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Regional Director
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Perou

Objet : ARCM Participation

Mr. Regional Director

I am writing to you in your capacity as General Coordinator of Regional Cooperation AIG South America,

I congratulate you for the establishment of a cooperation mechanism in the field of accident investigation of aviation (ARCM) with an agreement concluded by the AIG-SAM United Authorities.

I think this cooperation will be very useful for promoting the best practices in accident investigations and contribute to improving safety in the South American region.

The BEA has already had the opportunity to work closely with some of the South American Accident Investigation Authorities within the framework of safety investigations in the region. On these occasions, they have expressed their desire to see this cooperation extended preferably in a broader context in the South American region.

BEA participation in ARCM activities with the status of special observer, could be mutually beneficial.

Hoping for a positive response from the Executive Committee of ARCM.

Please accept my cordial greetings.

Rémi Jouty
Directeur du BEA

National Transportation Safety Board
Washington, D.C. 20594

March 7, 2016

Ms. Pamela Suarez
Chair
South American AIG Regional Cooperation Mechanism
c/o ICAO South American Regional Office
Lima, Peru

Dear Ms. Suarez,

The United States National Transportation Safety Board (NTSB) requests to participate in the South American AIG Regional Cooperation Mechanism (ARCM) as an observer.

NTSB understands that participation as an observer carries no fiscal, investigative, training or other requirements, but allows it to attend meetings as it is able. NTSB cooperation with investigations or training would be decided by NTSB on a case-by-case basis when such requests are made. We view our participation as an observer as an opportunity to build relationships with accident investigation agencies in South America.

Thank you for your consideration.

Sincerely,

Thomas E. Zoeller
Managing Director