

SOUTH AMERICAN AIG REGIONAL COOPERATION MECHANISM (ARCM)

THIRD AIG AUTHORITIES MEETING

(Lima, Peru, 07 to 09 March 2016)

Agenda Item 06: ARCM Safety data collection and processing system (SDCPS) procedures review

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

(Working paper presented by the ARCM Technical Committee)

Summary

This working paper presents to the Third AIG Authorities Meeting (AIG-SAM/3) the procedures for the implementation of the safety data collection and processing system (SDCPS) under the framework of the AIG Regional Cooperation Mechanism (ARCM) of the SAM Region. The ARCM SDCPS will address the processing and reporting systems, AIG databases (States – ARCM) and the schemes to exchange information.

References

- Report of the Second Meeting of AIG Authorities of the SAM Region (AIG-SAM/2), Buenos Aires, Argentina, 09 to 11 June 2015.
- AIG Regulations of the ARCM
- LAR 113 – Aircraft accident and incident notification and reporting requirements
- Annex 13 – Aircraft accident and incident investigation
 - Chapter 4 - Notification
 - Chapter 7 – ADREP Reporting
- Annex 19 – Safety management
- Doc 9946 – Manual on Regional Accident and Incident Investigation Organization (RAIO).

1. Introduction

1.1. The South American AIG Regional Cooperation Mechanism (ARCM) was established in the Second AIG Authorities Meeting of the SAM Region, held in Buenos Aires, Argentina, 09 to 11 June 2015, to support the States that request in the aspects related to aircraft accident and incident investigation in a regional cooperation environment that allows to improve the effective implementation in the AIG area and to contribute to the reduction of the aircraft accident and incident rate of the SAM Region below the global rate in all the aviation segments.

1.2. In relation to this, the Meeting focused on the fact that the creation of a South American ARCM would significantly contribute to start AIG cooperation activities between the States and would benefit the States that have greater difficulty in establishing an efficient and effective AIG system.

2. **Safety data collection and processing systems (SDCPS)**

2.1 When an accident, serious incident and incident occur, the event investigation process starts to identify possible deficiencies within the aviation system, to determine, if possible, the causes or contributing factors and to issue the necessary recommendations in order to avoid recurrence. Since it is a reactive component, the accident and incident investigations contribute to the continuous improvement of the aviation system providing the probable causes of accidents/incidents and the lessons learned from the events.

2.2 Besides providing facts and probable causes of accidents/incidents, most investigations identify hazards and threats. In the safety management proactive current environment, there is an important and necessary integration between an accident/incident investigation process and the hazards identification and reporting process in an organization.

2.3 Paragraph 8.1 of Annex 13 – Aircraft accident and incident investigation, prescribes that each State shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety **deficiencies** and to determine any **preventive actions required**.

2.4 Since 2008, the SAM Region has been implementing the European Co-ordination centre for Accident and Incident Reporting Systems (ECCAIRS), with the purpose of meeting the accident and incident notification requirements of Annex 13 and the pertinent protocol questions (PQs), object of the audits of the Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA).

2.5 In order to optimize the potential benefits of a centralized database, basic aspects are required in its operation, such as data analysis, management, integrity and security; they are needed to establish effective indicators so as to have a clear understanding of the hazards and their related consequences. This safety information is considered of interest, therefore it has to be shared among all ARCM States as quickly as possible. In this sense, standardized formats and procedures guiding and facilitating data exchange shall be established.

2.6 In order to conduct thorough accident and incident data analysis at regional level, the ARCM **safety data collection and processing system (SDCPS)** shall be established as a solution for decision-making, and as a State tool for the issuing of effective and timely recommendations in a regional framework.

2.7 The SDCPS shall use the ADREP/ECCAIRS system as platform; therefore, the ARCM procedures for the SDCPS implementation in every State shall be established in order to allow to store, add and keep updated and concise information. The structuring of these procedures shall have the following tools:

- a) for **notification** that defines how the States shall notify the ARCM and what they shall notify and how the ARCM shall inform to the States in case the events are not validated as well as the deadlines for the notifications;
- b) for **standardized register** of notifications;
- c) for **collection and capture**;
- d) for processing of the ARCM **collected data**;
- e) to present the list of **safety performance indicators**;
- f) to determine **preventive measures** necessary to mitigate safety risks;
- g) of **safety surveillance** based on risks;
- h) to **protect the information**;
- i) to **exchange the information**; and
- j) **to communicate** accessible safety information to the users, for example, annual ARCM safety reports to the States and to the users of the SAM Region.

2.8 Regarding safety reported information management, procedures shall be developed to:

- a) provide timely and precise hazards notification;
- b) have the quality of the collected data processing;
- c) clearly have the type of data or information that can be used to support safety analysis;
- d) analyze to identify hazards through identification measures and monitor the potential consequences;
- e) manage safety risks and safety risks related to combined hazards;
- f) balance the need for data protection with that that shall provide data for those that can strengthen aviation safety;
- g) constantly monitor safety with the view of creating safety trends indicators, and
- h) produce safety reports.

2.9 In the context of the safety data analysis and collection, the ARCM SDCPS shall include the following types of data or information, among others, that shall be used to support the safety data analysis that the ARCM manages:

- a) accident investigation data;
- b) serious incident investigation data; and
- c) incident investigation data (when AIG organizations are involved)

2.10 The ARCM SDCPS system shall have to be able to collect aircraft accident/incident safety information for aircraft with weight over 2250 kg and with 2250 kg or less for the following operations:

- a) scheduled and non-scheduled commercial air transport;
- b) general aviation;
- c) corporate aviation;
- d) air work; and
- e) unmanned aviation (remotely piloted aircraft systems – RPAS).

3. Additional aspects

3.1 For the initial and familiarization functioning and presentation by the States, the preliminary physical location of the SDCPS (until the Executive Committee determines the final location) shall be in the JIAAC of Argentina; it shall also provide the technological facilities.

3.2 As part of the SDCPS implementation, a proposal on procedures manual has been developed that considers the concepts and tools described in this working paper.

4. Suggested actions

4.1 The AIG Authorities of the Region are invited to:

- a) take note and comment on the information provided in this working paper and in **Appendix A**; and
- b) approve the proposal on procedures manual for the implementation of the South American ARCM safety data collection and processing systems (SDCPS) and its implementation for the year 2016.

South American AIG Regional Cooperation Mechanism (ARCM)

**Procedures manual for the
implementation of the
South American ARCM
safety data collection and
processing system
(SDCPS)**

**First edition
March 2016**

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Definitions

Term	Definition
Attribute	The attributes are the characteristics through which an entity can be described. In the case of ADREP/ECCAIRS, the attributes are the fields for data entry. Their entry can be mandatory, optional, with pull-down list, or text entry, etc.
Database	A database is the set of informative data organized in a same context for use and relation.
Query	A query is the method to access data in the databases. With the queries, data in a database can be modified, deleted, shown and added. For this a query language is used.
Data manager	Module of the system that allows to import/export information in different formats (<i>mdb, xls, txt</i>) with specific parameters.
Data exchange	Module of the system management used to exchange information between repositories, make backups, as well as change between taxonomies versions.
E5f (<i>Eccairs 5 file</i>)	Format used by ADREP/ECCAIRS in order to store up to 1000 encrypted records for exchange.
Id	Unique identification code; each attribute of the system has a numeric "id" for indexation in the database.
Interface	It is the means through which the user can communicate with a system or device, and comprises all the points of contact between the user and the equipment. Easy to understand and easy to activate, "friendly and intuitive".
Record	<i>(line or tuple)</i> It represents a unique object with implicitly organized data in a table. In ADREP/ECCAIRS it is a specific occurrence.
Repository	ADREP/ECCAIRS module for the general management of the system, such as security policies, connection to the database, roles, users, etc.
Software	Set of programmes and routines that allow the computer to fulfil specific tasks.
Taxonomy	Science that studies the principles, methods and purposes of the classification.

Abbreviations

Abbreviation	Meaning
ADREP	Accident/Incident data reporting system
AIG	Accident and incident investigation

ARCM	South American AIG Regional Cooperation Mechanism
TC	ARCM Technical Committee
DBA	Database administrator
ECCAIRS	European Co-ordination Centre for Accident and Incident Reporting Systems
IT	Information technology
JRC	Joint Research Centre
RAIO	Regional accident and incident investigation organizations
RE	Runway excursion
SAM	South American Region
SDCPS	Safety data collection and processing systems
SPI	Safety performance indicators
SPIES	Safety performance indicators for ECCAIRS system, ECCAIRS tool for the SPI management
SQL	Structure query language
SSP	State safety programme

Procedures manual for the implementation of the safety data collection and processing system (SDCPS)

Chapter 1 - General

1.1 Foreword

The importance of the aircraft accident and incident investigations lies in determining the causes to issue effective recommendations and the necessary measures to avoid recurrence. Regarding the South American Region (SAM), it is necessary that the AIG Regional Cooperation Mechanism (ARCM) has a tool that allows it to achieve the proposed objectives and to contribute to safety.

Considering that ICAO adopted since 2004 the ADREP/ECCAIRS (*European Co-ordination centre for Accident and Incident Reporting Systems*) system developed by the JRC (*Joint Research Centre*) of the European Commission (EC), based on the ADREP taxonomy from the International Civil Aviation Organization (OACI), the SDCPS will use the ADREP/ECCAIRS system as a technological platform for the AIG data notification, registry and exchange. Therefore, all the SAM Region will be able to store and notify events using the same language and criteria.

1.2 About ADREP/ECCAIRS

Since 1998 the JRC, at the request of the EC, developed a set of computing solutions for transport safety information exchange and analysis. This pack of tools was successfully implemented in the European Union; it has a license of use for AIG organizations and safety-related agencies. This allows that AIG investigation organizations, aviation authorities, operators, air traffic service providers use ADREP/ECCAIRS individually and collectively to notify and share information.

The JRC website (<http://eccairsportal.jrc.ec.europa.eu>) is available to users to download software and share opinions, experiences, analysis and results in favor of constant development.

The ADREP/ECCAIRS system provides a great variety of technologies for the exchange, export and import for safety data analysis; it is the ideal tool for the SDCPS implementation.

1.3 ARCM Database (SDCPS)

The ARCM database based on ADREP/ECCAIRS (SDCPS) could be physically located in the technological infrastructure of the ICAO South American Regional Office (or where the Executive Committee determines). The client/server mode will give access to the ARCM TC (Technical Committee) members and to the users assigned by the States according to their information management policies.

For the SDCPS implementation, the implementation of the ADREP/ECCAIRS system is necessary in each State (*); this will ensure the standardization of the SDCPS data, allowing to adopt the corresponding procedures, for example, notification, validation, publication, etc. The ARCM TC will evaluate the ADREP/ECCAIRS versions and revisions and new tools and will technically advise the States in order to keep the standard.

Figure 1 – SDCPS general diagram

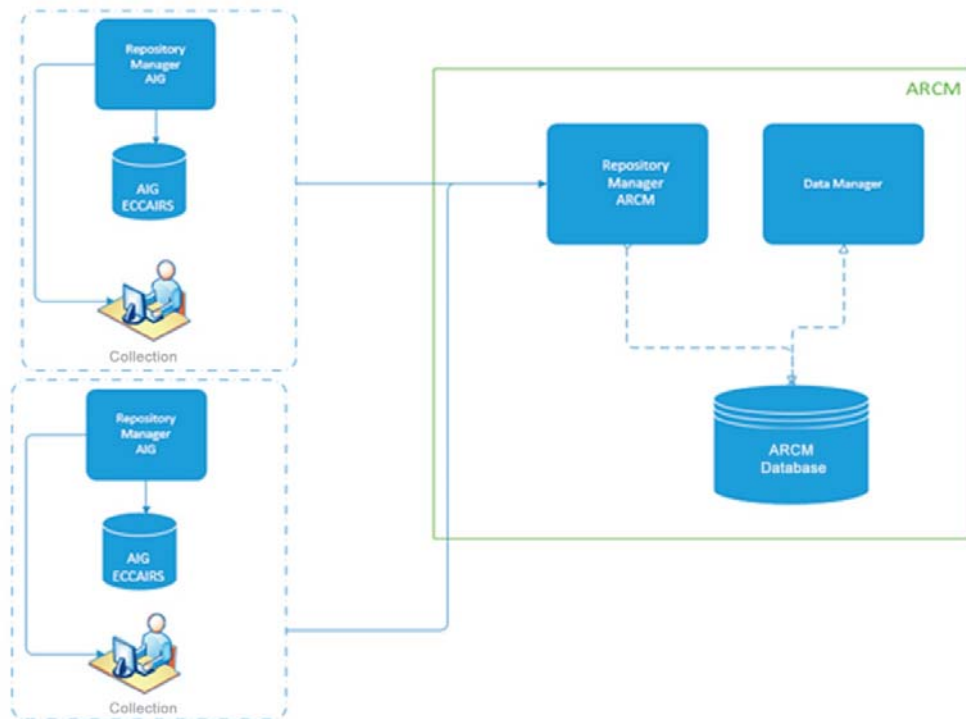
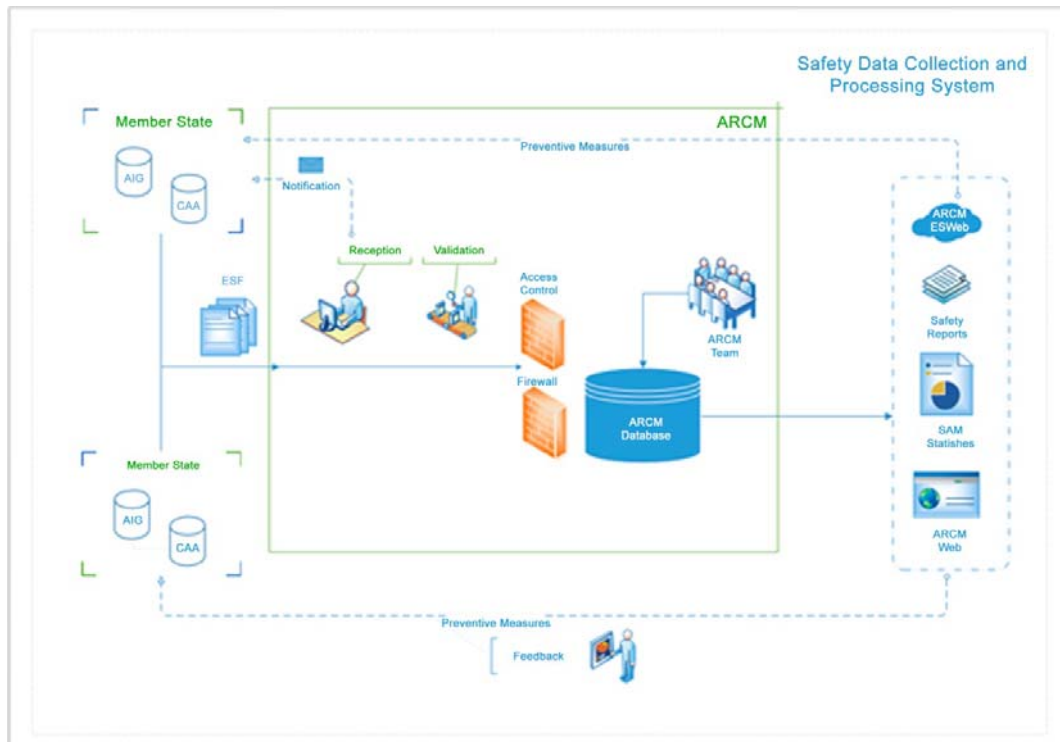


Figure 2 – Detailed diagram



1.4 Scope of the SDCPS

The data specification that will be collected by the system is considered the scope of the SDCPS.

In accordance with Chapter 5 of the Manual on Regional Accident and Incident Investigation Organizations (RAIO)” (ICAO Doc. 9946), which establishes the development of a regional information exchange system as its main objective in order to improve the access to safety information. Therefore, it is established that the information to be stored in the SDCPS will be the reactive type of occurrences (accidents/serious incidents/incidents) that correspond to AIG organizations.

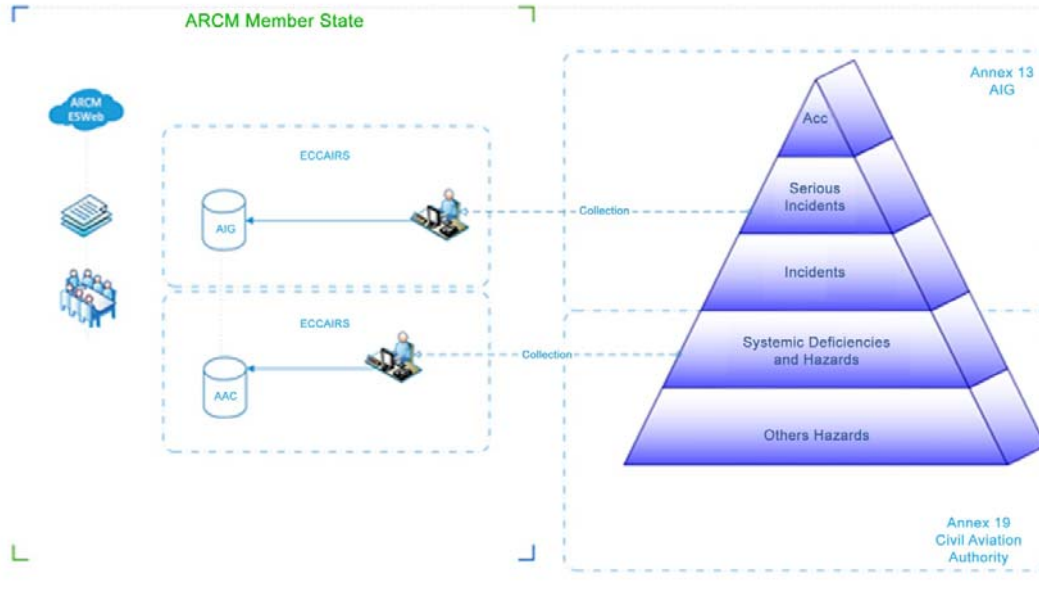
“The SDCPS is a database with data coming from other databases”

If we analyze the previous concept, it is clear that for the success of the SDCPS at regional level, success at local level is required. Therefore, the ARCM will provide technical/operational assistance for the correct implementation of ADREP/ECCAIRS as primary accident/incident database to the States that request according to their organizational policies and standards.

In turn, each State will assign the one/s responsible for notifying the events through notification dynamic procedures (*).

The ARCM will, through the TC, assign the ones responsible for the notified events validation (**).

Fig. 3 – Occurrences and competencies



1.5 Levels of information

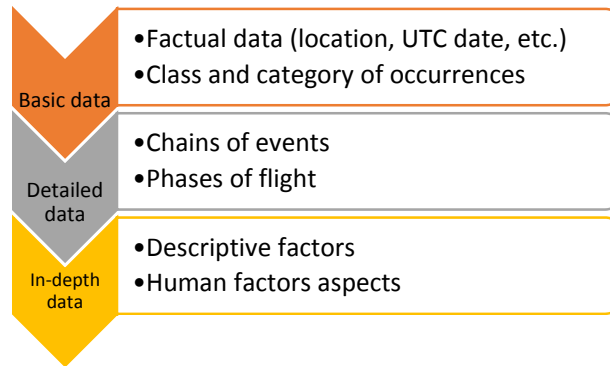
Technical investigations of occurrences have different levels of information according to their state and depth. The system allows to show those states through levels of information expressed in “views”, allowing the display of information with different levels of depth according to the indicators managed in terms of safety. Initially, the compulsory data required is the file number and the reporting organization. However, for a notification to the ARCM it is recommended that the highest amount of available data is stored; likewise, the ADREP/ECCAIRS system allows the storage of over 800

attributes according to the criteria and scopes of the investigations.

* 3.1 Events notification procedures

** 3.2 Events validation procedures

Figure 4 – Levels of information



These levels of information allow to manage, through the SDCPS, the general and in-depth data, allowing the identification of potential factors and specific elements that can be subject of occurrence dynamics analyses at a regional level. This represents an opportunity to document real or potential deficiencies of the system, which must go through a useful analysis for decision making.

Chapter 2 – System management

2.1 Repository

The central management of the SDCPS is conducted through a “repository manager”, which is a general management module that works as the interface between the user and the database. Its function is to manage occurrence through security means, presentation standards and data access configuration. The ADREP/ECCAIRS manager uses the repository to make all the specific adjustments of the users, to configure access methods, databases and application properties.

The management task is a very important task since it will depend on the integrity of the stored data.

“One State, two repositories”

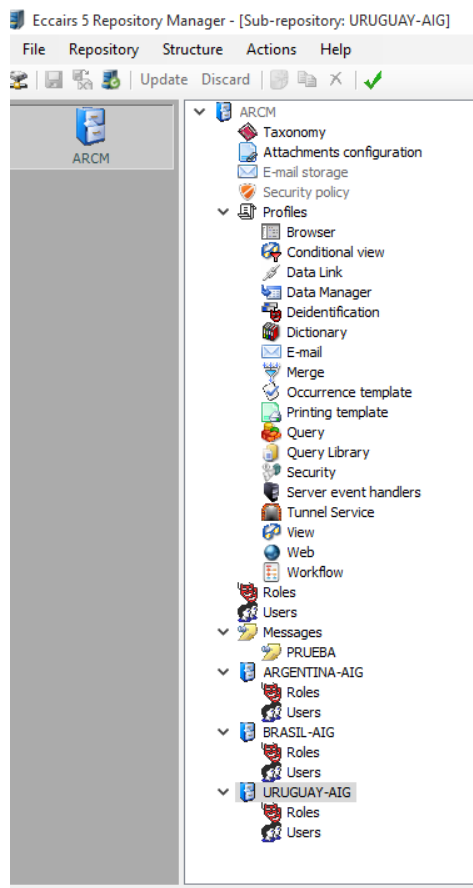
Each State with its local ADREP/ECCAIRS system has its own repository and, as part of the ARCM it has a repository in the SDCPS, that includes all the configuration of the main repository (ARCM), but with specific users and roles. Each State will store the occurrences that they notify in this repository, having the control of the notifications

as to when and who notified. This information collection mechanism is dynamic and simple, and it has the additional function of supporting the State AIG information.

Note:

- A State cannot have access to other State's repository.
- The States cannot manage the SDCPS repositories; however, they can request modifications.
- The repositories have a backup service, essential condition upon the occurrence of any contingency.

Figure 5 – SDCPS repository



2.2 Protection of information

The SDCPS provides tools that ensure the protection of information, connections are private, and data sent by email are encrypted through compression algorithms in E5F files, a specific file type that stores up to 1000 records of occurrences and is only compatible with ADREP/ECCAIRS.

The ADREP/ECCAIRS system needs a license of use “key”, therefore its use is limited to safety agents.

The SDCPS has 3 levels of protection of information:

- Database level
- Repository level
- User level

At database level, only the owner has access to the stored data; this avoids unauthorized access or conflicts with other databases, systems, etc.

At repository level, the security of information is clear and precise. The users and roles are managed through rules and profiles. The SDCPS repository managements is protected with password.

At user level, the system requires identification information and users have specific functions with appropriate permissions. Besides, the system records all the users’ activities.

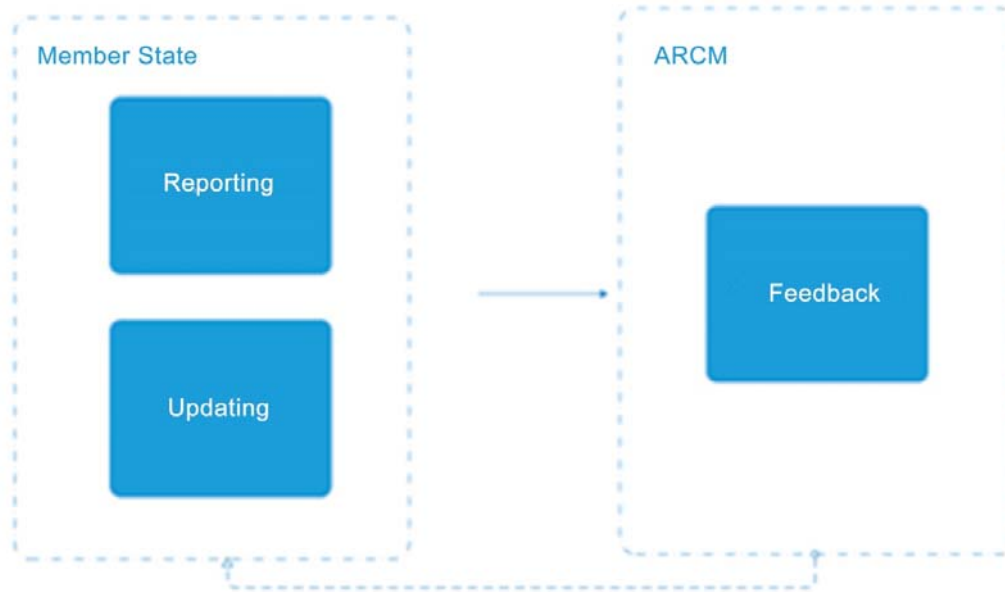
2.3 Interaction between the States and the ARCM

As mentioned above, each AIG organization must have its ADREP/ECCAIRS system implemented, for internal use and to report occurrences to the ARCM and to ICAO in compliance with Annex 13 to the Convention on International Civil Aviation. Unlike notifications to ICAO (sent as attachments via email), the States can connect to ARCM with access to queries libraries, graphics predefined by the ARCM, facilitating the familiarization with the system, especially when we refer to safety information exchange, with sensitive and developing data. .

It is essential to have into account that the most important thing in the interaction among the AIG States is feedback on safety reports, risk analysis, etc., by the ARCM to the SAM States.

The interactions can be defined in three levels:

Figure 6 – Interaction diagram



Level 1 – Initial notification

Notification of every occurrence (accidents, incidents and serious incidents) investigated by the State AIG organization.

Such notification has to be given as quickly as possible with the factual data of the occurrence.

Level 2 – Updating

In the course of the investigation, analysis and conclusions, the record has to be updated filling in all the information available in order to determine the high and low impact indicators. This information is validated by the ARCM TC.

Level 3 – Feedback

The ARCM TC will, through the experts panel, provide the member States with periodic reports and safety recommendations that allow the analysis of the safety information

in a regional context.

2.4 Safety performance indicators:

SPI (Safety performance indicators)

“Data-based safety parameter used to observe and evaluate the safety performance”

The SPIs development is an essential aspect of the SDCPS in the context of continuing monitoring that allows the determination of deficiencies affecting safety.

For high-impact SPIs

- ✓ the accident rate that could be monthly, quarterly, biannual and annual;
- ✓ the accident rate related to runway excursions (RE) quarterly, biannual and annual;
- ✓ the accident rate related to loss of control in-flight (LOC-I) quarterly, biannual and annual;
- ✓ the accident rate related to controlled flight into terrain (CFIT) quarterly, biannual, and annual;
- ✓ the serious incident rate that could be monthly, quarterly, biannual and annual

For low-impact SPIs

- ✓ the incident rate.

Indicators and levels of reference

The indicators are the result of the application of a formula that expresses the quantitative and qualitative relation between two or more variables to be determined and they are used to measure if the objective has been achieved.

Indicator example

$$\text{Acc/Million departures} = \frac{2 \text{ accidents} \times 1.000.000}{1.900.000} = 1.05$$

In order to verify the result of the indicator, there has to be a level of reference, historical, standard, theoretical, etc.

To facilitate the monitoring, the safety analyst must determine what indicators the SDCPS will create. This will be achieved with the use of the tool and the analysis of the information sent.

“What it cannot be measured cannot be managed”

Alerts

The performance markers are reference values used to activate the alert of the high incident rate within each SPI, or to establish the level of objective of the planned improvement within each SPI. (Doc. 9859)

Figure 7 – SPI example

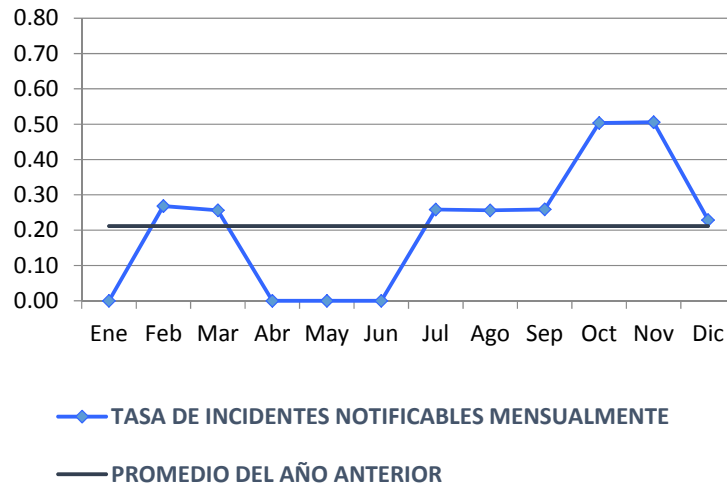
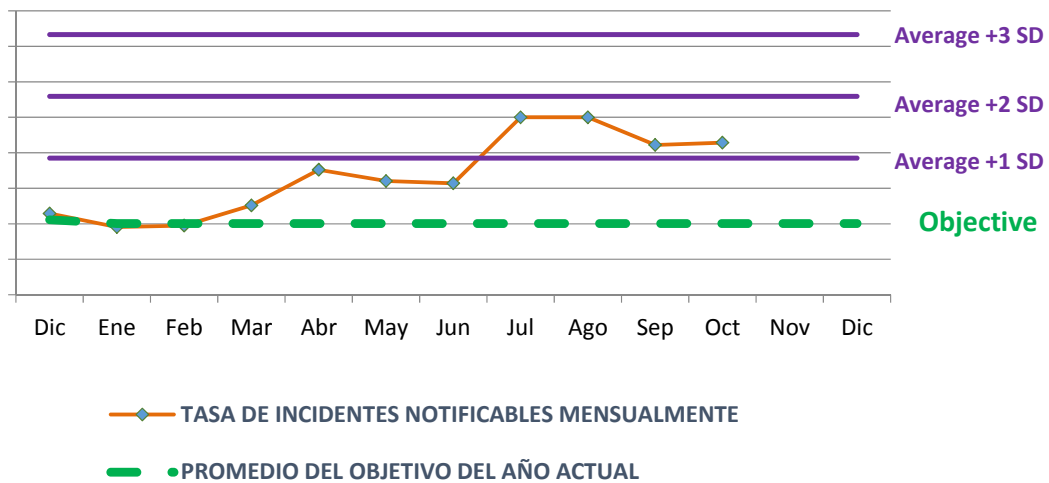


Figure 8 – Alerts

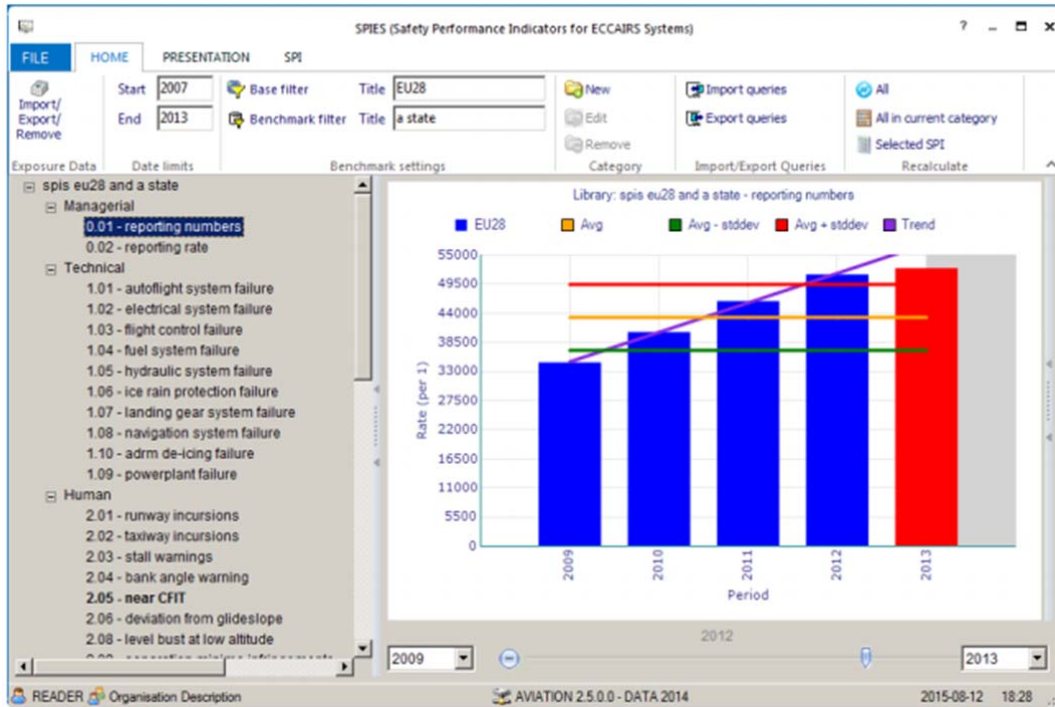


In order to achieve the correct functioning of SPIs and alerts in the SDCPS, SPIES (*Safety Performance Indicators for ECCAIRS System*) tool will be used.

This complement integrates into the ADREP/ECCAIRS system to obtain the expected alerts and indicators allowing for a great variety of parameters configuration among them:

- Time period to evaluate (1 year, 10 years, etc.)
- Cross references (queries)
- Technical indicators (hydraulic system failure)
- Human factors indicators (runway incursions)

Figure 9 – SPIES



The different SPIES can be modified according to what the ARCM TC requires and exported to other tools (spreadsheets, word processors, etc.) for subsequent analysis.

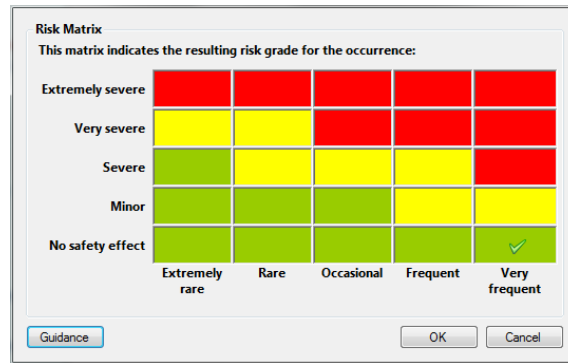
2.5 Hazards identification and prioritization:

In the ARCM framework, the State accident and incident reports must contain precise and timely hazards information allowing the SDCPS to appropriately manage risks.

The SDCPS allows the identification of hazards using the risk matrix that ADREP/ECCAIRS provides. Here, occurrences are classified according to the “severity” and “frequency”, which allows to obtain information about more frequent and more severe hazards through the query module.

This requires the individual (State) and general (SAM Region) information analysis from safety analysts. The ARCM will then be able to monitor the behaviour of the accident rate and identify the areas that need to have risk mitigation strategies developed at regional and individual (by State) level.

Figure 10 – Risk matrix



The SDCPS hazards identification and analysis will generate greater benefits if there is a standardized data treatment. To this aim, the ARCM will articulate training, standardization, and updating of the system with the technical support to create technical channels for the flow of information.

2.6 Safety surveillance system:

The SDCPS will determine how often the safety surveillance will be needed when the levels of alert established by the SPIs are announced.

2.7 Trends presentation:

The result of the query to the ADREP/ECCAIRS database can show analysis and trends with the “Grapher” tool.

Chapter 3 - Procedures

3.1 ADREP/ECCAIRS implementation procedure:

For the correct implementation of the ADREP/ECCAIRS system, each AIG organization must have the assurance that this system is reliable and the decision to manage the technical investigation data through the ADREP/ECCAIRS system.

As regards staff, an IT specialist is required for the configuration and management of the system and a safety analysis specialist, for information validation.

The State safety analyst will be in charge of determining “what” must be entered, “how” this entry will be made and “when”. Besides, this person will determine the indicators and trends to get from the system.

Each State IT staff has the task of implementing the ADREP/ECCAIRS server for internal use and the connection with the ARCM repository, and obtaining from the system the information the safety analyst requires.

It is possible to create multiple implementation diagrams, adapting to the organizations and taking advantage of the potential benefits of the system.

The software and hardware requirements for the implementation depend on the size of the organization, the number of users, the number of records (occurrences) and they are available in the ECCAIRS documentation; the repository and database configuration procedures are described in the ADREP/ECCAIRS installation manual.

The registration in the JRC website is recommended in order to keep the system updated and access relevant information (*news, work documents*).

Each State must request a license of use “*Organization ID*” to the JRC (*eccairs@jrc.ec.europa.eu*) to use the system.

3.2 Occurrence notification procedure:

For the notification of new occurrences, a series of steps must be followed to enter data in order to have the advantage of notifying at the moment of entry and/or update. This can be done by means of a link for desktop platform or logging into the ARCM website (<https://arcm-sam.org/eccairs>).

Capture mechanism

The system data capture mechanism (forms), backed up by the ADREP taxonomy, is mostly represented by selection lists, multiple choices, and manual input data. The selection lists, as well as the choices, give integrity to data, since each attribute has its corresponding explanation in the “taxonomy browser”; however, the manual input data require a standardized criteria and previous knowledge, so that the data entered truly reflects the occurrence.

The constant use of the system allows that the users’ learning curve is continuous, removing any potential barriers in the use of the tool.

Figure 12 – Initial notification

The screenshot displays the ECCAIRS 5 Browser interface for reporting an occurrence. The form is titled "Accidente N-989AN 199/11" and is set to "OPERATIONAL PRELIMINARY" status. The "Filing information" section includes fields for "Where" (South America, Bolivia) and "When" (Local date: 21/10/2011 8:20, UTC date: 21/10/2011 11:20). The "Severity" section shows "Injury level" as None and "Highest Damage" as Substantial. The "Injury totals" table shows 1 injury on aircraft. The "Events" section lists "Landing - Hard related event, during Landing: Other" and "Nosed Down/Overturned related event, during Post-impact". The "Call sign" is "A". The "Aircraft identification" section shows "Manufacturer/mod" as CESSNA 150 A and "State of registry" as Argentina. The "Aircraft operation" section shows "Operator" as Bolivia Administracion De and "Operation type" as General Aviation Pleasure Local. The "Itinerary" section shows "Planned destination" as empty and "Flight phase" as empty. The "Injuries" table shows 1 injury for crew.

	Fatal	Serious	Minor	None	Unknown	Total
Total on ground						
Total on aircraft				1		1
Grand total				1		1

	Fatal	Serious	Minor	None	Unknown	Total
Crew total				1		1
Passengers						

The initial notification has a capture mechanism of about 30 attributes (fields), with mandatory attributes (“Responsible Entity” and “File Number”, highlighted in yellow).

Minimum data allowing the creation of high-impact indicators (accidents and serious incidents):

ID Name Attribute

- 430 Occurrence Category
- 431 Occurrence Class
- 214 Operation Type
- 32 Aircraft Category
- 14 Events
 - 12 Descriptive Factor
 - 15 Explanatory Factor
- 319 Mass Group

Likewise, low-impact indicators (incidents):

ID Name Attributes

- 430 Occurrence Category
- 431 Occurrence Class

The steps to give notification are described below.

- 1- Create a local folder (temporary) to store the notified files.
- 2- Enter the “Browser” system connected to the State AIG repository.
- 3- Enter the occurrence data and record them in the database (File/Send to/Database).
- 4- Save the record in the previously created folder (File/Send to/File)
- 5- Open the created file and select the ARCM repository
- 6- Record in the ARCM database (File/Send to/Database)
- 7- Exit (File/Exit)

Alternate procedure:

In case connection to the State ARCM repository cannot be established (connection failure, stand alone, etc.), a notification can be sent to sdcps@arcm-sam.org attaching the e5f file with the following nomenclature:

- Country code: 3 capital letters (ARG, BRA, URU, PAR, CHI, etc.)
- - hyphen (separator)
- State file number
- - hyphen (separator)
- PREL (preliminary report) DATA (final report)

ARG-353-16-PREL.e5f

ARG-353-16-DATA.e5f

3.3 Events validation procedures (ARCM):

With the purpose of ensuring the consistency of the data stored in the SDCPS, quality rules will be established using the ADREP/ECCAIRS “data quality” tool in order to avoid inconsistencies in the record, for example, the fields MASS GROUP y MAXIMUM TAKEOFF MASS not being related, or differences regarding the number of injured people in the aircraft and total number of occurrences, etc.

The unique identification attribute of each record is the “file number”; the SDCPS will keep the format used by each State.

Cases with no data validation:

- ✓ Incomplete or incorrect classification
- ✓ Invalid data
- ✓ Occurrence involving crime
- ✓ Aircraft with military registration

The validation process can extend depending on the observations from the ARCM data management expert, therefore each time the State revises a record, the validation by the ARCM data management expert can be repeated.

Each verification or validation process or its repetition will take place within a period of 5 working days.

Steps to follow

- ✓ Open “Browser” with the appropriate identity information (provided by the TC) for the ARCM repository.
- ✓ Build the query “not validated occurrences” and select the corresponding State (database/build query/not validated occurrences)
- ✓ Verify the data entered taking into account the considerations in this document.
- ✓ In the case the validation is approved, the attributes “validation status” and “validation date” will be completed. Afterwards, they will be sent to the database (file/send to/database).

- ✓ In the case the validation process is not approved (inconsistency, lack of data), the user that notified will be contacted and the appropriate information requested.

This process can be repeated depending on the quality of data sent.

Chapter 4 – Technical aspects

4.1 Roles of IT staff:

The management of distributed systems requires defined responsibilities and functions; each role is important and they determine the level of integrity of the system in general. In information technology it is not always feasible to have the necessary staff for each role, and it is common that a person or a team manages several roles.

IT in charge

- Responsible of the general working of the system

- Coordination of the IT team

- Link with ARCM operational analysts (for the elaboration of reports)

- Link with JRC (recommendations of improvements, errors report, etc.)

- Coordination with States IT in charge.

Server manager (sysadmin)

- Infrastructure security, user management (DBA), safety policies, firewalls, ports configuration, updatings, etc.

Database management (DBA)

- Database configuration (script of tables creations)

- E5Manager user management

- Data integrity

- Performance

Repository manager

- Roles (management/reading/writing/report creation/query, etc.)

- Users (roles assignment, admissions, discharges)

Profiles (browser/views/customization)

Repository connection to the database (with information provided by DBA)

Web access (IIS7 management), responsible for web repository

Technical support

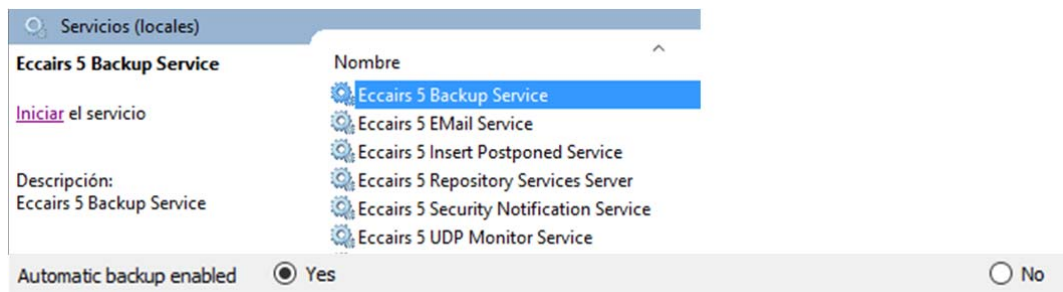
Technical assistance to the States about installation, configuration and management

Distribution of software updatings

4.2 Contingencies

In case of any contingency, or service interruption due to lack of hardware, unauthorized access or operating errors, the system is prepared to avoid any information losses and improve the level of availability.

Figure 13 –ADREP/ECCAIRS backup service



ECCAIRS has “backup services”, a service that protects general configuration data and is able to reset to a previous point in case of a general failure of the system.

At database level, engines like SQL (*Structure Query Language*) have a backup service to protect the information. This configuration is done by the database manager.

Chapter 5 - Bibliography

5.1 Bibliography and sources of information

- State AIG regulations
- Report on regional database implementation Mr. Winston San Martin
- Annex 13 – Aircraft accident and incident investigation
- Annex 19 – Safety management
- Doc. 9946 – Manual on regional accident and incident investigation organization (RAIO).
- ICAO Accident/Incident Data Reporting System (ADREP).
- Joint Research Centre <http://eccairsportal.jrc.ec.europa.eu> (ECCAIRS).