International Civil Aviation Organization
Fifth Meeting of the Regional Aviation Safety Group – Pan America (RASG-PA/5)
Santiago, Chile, 22 – 24 October 2012

Agenda Item 3 **RASG-PA Working Groups**
3.1 Pan America - Regional Aviation Safety Team (PA-RAST)

PA-RAST REPORT

(Presented by the Secretariat)

SUMMARY

This working paper describes the activities of the PA-RAST since the PA-RAST/9 and 10 Meetings held in Bogota, Colombia, 28 June 2012 and Seattle, United States, 13 to 14 August 2012, respectively.

PA-RAST is focused on the establishment of achievable projects based on prioritized mitigation measures with well-defined deliverables in a specific timeframe.

References:

- Resolution A 36-7 of the 36th Session of ICAO Assembly
- Declaration of the Conference of Directors General of Civil Aviation on a Global Safety Strategy (Montreal, Canada, March 2006)
- ICAO Global Aviation Safety Plan (GASP)
- ISSG Global Aviation Safety Roadmap (GASR)
- PA-RAST/9 and 10 Summary of Discussions

Strategic Objectives	*This working paper is related to Strategic Objective A – Safety*

1. Introduction

1.1 The Pan America – Regional Aviation Safety Team (PA-RAST) is one of three RASG-PA workgroups that is responsible for identifying and developing Safety Enhancement Initiatives (SEIs) and associated mitigation actions for each of the three top risk areas in the Pan America Region as identified by RASG-PA and includes: Runway Excursion (RE), Controlled Flight into Terrain (CFIT) and Loss of Control In-Flight (LOC-I).

1.2 The process developed is as follows: first the SEI is prioritized, then a corresponding Detailed Implementation Plan (DIP) is developed, identified by a reference number and categorized by Global Safety Initiative (GSI), safety impact, changeability indicator, time frame for completion, identification of a respective champion and available references related to the DIP.

2. Detailed Implementation Plans (DIPs) Activities

2.1 PA-RAST has been following the progress of the approved DIPs and providing support to DIP champions.

2.2 PA-RAST, as a data-driven team, is utilizing the RASG-PA Annual Safety Reports to monitor the progress of the mitigation strategies in the Pan American Region and adjusting the DIPs as necessary.

3. Discussion

3.1 The PA-RAST/10 Summary of Discussions is contained in the **Appendix** to this working paper and includes a progress report of PA-RAST activities as well as DIP developments. This Report is also available at: http://www.mexico.icao.int/Meetings/RASGPA/PA-RAST10/PARAST10FinalReport.pdf)

3.2 To continue with the success of this initiative, all RASG-PA stakeholders are asked to actively participate in PA-RAST, recognizing that the work group is responsible for RASG-PA core activity.

4. Conclusion

4.1 PA-RAST will continue to work with DIP Champions to provide support and monitor DIP implementation progress.

5. Action by the Meeting

5.1 The RASG-PA/5 Meeting is invited to:

a) encourage State and industry stakeholders to provide additional resources by assigning experts to assist PA-RAST, and by providing financial and/or in-kind contributions;

b) note the Detailed Implementation Plans (DIPs) and time lines in the Appendix; and

c) suggest future activities for PA-RAST, considering resource requirements and limitations.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

REGIONAL AVIATION SAFETY GROUP – PAN AMERICA (RASG-PA)

TENTH PAN AMERICA – REGIONAL AVIATION SAFETY TEAM MEETING

PA-RAST/10

SUMMARY OF DISCUSSIONS

SEATTLE, UNITED STATES, 13 TO 14 AUGUST 2012

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ii.1 Place and Date of the Meeting

The Tenth Meeting of the Pan America - Regional Aviation Safety Team (PA-RAST/10) was held in Seattle, United States, from 13 to 14 August 2012, at the Boeing facilities.

ii.2 Opening Ceremony

Mrs. Loretta Martin, Regional Director, of the ICAO NACC Regional Office and RASG-PA Secretary, greeted the participants and opened the meeting, highlighting the relevance of the RASG-PA activities to enhance safety in the Pan American Region and the role of the PA-RAST in the progress of safety enhancement initiatives throughout the Pan American Region.

ii.3 Officers of the Meeting

Mr. Enrique Herrera, Deputy Director for Safety, DGAC Mexico, and Mr. Gerardo Hueto, Chief Engineer, Aviation System Safety, Boeing, acted as Co-Chairpersons of the meeting. Mr. Eduardo Chacin, Regional Officer, Flight Safety, served as the PA-RAST Secretary, assisted by Mr. Adolfo Zavala, Regional Officer, Air Traffic Management, both from the of the ICAO NACC Regional Office.

ii.4 Working Languages

The working language of the meeting was English.

ii.5 Agenda

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Agenda Item 3: Controlled Flight Into Terrain (CFIT) Detailed Implementation Plans (DIPs)

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Agenda Item 6: Aviation Safety Information Analysis and Sharing (ASIAS) System

Agenda Item 7: United States FAA Runway Safety Initiatives

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8.1 Logistics
8.2 Agenda

Agenda Item 9: Recommended Actions for the RASG-PA Executive Steering Committee (RASG-PA/ESC/14)

Agenda Item 10: Other business

ii.6 Attendance

The Meeting was attended by 12 members of the Pan America – Regional Aviation Safety Team (PA-RAST). The list of participants is shown in pages iii-1, iv-1 to iv-2.

ii.7 List of Working and Information Papers

WORKING PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
WP/01	1.3	Provisional Agenda and Schedule of the Tenth Pan America – Regional Aviation Safety Team Meeting	24/07/12	Secretariat
WP/02	2	Comments to "Guidance in Maintaining Runways in Accordance to ICAO's Annex" Developed by ACI-LAC – RAST PA/RE/8	09/08/12	Secretariat
WP/03	2 3 4	Detailed Implementation Plans Update	07/08/12	Secretariat
WP/04	10	Terms of Reference for the Pan America – Regional Aviation Safety Team	24/07/12	Secretariat

INFORMATION PAPERS

Number	Agenda Item	Title	Date	Prepared and Presented by
IP/01	--	List of Working and Information Papers	09/08/12	Secretariat
IP/02	1.2	Minutes for the 27 July PA-RAST Teleconference	08/08/12	Secretariat

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Agenda Item 1: Opening of the Meeting

1.1 Introduction

1.1.1 *See Historical section of this report.*

1.2 Administrative Notes

1.2.1 Mr. Gerardo Hueto, RASG-PA Boeing representative, as a host of the RASG-PA PA-RAST and the Executive Steering Committee (ESC) meetings in Seattle, United States, explained to the schedule of activities and meeting locations for the rest of the week.

1.3 Approval of the Agenda

1.3.1 Mr. Enrique Herrera, Deputy Director for Safety, DGAC Mexico, and Mr. Gerardo Hueto, Chief Engineer Aviation System Safety, Boeing,~~,~~ in their role as PA-RAST Co-Chairpersons, presented the draft agenda for approval by the Meeting. The agenda was approved and is included in the historical section of this report.

Agenda Item 2: Runway Excursions (RE) Detailed Implementation Plans (DIPs)

2.0 The DIPs table was updated, and the latest version is included in the **Appendix** to this part of the report.

2.1 RE/08 (Guidance in maintaining runway in accordance with Annex 14): ACI-LAC

2.1.1 During the PA-RAST/9, ACI-LAC presented "*Guidance for Maintaining Runways in Accordance with ICAO Annex 14*," as an output for DIP RE/08, which is related to runway maintenance guidance for airports in the Pan American Region. This guide was a collection of best practices for runway maintenance to reduce runway condition/maintenance related accidents and incidents at airports by following a runway maintenance guide in accordance with ICAO Annex 14.

2.1.2 As agreed by PA-RAST/9, the draft document was subject to review by AGA State and ICAO experts who provided comments to the Meeting.

2.1.3 Based on these comments, the Meeting determined that the document might have additional value if it incorporated important issues such as maintenance planning and the latest amendment to Annex 14, Vol. I – *Aerodrome Design and Operations*, which will be effective on 15 November 2012.

2.1.4 Considering that the ACI-LAC representative was not present at the meeting, it was determined that PA-RAST should advise ACI-LAC of the recommendations in order to update the above-mentioned guide to make it available for distribution to the appropriate stakeholders.

2.1.5 The Meeting was also informed about the outcome of the SAM Regional Runway Safety Seminar (RRSS) that was held in Quito, Ecuador, 16-20 July 2012, sponsored by ACI-LAC and ICAO.

2.2 RE/04 (Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go-around decision making process) and RE/09 (Specific Training for pilots and air traffic controllers to avoid unstabilized approaches): ALTA

2.2.1 RE/04: the ALTA representative informed the Meeting that the RERR toolkit was resent to the airlines and that ALTA would monitor its implementation and report the status back to the PA-RAST. Therefore, the Meeting considered this DIP completed.

2.2.2 RE/09: the ALTA representative informed that they were working together with IFALPA reviewing the information from the FAA to prepare a script for a video (control tower). The IFALPA representative mentioned that Aeromexico supported the initiative and considered that this material would be useful for their Human Factors training programme.

2.2.3 The Meeting also considered that the inclusion of CANSO in this initiative would be appropriate.

2.2.2 The Meeting was informed that ALTA expected to have the first draft of the proposed video as mentioned before, ready by December 2012 to be reviewed by the PA-RAST.

2.3 RE/11 (Develop guidance material and training programs to create action plans for runway safety teams): Mexico DGAC

2.3.1. The representative of the Mexico DGAC informed the Meeting about DIP RE/11: Develop Guidance Material and Training Programs to create action plans for runway safety teams.

2.3.2 In regard to Output 2 – *Electronic Checklist Development*: the representative of Mexico DGAC confirmed that there was ongoing coordination with IATA for the development of a generic checklist, which would be useful for any aerodrome to implement a RST.

2.3.4 In this context, the PA-RAST was briefed by the United States FAA representative about the Local Runway Safety Action Team (LRSAT) program and respective toolkit V1.0, which was created to provide supplemental guidance to FAA Air Traffic Managers on how to plan and conduct effective local RSAT meetings and develop and update Runway Safety Action Plans (RSAPs). It is available at: http://www.faa.gov/airports/runway_safety/resources/lrsat/

2.3.5 The ICAO Secretariat mentioned that this toolkit was presented to the stakeholders in charge of implementation of the RST at Mexico City International Airport (MMMX).

2.3.6 The Meeting deemed the material appropriate to be considered and reviewed by the ESC for proper dissemination by RASG-PA.

2.3.3 In regard to Output 3 – *Establishment of a Regional Runway Safety Database*: the DGAC of Mexico informed that the feasibility of accomplishing it would be reviewed and informed accordingly to the PA-RAST.

2.3.4 In regard to Output 4 – *Develop a Roll-Out Plan:* the DGAC of Mexico informed that it would review and inform the PA-RAST accordingly.

2.3.5 In regard to Output 5 – *Review and Update of Runway Safety Teams (RSTs) Implementation:* the Meeting was briefed on the progress of RST implementation at MMMX with the support of AICM *(Aeropuerto Internacional de la Ciudad de México)*, stakeholders, and the ICAO NACC Regional Office.

2.3.6 The Meeting was briefed in relation to the progress of RST implementation at Quito International Airport (SEQU), Ecuador, and Montego Bay International Airport (MKJS), Jamaica.

2.3.7 The Meeting considered that more promotion was needed for expediting the implementation of RSTs throughout the CAR/SAM Regions. It was noted that a presentation by the ICAO representative on RST implementation had been included in the RASG-PA Workshop programme.

#	DIP	Description	Champ	Output	Deadline	Status	Comments
1	RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go-around decision making process	ALTA	1) Distribute RERR Toolkit and establish "no fault go-around policies & Uns. App SOP's"	18/01/11	Completed	
				2) Operators to include material in training programs	18/01/11	Completed	Completed 13 August 2013
2	RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches	ALTA	1) Survey operators on Uns. App. Mitigations	20/02/11	Completed	
				2) Develop a strategy to deliver safety seminars on this subject in the region	31/12/12	In process	Reviewing the information from the FAA to prepare script for video (control tower) IFATCA has not participated lately /Updated deadline on 13/08/2012 - 50% completed, it will be completed in stages
3	CFIT/02	Specific ALAR/CFIT Training for Pilots	IATA	1) Survey operators on CFIT training	20/02/11	Completed	
				2) Incorporate CFIT training in programs	20/12/11	Completed	
4	CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers	IFALPA & IFATCA	1) CRM/situational awareness training programs for all flight crew	20/02/12	In process	Reviewing the information from FAA to prepare script for video (control tower) IFATCA has not participated lately (see RE/09)
				2) CRM/situational awareness training programs for all air traffic controllers	20/08/12	In process	
5	LOC-I/06	LOC Training – Human factors and automation	PA-RAST	1) Review and evaluate the advisory circular created by the COSCAP's in Asia	20/02/11	Completed	
				2) Distribute to States	20/03/11	In process	The RASG-PA Safety Advisory (RSA) was approved to encourage States and Industry to adopt practices to mitigate Mode Awareness and Energy State Management risks. It will be distributed in English and Spanish by the RASG-PA Secretariat to the Region.
				3) States to send a State Advisory Circular on mode awareness and energy state management.	20/09/11	Pending	To be monitored 6 months after dissemination of RSA
				4) Operators to provide guidance to pilots	20/09/12	Pending	To be monitored 6 months after dissemination of RSA
6	LOC-I/07	LOC Training – Advanced maneuvers	ALTA	1) Listing of training materials available	18/01/11	Completed	
				2) Advanced Maneuvers Training provided to all operators.	18/04/11	Completed	
				3) Include training in initial and recurrent ground and simulators	18/08/13	Superseded	Pending feedback from Airbus. PA-RAST is aware of the ICAO LOCART initiative
7	LOC-I/9	Pilot monitoring policies and procedure for the operator and training program for crews	IFALPA	1) Listing of training materials	20/02/11	Completed	
				2) Raise awareness of availability and need	20/03/11	Completed	
				3) Training material provided to all operators	20/03/11	Completed	Available in the RASG-PA website and has being delivered through RASG-PA Safety Workshops
				4) Training provided to pilots	20/09/12	Completed	Available in the RASG-PA website and has being delivered through RASG-PA Safety Workshops

8	RE/8	Guidance in maintaining runway in accordance with Annex 14	ACI-LAC	1) Create a guide that collects best practices for runway maintenance	18/04/12	Completed	Guide reviewed by ACI-LAC's safety committe members, ICAO and States who provided feedback to PA-RAST for enhancement
				2) Promote and encourage its use		In process	Awaiting finished version of the guide
				3) Airports implement guide on maintenance program		In process	Awaiting finished version of the guide
9	RE/11	Develop guidance material and training programs to create action plans for runway safety teams	DGAC Mexico	1) Gather and publish related material in RASG-PA's website		Completed	Included link to ICAO Runway Safety website was included in the RASG-PA website
				2) Electronic checklist development		In process	
				3) Establishment of a regional Runway Safety Database	25/02/12	In process	Under Review - Will discuss during September PA-RAST Telcon
				4) Develop a roll out plan	25/08/12	In process	Under Review - Will discuss during September PA-RAST Telcon
				5) Review and update of the Runway Safety Teams		In process	Under Review - Will discuss during September PA-RAST Telcon

ESC Approved Detailed Implementation Plans (DIPs)

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go- around decision making process.		9	High	Easy	P1	1	Short

Safety Enhancement Action (expanded):
Promoting pilot adherence to Standard Operating Procedures (SOPs) which would include stabilized approach criteria and go/no go take-off decision making procedures is key to preventing and reducing the risk of runway excursions. Reviewing existing operational policies, procedures and programs is also part of an overall strategy in mitigating runway excursion risk.

Statement of Work:
Runway Excursion has been identified as the highest safety risk area in Pan America. In order to proactively reduce this risk, RASG-PA chartered the Regional Aviation Safety Team (RAST) to review runway excursion information and develop mitigation strategies to reduce this risk.

Champion Organization:
ALTA

Human Resource:
ICAO (NACC, SAM, HQ), IATA, ALTA, ACSA, FSF, CANSO, aircraft manufacturers, ALPA, IFALPA, IFATCA, CAA's, and other stakeholders.

Financial Resource:
10000

Relation Current Aviation Community Initiative:
IATA Runway Excursion Risk Reduction toolkit/FSF: ALAR toolkit (version June 2010)
Colegio de Pilotos Aviadores de México: Aeronautical Decision Management Training

Performance Goal Indicators:
Goal 1: target audience(s): Latin America and Caribbean, will value the information provided
(1) Objective: educate the target audience(s)
(2) Indicator: to reach 80% of the airlines pilots in the Region
(3) Indicator: to reach 80% of other stakeholders as determined by the research.

Goal 2: increase the awareness on runway excursions
(1) Objective: reduce the number of events
(2) Indicator: reduction of 80% of the events in the region

Key Milestones:
- Authorization by IATA to upload copyright material from RERR Toolkit in RASG-PA website: pending
- Release of State letters from RASG-PA Secretariat recommending establishment of SOPs: SCA+02
- RAST – PA Report from metrics regarding RE/04: Upon completion of Output 2 +03

Potential Blockers:
a)Strategic Challenges
i)Incorporate new audience in addition to airline's pilots
ii)Distribution of training material to airlines
iii)Distribution of training material to non-airline pilots
iv)Establish and maintain communication with the Pan American pilots and other stakeholders
v)Operators to include recommendations into their Manual of Operations
vi)Operators to include recommendations into their training programmes
vii)Get feedback
viii)Metrics to determine penetration of this programme

DIP Notes:
1. Research to determine the target audience(s) Determine the specific groups of pilots to be reached in order to achieve our objective Determine other stakeholders that would benefit.

2. Communication and distribution options: Letter from RASG-PA Secretary to recommend that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit. Letter from RASG-PA Secretary to States recommending that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit.

3. Press releases from ALTA, IATA, IFALPA. 4. RASG-PA website news release, uploading of training material and E-mails to target audience

Keep in mind that there is no contradiction with the pressure for pilots in the subsequent flight analysis.

RAST-PA/RE/04 Output 1

Description: Distribution

Resources:

Resource Notes: Cost of the material and distribution to the operators.

Time Line: SCA+ 5 months

Actions: 1. RAST/RE recommends that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches. 2. In coordination with FSF and IATA, RAST/RE should develop an awareness campaign to promote the adherence to SOP's for approach procedures including the go-around decision making process. The campaign will distribute the FSF/IATA Runway Excursion Risk Reduction Tool Kit, the Colegio de Pilotos Aviadores de Mexico Aeronautical Decision Management training, and any other available material. 3. Time to train trainers

Target Completion Date: 12

RAST-PA/RE/04 Output 2

Description: Training

Resources:

Resource Notes: Variable costs depending on the operator.

Time Line: SCA+ 15 months

Actions: Operators to include material in training programs.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/08	Guidance in maintaining runway in accordance with Annex 14 (put this point next to 6)	Annex 14, Doc 9137 ICAO	1	High	Easy	P1	3	Short

Safety Enhancement Action (expanded): To reduce runway condition/maintenance related accidents and incidents at airports by following a runway maintenance guide in accordance with ICAO Annex 14.

Statement of Work: Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Panamerican region.

Champion Organization: ACI-LAC

Human Resource: CAAs, ICAO, ACI, IATA, ALACPA, Airport Operators, Maintenance staff and providers.

Financial Resource: To be determined, in-kind support to develop the guidance material.

Relation Current Aviation Community Initiative:
ACI Airside Safety Handbook
Annex 14
ICAO Doc 9137 Airport Services Manual Par 2 – Pavement Surface Conditions
ICAO Doc 9157 Part 4 Visual Aids
Runway excursion risk reduction toolkit

Performance Goal Indicators:
Goal 1: Create a guide that collects best practices for runway maintenance.
Indicator: Online availability of the guide.

Goal 2: Promote and encourage the use of the guide.
Indicator: RASG-PA promotion of the guide.

Goal 3: airports implement their maintenance plans according to this guide.
Indicator: A measurable amount of airports that incorporate the use of the guide into their action plans.

Goal 4: Reduce the occurrence of runway condition related incidents and accidents.
Indicator: A measurable and continued reduction in runway condition related incidents and accidents.

Key Milestones:

DIPESC X	Approval
Output 1 The guide	ESC X Date + 6
Output 2 Promote	Output 1 + 12
Output 3 Implementation of the guide	Output 1 + 18

Potential Blockers:
- Lack of resources to establish the plans correctly
- Differences between CAAs and airport operators
- Weaknesses in regulatory oversight
- Airport operators may not recognize safety enhancement benefits of implementing the plan according to the guidelines
- Data sharing

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report

RAST-PA/RE/08 Output 1

Description: Create a guide that collects best practices for runway maintenance.

Resources:

Resource Notes: ACI

Time Line: 6 months

Actions: Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Pan American region. The team should be composed of at least; an ICAO Annex 14 expert, a representative from aerodromes and Aerodrome cognizant CAA representative. Once available the guidance should be translated into Spanish.

Target Completion Date:

RAST-PA/RE/08 Output 2

Description: Promote and encourage the use of the guide.

Resources:

Resource Notes: RASG-PA

Time Line: 12 months

Actions: Produce information material that may be disseminated at events throughout the Region. Call on RASG-PA Members to disseminate the information.

Target Completion Date:

RAST-PA/RE/08 Output 3

Description: Airports implement their maintenance plans according to the runway maintenance guide.

Resources:

Resource Notes: ACI, RST's

Time Line: 18 months

Actions: Use a data-driven approach to identify aerodromes that could benefit from improved runway maintenance. Encourage RST at Airports to use the runway maintenance guide and track outcomes through their action plans. Track aerodrome action plans to determine the number of aerodromes that are using the guide.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches		9	High	Easy	P1	2	Short

Safety Enhancement Action (expanded): Develop safety seminars for pilot and air traffic controllers to mitigate the causes of unstable approaches in Pan America.

Statement of Work: Runway Excursion has been identified as one of the highest safety risk area in Pan America. In order to proactively reduce this risk, RAST in collaboration with ALTA will develop safety seminars for pilots and controllers that will provide specific training and tools to mitigate the causes of unstable approaches and related actions as requiered.

Champion Organization: ALTA

Human Resource: IATA, ATA, ATAC, ACSA, ICAO, aircraft manufacturers, IFALPA, IFATCA, flight data analysis companies (Sagem, ADI, Airfase, etc.), organizations, CANSO, local pilot and air traffic controller associations, flight academies, training centers and other stakeholders.

Financial Resource: Costs would be shared by the operators, manufacturers, pilot associations and governments.

Relation Current Aviation Community Initiative: - Runway Safety Action Teams (RSAT); local equivalent collaborative teams in Pan America.

Performance Goal Indicators: Goal: reduce occurrence of runway excursion accidents.
Indicator: a measurable reduction of runway excursion incidents and accidents.

Key Milestones: The following milestones are based on the date of SCA approval (months):
- Survey & Reports SCA + 6
- Seminars Output 1 + 24

Potential Blockers:
- Insufficient funds to conduct seminars
- Inadequate implementation of recommendations from outputs
- Participation from industry
- Human resources, specialists, facilitators
- Language barriers
- Obtaining copyright approval for available training material
- Political barriers
- Data sharing restrictions
- Time availability

DIP Notes: Impact on Aviation Safety in the Region:
This project would have a positive impact on aviation by avoiding accidents and incidents related to runway excursion.

RAST-PA/RE/09 Output 1

Description: ALTA will conduct a survey within its operators regarding the actions taken to mitigate unstable approaches.

Resources:

Resource Notes: ALTA members

Time Line: SCA + 6 months

Actions: The information obtained will be presented and be used to prepare the content for the safety seminars.
The goal will be to identify needs and share best practices to improve training methods.

Target Completion Date:

RAST-PA/RE/09 Output 2

Description: Develop a strategy to deliver safety seminars for pilots and controllers in Pan America that targets recognition and avoidance of unstable approaches.

Resources:

Resource Notes: Stakeholders as listed above

Time Line: Output 1 + 24 months

Actions: Develop a strategy and timeline to deliver safety seminars for pilots and controllers.

At a minimum the following topics should be covered:
- Stabilized Approaches
- Go Around Gates and Missed Approach Criteria
- Approach Procedures and Briefings
- Non Normal Aircraft Conditions
- Transfer of Aircraft Control
- CRM/TRM and human factors
- Weather conditions and information dissemination including tail wind landings

During the safety seminars participant will be asked to provide additional mitigation measures that will be compiled and used as the basis of future safety enhancements for runway exercusions.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/11	Develop guidance material and training programs to create action plans for runway safety teams.	Annex 14, ICAO Doc. 9137, IATA, FAA, IFALPA Airport Liaison Program	9	High	Easy	P1	1	Short

Safety Enhancement Action (expanded): To reduce runway related accidents and incidents at airports by identifying airport specific hazards and developing mitigations.

Statement of Work: Establish the framework to create Runway Safety Teams (RST) which will evaluate airports for hazards and implement the appropriate mitigations. Facilitate the sharing of data, training material, mitigations, and workshops.

Champion Organization: Mexico

Human Resource: CAAs, ICAO, Airport Operators, Air Operators, Air Traffic Management/Communication Navigation Surveillance providers, Fixed Base Operators, Pilots.

Financial Resource: Database creation, workshops, RASG-PA resources for material compilation.

Relation Current Aviation Community Initiative: ICAO Global and Regional Runway Safety Initiative, Flight Safety Foundation Runway Safety Initiative, Commercial Aviation Safety Team Safety Enhancement

Material currently available:

- ICAO (http://www2.icao.int/en/RunwaySafety/Pages/Toolkits.aspx)
- Flight Safety Foundation (http://flightsafety.org/current-safety-initiatives/runway-safety-initiative-rsi)
- Federal Aviation Administration (http://www.faa.gov/airports/runway_safety/resources/lrsat/)
- EUROCONTROL (http://www.eurocontrol.int/runwaysafety/public/standard_page/keyActions.html)
- IFALPA (http://ifalpa.org/ifalpa-training/alr/alr.html)

Performance Goal Indicators:

Goal 1: Establish a runway safety team (RST) at the busiest airport of each contracting State in the Pan American region in terms of operations per year.
Indicator: Twelve teams established per year.

Goal 2: Establish a RST at all international airports of each contracting State in the Pan American region.
Indicator: Twelve teams established per year.

Goal 3: Reduce the occurrence of runway related incidents and accidents.
Indicator: A measurable reduction in runway related incidents and accidents.

Key Milestones:

DIP	ESC X Approval
Output 1 Gather & Publish information	ESC 10 Date + 3
Output 2 Checklist	Output 1 + 6
Output 3 Database	Output 1 + 6
Output 4 Roll out plan	Output 3 + 6
Output 5 Review and update	Output 4 + 6

Potential Blockers:

- Lack of resources to establish RSTs
- Differences between CAAs and airport operators
- Airport operators may not recognize safety enhancement benefits
- Data sharing
- Lack of resources to implement mitigations

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report.

Multidisciplinary runway safety teams are envisaged to work with airport operators to identify areas of opportunity and available resources to enhance runway safety for specific aerodromes.

RAST-PA/RE/11 Output 1

Description: Gather and publish in the RASG-PA website available material that may be used to mitigate hazards related to runway safety.

Resources:

Resource Notes: ICAO

Time Line: 6 months

Actions: Publish or make links available to websites such as FSF, CAST, FAA, EURCONTROL and IFALPA which RST may use to proposed mitigation actions for identified hazards related to runway safety.

Target Completion Date:

RAST-PA/RE/11 Output 2

Description: Electronic checklist development

Resources:

Resource Notes: ICAO, IFATCA, IATA & ACI

Time Line: 6 months

Actions: Develop an electronic checklist based on best practices and threat and error management that RST may use to identify hazards and propose mitigation actions. The checklists should address the following areas:
- ATM/CNS
- Air operators
- Airport
- Before releasing final versions of the checklists, field test in a pilot project
- Translate Checklists into Spanish

Target Completion Date:

RAST-PA/RE/11 Output 3

Description: Establishment of a regional Runway Safety Database

Resources:

Resource Notes: ICAO

Time Line: 6 months

Actions: Create a Regional database that will house the data from the checklists (Output 2) with at least the following considerations:
- Option to de-identify the source of the information
- Where possible responses should be selectable (rather than free text)
- Contain appropriate level(s) of data entry
- Consider the legal aspects of data sharing
- Capture the resulting mitigation actions and their end result
- Before releasing final versions of the checklists/database interface, field test in a pilot project
- Spanish version

Target Completion Date:

RAST-PA/RE/11 Output 4

Description: Develop a roll out plan

Resources:

Resource Notes: RAST-PA / FSTT-PA

Time Line: 6 months

Actions: Organize workshops in Pan America to disseminate the information and train on:
- Establishment of RST
- The use of the DB
- The use of the checklist
- Finding Material related to runway safety.

Target Completion Date:

RAST-PA/RE/11 Output 5

Description: Review and Update of the Runway Safety Teams

Resources:

Resource Notes: RAST-PA

Time Line: 6 months

Actions: Develop a process to review on a two times a year basis the number of RSTs established and ensure that all relevant runway safety material is maintained updated.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/02	Specific ALAR/CFIT Training for Pilots	SE-12, ALAR Toolkit, FSF CFIT Training	9	Medium	Moderate	P5	1	Short

Safety Enhancement Action (expanded): Promote specific ALAR/CFIT prevention training and procedures to be included in operators approved training curriculums, emphasizing pilot situational awareness and escape procedures for flight crews to use in the event of a terrain warning indication.

Statement of Work: Controlled Flight Into Terrain (CFIT) has been identified as one of the top three data driven risk areas in Pan-America. CFIT is a significant cause of commercial aviation equipment loss and fatalities, worldwide. CFIT accidents could be substantially reduced if all operators and training centers in Pan America developed CFIT prevention procedures and add them to their approved initial and recurrent training curriculums.

Champion Organization: IATA

Human Resource: CAA's, ICAO, IATA, ATA, ALTA and industry partners.

Financial Resource:

Relation Current Aviation Community Initiative:
- RASG-PA has identified CFIT as the number two flight safety risk area in Pan America.
- Flight Safety Foundation (FSF) has recently updated (April 2010) the ALAR Toolkit that includes CFIT Education and Training.

Performance Goal Indicators:
Goal 1: A reduction of 80% in ten years of CFIT accidents involving operators in Pan America.
Indicator: Operator CFIT accident rate in Pan America is continuously reduced toward the goal.

Goal 2: CFIT training and guidance material will be provided to all operators and training centers not conducting CFIT training.
Indicator: All operators and training centers are conducting CFIT training.

Goal 3: Post CFIT Education and Training Guidance Material on the RASG-PA Website. Indicator: CFIT training material posted on the RASG-PA Website prior to completion of Output 1.

Key Milestones:
- CAA's conduct a review of all operators CFIT training programs SCA + 6 months
- CFIT Education and Training Guidance Material Available on the Web. SCA + 2 months
- Operators and training centers will incorporate CFIT training into their training programs. SCA + 12 months

Potential Blockers:
- Availability of CAA resources.
- Operators may not recognize the safety enhancement benefits

DIP Notes:

RAST-PA/CFIT/02 Output 1

Description: CAA's conduct a review of all operators to ascertain which operators have CFIT prevention training and procedures in their approved training programs.

Resources:

Resource Notes: CAA (Flight Safety Oversight Department)
Estimate of 2 to 4 CAA man-hours per airline to complete operator review
CAA Inspector review checklist

Time Line: SCA+ 6 months

Actions: Through the flight safety oversight departments, CAA's will direct inspectors to conduct a review of their operator and identify which operators provide CFIT prevention training and procedures within their approved training programs.

Target Completion Date:

RAST-PA/CFIT/02 Output 2

Description: If an operator does not have CFIT training, he will be encouraged to incorporate CFIT training into the airline training program.

Resources:

Resource Notes: Operators, CAA's and ICAO
Variable cost depending on the operator and the number of pilots

Time Line: SCA+ 16 months

Actions: Operators will incorporate CFIT prevention training and procedures into their training programs.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers (To include review of actual events when possible)	SE -11, SE-46, SE-47	12	Medium	Moderate	P5	2	Medium

Safety Enhancement Action (expanded): Include specific CRM/situational awareness training and procedures to all pilots and air traffic controller training curriculums, emphasizing pilot and controller situational awareness with respect to CFIT.

Statement of Work: Crew Resource Management/Controller Resource Management (CRM) training, situational awareness and CFIT prevention are closely linked. This project will reduce CFIT accidents by promoting comprehensive pilot and air traffic controller CRM training programs.

Champion Organization: IFALPA/IFATCA

Human Resource: CAA's, ICAO, ANSP's, IFALPA, IFATCA, IATA and industry partners.

Financial Resource:

Relation Current Aviation Community Initiative:
- RASG-PA website (http://www.mexico.icao.int/RASGPA.html#TrainingRefs)
- FSF virtual library (http://flightsafety.org/)
- ALAR Briefing Note – Crew Resource Management (http://flightsafety.org/files/alar_bn2-2-crm.pdf)
- Airbus (http://www.airbus.com/en/corporate/ethics/safety_lib/)
- Boeing operators (www.myboeing.com)

Performance Goal Indicators:
Goal 1: A substantial reduction of CFIT accidents involving air transport operators in Pan America.
Indicator: Operator CFIT accident rate in Pan America decreases by 80%.

Goal 2: CRM/situational awareness training and guidance material provided to all air transport operators and Air Traffic Personnel.
Indicator: Increase in number of operators and Air Traffic Personnel that are conducting CRM/situational awareness training.

Goal 3: Post the CRM/situational awareness guidance material on the RASG-PA Website.
Indicator: CRM/situational awareness guidance material posted on the RASG-PA Website by the time of SCA +2 months.

Key Milestones:
- CRM/situational awareness training and guidance material available on the Web. SCA +2 months
- Operators will incorporate CFIT training into their training program. SCA +18 months
- ANSP will incorporate CFIT training into their training program. SCA+ 24 months

Potential Blockers:
- Availability of CAA/ANSP/State resources.
- Operators, States and ANSP may not recognize the safety benefits

DIP Notes: All communications to States should be conducted through the RASG-PA Secretariat. Guidance on coordinating with ICAO and identifying which operators and ANSPs are providing CFIT prevention training and procedures within their approved training programs may be useful to States.

ATC training in this area has already been developed

RAST-PA/CFIT/04 Output 1

Description: Incorporate and/or update CRM/situational awareness training programs for all flight crew members of air transport operators emphasizing aircraft position with relation to terrain and reviewing past occurrences.

Resources:

Resource Notes: Air transport operators (training departments),
Variable cost depending on the operation

Time Line: SCA+ 18 months

Actions: Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of flight crewmembers of all air transport operators.

Target Completion Date:

RAST-PA/CFIT/04 Output 2

Description: Incorporate CRM/situational awareness training programs for all air traffic controllers of air navigation service providers (ANSP) emphasizing aircraft position with relation to minimum allowable altitudes.

Resources:

Resource Notes: ANSP's (training departments),
CRM/situational awareness guidance material posted on the RASG-PA Website
Variable cost depending on the ANSP

Time Line: SCA+ 24 months

Actions: Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of air traffic controllers of all ANSPs.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/06	LOC Training – Human factors and automation	SE 30	9	**High**	Moderate	P2	3	**Short**

Safety Enhancement Action (expanded): To improve the overall performance of flight crews to recognize and prevent loss of control accidents, through effective use of automation.

Statement of Work: To reduce loss of control accidents, operators will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management aspects of flight deck automation, as appropriate to their respective operations.

Champion Organization: RASG-PA (RAST-PA)

Human Resource: IATA, Pilot Associations; Safety, Flight Operations and Training managers; ICAO, CAA's, aircraft manufacturers, training centers.

Financial Resource: The total estimated cost would be X person-years.

Relation Current Aviation Community Initiative: The following are some of the activities related to this project:

•Incident data has shown that flight deck automation is a core issue that needs to be addressed. To enhance safety, a CAST working group, including aircraft manufactures, pilot associations, etc. developed a tactical approach and distributed policies and procedures relating to mode awareness and energy state management. The COSCAP's in Asia used this material to develop a generic advisory circular.

•CAST Flight Deck Automation Working Group has been formed to recommend and prioritize actions to address, for current and projected operational use, the safety and efficiency of modern flight deck systems for flight path management (including energy state management).

•The Human Factors and Pilot Training Group of the ALPA, Air Safety Structure has identified its position regarding CRM and Human Factors with respect to the use of automation.

•SAE G10, Aerospace Behavioral Engineering Technology (ABET) Committee, deals with the philosophies, principles and criteria by which designers, engineers, pilots and behavioral scientists structure systems to achieve maximum human workload compatibility for automation efficiency. The committee has several subcommittees with on-going work into human factors and automation

Performance Goal Indicators: Goal 1: Mitigate the effects of mode confusion and energy state management as contributing factors in loss of control accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to automation.

Goal 2: Mode awareness and energy state management aspects of flight deck automation advisory circular is readily available.
Indicator: Each ICAO contracting State in the region has issued an advisory circular and distributed it to each operator's in the State. Completion of Output 3.

Goal 3: All operators incorporate mode awareness and energy state management aspects of flight deck automation guidance in their approved training programs.
Indicator: Mode awareness and energy state management aspects of flight deck automation guidance is provided to all transport airplane pilots Completion of Output 4.

Key Milestones: The following milestones are based on the date of Steering Committee Approval (SCA) (months):
•Review Asian advisory circular IATA SCA+6
•Issue generic advisory circular ICAO Output 1 +1
•Issuance of advisory circular by States in the Region. CAAs Output 2 +6
•Operators develop guidance based on the AC and train pilots. Operators Output 3 + 18
•Track Implementation RASG-PA SCA +12 and yearly

Potential Blockers:
•Operator might not embrace advisory circular material,
•Operators might not accept the potential cost of this training,
•Operators may not recognize the safety enhancement benefits,
•States may opt not to adopt and issue the advisory circular.

DIP Notes:

To reduce loss of control accidents, air carriers will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management, as appropriate to their respective operations.

RAST-PA/LOC-I/06 Output 1

Description: Review and evaluate the advisory circular created by the ICAO COSCAP's in Asia

•ALTA / IFALPA / IATA team to review and evaluate the advisory circular created by the ICAO COSCAP's in Asia related to mode awareness and energy state management of flight deck automation.
•Based on this review create a generic advisory circular for the Region

Resources:

Resource Notes: ALTA, IFALPA, IATA, Pilot Associations, Flight Operations, Safety and Training managers, and Aircraft Manufacturers. The estimated cost of a one day meeting of the appropriate persons.

Time Line: SCA + 6 months

Actions: ALTA / IFALPA / IATA will convene a team to analyze the advisory circular, to verify policies and procedures related to mode awareness and energy state management are appropriate for the Region. The team will develop a generic mode awareness and energy state management aspects of flight deck automation advisory circular for Pan America.

Target Completion Date:

RAST-PA/LOC-I/06 Output 2

Description: •ICAO will distribute a copy of the developed generic advisory circular to each State in the Region.

Resources:

Resource Notes: ICAO

Time Line: Completion of Output 1 + 1 months

Actions: ICAO Regional Offices will prepare a cover letter and disseminate the generic advisory circular to each member State in the Region.

Target Completion Date:

RAST-PA/LOC-I/06 Output 3

Description: •Each State in the region will use the generic advisory circular as a template to prepare a State advisory circular on mode awareness and energy state management aspects of flight deck automation.

Resources:

Resource Notes: State regulatory authorities

Time Line: Completion of output 2 + 9 months

Actions: States in the Region to issue their own advisory circular on mode awareness and energy state management aspects of flight deck automation.

Target Completion Date:

RAST-PA/LOC-I/06 Output 4

Description: Mode awareness and energy state management aspects of flight deck automation guidance is provided by operators to all of their pilots.

Resources:

Resource Notes: Operator's flight operations, standards and training departments.

Time Line: Completion of Output 3 + 18 months

Actions: Each operator should carefully developed procedures and guidelines that support the proper use of mode awareness and energy state management aspects of flight deck automation in their training programs. Each transport airplane pilot should be trained to the flight deck automation procedures and guidelines developed by their organization.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/07	LOC Training – Advanced maneuvers	SE 31	9	High	Moderate	P2	1	Short

Safety Enhancement Action (expanded):
Promote LOC Training – Advanced maneuvers
Pilots will be better trained to avoid and recover from excursions from normal flight and loss of control.

Statement of Work:
Advanced Maneuvers Training (AMT) focuses on training to prevent and recover from hazardous flight conditions outside of the normal flight envelope, such as, inflight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. There has been a recent increase in accidents where loss of control was a contributing factor.

The purpose of this project is to collect and provide advanced maneuver training material and to encourage operators to use these materials to implement advanced maneuver ground training and flight training using appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, unusual attitudes, upset recoveries, effects of icing, energy awareness and management, and causal factors that can lead to loss of control

Champion Organization:
ALTA

Human Resource:
Airline Associations, Pilot Associations; Safety, Flight Operations, and Training managers, aircraft manufacturers, ICAO, flight simulation device manufacturers, training centers, existing training aids, and new materials developed by manufacturers.

Financial Resource:
The total cost associated with this project would be determined by the number of crew personnel that need to be trained and the amount of training time required. This initiative is considered essential for flight safety, there would be no cost associated with the devel

Relation Current Aviation Community Initiative:
•Voluntary training currently being done – both ground and flight
•Wind shear training required since 1988
•Airplane Upset Recovery Training Aid
•Commercial training products becoming available

Performance Goal Indicators:
Goal 1: Develop and make available AMT material for operators approved training programs
Indicator: Availability of the AMT material within 8 months of SCA.

Goal 2: All operators incorporate AMT in their approved training programs.
Indicator: Operators incorporate AMT material within 36 months of SCA.

Goal 3: Reduce occurrence of LOC accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to excursion from normal flight.

Key Milestones:
The following milestones are based on the date of Steering Committee Approval (SCA) (months):
•Distribute currently available Training Aids ALTA SCA +8
•Track adoption of AMT ALTA SCA +8
•Track Implementation SCA+8 and on a yearly basis

Potential Blockers:
•Some special interests might discredit AMT simulator training
•Operators might ignore AMT materials
•Operators might not accept the potential cost of this training
•Operators may not recognize the safety enhancement benefits

DIP Notes:

Advanced Maneuvers Training (AMT) refers to training to prevent and recover from hazardous flight conditions outside of the normal flight envelope. Examples include in-flight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. This safety enhancement collects and provides advanced maneuver training material and encourages operators to use these materials to implement advanced maneuver ground and flight training using appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, unusual attitudes, upset recoveries, effects of icing, energy awareness and management, and causal factors that can lead to loss of control.

RAST-PA/LOC-I/07 Output 1

Description: Listing of training materials available from regulators, industry, operators, academia and other resources.

Resources:

Resource Notes: RAST-PA Secretariat (NACC office) will produce a comprehensive list, with input from all RAST-PA members.
All aircraft manufacturers should provide a list of available training materials and aids.
FAA Airplane Upset Recovery Training Aid: is available on its public web site.

Time Line: SCA+ 5 months

Actions: RAST-PA should distribute the Airplane Upset Recovery Training Aid to all appropriate regional stakeholders.

Target Completion Date:

RAST-PA/LOC-I/07 Output 2

Description: Advanced Maneuvers Training provided to all operators.

Resources: 10000

Resource Notes: Estimated distribution costs in USD.
ALTA, IATA

Time Line: Output 1 Complete + 3 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report the level of commitment by the operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/07 Output 3

Description: Advanced Maneuvers Training provided by all operators. The expectation is that this training will be accomplished during initial training and as part of the recurrent training program, via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention and recovery techniques.

Resources:

Resource Notes: Costs may vary from operator to operator and would need to consider;
1) Revising the training program for AMT.
2) Assessing the simulator time allotted on the initial and recurrent syllabuses to accommodate AMT.
3) It is estimated that AMT training would require 30 minutes or less of simulator time.

Time Line: Output 2 Complete + 28 months

Actions: ALTA and IATA should promote a high level of commitment to advanced maneuvers training (AMT) by operator flight operations and training departments. Advanced maneuvers training will be conducted emphasizing energy state management and early recognition and recovery from flight outside the certified aircraft-operating envelope.Flight conditions outside of the certified flight envelope include inflight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. The training will be accomplished via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention and recovery techniques. The simulator instruction will be within the limitation of the training device being utilized.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/09	LOC Training – Pilot monitoring policies and procedure for the operator and training program for crews.		9	High	Easy	P1	2	Short

Safety Enhancement Action (expanded):
Promote Pilot Monitoring Techniques and Training. Monitoring performance can be significantly improved by training these skills

Statement of Work:
The purpose of this project is to collect and provide pilot monitoring training material and to encourage operators to use these materials to implement pilot monitoring training and flight procedures.

Inadequate flight crew monitoring has been cited by a number of sources as a problem for aviation safety. A collaborative research effort by NASA-Ames, 21 worldwide airlines and the University of Texas Human Factors Research Program, which observed more than 2,000 airline flights, noted that roughly 62 percent of unintentional errors went undetected by flight crews. In addition, the Flight Safety Foundation, ALAR working group, has established that poor monitoring has been a factor in 63 percent of approach and landing accidents. ICAO has also determined that 50 percent of CFIT accidents had pilot monitoring as a common factor.

The term 'Pilot Monitoring' (PM) should be used as an alternative to 'Pilot Not Flying' (PNF) since it reflects clearly the most important function of a PNF.

Conventionally, when two pilots fly a fixed-wing airplane the aircraft commander occupies the left hand seat, and the co-pilot or first officer occupies the right hand seat. Before the commencement of each flight leg, the aircraft commander decides which pilot will take direct responsibility for flying the aircraft and they become 'Pilot Flying' (PF) for that leg. The other pilot is then 'Pilot Not Flying' (PNF) and carries out supporting duties such as communications and check-list reading. Currently some operators use alternative terms for PF and PNF.

Several major airlines have recently revised their procedures to maximize the monitoring of aircraft trajectory, automation and systems. They have tried to minimize or eliminate concurrent procedures that conflict with crew monitoring.

Champion Organization:
IFALPA

Human Resource:
Pilot Associations, IATA, ALTA, ICAO, Flight Operations, and Training managers, training centers, existing training aids.

The total cost associated with this project would be determined by the number of flight crews that need to be trained and the amount of time required. This initiative is considered essential for flight safety.

Estimated 2 meetings of RAST representatives to implement Output 1.

Financial Resource:

Relation Current Aviation Community Initiative:
•Aligns with major findings by ICAO, FSF, NTSB.
•Aligns with components of CRM

Performance Goal Indicators:
Goal 1:Reduce occurrence of LOC accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to deviations from normal flight.

Goal 2: Pilot Monitoring Training material is readily available.
Indicator: Availability of the Pilot Monitoring Training material in each operator's organization within 2 months of Output 3.

Goal 3: All operators incorporate Pilot Monitoring Training in their approved training programs.
Indicator: Pilot Monitoring Training is provided to all transport airplane pilots. Within 18 months of Output 4.

Key Milestones:
The following milestones are based on the date of Steering Committee Approval (SCA) (months):
•Distribute currently available Training Aids ALTA SCA+5
•Track adoption of Pilot Monitoring Training ALTA SCA+12

Potential Blockers:
•Operators might not accept the potential cost of this training

•Operators may not recognize the safety enhancement benefits

DIP Notes:

Pilot Monitoring policies and procedure for the operator and training program for crews.

RAST-PA/LOC-I/09 Output 1

Description: •Listing of training materials available from industry, operators, and other resources.

Resources:

Resource Notes: RASG-PA Secretariat (NACC office) will produce a comprehensive list.

Time Line: SCA + 5 months

Actions: RASG-PA should distribute the Pilot Monitoring Training Aid to all appropriate regional stakeholders (IATA, ALTA, CAA, etc.).

Target Completion Date:

RAST-PA/LOC-I/09 Output 2

Description: •Raise awareness of availability and need of Pilot Monitoring Training.

Resources:

Resource Notes: IFALPA, Local Pilot Associations

Time Line: Completion of Output 1 + 1 months

Actions: IFALPA, ALTA and local pilot associations should market and promote ongoing activities that develop a higher level of commitment to Pilot Monitoring Training by operator's flight operations, standards and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 3

Description: •Pilot Monitoring Training material provided to all operators.

Resources:

Resource Notes: ALTA, IATA, CAA's

Time Line: Completion of Output 1 + 2 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report to RASG-PA the level of commitment by the operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 4

Description: •Pilot Monitoring Training provided by operators to all of their pilots.

Resources:

Resource Notes: Operator's flight operations, standards and training departments, pilot associations.

Time Line: Completion of Output 3 + 18 months

Actions: Each operator should carefully developed procedures and guidelines that support pilot monitoring in their training programs. Each transport airplane pilot should be trained to the Pilot Monitoring procedures and guidelines developed by their organization.

Target Completion Date:

Agenda Item 3: Controlled Flight Into Terrain (CFIT) Detailed Implementation Plans (DIPs)

3.0 The DIPs table was updated, and the latest version is included in the Appendix to the Report on Agenda Item 2.

3.1 CFIT/02 (Specific ALAR/CFIT Training for Pilots): IATA

3.1.1 Regarding DIP CFIT/02: *Specific ALAR/CFIT Training for Pilots*, the representative of IATA confirmed its completion. IATA will monitor the delivery of the training by their Member airlines and keep PA-RAST informed.

3.2 CFIT/04 (CRM/Situational Awareness for pilots and air traffic controllers): IFALPA/IFATCA

3.2.1 In reference to DIP CFIT/04: *CRM/Situational Awareness for Pilots and Air Traffic Controllers*, IFALPA informed that they were coordinating with other entities to develop a video for pilots and air traffic controllers regarding Crew Resource Management (CRM).

3.2.2 The Meeting acknowledged the complexity and cost involved for developing this type of material; therefore, the Meeting suggested to review the available material already produced by the United States FAA, Eurocontrol, and other organizations, which may fulfil the purpose of this DIP.

Agenda Item 4: Loss of Control-Inflight (LOC-I) Detailed Implementation Plans (DIPs)

4.0 The DIPs table was updated, and the latest version is included in the Appendix to the Report on Agenda Item 2.

4.1 LOC-I/07 (LOC Training – Advanced manoeuvres): ALTA

4.1.1 Regarding LOC-I/07: *LOC Training – Advanced Manoeuvres,* the ALTA representative informed the Meeting that it was completed.

4.1.2 The Secretary informed the Meeting about the ICAO Loss of Control and Recovery Training (LOCART) initiative and its expected outcome for the year 2013.

4.2 LOC-I/09 (Pilot monitoring policies and procedure for the operator and training program for crews): IFALPA

4.2.1 Regarding LOC-I/09: *Pilot Monitoring Policies and Procedure for the Operator and Training Program for Crews*, IFALPA informed the Meeting that it was completed.

4.2.2 The Pilot Monitoring Toolkit will continue to be part of the RASG-PA Aviation Safety Workshop programme to be delivered throughout the Region.

4.3 LOC-I/06 (LOC Training – Human factors and automation): PA-RAST

4.3.1 Regarding DIP LOC-I/06: *LOC Training – Human Factors and Automation*; Output 2: ICAO to distribute a copy of the generic advisory circular to each State in the Region, the ICAO Secretary informed that in order to comply with this output, and as agreed by the PA-RAST, distribution would be accomplished by means of a RASG-PA Safety Advisory (RSA). This RSA and the advisory circular attached in the **Appendix** to this part of the Report were translated into Spanish, and they are in the process of being distributed both in English and Spanish throughout the Pan American Region.

RSA
RASG-PA SAFETY ADVISORY

Regional Aviation Safety Group-Pan America

Subject: Mode Awareness and Energy State Management Aspects of Flight Deck Automation

Date: 1 September 2012

RSA No. RSA 2011- 001-R0

1. Purpose

This RASG-PA Safety Advisory is issued to encourage States and Industry to adopt practices to mitigate Mode Awareness and Energy State Management risks.

2. Background

A regional study undertaken by RASG-PA has identified risks associated with the subject issue. As part of a detailed implementation plan to mitigate these risks, RASG-PA is issuing this RSA to States and Industry.

This RSA is intended to reduce the risk of loss of control, which has been the predominant accident type in the Pan American region for the past ten years.

More detailed information can be found in the RASG-PA Annual Safety Report, which can be found at: www.rasg-pa.org/

3. Recommended Action

States and air operators are encouraged to review the attached model circular and consider adopting its contents.

Loretta Martin
RASG-PA Secretary

CAA/Industry LOGO

RSA
RASG-PA SAFETY ADVISORY

[Civil Aviation Authority of XXX] / [Name of Organization]

Subject: **Mode Awareness and Energy State Management Aspects of Flight Deck Automation**

Date: **xx-xx-2012**

Initiated By: **RASG-PA**

AC No.: **[Insert number]**

1. PURPOSE

This Advisory Circular is issued to alert air operators to the importance that air crews are aware of the automation mode under which the aircraft is operating. It provides a sample automation policy to support the use of aircraft automation.

2. BACKGROUND

Automation has contributed substantially to the improvement in air operator safety around the world. Automation increases the timeliness and precision of routine procedures, and greatly reduces the opportunity to introduce risks and threatening flight regimes.

Nevertheless, in complex and highly automated aircraft, automation has its limits. More critically, flight crews can lose situational awareness of the automation mode under which the aircraft is operating or may not understand the interaction between a mode of automation and a particular phase of flight or pilot input. These and other examples of mode confusion often lead to mismanaging the energy state of the aircraft or to the aircraft deviating from the intended flight path for other reasons. These issues have been identified as factors in several major accidents around the world.

The objective of the sample policy is to help minimize the frequency with which pilots experience mode confusion and undesirable energy states. This, in turn, requires that crews understand the functions of the various modes of automation. The sample policy is based on a set of common industry practices that are known to be effective. Operators should compare this to their existing policies and identify any needed changes. In addition, the sample policy includes practical guidance that air operators may include in their policies in order to help pilots respond effectively to particular types of automation anomalies. The suggested guidance is intended only as examples of effective responses to selected circumstances. The suggested guidance does not necessarily identify the only proper response.

Note: The terminology used in this document and in the examples reflects terminology for Airbus and Boeing aircraft. Air operators may need to amend the terminology to apply this document to their own fleet mixes, the need for consistent language within a single air operator, or other unique characteristics.

3. FINDINGS

In almost all cases, the flight crew did not understand what the automation was doing or did not know how to manipulate the automation to eliminate the error. In such cases, when the crew changed automation levels they often made the problem worse. This problem applied to all automation modes and it applied regardless of whether the crew induced the event or the event was precipitated by a problem with the automation system. *In all 50 cases from the last 5 years of data, pilots were unable to return the aircraft to the desired flight path in a timely manner*.

This was due to two root causes:

- inadequate training and system knowledge; and
- the unexpected incompatibility of the automation system with the flight regime confronting pilots in their normal duties.

For example, the crew may have made a manual input to the flight controls that would have been appropriate with the autopilot disengaged. However, if the auto thrust system was still engaged and was in a mode that did not support the flight control input, the resulting flight path or energy state was often undesirable.

Yet, among the 16 air operator automation policies reviewed, the most common concept simply directs crews to "*use the level of automation that will best support the desired operation of the aircraft.*" This concept is fine if the crew understands what the automation is doing at the time of the problem onset and is then able to determine if the current or another automation level will better suit the operation. However, nearly all incident reports shared one common factor: regardless of whether an error was pilot-induced or was a function of the automation system, pilots did not understand what the automation was doing or did not know how to use the automation to eliminate an error. Consequently, the recommendations emphasize specific elements that should be incorporated into automation policies and then systematically reinforced.

A core philosophy of *"fly the airplane"* should permeate any air operator's policy on automation. While recognizing that automation has brought major improvements to safety, air operators should require and systematically reinforce a philosophy of "*fly the airplane*." If pilots recognize that they do not understand the nature of an anomaly and do not precisely understand the solution, pilots should not continue in an unstable or unpredictable flight path or energy state while attempting to correct an anomaly. Instead, crews should revert to a more direct level of automation until the aircraft resumes the desired flight path and/or airspeed. This may ultimately require the crew to turn off all automation systems and fly the aircraft manually. When the aircraft once again is flying the desired flight path and/or airspeed, the crew can begin to re-engage the automation, as appropriate. Below is a recommended statement to be included in operators' automation policies and which should be systematically reinforced.

At any time, if the aircraft does not follow the desired vertical flight path, lateral flight path or airspeed, do not hesitate to revert to a more direct level of automation. For example, revert from FMS guidance to non-FMS guidance, or when operating in non-FMS guidance but with A/THR or A/T engaged, disengage and set thrust manually.

In addition to this recommended philosophical foundation, air operators are recommended to: prepare, in cooperation with their respective airplane manufacturers, an Automation Policy, which should in particular address the following topics:

- Philosophy
- Levels of Automation
- Situational Awareness
- Communication and Coordination
- Verification
- System and Crew Monitoring
- Workload Sharing and System Use

4. APPLICABILITY

All air operators should review this guidance and ensure that their policy, procedures and training reflect these industry best practices. Confirmation by air operators that the findings and guidance contained in the Advisory Circular will be a positive contribution to flight safety.

Signed by:

(Appropriate Official)

Recommended Automation Policy Sample

1. Philosophy and Approach to the Use of Automation

An automation policy should begin with a description of the organization's philosophy and approach to the use of automation.

1.1 Fly the Aeroplane

First and foremost, though automation has brought major improvements to safety, air operators should promulgate and systematically reinforce the philosophy of "fly the airplane." If pilots recognize that they are uncertain about the autoflight modes or energy state, they should not allow the airplane to continue in an unstable or unpredictable flight path or energy state while attempting to correct the situation. Instead, pilots should revert to a better understood level or combination of automation until the aircraft resumes the desired flight path and/or airspeed. This may ultimately require that pilots turn off all automation systems and fly the aircraft manually. When the aircraft again is flying the desired flight path and/or airspeed, pilots can begin to reengage the automation as appropriate.

Note: This type of statement in the automation policy would help the pilot to know how to correctly interact with automation to reduce workload and increase safety and efficiency.

1.2 Adopt "CAMI" or "VVM" Procedure

Include references to and descriptions of generalized procedures, such as the CAMI or VVM, that have been developed by various air operators as effective means for pilots to validate the arming/engagement of the AFS and to monitor functions/mode changes.

- **CAMI** procedure for the pilot flying:

  Confirm airborne (or ground) inputs to the FMS with the other pilot.
  Activate inputs.
  Monitor mode annunciations to ensure the autoflight system performs as desired.
  Intervene, if necessary.

  or

- **VVM** policy for both flight crew members:

  Verbalize
  Verify
  Monitor

General approaches like these are easy to train and review on the line and have been shown to help flightcrews in their overall approach to the use of automation.

1.3 Other Topics

Operators also should consider including other statements on automation philosophy to provide operational guidance to pilots.

- Appreciate specified capability, limitations, and failure susceptibility of the automation.
- Be wary of autoflight states when crew coordination, communication, and monitoring of automation is more important.
- Resist situations when automation can increase pilot workload or degrade performance.
- Avoid over-reliance on automation to the detriment of manual flying skills.

2. Choice of Systems or "Levels" of Automation

Automation policy should include information to guide pilots on making choices about how to combine and use automated systems. Some airlines have defined "levels of automation" to help with this. However, a definition alone is not adequate for this topic. Below is a list of recommended topics that could add substance to a definition and that could provide practical guidance for pilots.

2.1 Use the Appropriate Automation for the Task

On highly automated and integrated aircraft, several combinations or levels of automation may be available to perform a given task in either FMS modes and guidance or non-FMS modes and guidance.

- The most appropriate level of automation depends on the task to be performed, the phase of flight and the amount of time available to manage a task. A short-term or tactical task, such as responding to an ATC direction to go briefly to a different altitude or heading, should be accomplished in the FCU/MCP. This allows the crew to maintain heads-up flight. A long-term or strategic task that changes most or all of the remaining flight should be accomplished in the FMS CDU, which requires more head-down time by one pilot.
- The most appropriate level also may depend on the level with which the pilot feels most comfortable for the task or for the prevailing conditions, depending on his/her knowledge and experience operating the aircraft and systems. Reverting to hand-flying and manual thrust control actually may be most appropriate, depending on conditions.
- The PF should retain the authority and capability to select the most appropriate level of automation and guidance for the task. Making this selection includes adopting a more direct level of automation by reverting from FMS guidance to selected guidance (that is, selected modes and targets through the use of either the FCP or MCP); selecting a more appropriate lateral or vertical mode; or reverting to hand-flying (with or without FD guidance, with or without A/THR or A/T) for direct control of aircraft vertical trajectory, lateral trajectory, thrust and airspeed.

2.2 Ensure that Pilots Possess Required Skills and Knowledge

Some airlines have also included statements in their automation policies about the requirement for pilots to be skilled in and knowledgeable about the use of certain combinations of automated systems or all possible combinations of systems. Understanding and interacting with any autoflight system ideally requires answering the following fundamental questions:

- How is the system designed?
- Why is the system designed that way?
- How does the system interact and communicate with the pilot?
- How does the pilot operate the system in normal and abnormal situations?

Ensure that pilots fully understand the following aspects in the use of automation:

- Integration of AP/FD and A/THR or A/T modes (that is, pairing of modes), if applicable.
- Mode transition and reversion sequences; Integration of AP/FD and A/THR or A/T modes (that is, pairing of modes), if applicable.
- Pilot-system interaction for:
    - Pilot-to-system communication (that is, for target selections and modes engagement).
    - System-to-pilot feedback (that is, for cross-checking the status of modes and accuracy).

2.3 AP - A/THR Integration

Integrated AP-A/THR or AP-A/T systems pair AP pitch modes (elevator control) with the A/THR or A/T modes (thrust levers/throttle levers). Integrated AP - A/THR or AP-A/T systems operate in the same way as a pilot who hand flies with manual thrust.

- Elevator is used to control pitch attitude, airspeed, vertical speed, altitude, flight-path-angle, and vertical navigation profile or to capture and track a glideslope beam.
- Thrust levers or throttle levers are used to maintain a given thrust or a given airspeed.
- Throughout the flight, the pilot’s objective is to fly either:
    - Performance segments at constant thrust or at idle, as on takeoff, climb or descent; or
    - Trajectory segments at constant speed (as in cruise or on approach).

Depending on the task to be accomplished, airspeed is maintained either by the AP (elevators) or the A/THR (thrust levers) or A/T (throttle levers) as shown in **Table 1** below.

Table 1
AP – A/THR & A/T Mode Integration

	A/THR or A/T	**A/P**
	Thrust levers/ Throttle levers	**Elevators**
Aircraft Performance is controlled by:	**Thrust or idle**	**Speed**
Aircraft Trajectory is controlled by	**Speed**	**V/S Vertical profile Altitude Glide slope**

2.4 Automation Design Objectives

The AFS provides guidance to capture and maintain the selected targets and the defined flight path in accordance with the modes engaged and the targets set by the flight crew on either the flight control unit (FCU)/mode control panel (MCP) or on the flight management system (FMS) control and display unit (CDU).

The FCU/MCP constitutes the main interface between the pilot and the autoflight system for *short-term guidance* (i.e., for immediate guidance such as radar vectors).

The FMS CDU constitutes the main interface between the pilot and the autoflight system for *long-term guidance* (i.e., for the current and subsequent flight phases).

Two types of guidance (modes and associated targets) are available on aircraft equipped with either a flight management guidance system (FMGS) or flight management computer (FMC) featuring both lateral and vertical navigation:

- Selected guidance:

The aircraft is guided to acquire and maintain the targets set by the crew using the modes engaged or armed by the crew (i.e., using either the FCU or MCP target setting knobs and mode arming/engagement push buttons).

- FMS guidance:

The aircraft is guided along a pilot-defined FMS lateral navigation (LNAV) and a vertical navigation (VNAV) flight plan, speed profile, altitude targets/constraints.

2.5 Engaging Automation

Before engaging the AP, ensure sure that:

- Modes engaged (check FMA annunciations) for FD guidance are the correct modes for the intended flight phase and task.
- Select the appropriate mode(s), as required.
- Confirm FD command bars do not display any large displacements; if large displacements are commanded, continue to hand fly until FD bars are centered prior to engaging the AP.

Engaging the AP while large commands are required to achieve the intended flight path may result in the AP overshooting the intended vertical target or lateral target and/or surprise the pilot due to the resulting large pitch / roll changes and thrust variations.

2.6 Other Topics Related to the Choice of Automation Levels

Include other statements to help pilots choose the appropriate level of automation.

- Use optimum automation combination or “level” for comfortable workload, high situation awareness, and improved operations capability (passenger comfort, schedule, and economy).
- Do not try to solve automation problems with conditioned responses from the same level of automation.
- Prioritize correctly (e.g., avoid programming during critical flight phases).

3. Situational Awareness

Policies should include statements about the importance of maintaining situation awareness and, particularly, mode and energy awareness.

3.1 Mode and Energy Awareness

Situational awareness requires that pilots know the available guidance at all times. The FCU/MCP and the FMS CDU are the primary interfaces for pilots to set targets and arm or engage modes. Any action on the FCU/MCP or on the FMS keyboard and line-select keys should be confirmed by crosschecking the corresponding annunciation or data on the PFD and/or ND (and on the FMS CDU). At all times, the PF and PNF should be aware of the status of the guidance modes being armed or engaged and of any mode changes throughout mode transitions and reversions.

3.2 Monitor the Use and Operation of the Automated Systems

- Check and announce the status of the FMA, such as the status of AP/FD modes and A/THR or A/T mode.
- Observe and announce the result of any target setting or change (on the FCU/MCP) on the related PFD and/or ND scales.
- Supervise the AP/FD guidance and A/THR or A/T operation on the PFD and ND (pitch attitude and bank angle, speed and speed trend, altitude, vertical speed, heading, or track).

3.3 Other Topics on Situational Awareness

- Remain alert for signs of deteriorating flying skills, excessive workload, stress, or fatigue (avert complacency).
- Ensure at least one crewmember monitors the actual flight path.
- Consider “hand flying” in manual mode for immediate change of flight path.
- Brief the plan for using automation before takeoff and debrief in flight as the situation dictates.

4. Communication and Coordination

Topics related to communication and coordination to consider in developing the automation policy are statements to help flight crews:

- Announce automatic or manual changes to autoflight status (or update the other pilot at first opportunity).
- Brief and compare programmed flight path with charted procedure/ active routing.
- Coordinate (verbalize) before executing any inputs that alter aircraft flight profile.
- Make callout 1,000 feet before clearance altitude and verbally acknowledge.
- Utilize the “point and acknowledge” procedure with any ATC clearance.
- Brief special automation duties and responsibilities.
- Actively listen for traffic, communication, and clearances.

5. Verification

Include statements about verifying and cross-checking automation selections and anticipating subsequent aircraft performance in an automation policy.

5.1 Know your Modes and Targets

At a high level, the goal of verification can be generalized as "know your modes and targets." The AP control panel and FMS control display unit/keyboard are the prime interactions for pilots to communicate with aircraft systems (to arm modes or engage modes and to set targets). The PFD, particularly the FMA section and target symbols on the speed scale and altitude scale, and ND are the primary interactions for the aircraft to communicate with pilots. These interfaces confirm that aircraft systems have correctly accepted the pilot's mode selections and target entries.

Any action on the autopilot control panel or on FMS keyboard/line-select keys should be confirmed by cross-checking the corresponding annunciation or data on the PFD and/or the ND. The PF and PNF (PM) should be aware of the following:

- Modes armed or engaged
- Guidance targets set
- Aircraft response in terms of attitude, speed, and trajectory
- Mode transitions or reversions

When flight crews perform an action on the FCU/MCP or FMS CDU to give a command, the pilot expects a particular aircraft reaction and, therefore, must have in mind the following questions:

- Which mode did I engage and which target did I set for the aircraft to fly now?
- Is the aircraft following intended vertical and lateral flight path and targets?
- Which mode did I arm and which target did I preset for the aircraft to fly next?

To answer such questions, pilots must understand the certain controls and displays:

- FCU/MCP mode selection keys, target-setting knobs, and display windows
- FMS CDU keyboard, line-select keys, display pages, and messages
- Flight modes annunciator (FMA) on the PFD
- PFD and ND displays and scales (that is, for cross-checking guidance targets)

5.2 Specific Topics Related to Verification

Include statements to help pilots verify and cross-check inputs and aircraft responses.

- Cross-check raw data and computed data, as appropriate.
- Verify (both pilots) entered waypoints and confirm FMS data against printed charts.

- Maintain effective cross-check of system performance with desired flight path.
- Verify programming that alters route, track, or altitude, and cross-check proper mode annunciation.
- Cross-check (verify) result of selections, settings, and changes.
- If a transition is selected or built, verify between pilots that it matches clearance and that it produces desired track.

6. System and Crew Monitoring

Monitoring automation is simply carefully observing flight deck displays and indications to ensure the aircraft response matches your mode selections and guidance target entries and the aircraft attitude, speed, and trajectory match expectations.

- During the capture phase, observe the progressive centering of FD bars and the progressive centering of deviation symbols (during localizer and glideslope capture). This enhances supervision of automation during capture phases and cross-check with raw data, as applicable, to enable early detection of a false capture or capture of an incorrect beam.
- If the aircraft does not follow the desired flight path or airspeed, do not hesitate to revert to a more direct level of automation as recommended by the airplane manufacturer or as required by the operator's SOPs.
- In the event of an uncommanded AP disconnection, engage the second AP immediately to reduce pilot workload.

The effective monitoring of these controls and displays promotes increased pilot awareness of the modes being engaged or armed and the available guidance (flight path and speed control). Active monitoring of controls and displays also enables the pilot to anticipate the sequence of flight modes annunciations throughout successive mode transitions or mode reversions. Operators should also consider the following types of statements to help provide operational guidance to pilots.

- Scan indications to ensure aircraft performs "as expected."
- Monitor status (indications and mode annunciations).
- Monitor ALT capture mode to ensure commands for smooth level-off at assigned altitude are followed when using ALT capture mode of A/P - F/D, or VNAV.
- Maintain one "head up" at all times at low altitude.
- Avoid distraction from duties.
- Do not let automation interfere with outside vigilance.
- Maintain continuous lookout during ground movement and VMC flight PF and PNF monitor each other's actions.
- Do not use any system displaying an inoperative flag or some other failure indication.

7. Workload Sharing and System Use

Consider including statements on workload sharing and system use to provide some operational guidance to pilots, such as the following:

- Ensure PF has responsibility for flight path; remain prepared to assume manual control (abnormal conditions).
- Intervene if the flight status is not “as desired”; revert to lower automation level; disengage any A/F system not operating “as expected.”
- Encourage manual flying for maintaining proficiency when flight conditions permit.
- Clearly establish who controls aircraft under what conditions.
- Allow for switch of PF and PNF duties, providing that control is properly maintained. PF and PNF monitor each other's actions.

8. Summary

The Advisory Circular identifies the above broad topics that should be addressed in automation policies. Only a specific air operator and the respective aeroplane manufacturer knows what is best for particular circumstances. This model circular provides a suggested baseline for developing the operator specific mode awareness and emergency state management policy.

For the optimum use of automation, operators should promote the following, in which the central point remains “fly the airplane.”

- Understanding the integration of AP/FD and A/THR-A/T modes (pairing of modes).
- Understanding all mode transition and reversion sequences.
- Understanding pilot-system interfaces for:
  - pilot-to-system communication (for mode engagement and target selections)
  - system-to-pilot feedback (i.e., for mode and target cross-check)
- Awareness of available guidance (AP/FD and A/THR or A/T status and which modes are armed or engaged, active targets).
- Alertness to adapt the level of automation to the task and/or circumstances, or to revert to hand flying or manual thrust/throttle control, if required.
- Adherence to the aircraft specific design and operating philosophy and the air operator´s SOPs.
- If doubt exists regarding the aircraft flight path or speed control, do not attempt to reprogram the automated systems.
- Selected guidance or hand flying together with the use of navaids raw data should be used until time and conditions permit reprogramming the AP/FD or FMS.

- If the aircraft does not follow the intended flight path, check the AP and A/THR or A/T engagement status.
  - If engaged, disconnect the AP and/or A/THR or A/T using the associated disconnect push button(s), to revert to hand flying (with FD guidance or with reference to raw data) and/or to manual thrust control.
  - In hand flying, the FD commands should be followed. Otherwise, the FD bars should be cleared from display, AP and A/THR or A/T.

9. References

The following documents have been taken into consideration in the preparation of this RSA:

1. ICAO's Cooperative Development of Operational Safety & Continuing Airworthiness Programme (COSCAP) North Asia Advisory Circular for Air Operators, CNA 020 Issue 1. *"Mode Awareness and Energy State Management Aspects of Flight Deck Automation"*
2. Commercial Aviation Safety Team (CAST) Safety Enhancement 30 Rev 5 (CAST SE-30 Rev 5) August 2008 *"Mode Awareness and Energy State Management Aspects of Flight Deck Automation"*
3. EASA Safety Information Bulletin 2010-33 (EASA SIB No:2010-33 issued 18 Nov. 2010) *"Flight Deck Automation Policy – Mode Awareness and Energy State Management"*

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Agenda Item 5: Issue Analysis Team (IAT)

5.1 The Meeting discussed the role of the Issue Analysis Team (IAT), which is to conduct studies and provide reports for the Aviation Safety Information Analysis and Sharing (ASIAS) initiative and other RASG-PA programmes, as required.

5.2 The Meeting discussed IAT membership and recommended that its composition include a small group of subject matter experts that represent all RASG-PA stakeholders.

5.3 The Boeing representative offered to provide the Terms of Reference (ToRs) used in the Commercial Aviation Safety Team (CAST) as a reference for developing the IAT TORs, while considering the different scope of activities as agreed by the PA-RAST for the IAT.

5.4 The proposed TORs will be discussed at the PA-RAST/11 Meeting in Santiago, Chile.

Agenda Item 6: Aviation Safety Information Analysis and Sharing (ASIAS) System

6.1 The Meeting discussed the capabilities of the ASIAS system and how it is used by the Commercial Aviation Safety Team (CAST) in the United States.

6.2 The Meeting discussed the role of the PA-RAST IAT and concluded that the IAT was the appropriate body to be charged with conducting studies and providing reports as requested by the PA-RAST; the Terms of Reference to be developed must reflect the role of the IAT and the sensitivity and required confidentiality of the safety data that the IAT would have access to.

6.3 The Meeting considered that in order to initiate data mining from the ASIAS system, the IAT should focus on three case studies to be proposed by the PA-RAST.

6.4 The Meeting also discussed how the IAT would have access to the ASIAS database, either through a CD-ROM or direct on-line access. The Meeting considered covering this issue in detail at the PA-RAST/11 meeting.

6.5 The IATA representative stated their willingness to share safety information from the ALTA-IATA Trend Sharing Program (AITSP) with RASG-PA. This Programme is a joint effort from both associations to analyze, track and improve safety risks in the region while focusing resources on the key areas of concern based on safety information provided by their Member airlines. Approximately 40 airlines supported developing the AITSP during the 2nd Pan American Aviation Safety Summit held in 2011 in Mexico City, Mexico.

6.6 The Meeting also considered that RASG-PA Project GSI-12 – *FOQA Information Sharing Programme* that includes the Operation Safety Action Plan (PASO) programme, which is led by the Civil Aviation Authority of Costa Rica and COCESNA/ACSA with the participation of the air operators, would be another source of safety data/information/trends to be used by the IAT.

Agenda Item 7: United States FAA Runway Safety Initiatives

7.1 In addition to the introduction of the Local Runway Safety Action Team (LRSAT) mentioned in the report on Agenda Item 2, the FAA representative delivered a presentation about the FAA Airport Safety Assessment Program (FASAP).

7.1 The Meeting acknowledged that certain States have not applied due diligence to the application of Standards and Recommended Practices (SARPs) of ICAO Annex 14, and thus airports in those States may not meet the internationally recognized level of safety described in the Annex and not meet basic safety standards of airport design and operation.

7.2 United States informed the Meeting that the FASAP program has attempted to address that problem by culling the Annex 14 SARPs and selecting only the most salient and relevant standards:

- those that are essential to a minimum level of airport safety; and
- those that are by and large indicative of a functioning airport certification programme.

7.3 The Meeting was informed that the application of this programme was entirely voluntary by the air operator. However, to ensure a reasonable and structured safety assessment of a new airport service location, air operators are encouraged to apply the provisions detailed in the programme, considering that the ultimate responsibility for the completion of a proper safety assessment of an airport rests solely with the air operator making application to fly into a foreign destination.

7.4 The FAA representative informed that the standards listed in the checklists of the programme were representative of those SARPs found in ICAO Annex 14, Volume I, through Amendment 10, and that the analysis of the status of the safety critical elements at an airport would help to ensure that an air operator is aware of all areas of airport non-compliance with Annex 14. Combined with the development of appropriate risk mitigation strategies for areas of airport non-compliance, application of this programme would aid in ensuring a standardized level of safety for air carrier operations at all airport operating locations.

7.5 The Meeting decided to elevate the FASAP to the ESC for further analysis and approval for dissemination by RASG-PA.

Agenda Item 8: PA-RAST/11 Meeting

8.1 Logistics

8.1.1 The Meeting agreed that PA-RAST/11 would meet in Santiago, Chile, from 18 to 19 October 2012, hosted by the DGAC of Chile.

8.1.2 The Secretary advised the Meeting to make hotel reservations well in advance taking into consideration the high season for visitors to Santiago.

8.2 Agenda

8.2.1 The Meeting agreed that the proposed draft agenda be circulated by the RASG-PA Secretariat as part of the invitation letter to the PA-RAST/11 Meeting.

8.2.2 The Secretary encouraged the Meeting to review the draft agenda that would be circulated and propose any changes or inputs as required.

Agenda Item 9: Recommended Actions for the RASG-PA Executive Steering Committee (RASG-PA/ESC/14)

9.1 The Meeting invited the ESC to note the progress of PA-RAST activities as detailed in the summary of discussions of this meeting and:

a) note that Boeing will provide guidance material to develop the Terms of Reference (ToRs) for the IAT;

b) note that ACI-LAC should review the draft Manual on guidance in maintaining runways in accordance with ICAO's Annex 14 as suggested by the PA-RAST/10 Meeting;

c) promote and support the participation of PA-RAST members in upcoming meetings;

d) acknowledge, promote and disseminate the accomplishments and success stories of PA-RAST;

e) provide additional resources for the accomplishment of PA-RAST activities;

f) issue and distribute a RASG-PA Safety Advisory (RSA) when a Detailed Implementation Plan (DIP) is completed;

g) accept the IATA/ALTA offer of sharing safety information from the ALTA-IATA Trend Sharing Program (AITSP) with the Issue Analysis Team (IAT);

h) review the FAA Airport Safety Assessment Program (FASAP) as presented; and

i) note the progress reported by Boeing regarding RASG-PA Project GSI/3 – *Protection of Safety Information*.

Agenda Item 10: Other business

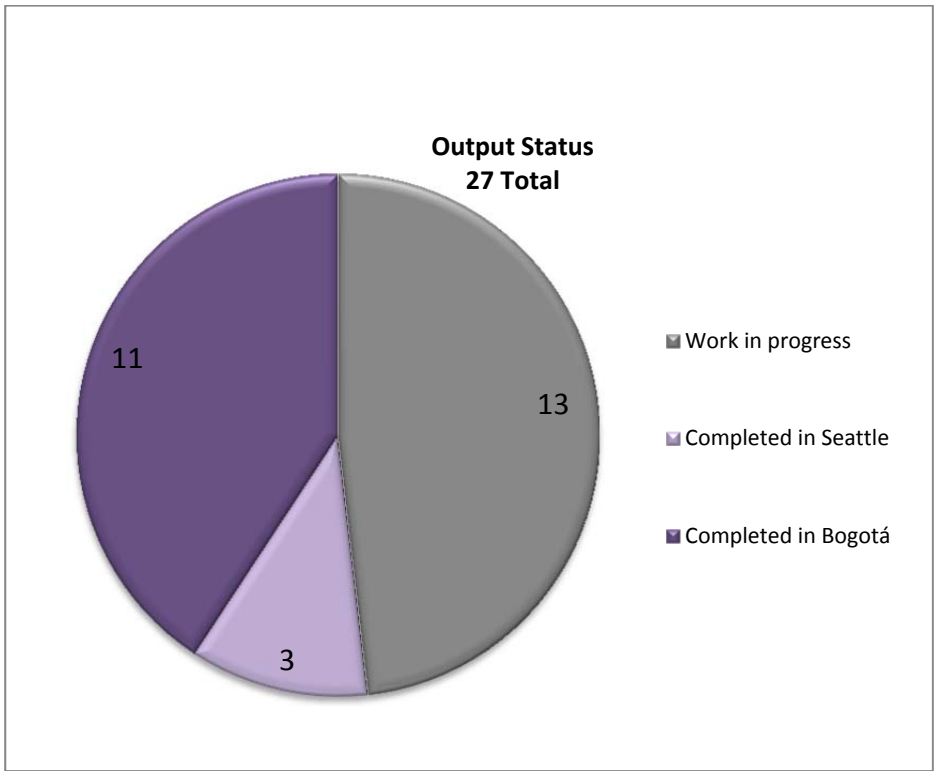
10.1 RASG-PA accomplishments, success stories and on-going activities

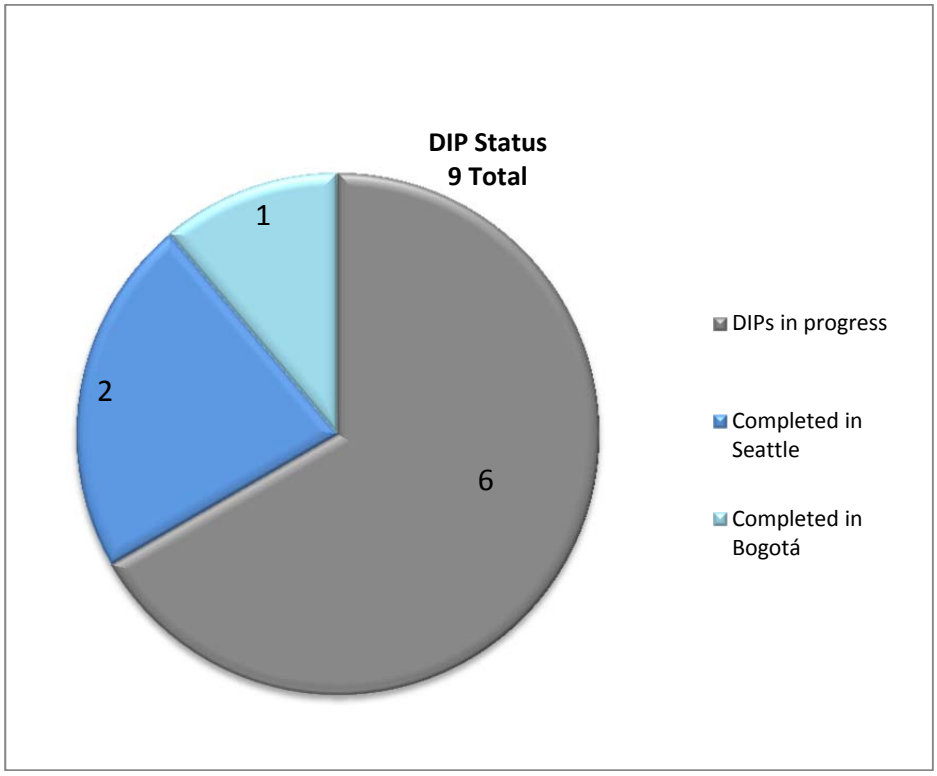
10.1.1 The Meeting acknowledged the relevance of promoting and communicating the accomplishments, success stories and on-going activities of RASG-PA and its Teams. Therefore, the Meeting decided, as they did at the PA-RAST/09 Meeting, to create the following list in order to inform RASG-PA members and other aviation stakeholders:

- RASG-PA accomplishments:
  - Distributed Runway Excursion Risk Reduction (RERR) Toolkit version 2 to air operators and States
  - Conducted surveys on go-around policies and unstable approach mitigation
  - Provided advanced maneuvers manual to all air operators
  - Developed RASG-PA Aviation Safety Workshop (4 delivered, 4 more planned) with average participation of 100 people
  - Developed and delivered the Pilot Monitoring Toolkit through RASG-PA Aviation Safety Workshops and posted it on the RASG-PA website
  - Developed a first draft of the Manual on guidance in maintaining runways in accordance with ICAO's Annex 14 (comments received from States and ICAO)
  - Compiled aviation training material and published it on the RASG-PA website: www.rasg-pa.org
  - Standardized CFIT training across air operators in the CAR/SAM Regions
  - Developed the RASG-PA Safety Advisory (RSA) process
  - Developed, translated, and submitted for dissemination a RSA on Mode Awareness and Energy State Management Risks
  - Supported the implementation of Runway Safety Teams in Mexico City, Mexico; Montego Bay, Jamaica; and Quito, Ecuador
  - Compiled and delivered advanced maneuver training materials to air operators

- Success stories
  - Identified 30 Safety Enhancement Initiatives (related to the top 3 aviation safety risk areas in the Pan American Region) – 10 for each risk area
  - 9 DIPs developed: 6 in-progress, 3 completed
  - 27 Outputs developed: 13 in-progress, 14 completed
  - PA-RAST Terms of Reference under review
  - Signed a MOU between RASG-PA and CAST to use ASIAS information
  - Established the RASG-PA Issue Analysis Team (IAT)

- On-going activities
  - Working on 21 Safety Enhancement Initiatives (SEIs) related to Runway Excursion (RE), Loss of Control In-Flight (LOC-I) and Controlled Flight Into Terrain (CFIT).


Output Status
27 Total
11
13
3
Work in progress
Completed in Seattle
Completed in Bogotá


DIP Status
9 Total
1
2
6
DIPs in progress
Completed in Seattle
Completed in Bogotá

10.2 RASG-PA Project GSI/3 - Protection of Safety Information

10.2.1 The Meeting was informed by the Boeing representative on the status of the RASG-PA GSI/3 Project. The Meeting was advised that they are in the process of coordinating with Airbus in order to present a final document to RASG-PA in Santiago, Chile. Considerable progress had been achieved since the previous draft of the document, and is more consistent with ICAO related documentation. Therefore, no major delay in providing the final draft document to RASG-PA for distribution as planned to conclude the delayed project is expected.