



International Civil Aviation Organization

E/CAR/WG/33

Barbados, 4-8 June 2012

ICAO Electronic Safety Tools

Contents



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9.1 Introduction

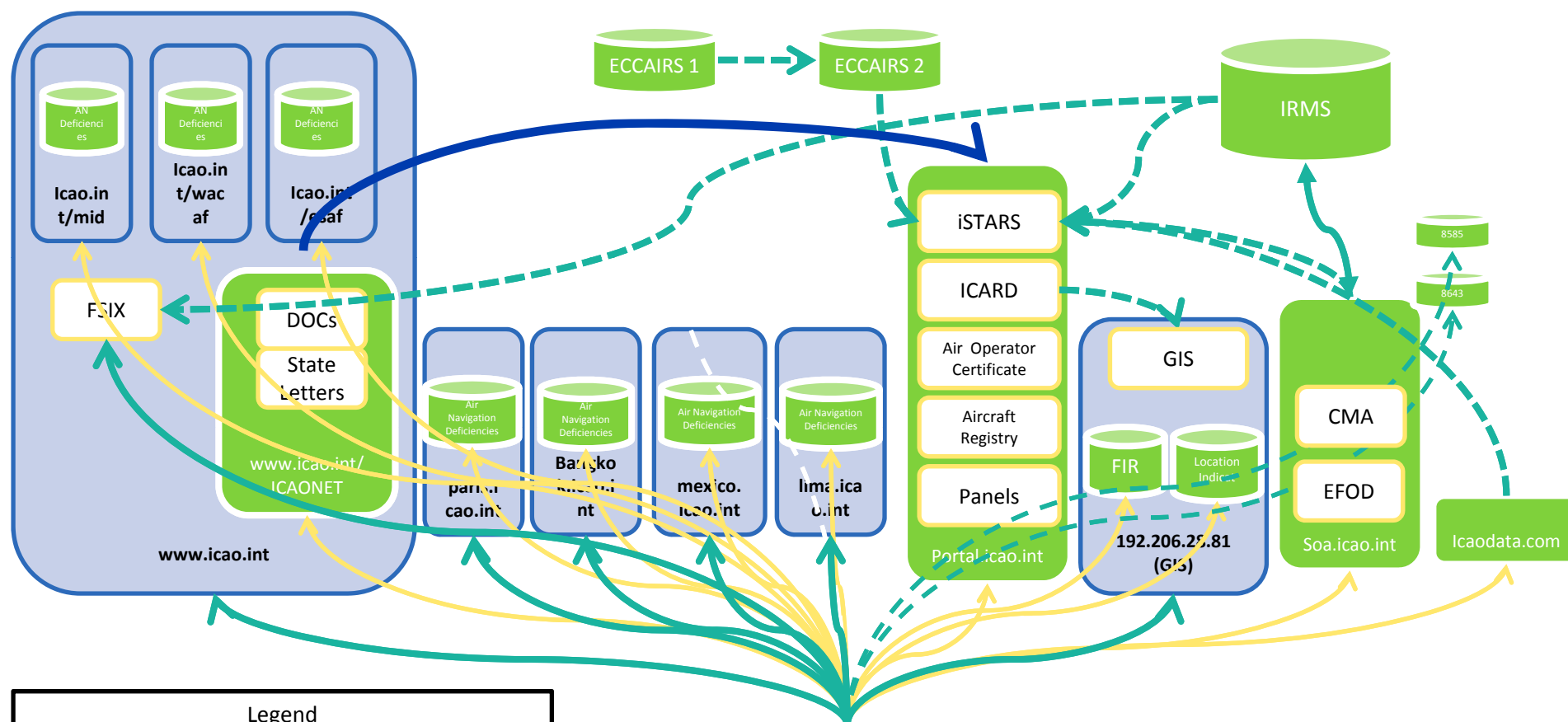
- ✓ Background
- ✓ Safety and air navigation data
- ✓ Challenges and issues

Background



- ❑ The improvement of aviation safety continues to become **a more data-driven/focused effort**
- ❑ ICAO has reviewed and revised the processes and tools to provide the safety information **more efficiently through a collaborative framework that enables improved data collection and dissemination on sector-wide basis.**

Safety and Air Navigation Data



Challenges & Issues



How data is updated

Complex Work Flows, not much on QA

Duplicated efforts to update same data for different purposes

How data is kept

Fragmented in different format and platform

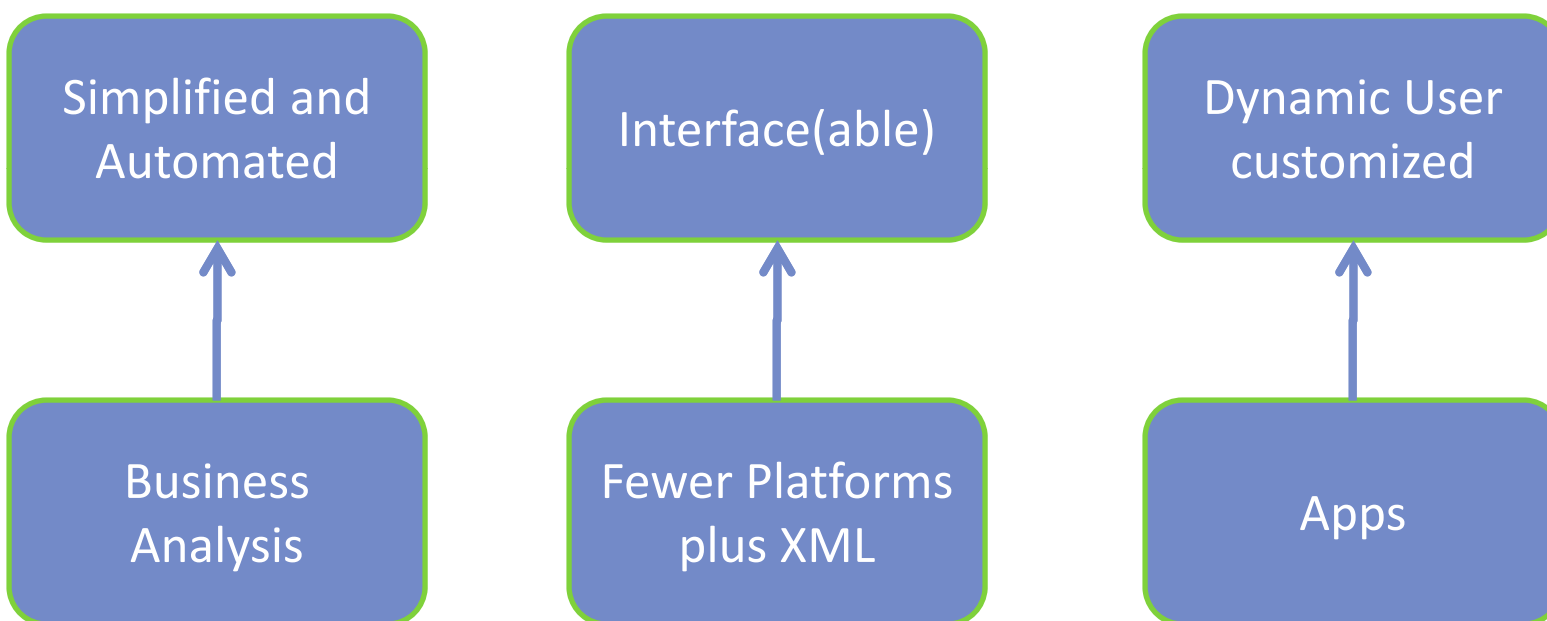
Not transferable
Some are only on paper

How data is delivered

By ICAO homeroom (mostly web based)

Multiple User ID/Passwords

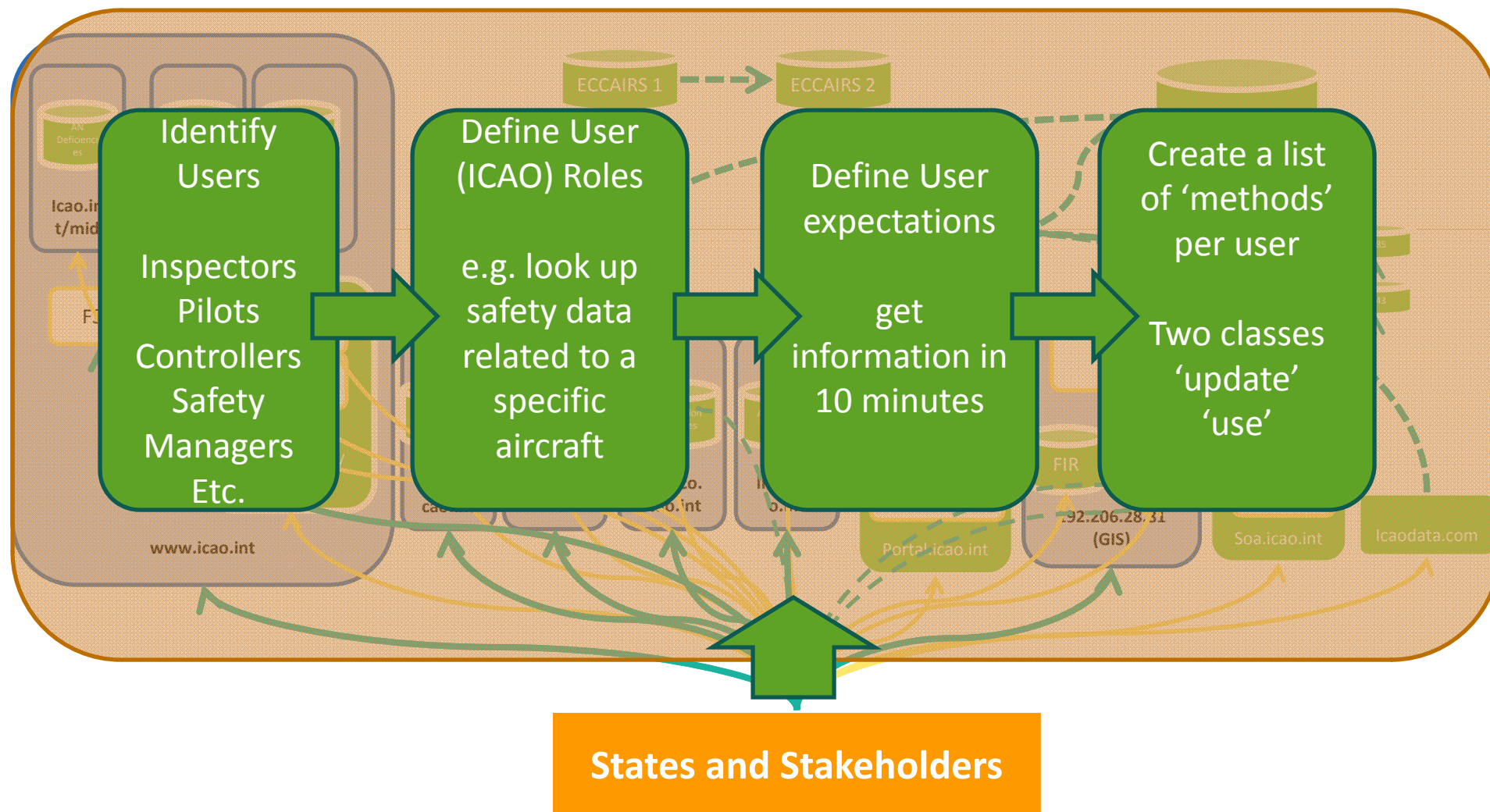
Possible ways to resolve issues



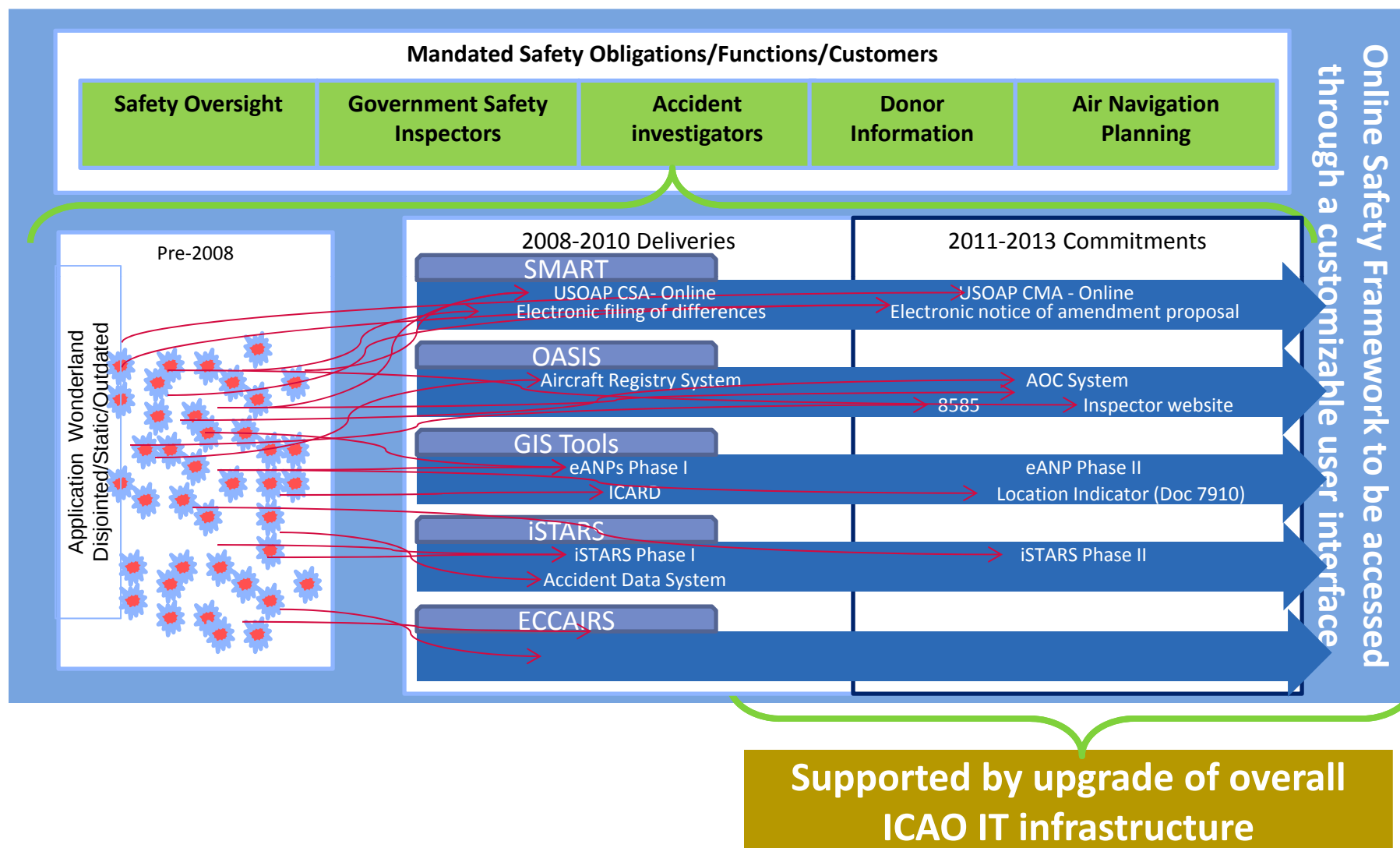
9.2 Online Safety Framework

- ✓ Overview
- ✓ SMART
- ✓ OASIS
- ✓ GIS-tools
- ✓ ECCAIRS
- ✓ iSTARS

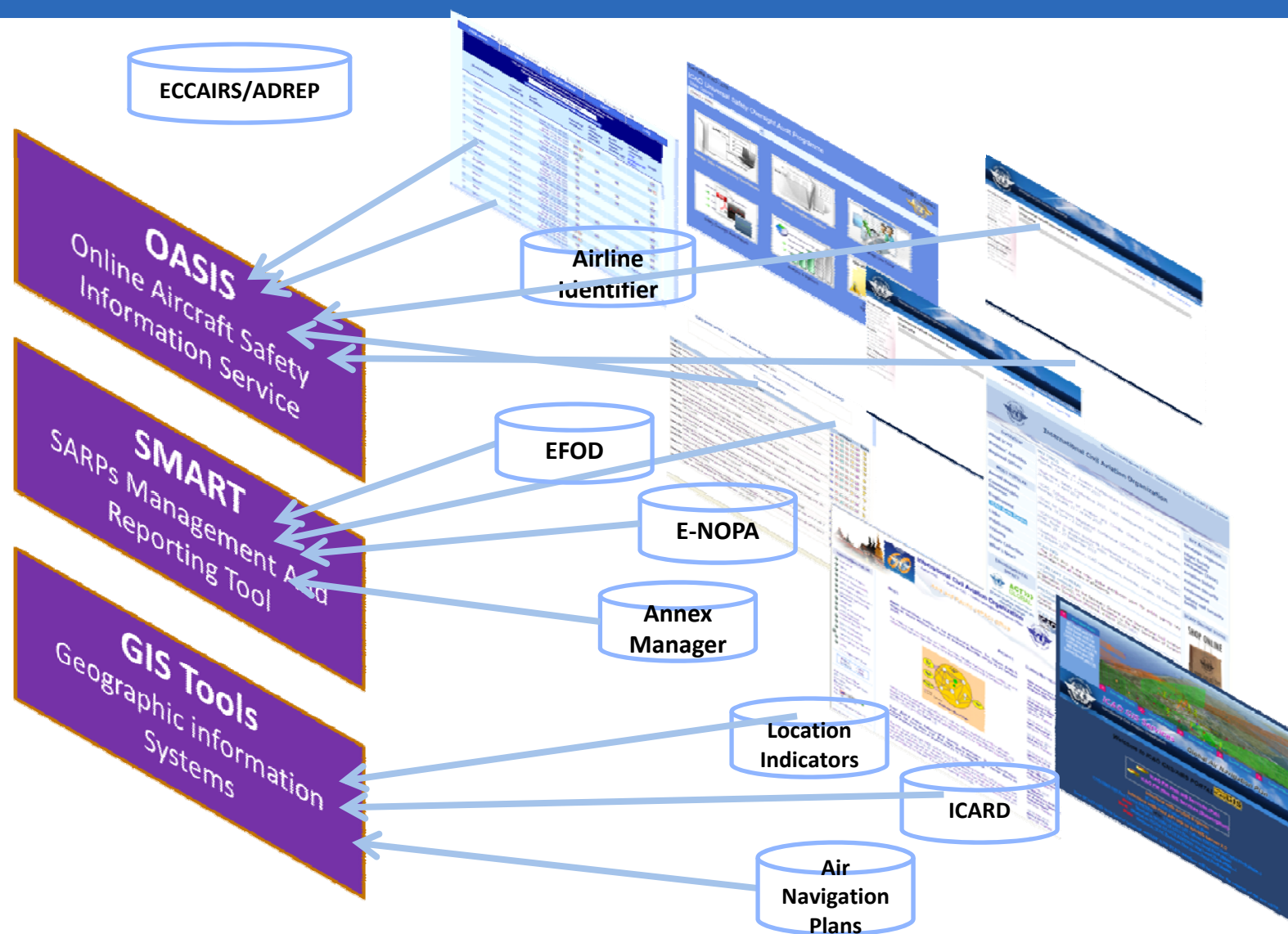
Overview



Overview

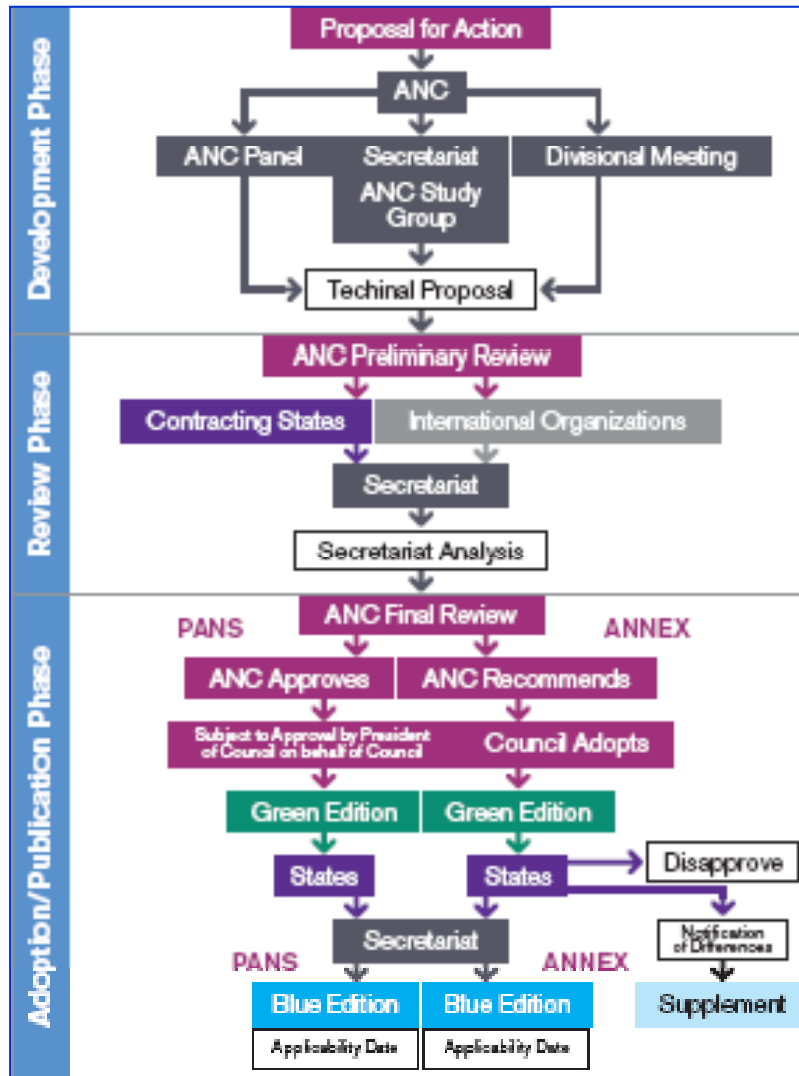


Overview



SMART

SARPs Management And Reporting Tools



❑ A set of tools that will manage and facilitate following processes:

- ✓ Management of Annexes (SARPs)
- ✓ State letter consultation
- ✓ Filing of differences
- ✓ Continuous monitoring on level of States' compliance

SMART- Annex Manager



❑ ICAO to:

- ✓ Replace paper-based management of SARPs
- ✓ View global level of implementation
- ✓ Trace history of amendments
- ✓ Search for inter-related provisions
- ✓ Update SARPs information in EFOD

The screenshot displays the SMART- Annex Manager interface. At the top, there is a menu bar with options like 'Select', 'First', 'Previous', 'Next', 'Last', 'Cancel', 'Save', 'Modify', 'New', 'Export', 'Print', 'Spell', 'Check', 'Tables', 'Create Manage', 'Frames/Design', 'Status', 'Filter', 'Delete', 'Current', 'Search', 'Character', 'Paste', 'Cut', 'Copy', 'Full Screen', 'Display', 'Grid', 'Startup', 'Default', 'Language', and 'Menu'. Below the menu bar is a table with six columns representing different implementation statuses: 'No Difference', 'More Protective or Stricter', 'Different in Character or Other Means of Compliance', 'Less Protective or Partially Implemented or Not Implemented', 'Not Applicable', and 'Insufficient Information Provided'. The table contains numerical data for each status. Below the table, there is a section for 'Standard and Recommended Practice' with a search bar and a list of filters (Annex Number, Part/Volume Number, Letter, Reference Number, Status, Type, Sub-Chapter, Section Number, Core Part Number). The main content area displays the text of a specific SARP, including the main provision and two notes.

No Difference	More Protective or Stricter	Different in Character or Other Means of Compliance	Less Protective or Partially Implemented or Not Implemented	Not Applicable	Insufficient Information Provided
31	10	4	0	3	143

Annex Number: 1
Part/Volume Number: 1
Letter: A
Reference Number: 5.2.6.1
Status: Active
Type: Standard
Sub-Chapter: 5
Section Number: 6
Core Part Number: 1

Standard and Recommended Practice

Electrocardiography shall be included in re-examinations of applicants after the age of 50 no less frequently than every two years.

Note 1.—The purpose of routine electrocardiography is case finding. It does not provide sufficient evidence to justify disqualification without further thorough cardiovascular investigation.

Note 2.—Guidance on resting and exercise electrocardiography is contained in the Manual of Civil Aviation Medicine (Doc 8984).

SMART – ENOPA

Electronic Notice of Proposed Amendment



❑ ICAO to:

- ✓ Replace paper-based State letter processing
- ✓ Produce related working paper and State letter
- ✓ Generate various reports related to responses to ENOPA State letters

The screenshot displays the ENOPA web application interface. At the top, the ICAO logo and the text 'International Civil Aviation Organization' are visible. A user greeting 'Welcome Crystal Kim' is on the right. The main content area is titled 'Notice of Proposed Amendments' and 'Search State Letter for State Response'. It includes a search criteria form with fields for State Letter Number, State Letter Year, State Letter Title, Annex Number, and State/Province. A 'Search' button is present. Below the form, a 'Search Result' table is shown with columns for Action, State Letter Number, State Letter Date, State Letter Title, and Annex Number. The table contains four rows of test data.

Action	State Letter Number	State Letter Date	State Letter Title	Annex Number
	Test010	7/6/2011	Annex 10	10-1
	Test005	7/14/2011	Test005	6-1.18
	Test004	6/30/2011	Test004	6-1
	Test002	7/12/2011	Test002	6-1.18

SMART – ENOPA

Electronic Notice of Proposed Amendment



States to:

- ✓ View amendments in progress
- ✓ Provide comments to State letter
- ✓ View history of State responses to amendments
- ✓ View other States' comments

The screenshot displays the SMART – ENOPA web application interface. The header includes the ICAO logo and the text 'International Civil Aviation Organization'. A user greeting 'Welcome Crystal Kim' is visible. The main content area is titled 'Notice of Proposed Amendments' and features a 'Search State Letter for State Response' section. This section includes a 'Search Criteria' form with fields for 'State Letter Number', 'State Letter Year', 'State Letter Title', 'Annex Number', and 'State/Province'. A 'Search' button is located next to the 'State/Province' field. Below the search form is a 'Search Result' table with columns for 'Action', 'State Letter Number', 'State Letter Date', 'State Letter Title', and 'Annex Number'. The table contains five rows of data, each with a pencil icon in the 'Action' column.

Action	State Letter Number	State Letter Date	State Letter Title	Annex Number
	Test010	7/6/2011	Annex 10	10-1
	Test005	7/14/2011	Test005	6-1.18
	Test004	6/30/2011	Test004	6-1
	Test002	7/12/2011	Test002	6-1.18

SMART – EFOD

Electronic Filing of Differences



STATES shall give immediate notification to ICAO of the differences between its own practice and that established by the international standard

Article 36

Photographic apparatus

Each contracting State may prohibit or regulate the use of photographic apparatus in aircraft over its territory.

CHAPTER VI

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

Article 37

Adoption of international standards and procedures

Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulation, standards, procedures, and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve navigation.

To this end the International Civil Aviation Organization shall adopt and amend from time to time, as may be necessary,

Article 38

International standards

Any State which finds it impracticable to comply in all respects with such international standard or procedure, or to bring its own regulations or practices into full accord with any international standard or procedure after amendment of the latter, or which deems it necessary to adopt regulations or practices differing in any particular respect from those established by an international standard, shall give immediate notification to the International Civil Aviation Organization of the differences between its own practice and that established by the international standard. In the case of amendments to international standards, any State which does not make the appropriate amendments to its own regulations or practices shall give notice to the Council within sixty days of the adoption of the amendment to the international standard, or indicate the action which it proposes to take. In any such case, the Council shall make immediate notification to all other States of the difference which exists between one or more features of an international standard and national practice of that State.

COUNCIL shall make immediate notification to all other States of the difference



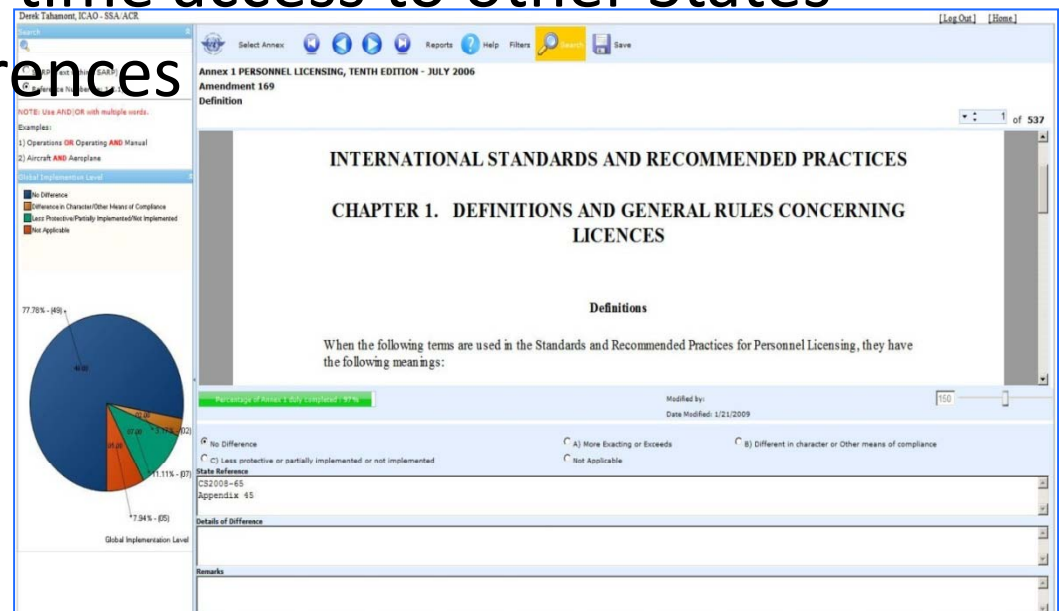
SMART – EFOD

Electronic Filing of Differences



□ States and ICAO to:

- ✓ Replace paper-based filing of differences
- ✓ Generate various reports related to States' compliance and difference information
- ✓ On-demand and real-time access to other States' compliance and differences



OASIS

Online Aircraft Safety Information System

STATES undertakes to supply, ..., on demand, information concerning the registration and ownership of any particular aircraft registered in that State.

In addition, each contracting State shall furnish report International Civil Aviation Organization, under regulations as the latter may prescribe, giving such pertinent information as can be made available concerning the ownership and control of aircraft registered in that State and habitually engaged in international air navigation. The data thus obtained International Civil Aviation Organization shall be available by it on request to the other contracting States

CHAPTER IV

MEASURES TO FACILITATE AIR NAVIGATION

Article 22

Facilitation of formalities

Each contracting State agrees to adopt all practical measures, through the issuance of special regulations otherwise, to facilitate and expedite navigation by between the territories of contracting States, and to unnecessary delays to aircraft, crews, passengers and especially in the administration of the laws relating to immigration, quarantine, customs and clearance.

Article 23

Customs and immigration procedures

Each contracting State undertakes, so far as it may find practicable, to establish customs and immigration procedures

Chaque État contractant s'engage, dans la mesure où il le juge réalisable, à établir des règlements de douane et

Article 21

Each contracting State undertakes to supply to any other contracting State or to the International Civil Aviation Organization, on demand, information concerning the registration and ownership of any particular aircraft registered in that State. In addition, each contracting State shall furnish reports to the International Civil Aviation Organization, under such regulations as the latter may prescribe, giving such pertinent data as can be made available concerning the ownership and control of aircraft registered in that State and habitually engaged in international air navigation. The data thus obtained by the International Civil Aviation Organization shall be available by it on request to the other contracting States

The data thus obtained by the ICAO shall be made available by it on request to the other contracting States



OASIS

Online Aircraft Safety Information System

☐ Civil Aviation Authorities

✓ Inspectors

☐ Air Operators

☐ Regional safety oversight organizations (RSOOs)

Expectation : be informed of the safety related information by Aircraft

1.Look up Aircraft history

2.Who Registered a/c

3.Who issued AOC

4.What is the A/C capabilities

5.What are the difference filed by the State of Registry and Operators

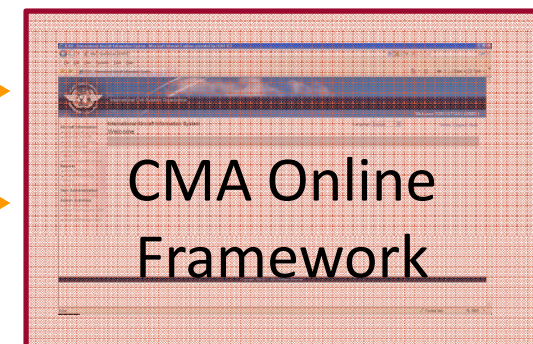
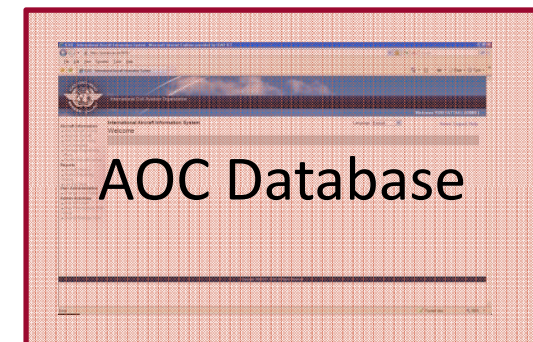
6.What are the relevant audit results for the State of Registry and Operators



OASIS

Online Aircraft Safety Information System

- ✓ Look up Aircraft history
- ✓ Who Registered A/C
- ✓ Who issues AOC
- ✓ What is the A/C capabilities
- ✓ What are the differences filed by State of Registry and Operators
- ✓ What are the relevant audit results for State of Registry and Operators



GIS (Geographic Information System) Tools

□ Primary Objectives

- ✓ Enable electronic Air Navigation Planning
- ✓ Provide safety information through correlation of data by common geographic reference

□ Secondary

- ✓ Present non-safety related reference information on a map



GIS (Geographic Information System) Tools

❑ Electronic ANP

- ✓ Still under development but can be used to find latest ANPs

❑ GIS Safety Tools

- ✓ Partly embedded on iSTARS
- ✓ Language proficiency

❑ Others



ECCAIRS European Co-ordination Centre for Aviation Incident Reporting Systems



CHAPTER 8. ACCIDENT PREVENTION MEASURES

Note.—The objective of these specifications is to promote accident prevention by collection and analysis of safety data and by a prompt exchange of safety information, as part of the State safety programme.

Incident reporting systems

8.1 A State shall establish a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies.

8.2 A State shall establish a voluntary incident reporting system to facilitate collection of information on actual or potential safety deficiencies that may not be captured by the mandatory incident reporting system.

Note.—States are encouraged to establish other safety data collection and processing systems to collect safety information that may not be captured by the incident reporting systems mentioned in 8.1 and 8.2 above.

8.3 A voluntary incident reporting system shall be non-punitive and afford protection to the sources of the information.

Note 1.—A non-punitive environment is fundamental to voluntary reporting.

Note 2.—States are encouraged to facilitate and promote the voluntary reporting of events that could affect aviation safety by adjusting their applicable laws, regulations and policies, as necessary.

Note 3.—Guidance related to both mandatory and voluntary incident reporting systems is contained in the Safety Management Manual (SMM) (Doc 9839).

Note 4.—Attachment E contains legal guidance for the protection of information from safety data collection and processing systems.

Database systems and analysis — Preventive actions

8.4 A State shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies obtained, including that from its incident reporting systems, and to determine any preventive actions required.

8.5 **Recommendation.**—The database systems should use standardized formats to facilitate data exchange.

Note 1.—Guidance material related to the specification for such databases will be provided by ICAO upon request from States.

Note 2.—States are encouraged to foster regional arrangements, as appropriate, when implementing 8.4.

Note 3.—Additional information on which to base preventive actions may be contained in the Final Reports on investigated accidents and incidents.

Note 4.—States are encouraged to use an ADREP-compatible system for accident/incident reporting as well as for collecting, storing, and disseminating relevant safety information.

ANNEX 13

S-1

18/11/10

International Standards
and Recommended Practices



Annex 13
to the Convention on
International Civil Aviation

Aircraft Accident and Incident Investigation

This edition incorporates all amendments adopted by the Council prior to 23 February 2010 and supersedes, on 18 November 2010, all previous editions of Annex 13.

For information regarding the applicability of Standards and Recommended Practices, see Chapter 2 and the Foreword.

Tenth Edition
July 2010

International Civil Aviation Organization

❑ ICAO State Safety Programme (SSP) Framework

1. State safety policy and objectives

1.1 State safety legislative framework

1.2 State safety responsibilities and accountabilities

1.3 Accident and incident investigation

1.4 Enforcement policy

2. State safety risk management

2.1 Safety requirements for service providers SMS

2.2 Agreement on service providers safety performance

3. State safety assurance

3.1 Safety oversight

3.2 Safety data collection, analysis and exchange

3.3 Safety data driven targeting of oversight on areas of greater concern or need

4. State safety promotion

4.1 Internal training, communication and dissemination of safety information

4.2 External training, communication and dissemination of safety information

ECCAIRS European Co-ordination Centre for Aviation Incident Reporting Systems



- ❑ Implements fully the ADREP taxonomy
- ❑ Contains full suite of tools to collect, analyze, and exchange safety data
- ❑ Currently being used/evaluated by 53 States and 16 International Organizations representing all regions

❑ FREE for:

- States
- Int'l Organizations
- Civil aviation related entities

The screenshot displays the ECCAIRS Browser interface with a query result for a specific incident. The interface includes a sidebar with a tree view of data categories, a main panel showing incident details, and a bottom table listing multiple incidents.

Incident Details:

- File Information:** Not applicable, 9999544, Date entered: 27/07/09, Reporting org: EASA
- Occurrence report:** Report identification: 27/07/09 05:47:13, Report status: Open, Report source: Mode, Date report created: 27/07/09 05:44:33
- ATM relation:** ATM contribution: Effect on ATM service
- Where:** Local date: 25/07/09, UTC date: 27/07/09, Location: India, Latitude of occ: approach to Mumbai, Longitude of occ: approach to Mumbai
- Classification:** Occurrence class: Incident, Occurrence category: SCF-AP: System/component failure or malfunction (non-powerplant)
- Severity:** Damage aircraft: None, Damage aircraft: Injury level: None

Table with 14 columns: State identifier, Report identification, State reporting, Occurrence class, Date/time of occurrence, Location of occ, Local date, UTC date, Manufacturer/model, Type designator, Aircraft registration, Operator, Operation type, Call sign.

The table lists several incidents, including those from the United States, Spain, New Zealand, Italy, and the United Kingdom, with details on the aircraft involved and the nature of the incidents.



☐ Fully scalable

- ✓ Could be run from a stand-alone PC or networked Application Server-DB Server-Client configuration

☐ Choice of back end databases eliminates need for new software investments, uses installed enterprise DBs

- ✓ Could run on Oracle, MS-SQL (any version) and/or stand-alone products like MSDE, SQL Express



❑ Suite of products providing:

- ✓ Data entry and retrieval
- ✓ Analysis
- ✓ Utilities
- ✓ System tools
- ✓ Data integration
- ✓ Data dissemination

iSTARS (integrated Safety Trend Analysis and Reporting System)



- ❑ ICAO's initiative to strengthen **predictive safety analysis capabilities** to concentrate efforts on areas of greatest concern
 - ✓ Initially, focused on relationship between accident rates, traffic volume and USOAP results
 - ✓ In a longer term, multi-dimensional safety analyses using diverse data sources



iSTARS (integrated Safety Trend Analysis and Reporting System)



❑ Concept of operation

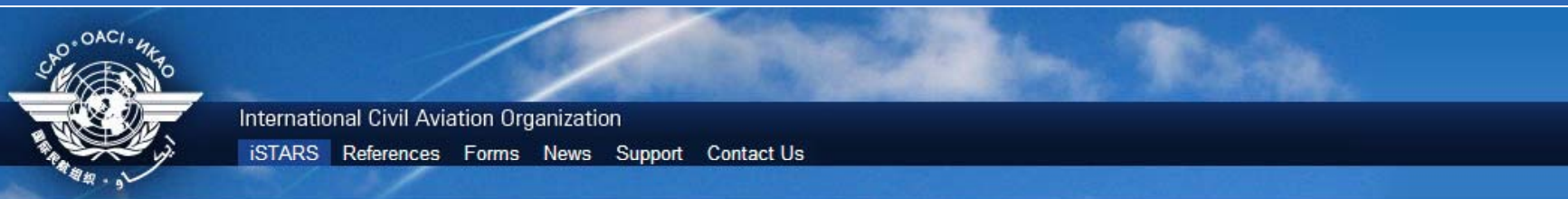
- ✓ create interoperable tools & analysis methods
- ✓ Integrate multiple data sources
- ✓ Leverage existing data & software applications

❑ Level of access

- ✓ Secretariat Site : Development/test site
- ✓ Secure Portal : Full access to restricted information
- ✓ Public : No access to restricted information and data



iSTARS (integrated Safety Trend Analysis and Reporting System)



Feature proposal

Point to point traffic- Provide airport movement data by route (origin - destination airport)



13 users want this feature

News

Title	Date
Pivot table on accident statistics released	23/12/2011
ICAO's First Global Safety Report Available Online	07/12/2011

Occurrences

Compliance

Risks

Accident and Incidents Reporting

Trends

Statistics

Implementation (LEI)

USOAP Questions

Action plans

Traffic

Integrated analysis

Geographical distributions

iSTARS - Occurrences



Occurrences

Reporting, trends and statistics

[Back to Home >](#)

[Report a problem >](#)

ACCIDENTS/INCIDENTS



[All Recent Events](#)

Displays all ADREP occurrences by year



[Runway Safety Events](#)

Displays events which are runway safety related

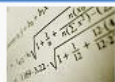
REPORTING



[Occurrence Reporting Instructions](#)

Instructions on how to report accidents and incidents to ICAO

STATISTICS



[Accident Statistics](#)

The list contains yearly high-level statistics on accidents since 2000 as they are available in ADREP



[Pivot table](#)

Pivot table on commercial air transport accident statistics

TRENDS



[Global Accident Rate](#)

View linechart trending the global accident rate in accidents per million flights

iSTARS - Compliances

CHARTS

[Report a problem >](#)

State integrated LEI colored by region - dynamic

Description

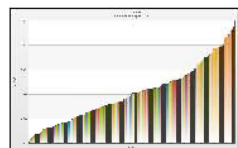
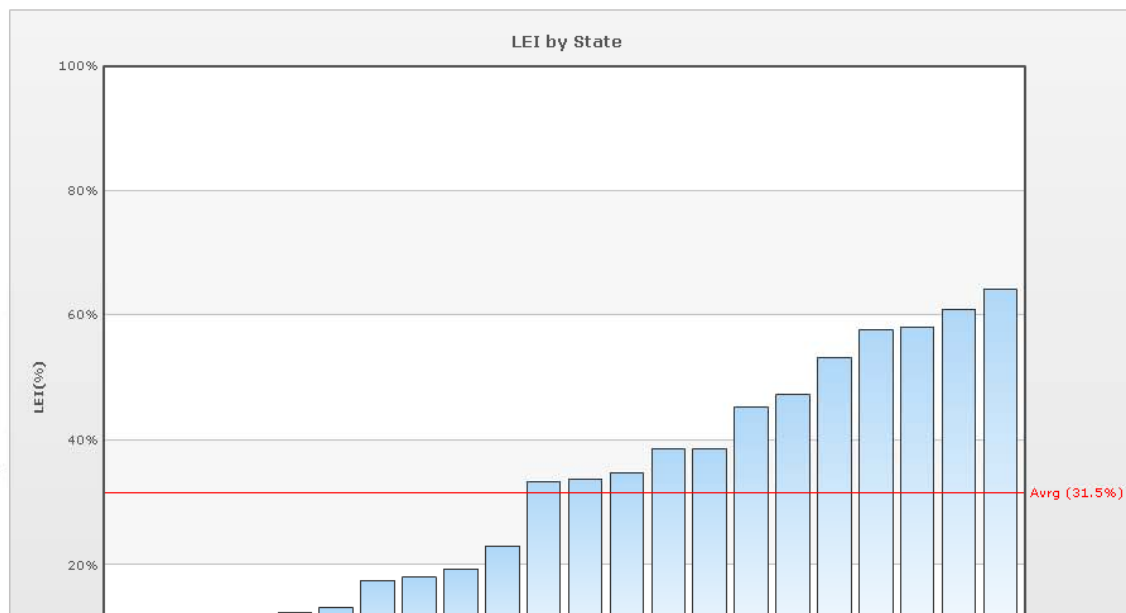
This bar chart displays the integrated lack of effective implementation (I-LEI) by State in ascending order. Each bar represents a State. The color of the bar is defined by the ICAO region to which belongs the State.

You can select a group of States from the drop-down menu. If a specific group of States does not exist, you can create that group through the "Manage my groups" section on the left. you can also view the composition of a selected group.

Select a region

APAC (Merens Marco, 23 hits) All

[View group composition](#)



Dataset: LEI
Last updated: 07/12/2011
Items: 195

Manage my Groups

Add or modify your custom groups of States.

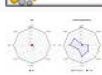
Export Graph

View more charts

Icon Name

 Accident rates versus LEI by ICAO Region

 Occurrence Category Relationship

 USOAP Radar Charts

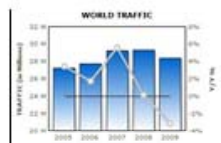
 LEI Column Chart

View data used in this chart

Icon Name

 LEI

iSTARS - Risks



Dataset: State Traffic Data
Last updated: 07/12/2011
Items: 2596

More Tools on Risks

Icon	Name
	State Traffic Charts
	State Traffic Data
	Regional Traffic Data
	Airport movement data

CHARTS

State Traffic Charts

[Report a problem >](#)

Description

This dynamic chart lists all commercial scheduled departures from airports of a given State or Region from 2000 to 2010. To query a specific state, click on the drop down menu and choose a state or region from the list, then click on "Go!". You may also define a start and end year for the analysis.

The left Y-Axis lists the traffic value in Millions, while the right Y-Axis contains the Year-over-year (Y/Y) percentage change comparison.

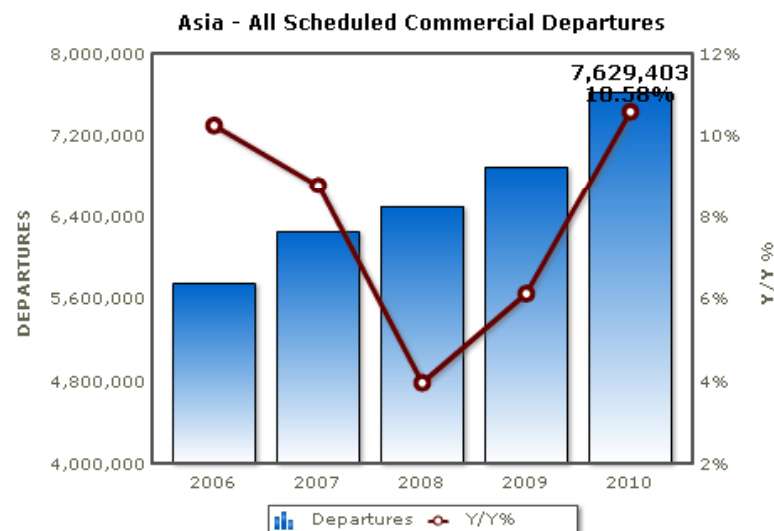
The domestic departures only feature is only available when selecting a State, not a region or the world.

For data used to generate these charts, access the [iSTARS State Traffic Data](#) page.

Choose a State or Region

Asia From 2006 to 2010 as only ☐

[Go](#)



9.3 Training Plan

Training Plan

❑ Online training (2011~2012)

- ✓ Help files, tutorial video, CBT training

❑ On-site training

- ✓ upon request by State(s) and on a cost-recovery basis

Tools	Duration	Note
ECCAIRS (Technical)	3 days	Available now
ECCAIRS (End User)	5 days	Available now
ICARD	3 days	Available now
SMART + CMA online Framework + iSTARS	5 days	To be available in 2 nd half of 2012
OASIS	2 days	
EANP	5 days	

9.4 Safety Tools User Group

Safety Tools User Group (STUG)

☐ Scope

- ✓ Provide valuable input for new and/or enhanced changes for the electronic safety tools
- ✓ Participate in the development of user requirements and testing of B-versions

☐ Membership

- ✓ Nominated representatives from States and international organizations

☐ Reference

- ✓ (State letter AN2/28-11/58)



STUG Portal

STUG HOMEPAGE

SAFETY TOOL GROUPS

- ▶ SMART
- ▶ OASIS
- ▶ GIS Tools
- ▶ ISTARS
- ▶ ECCAIRS

SUB-SITES

- ▶ Filing of Differences Task Force (FDTF)

ADMIN LINKS

- ▶ STUG Library

 Recycle Bin

ICAO SAFETY TOOLS USER GROUP (STUG) PORTAL

WHAT CAN I DO IN THE STUG PORTAL?



[More Information About STUG »](#)

The STUG portal is used to facilitate and collect feedback from the States for the several online tools related to aviation safety. The STUG portal provide States a means to:

- Try and test out the aviation safety tools currently in development
- Access and download documents / training material related to aviation safety tools
- View project milestones and training events
- Give feedback to ICAO on how to improve the safety tools
- Discuss ideas and/or concerns with the rest of the STUG community

AVIATION SAFETY TOOL GROUPS

Each of the actions listed above can be accessed through the individual tool group pages found below.
To navigate to a specific tool group, click on their respective image icon below:

SMART

SARPS Management And Reporting Tools

SMART is a set of tools related to the development and amendment of SARPs, and composed of mainly three components: e-State Letter Consultation (State Letter AN 1/1-10/32 refers); the Management of Amendments to Annexes (Annex Manager); and the Electronic Filing of Differences (EFOD), which will be linked to the Online CMA Framework. [More information »](#)

OASIS

Online Aircraft Safety Information System

OASIS is a set of tools designed to collect and share the following aviation data related to aircraft and air operators: Aircraft Registration System (ARS), Air Operator Certificates (AOCs), Aircraft Type Designators (Doc 8643), and Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services (Doc 8585). It provides a one-stop access to safety data related to aircraft and operators, allowing the ability to enter, validate and modify the data at source. [More information »](#)

GIS TOOLS

GIS Tools are used for interactive and customizable online planning and analysis. These tools facilitate the management of updates and adjustments to

ANNOUNCEMENTS

Title	Date
STUG Portal Official Launch!	19/12/2011

UPCOMING EVENTS

Title	Date
CMA/SAST Regional Seminar and Workshop	16/01/2012
New Modules for Online CMA Framework	16/01/2012
Progress Report to ANC on EFOD	31/01/2012

[Full Calendar View »](#)

Information for:

BETA TESTING

Get to know the community:

List of STUG Members

ICAO

Uniting Aviation on

Safety | Security | Environment

