



International Civil Aviation Organization

ICAO Electronic Safety Tools

3rd RASG-PA Aviation Safety Workshop

Mexico City, Mexico, 30 – 31 January 2012

by

Eduardo Chacin

Regional Officer Flight Safety

ICAO

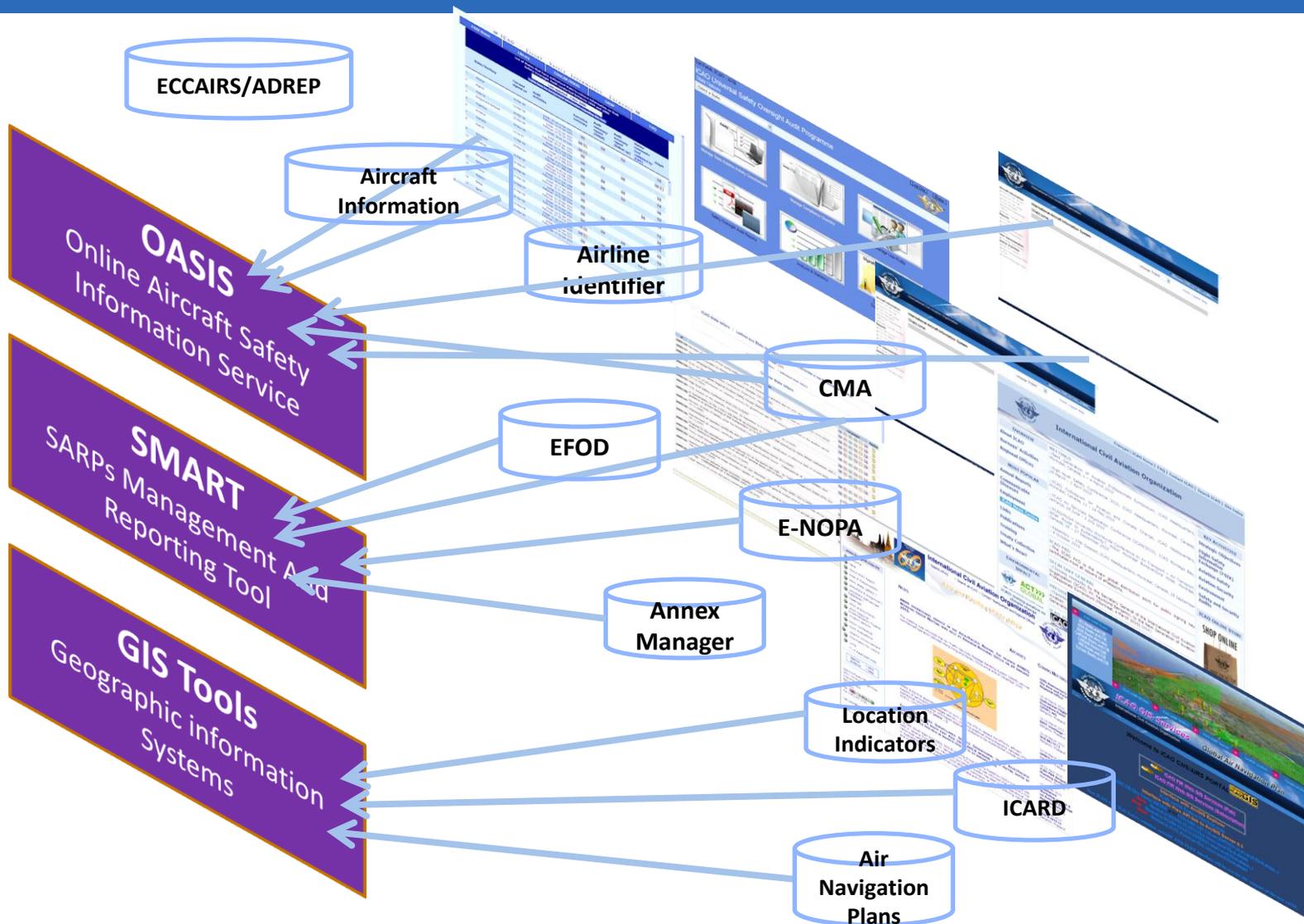
Background

- 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**

Electronic Tools

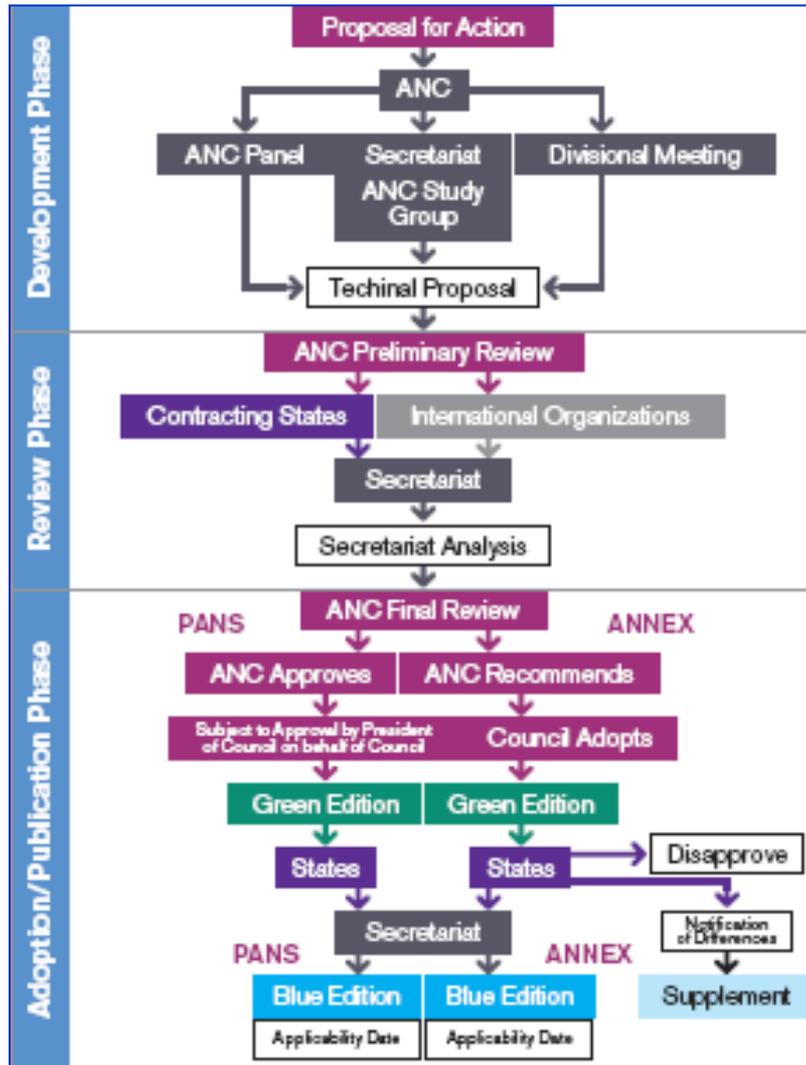
- SMART
- OASIS
- GIS-tools
- ECCAIRS
- iSTARS

Overview



SMART

SARPs Management And Reporting Tools

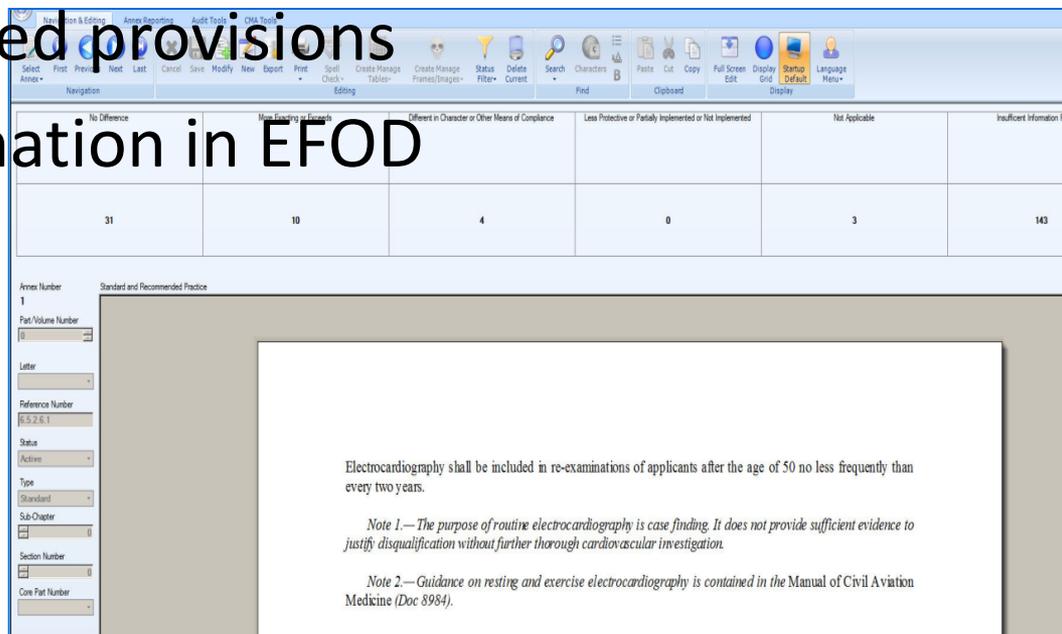


A set of tools that will manage and facilitate following processes:

- 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 Annex', 'Navigation', 'Editing', 'Find', 'Clipboard', 'Full Screen', 'Display Grid', and 'Language Menu'. Below the menu is a summary table showing the distribution of SARPs across different implementation categories.

No Difference	Minor Differences	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

Below the table, the 'Standard and Recommended Practice' section is visible. It includes a sidebar with fields for Annex Number (1), Part/Volume Number (II), Letter, Reference Number (5.2.6.1), Status (Active), Type (Standard), Sub-Chapter, Section Number, and Core Part Number. The main content area displays the following text:

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. The user is logged in as 'Crystal Kim'. The main heading is 'Notice of Proposed Amendments' with a search bar for 'Search State Letter for State Response'. Below this, there are search criteria fields: 'State Letter Number', 'State Letter Year', 'State Letter Title', 'Annex Number', and 'State/Province'. A 'Search' button is present. The search results table is as follows:

Action	State Letter Number	State Letter Date	State Letter Title	Annex Number
	Test010	7/6/2011	Annx 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. At the top, the ICAO logo and the text 'International Civil Aviation Organization' are visible. The user is logged in as 'Crystal Kim'. The main content area is titled 'Notice of Proposed Amendments' and includes a search form for 'Search State Letter for State Response'. The search criteria form has the following fields: State Letter Number (dropdown), State Letter Year (dropdown), State Letter Title (text input), Annex Number (dropdown), and State/Province (dropdown). A 'Search' button is located to the right of the State/Province dropdown. Below the search form is a 'Search Result' table with the following data:

Action	State Letter Number	State Letter Date	State Letter Title	Annex Number
	Test010	7/6/2011	Annx 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 38

International standards

... which finds it impracticable to comply in all 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



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,

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

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

CHAPTER 1. DEFINITIONS AND GENERAL RULES CONCERNING LICENCES

Definitions

When the following terms are used in the Standards and Recommended Practices for Personnel Licensing, they have the following meanings:

Percentage of Annex 1 fully compliant: 77.78%

Modified by: [150] | Data Modified: 1/21/2009

No Difference

More exacting or exceeds

Different in character or Other means of compliance

Less protective or partially implemented or not implemented

Not Applicable

State Reference: C32005-65, Appendix 45

Details of Difference

Remarks

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

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 made 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



- 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

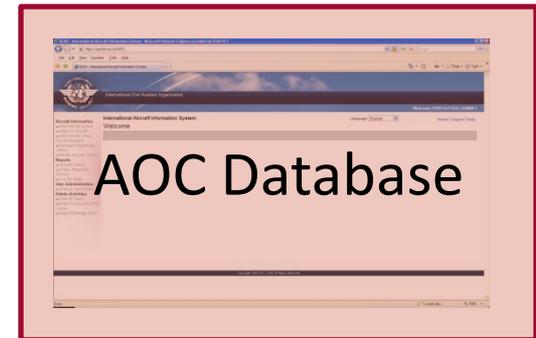
4. What is the A/C capabilities

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



- 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



ECCAIRS European Co-ordination Centre for Aviation Incident Reporting Systems



CHAPTER 7. ADREP REPORTING

Note 1.— Attachment B provides a notification and reporting checklist.

Note 2.— The provisions of this chapter may require two separate reports for any one accident or incident. They are:

Preliminary Report

Accident/Incident Data Report.

PRELIMINARY REPORT

RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

Accidents to aircraft over 2 250 kg

7.1 When the aircraft involved in an accident is of a maximum mass of over 2 250 kg, the State conducting the investigation shall send the Preliminary Report to:

- the State of Registry or the State of Occurrence, as appropriate;
- the State of the Operator;
- the State of Design;
- the State of Manufacture;
- any State that provided relevant information, significant facilities or experts; and
- the International Civil Aviation Organization.

Accidents to aircraft of 2 250 kg or less

7.2 When an aircraft, not covered by 7.1, is involved in an accident and when airworthiness or matters considered to be of interest to other States are involved, the State conducting the investigation shall forward the Preliminary Report to:

- the State of Registry or the State of Occurrence, as appropriate;
- the State of the Operator;
- the State of Design;
- the State of Manufacture; and
- any State that provided relevant information, significant facilities or experts.

ANNEX 13

7-1

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

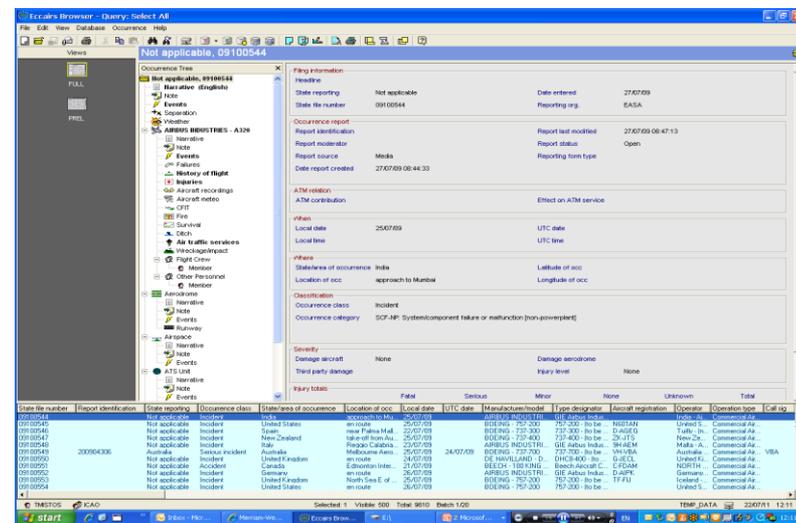
ECCAIRS European Co-ordination Centre for Aviation Incident Reporting Systems



- 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





- 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

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 : www.gis.icao.int/eanp
 - Still under development but can be used to find latest ANPs
- GIS Safety Tools
 - Partly embedded on iSTARS
 - Language proficiency www.gis.icao.int/icaolpr
- Others
 - www.gis.icao.int/map



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)



iSTARS

Secretariat > ANB > ISM > iSTARS



iSTARS

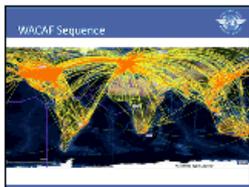
integrated Safety Trend Analysis and Reporting System

Version: alpha
Released: September 28, 2010

Top Features

cription
list displays the results of all States wh
e indicator used to benchmark State at

to	LE	CE-1
ania	58.94%	36.67%
lorra	71.57%	17.24%
gola	77.91%	83.33%
oua and Barbuda	52.78%	13.33%



Contribute

Provide comments, maps, charts, documentation. Update accident data.

Query

View USOAP audit results, accident data and many more

Explore

View maps, reports, research and analysis results as well as charts.



ADREP

Accidents and Incidents by Year

Description

ADREP contains all official accident and incidents which were officially notified to ICAO by the States as per ICAO Annex 13 since 1st of January 2005. The records are grouped by year of occurrence.

The list also contains unofficial reports, collected by ICAO through other sources. These unofficial reports (field called "Validity") still need to be validated by the State of occurrence.

Category: ADREP
 Last updated: 24 September, 2010
 Datafields: 25
 2.2 MB

[EXPORT THIS VIEW](#)

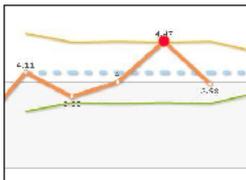
More views of ADREP

-  All Recent Events
-  Runway Safety Events
-  Occurrence Categories Causal Relationships

View charts using this data

-  Global Accident Rate
-  Accident rates versus LEI by ICAO Region

Local Date	Headline	Aircraft Type	Aircraft Registration	Operator	Total Fatalities	Location of Occurrence	State of Occurrence	Occurrence Class	Local Year
Count = 7157					Sum = 6,947				
22/09/2010	Al Atheer Aviation Incident on 22/09/10 in near Jeddah, Saudi Arabia	AIRBUS INDUSTRIES >> A310	HZ-NSA	Al Atheer Aviation		near Jeddah	Saudi Arabia	Incident	2,010
15/09/2010	Landing gear collapse after hard landing	DE HAVILLAND >> DHC8	LN-WIF	Wideroe's Flyveselskap A/S		Stokka	Norway	Accident	2,010
13/09/2010	CONVIASA Accident on 13/09/10 in 7nm from VOR GNA, Venezuela	AVIONS DE TRANSPORT REGIONAL >> ATR 42-300	YV1010	CONVIASA	17	7nm from VOR GNA	Venezuela	Accident	2,010
12/09/2010	Left wing struck vegetation next to the road on landing.	CESSNA >> 402	ZS-LXB	Private		Public road R64 Dealsville	South Africa	Serious incident	2,010
10/09/2010	Airprox SWR75PE/A939	SAAB >> 2000	HB-IZJ	DARWIN AIRLINE SA		Lugano CTR	Switzerland	Serious incident	2,010
10/09/2010	Airprox SWR75PE/A939	PILATUS >> PC-7	A939	Swiss Air Force		Lugano CTR	Switzerland	Serious incident	2,010
09/09/2010	Rejected takeoff due to engine nr.4 stall with engine nr.2 stall during thrust reverse action.	ANTONOV >> AN-124	RA82079	Volga-Dnepr		LIMF	Italy	Serious incident	2,010



CHARTS

Global Accident Rate

Description

This linechart shows the trend of the global accident rate. Only commercial scheduled flights were taken into account, including passenger and cargo flights. Accidents are as defined by Annex 13, including fatal and non fatal accidents.

The chart is dynamic and can only be captured through the built-in print screen function (screenshot) or any other screen capture utility you may have installed.

[Back to Explore >](#)

[Report a problem >](#)

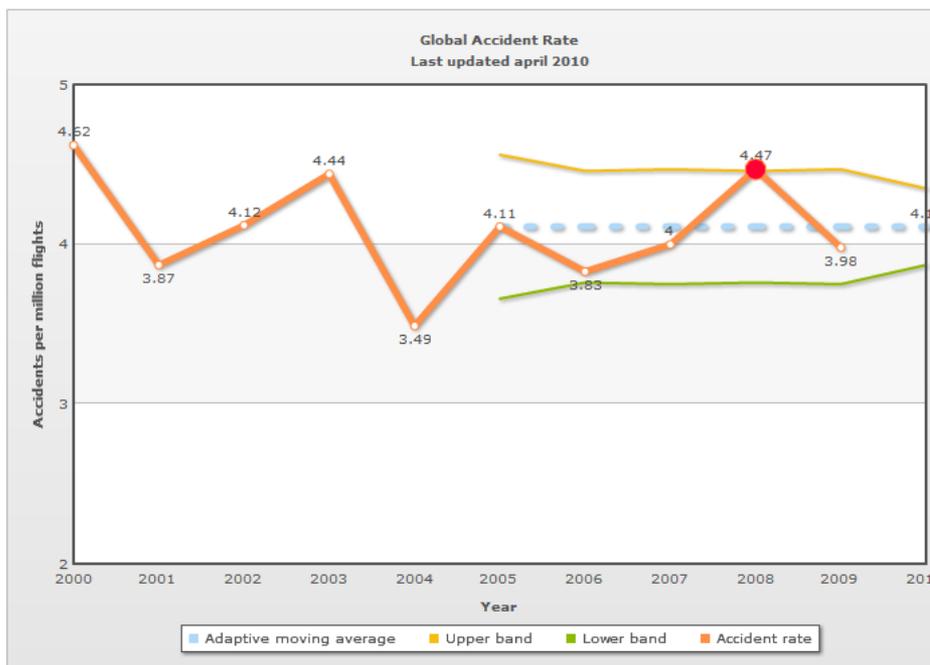
Category: Charts
 Created: April 2010
 Published: HLSC, April 2010
 Author: Marco Merens

View more charts

- | Icon | Name |
|------|--|
| | LEI by State |
| | LEI by State (dynamic) |
| | Accident rates versus LEI by ICAO Region |
| | LEI vs Traffic |
| | Occurrence Category Relationship |

View data used in this chart

- | Icon | Name |
|------|-------------------|
| | All Recent Events |



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	

Conclusion: ICAO Electronic Safety Tools

- That States, Territories, International Organizations and industry:
 - support ICAO's strategy of developing, improving and expanding the safety tools;
 - promote the use of ICAO Safety Tools among the aviation community; and
 - encourage States to provide safety data as required in a timely and reliable manner through ICAO electronic safety tools with the purpose of enhancing safety.

Support the ICAO Electronic Safety Tools initiative

Contact: echacin@icao.int

Visit: www.icao.mexico.int

www.icao.int

Thank You!