AVIATION SAFETY DATA COLLECTION AND PROCESSING (SDCP) - ECCAIRS SOFTWARE

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June 2011

Outline

- Safety Management System (SMS)
- ICAO Annexes and SARPs
- ECCAIRS
- Singapore's Experience on SDCP
  - Singapore Aviation Accident/Incident Reporting System (SAIRS)

Safety Management System (SMS)

4 Components & 12 Elements

1 Safety Policy and Objectives

a) Management commitment and responsibility
b) Safety accountabilities of managers
c) Appointment of key safety personnel
d) Emergency response planning
e) SMS Documentation

2 Safety Risk Management*

f) Hazard identification processes (HI)
   - Causal Factor
g) Risk assessment and mitigation processes (RA)
   - Preventive Measure

4 Components & 12 Elements

3 Safety Assurance*

h) Safety performance monitoring and measurement (SPI)
- Monitoring and Measurement: Trending and Analysis

i) Management of change

j) Continuous improvement and audit

4 Safety Promotion

k) Training and education

l) Safety Communication

Traditional vs Present-day
(Hazard & Risk)

- Traditional “System Safety”
  - focused on safety implication of technical aspects

- Present-day “Safety Management”
  - builds on system safety, and
  - include Human Factors and Human Performance as key safety consideration

Annex 8:

Human Factors principles = *Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.*

Human performance = *Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.*

SHELL Model – Human Performance

- ***Liveware-Hardware (L-H).***

  - interface between the human and technology
  - determines how the human interfaces with the physical work environment

  Example:

  Design of seats to fit the sitting characteristics of the human body, displays to match the sensory and information processing characteristics of the user etc

SHELL Model – Human Performance

- ***Liveware-Software (L-S).***

  - interface between the human and the supporting systems found in the workplace

  Example:

  Regulations, manuals, checklists, publications, standard operating procedures (SOPs) and computer software etc

SHELL Model – Human Performance

- ***Liveware-Liveware (L-L).***

  - interface between the human and other persons in the workplace
  - include Staff/management relationships, as are corporate culture, corporate climate and company operating pressures

  Example:

  Flight crews, air traffic controllers, aircraft maintenance engineers and other operational personnel etc

SHELL Model – Human Performance

- ***Liveware-Environment (L-E).***

  - interface between the human and both the internal and external environments

  Internal environment
  - workplace temperature, ambient light, noise, vibration and air quality etc

  External environment
  - visibility, turbulence and terrain etc

Next Step

After knowing the “WHY” !!!

- Casual Factor
- Preventive Measure
- Monitoring and Measurement
  > Trend and Analysis

“WHAT’s” the expectation ???

ICAO Annexes and SARPs

ICAO USOAP Protocol Questions

1. AIG 6.507

   Has the State established an *accident and incident database* for facilitating the *effective analysis* of information obtained, including that from its accident and incident reporting systems?

2. AIG 6.509

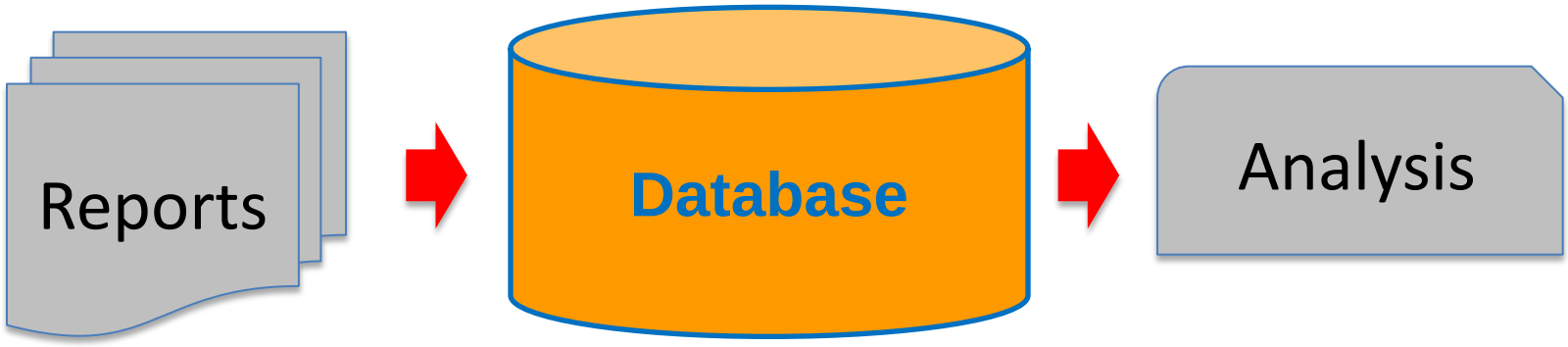
   If yes, is the database created in a *standardized format* to facilitate *data exchange*? (Verify if the taxonomy is compatible with ADREP/ECCAIRS).

3. AIG 6.511

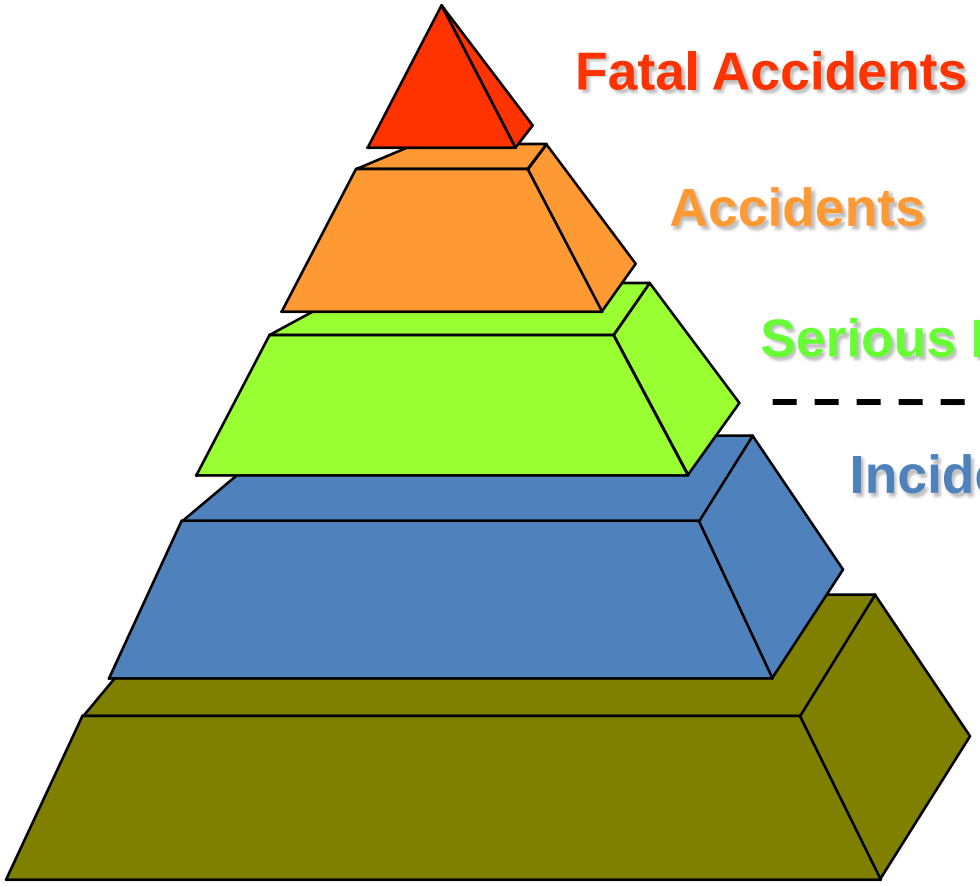
   Does the State *analyze the information* contained in its accident/ incident reports and the database to determine any *preventative actions* required?

AIG 6.507

Has the State established an *accident and incident database* for facilitating the *effective analysis* of information obtained, including that from its accident and incident reporting systems?



The Safety Pyramid – Data Driven



Fatal Accidents

Accidents

Serious Incidents

Incidents

Reportable Occurrences

ICAO ADREP System (Annex 13)

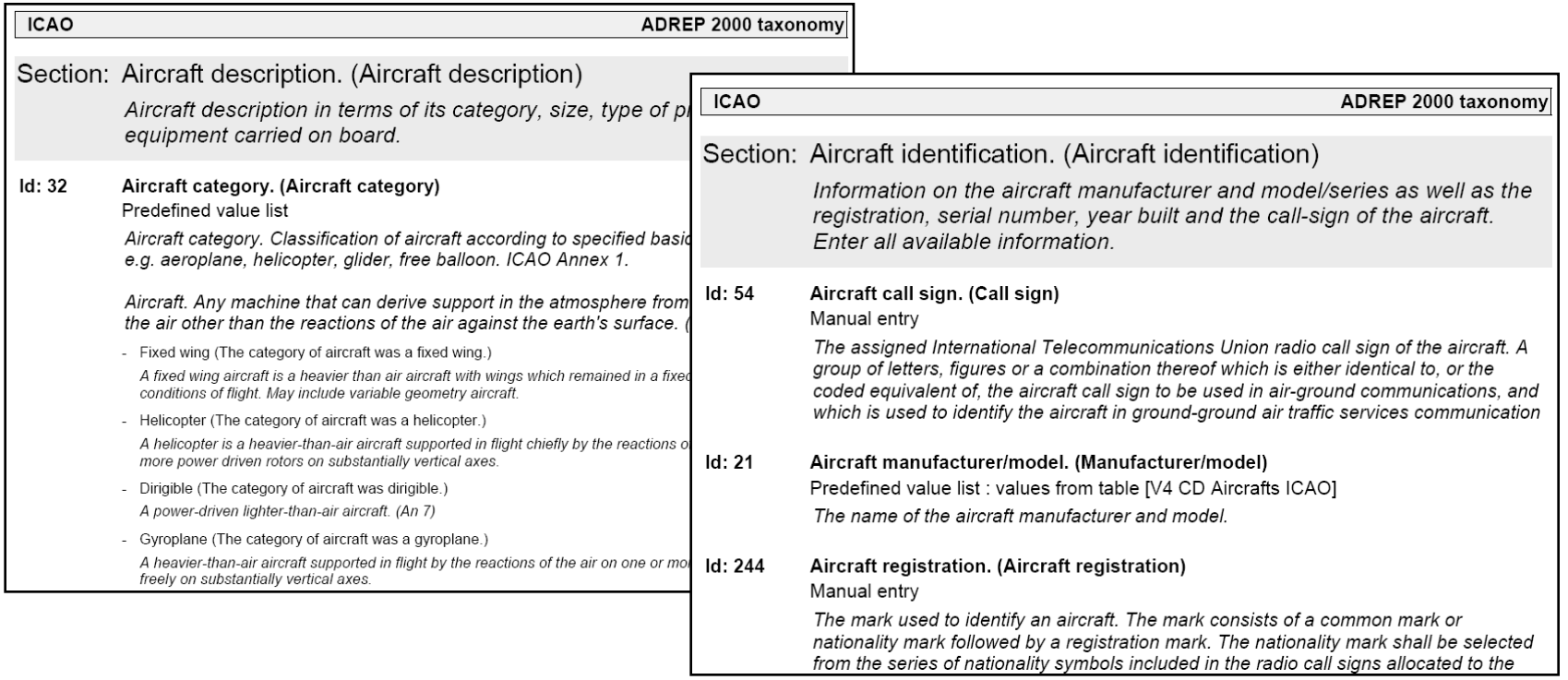
Beyond ADREP

Additional Prevention without any harmful consequence

“ DO NOT FOCUS ONLY ON THE CONSEQUENTIAL EVENTS ”

AIG 6.509

If yes, is the database created in a *standardized format* to facilitate *data exchange*? (Verify if the taxonomy is compatible with ADREP/ECCAIRS).



ICAO — ADREP 2000 taxonomy

Section: Aircraft description. (Aircraft description)

Aircraft description in terms of its category, size, type of pr
equipment carried on board.

Id: 32 **Aircraft category. (Aircraft category)**

Predefined value list

Aircraft category. Classification of aircraft according to specified basic
e.g. aeroplane, helicopter, glider, free balloon. ICAO Annex 1.

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

- Fixed wing (The category of aircraft was a fixed wing.)
  A fixed wing aircraft is a heavier than air aircraft with wings which remained in a fixed
  conditions of flight. May include variable geometry aircraft.
- Helicopter (The category of aircraft was a helicopter.)
  A helicopter is a heavier-than-air aircraft supported in flight chiefly by the reactions o
  more power driven rotors on substantially vertical axes.
- Dirigible (The category of aircraft was dirigible.)
  A power-driven lighter-than-air aircraft. (An 7)
- Gyroplane (The category of aircraft was a gyroplane.)
  A heavier-than-air aircraft supported in flight by the reactions of the air on one or mo
  freely on substantially vertical axes.

ICAO — ADREP 2000 taxonomy

Section: Aircraft identification. (Aircraft identification)

Information on the aircraft manufacturer and model/series as well as the registration, serial number, year built and the call-sign of the aircraft. Enter all available information.

Id: 54 **Aircraft call sign. (Call sign)**

Manual entry

The assigned International Telecommunications Union radio call sign of the aircraft. A group of letters, figures or a combination thereof which is either identical to, or the coded equivalent of, the aircraft call sign to be used in air-ground communications, and which is used to identify the aircraft in ground-ground air traffic services communication

Id: 21 **Aircraft manufacturer/model. (Manufacturer/model)**

Predefined value list : values from table [V4 CD Aircrafts ICAO]

The name of the aircraft manufacturer and model.

Id: 244 **Aircraft registration. (Aircraft registration)**

Manual entry

The mark used to identify an aircraft. The mark consists of a common mark or nationality mark followed by a registration mark. The nationality mark shall be selected from the series of nationality symbols included in the radio call signs allocated to the

ICAO ADREP Background

- **In 1971, Air Navigation Commission (ANC) noted the need to "determine the most satisfactory method of reporting information from inquiries into aircraft accidents and incidents"**
- **In 1972, ADREP panel "Terms of Reference" established.**
- **In 1974 Accident Investigation and Prevention (AIG) divisional meeting recommended to develop a data system**
- **ADREP First Generation (1976)**

  - Based on US NTSB data reporting system
- **ADREP Second Generation (1987)**

  - Improved factor system (ie. no blame factor, human factor, org factor etc)
- **ADREP Third Generation (2000)**

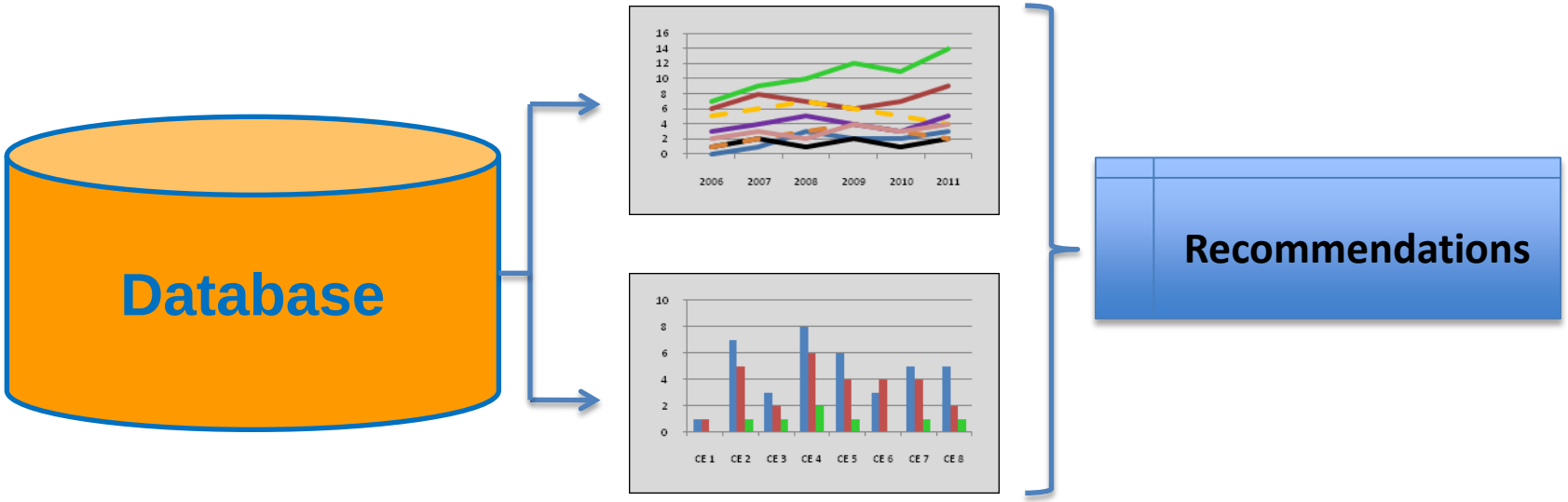
  - New definitions / New taxonomies
  - New Software

ICAO ADREP 2000 Taxonomy

- Aerodrome
- Air Traffic Services
- Aircraft
- Aircraft Meteo
- Aircraft Recording
- Airspace
- ATM Recording
- ATS Unit
- CFIT
- Ditch
- Events
- Failures
- Fire
- History of flight
- Injuries
- Management
- Member
- Narrative
- Note
- Occurrence
- Recommendations
- Runway
- Sector
- Separation
- Survival
- Weather
- Wreckage / Impact

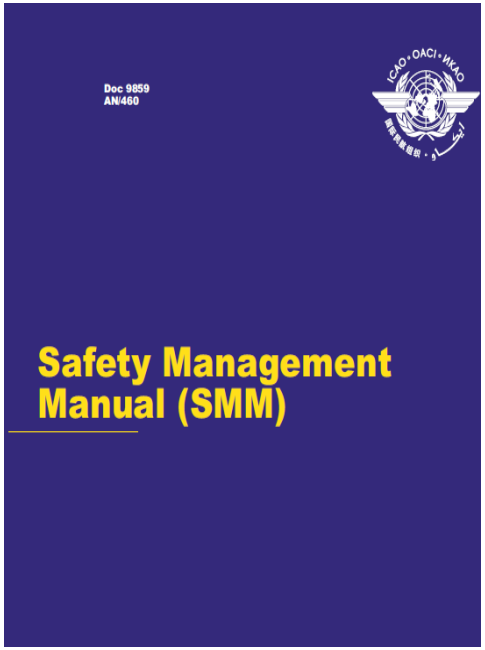
AIG 6.511

Does the State *analyze the information* contained in its accident/ incident reports and the database to determine any *preventative actions* required?



Safety Management Manual

ICAO Doc 9859



- **Quantification of the outcomes**
  - *Number of TCAS events per number of departures*
  - *Number of FOD events per number of ramp operations*
- **Safety Performance Measurement**
  - *Safety Performance Indicator (SPI)*
  - *Safety Performance Target*
  - *Safety Action Plan*
- **Software to support the Analytical Process**
- **ADREP uses ECCAIRS software**
  - *provides States with a database for safety analysis, facilitate safety data exchange and an analytical service.*

ECCAIRS

European Co-ordination Centre
For Aviation Incident Reporting Systems

European Commission
Joint Research Centre
Institute for the Protection and Security of the Citizen

Next Step

After knowing the expectation “WHAT” !!!

- Database
- Standardise Format
- Data Exchange
- Data Analysis
- Preventive Actions

“HOW” to do it ???

ECCAIRS Software

European Commission
Joint Research Centre
Institute for the Protection and Security of the Citizen

ECCAIRS
European Coordination Centre for Accident and Incident Reporting System

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- Products
- Collaboration
- Support
- Training
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Search

http://eccairsportal.jrc.ec.europa.eu/

Software is free-of-charge

"The mission of ECCAIRS is to assist National and European transport entities in collecting, sharing and analysing their safety information in order to improve public transport safety"

Latest Media News

Etihad to launch flights to Baghdad

19 Apr 2010 5:31:00 AM CEST
ABU DHABI: Abu Dhabi s national carrier, Etihad Airways, on Sunday announced plans to launch weekly flights to war-ravaged Iraq starting from April 26.

Airlines query flight ban as travel misery spreads

19 Apr 2010 5:31:00 AM CEST
LONDON: A cloud of volcanic ash tightened its grip on Europe s skies on Sunday, but amid a fourth day of global travel misery airlines carried out test flights and pressed for passenger jets to fly again.

ECCAIRS Events

<< April, 2010 >>

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Legend

Latest ECCAIRS News

Switzerland joins EU integration

14.04.10 12:03

On 12 April 2010 Switzerland joined the other 24 States, which were already integrating their data...

EU AIB's	Installed	Status
Austria	4.2.7 SP1	Operating
Belgium		
Bulgaria	4.2.6 SP1 HF1	Operating
Cyprus		
Czech Republic	4.2.7	Operating
Denmark	4.2.7 SP1 HF2	Operating
Estonia	4.2.6	Operating
Finland	4.2.7	Evaluating
France	4.2.7 SP1 HF2	Operating
Germany	4.2.6 SP1 HF1	Operating
Greece		
Hungary	4.2.7	Operating
Ireland	4.2.7 SP1 HF2	Operating
Italy	4.2.7 SP1 HF2	
Latvia	4.2.7	Operating
Lithuania		
Luxembourg		
Malta		
Netherlands	4.2.6 SP1 HF1	Operating
Poland		
Portugal		
Romania	4.2.6	Operating
Slovakia	4.2.7	Evaluating
Slovenia	4.2.6 SP1	Operating
Spain	4.2.6 SP1	Operating
Sweden		
United Kingdom		

EU CAA's	Installed	Status
Austria	4.2.7 SP1 HF1	Evaluating
Belgium	4.2.7 SP1 HF2	Operating
Bulgaria	4.2.6 SP1 HF1	Operating
Cyprus	4.2.6 SP1 HF1	Operating
Czech Republic	4.2.6 SP1 HF1	Evaluating
Denmark		
Estonia	4.2.7 SP1 HF2	Operating
Finland	4.2.7	Operating
France	4.2.7 SP1 HF2	Operating
Germany	4.2.7 SP1	Operating
Greece	4.2.7 SP1 HF2	Operating
Hungary		
Ireland	4.2.7 SP1 HF2	Operating
Italy	4.2.7	Operating
Latvia	4.2.7 SP1 HF2	Operating
Lithuania	4.2.7 SP1	Operating
Luxembourg	4.2.6 SP1 HF1	Operating
Malta		
Netherlands	4.2.7	Operating
Poland	4.2.7 SP1 HF2	Operating
Portugal	4.2.7 SP1 HF1	Operating
Romania		
Slovakia	4.2.6	Evaluating
Slovenia		
Spain	4.2.7 SP1 HF1	Operating
Sweden	4.2.7 SP1 HF2	Operating
United Kingdom	4.2.6	Evaluating

EU ANSP's	Installed	Status
Austria		
France	4.2.7	Evaluating
Germany	4.2.7 SP1 HF2	Operating
Hungary		
Poland		
Romania		
Spain		
Sweden		

Others	Installed	Status
AeroLogic GmbH	4.2.7 SP1	Evaluating
Institute of Aerospace Engineering, Brno University of Technology	4.2.7	Operating
DLR - German Aerospace Center	4.2.7 SP1 HF2	Evaluating
Joint Research Centre - Institute for Protection and Security of the Citizen	4.2.7 SP1 HF2	Operating
National Aerospace Laboratory (NLR)	4.2.7 SP1 HF2	Operating
Slovak Armed Forces	4.2.7 SP1 HF2	
Eurocontrol	4.2.6	Evaluating
EASA - European Aviation Safety Agency	4.2.7 SP1 HF2	Operating
ISDEFE	4.2.7 SP1 HF2	
Avanssa	4.2.7	Operating
International Civil Aviation Organization (ICAO)	4.2.6	Operating
United Nations Aviation Safety Section - UNHQ	4.2.7 SP1	Evaluating
Air Line Pilots Association (ALPA)	4.2.7	Operating

Non EU Auth./AIB/CAA/ANSP	Installed	Status
AIB Australia	4.2.6 SP1 HF1	Evaluating
AIB Brazil	4.2.6	Operating
AIB Canada	4.2.7	Evaluating
AIB Egypt	4.2.6 SP1	Evaluating
AIB Iceland	4.2.6 SP1 HF1	Operating
AIB Korea Republic of	4.2.6	Operating
AIB Mexico	4.2.6 SP1 HF1	Operating
AIB Russian Federation	4.2.6 SP1	Evaluating
AIB Singapore	4.2.6	Evaluating
AIB Switzerland	4.2.6	Operating
AIB Taiwan Island	4.2.6 SP1	Evaluating
AIB United States	4.2.7 SP1 HF2	Evaluating
AIB Venezuela	4.2.7	Operating
CAA Australia	4.2.7	Operating
CAA Bahamas	4.2.7	Evaluating
CAA Chile	4.2.7	Operating
CAA El Salvador	4.2.6	Operating
CAA Iceland	4.2.7 SP1 HF2	Operating
CAA Nicaragua	4.2.5	Operating
CAA Norway	4.2.6 SP1 HF1	Operating
CAA Paraguay	4.2.7	Operating
CAA Singapore	4.2.7	Operating
CAA Switzerland	4.2.7 SP1 HF2	Operating
CAA Thailand	4.2.7	Evaluating
CAA United States	4.2.7	Evaluating
ANSP Congo the Democratic Republic of	4.2.6	Operating
ANSP South Africa	4.2.7 SP1 HF2	Operating

ECCAIRS Community
Products
ECCAIRS 4.2 Family
ECCAIRS 4.3 Family
License Agreement
Collaboration
Support
Training
User Registration

Search

ECCAIRS 4.2 Product Family

The ECCAIRS 4.2 product family is composed of various applications forming together a suite of products allowing organisations to create, maintain and deploy a repository of accident and incident reports. The applications are presented here grouped by their purpose:

Data entry and retrieval

Brower / Query Builder / Taxonomy / Web version etc

Applications and services that can be used to enter accident or incident data in an ECCAIRS repository. **More...**

Analysis

Query Builder / Exporter / Grapher / Agregation Workbench etc

Applications and services that contribute to the analysis of the information stored. **More...**

Utilities

TARGA / ASYA / E4F Generator / E4F Loader etc

Handy litlle applications that perform functions not found in the standard software and useful for end-users of the system. **More...**

De-Identification of Data

System Tools

Applications and services facilitating maintenance of the ECCAIRS system. **More...**

Data integration

Applications and services required to perform integration of data at national and/or european level. **More...**

Data dissemination

Applications and services performing the dissemination of data at organisational, national and/or european level. **More...**

ECCAIRS license agreement

All ECCAIRS products, unless otherwise indicated in the appropriate documentation and setup procedures, are protected by a copyright and license agreement. **More...**

ECCAIRS Community

Products

ECCAIRS 4.2 Family

ECCAIRS 4.3 Family

License Agreement

Collaboration

Support

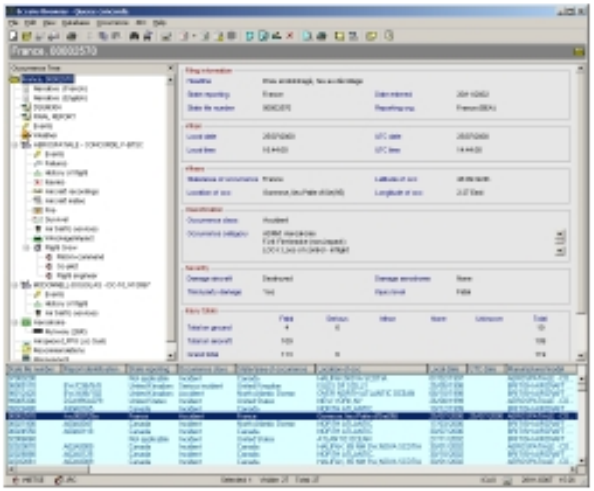
Training

User Registration

Search

Data entry and retrieval

The main fundamental requirement related to the usage of safety data is its availability. For this purpose a tool exist in the ECCAIRS reporting system to collect, store and retrieve information from a database.



Browser

This tool, in ECCAIRS terms, is called the Browser and it is available as a part of the standard installation of ECCAIRS. The Browser application is a customisable frontend to an ECCAIRS Repository and it allows very simple as well as complex 'views' on the data stored in the database and/or in an ECCAIRS data format file (*.E4F or *.E4Z).

Query Builder

The Browser allows an authorised user to insert new and modify existing information. In addition its flexible Query Builder supports the creation of query libraries in which predefined queries can be stored, exchanged and executed. Users have complete freedom in defining their queries. The Query Builder accepts criteria involving any attribute which is part of the current taxonomy. These criteria can be combined using logical operators and brackets. Using these queries and query libraries, the identification and retrieval of specific selected safety data out of a repository becomes very easy and flexible.

Taxonomy

The ECCAIRS system is built upon and implements sstandard taxonomies. Upto and inclusive release 4.2.7 the system has been developed for the aviation transport domain, in particular ICAO's ADREP standards. From version 4.3 onwards the complete ECCAIRS functionality can be exploited on different taxonomies, including, but not limited to, safety taxonomies for the other public transport domains.

Extensibility

In the Windows environment the ECCAIRS Browser functions can be used by other applications and, vice versa, the Browser can make use of custom built extensions that can enhance the functionality and interoperability of the system. Extensions made for the Browser can be shared between the ECCAIRS user community.

Web version

A web enabled version of the ECCAIRS Browser, with

ECCAIRS Community
Products
ECCAIRS 4.2 Family
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Utilities

In addition to the standard functions of the ECCAIRS Browser some additional utilities have been made available facilitating the life of ECCAIRS usres and administrators.

TARGA

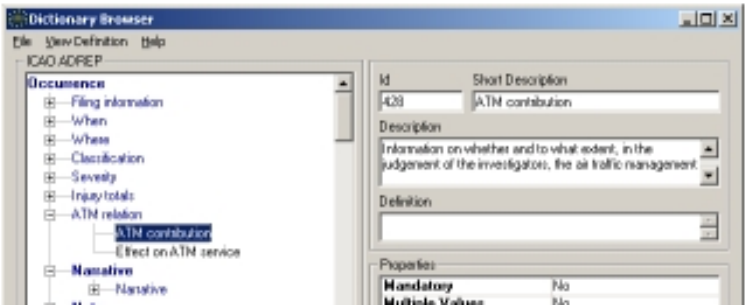
TARGA (The Aircraft Registry Guide Add-In) is an application running on the ECCAIRS Repository Server and using the universal attribute expander add-in of the Browser to facilitat data entry and thus to reduce data inconsistency. TARGA takes care of automatically filling in aircraft characteristics for a particular registered aircraft or for a particular aircraft model. The capabilities of TARGA are determined by the contents of the TARGA database, a database filled and maintained by each organisation, but of which the data anyway can be exchanged with other TARGA users.

ASYA

ASYA (the Aircraft Statistics and Yearly summary Add-In) is an Add-In for the ECCAIRS Browser which gives the user with a simple click of the mouse an overview of the statistics for a particular aircraft and of aviation in general. ASYA is based on requirements developed during the years in ICAO's ADREP information system. On request the source code of ASYA can be made available to organisations that want to develop similar functions.

Attachments

By default ECCAIRS does not allow storage of independent electronic documents related to occurrences. Anticipating a more complete solution in release 4.3, a functionality has been integrated in ECCAIRS 4.2.7 allowing organisations to maintain a parallel database of these documents. Like TARGA, attachments consists of an application at the server side complemented by a standard ECCAIRS Add-In preinstalled in the ECCAIRS Browser.



ECCAIRS Status / Future Outlook

- **ECCAIRS main draw backs:**
  - Working on a separate Hazards database that can link up with ECCAIRS
  - No fields for FH / FC, therefore unable to trend by rates (abs number only)
- **Taxonomy for Bird Strikes**
- **Library of analysis modules**
  - safety indicators
- **Development of this data system is constantly evolving in line with:**
  - New emerging demands
  - New reporting requirements
  - New software
  - Add-on developments

Aviation Safety Data Collection and Processing – Singapore's Experience

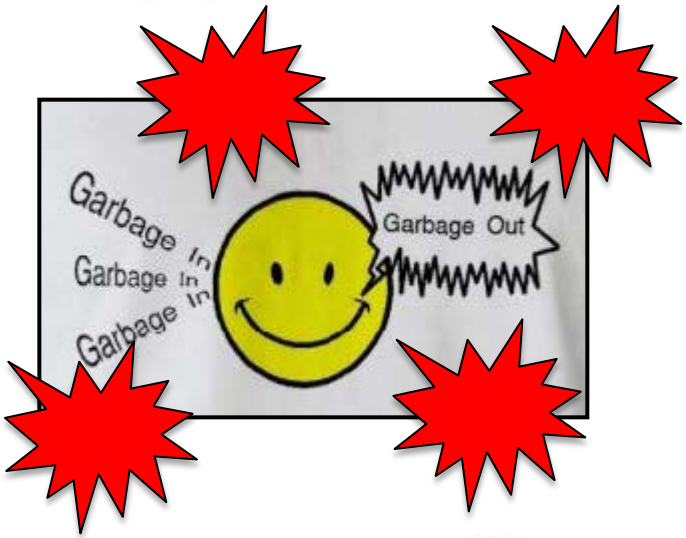
Background

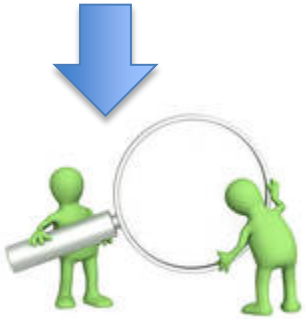
- Aviation safety data collection, analysis and exchange are the vital elements in SSP and SMS.
- Safety management relies on measurement of safety indicators and monitoring.
- Effective safety data collection is an important step.
- This presentation shares Singapore’s experience on safety data collection and processing.

data

ACCEPTED!

database
data
sql
server
databases
connectivity
storing
cylinders
connection
internet
web
mirror
php
communication
Information


Garbage In
Garbage In
Garbage In
Garbage Out



analysis

search

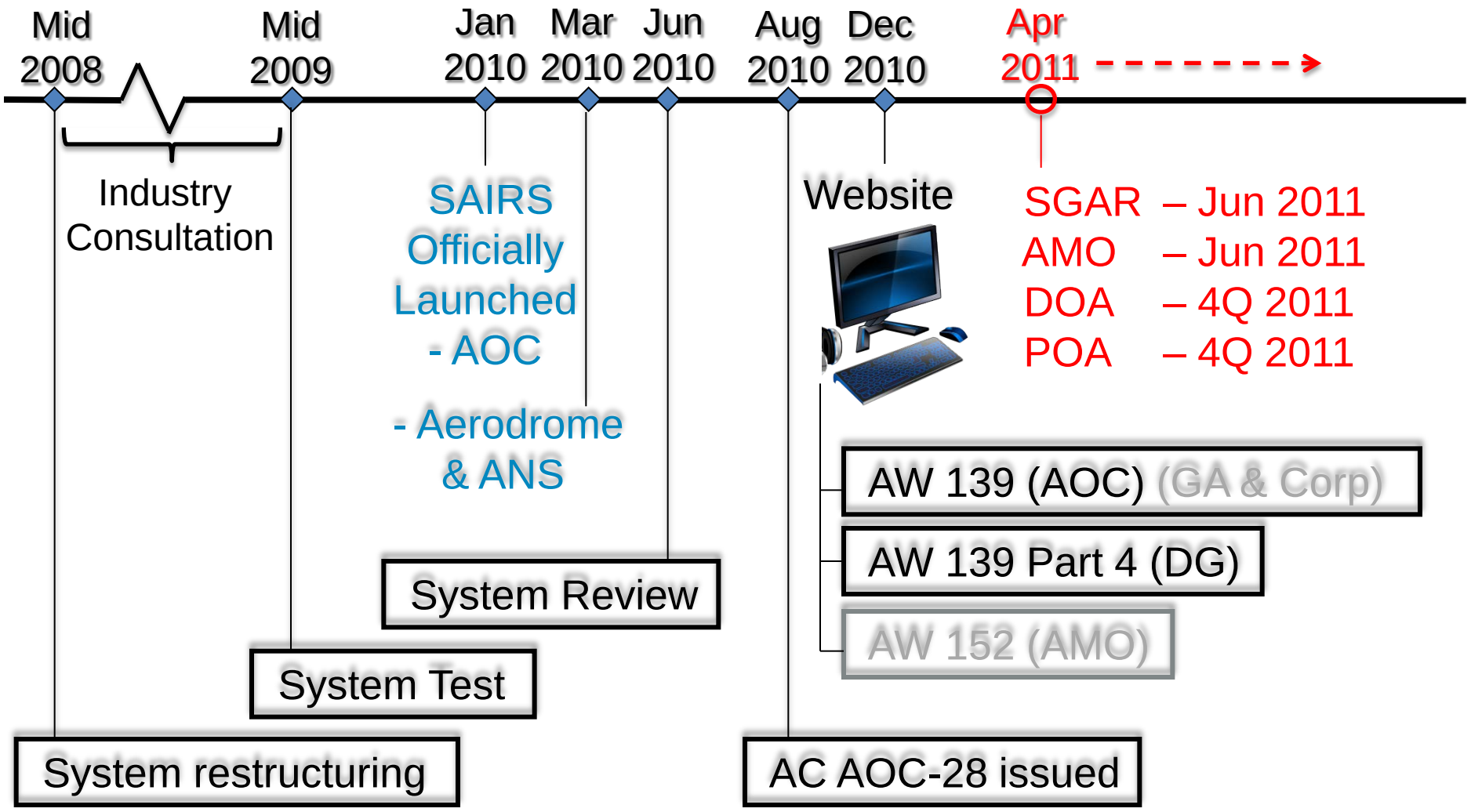
System Overhaul

- In mid 2008, CAAS started to restructure its mandatory reporting system framework and processes.

- ECCAIRS was adapted as the operating platform to facilitate standardization of safety data format iaw ICAO ADREP taxonomy.

- In mid 2009, the restructuring was completed and tested. The reporting system was named Singapore Aviation Accident / Incident Reporting System (SAIRS).

SAIRS Implementation Roadmap



Safety Data Collection

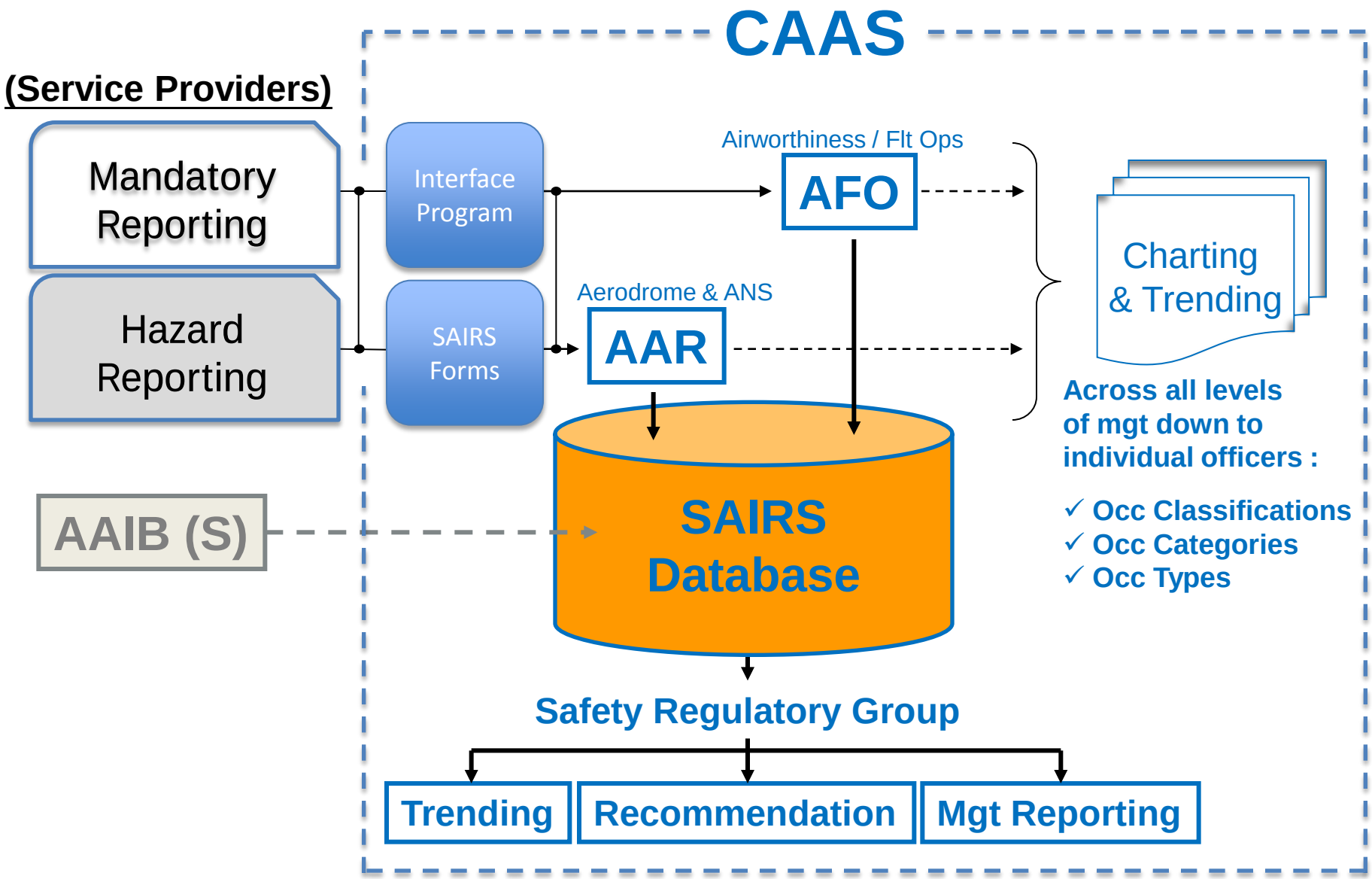
- SAIRS was first implemented to AOC holders in Jan 2010.

- Good structured safety data received.
  - Interface Programmes
  - SAIRS Form (built on Dexter)

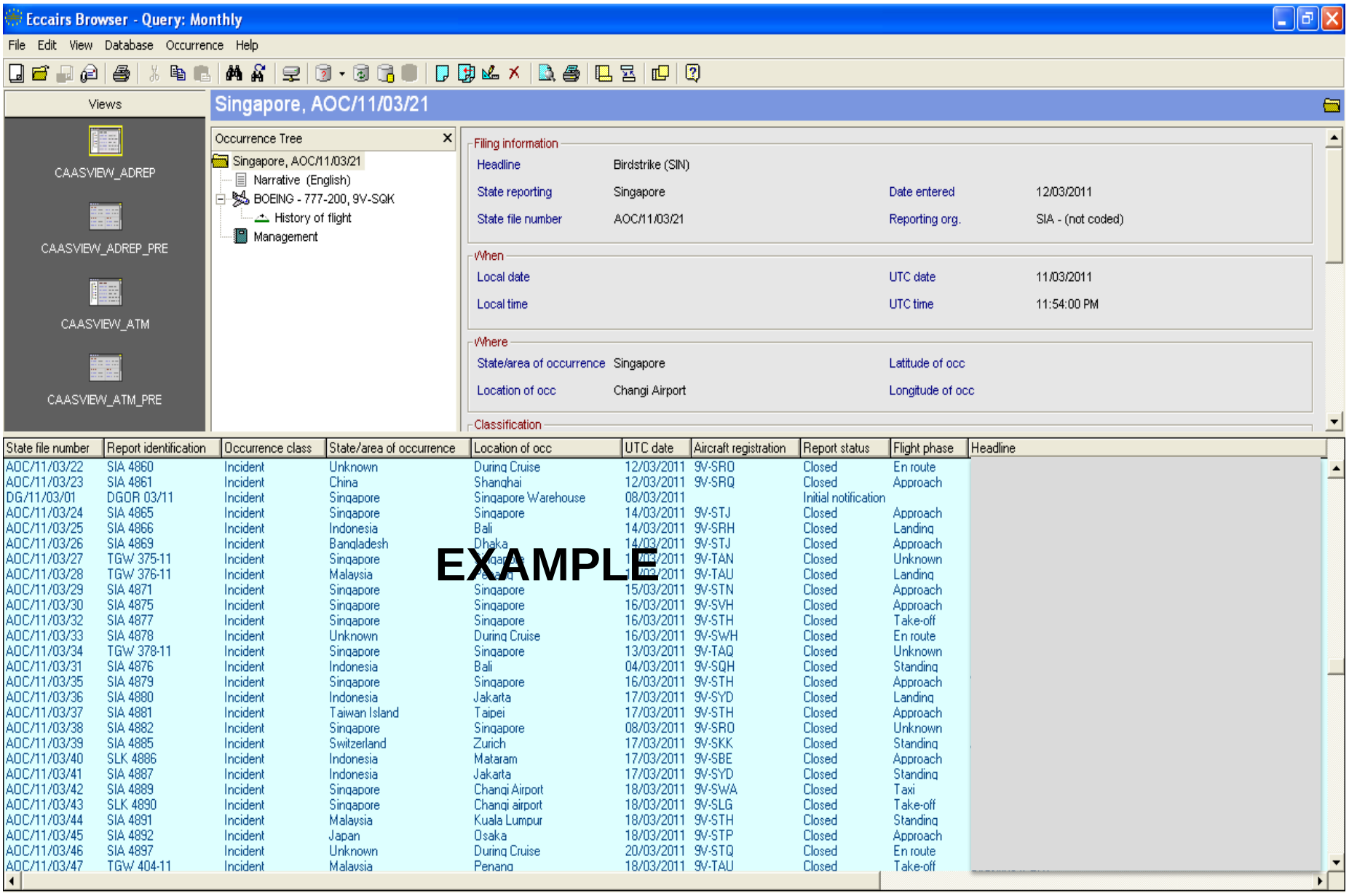
- Safety data validated prior entry into database.

- Integrates safety data from Aerodrome and ANS.

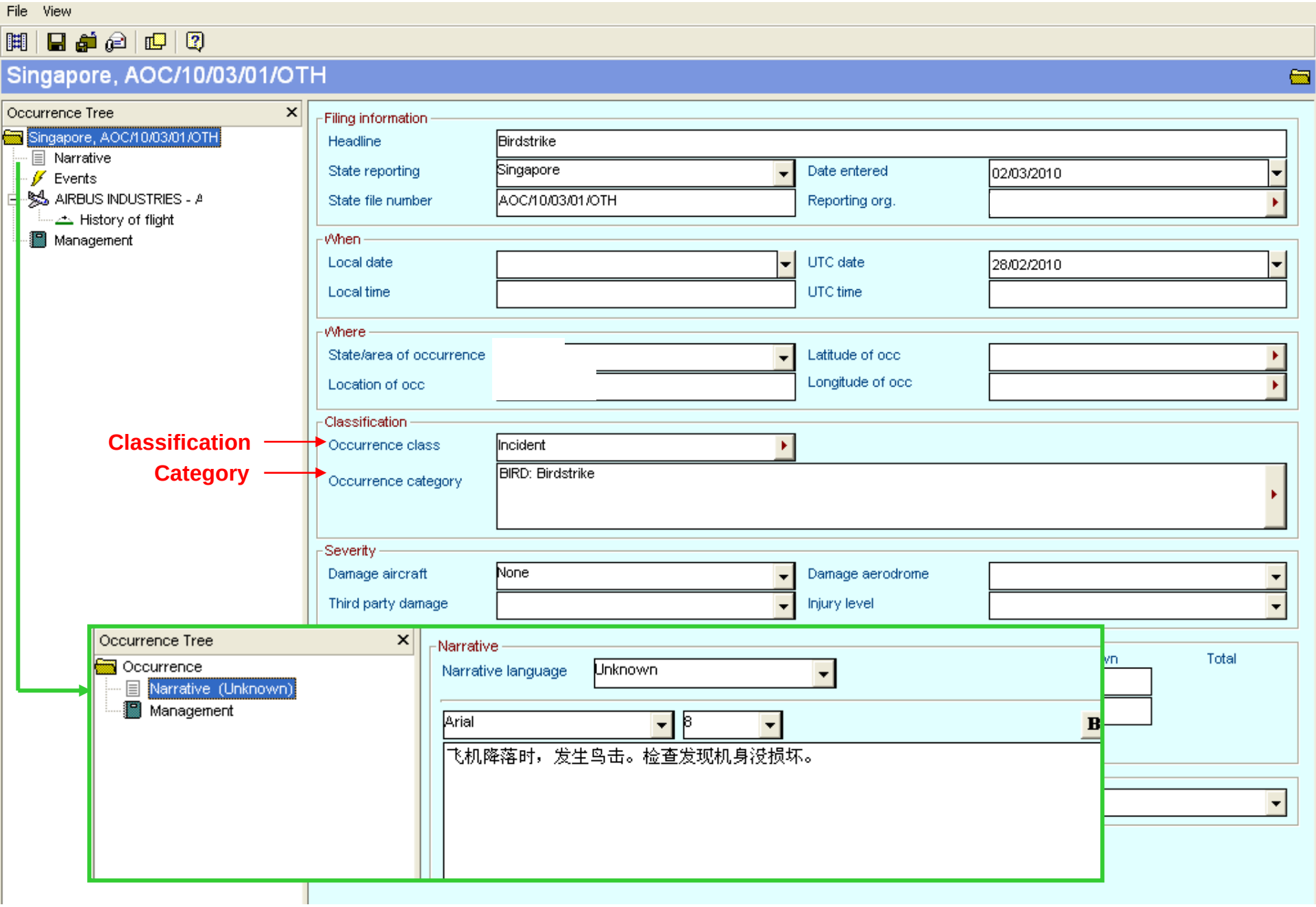
Data Collection Overview



CAREERS | MEDIA CENTRE | A-Z
Singapore Government
Integrity • Service • Excellence
CAAS
Civil Aviation Authority of Singapore
Enabling opportunities through aviation
CONTACT US | ENQUIRY | SITEMAP
SEARCH
HOME
ABOUT CAAS
AVIATION HUB
REGULATIONS
ESERVICES & FORMS
Aerial Photography Application
Aeronautical Information Services
Application for Aerial Activities
Air Operator's Certificate
Aircraft Maintenance Licensing & Examination
AIP Email Notification Service
Flight Crew Examination
Flight Crew Licence
IDERA and CDCL
Organisations Approval
Singapore Aviation Accident/Incident Reporting System (SAIRS)
Others
What's New
Safety Oversight And Promotion
Air Hub Development
Aviation Industry Development
UPDATES
REGULATIONS
AIP Supplements 81/11
NOTAM List 2/2011
MORE
ESERVICES
HOME » eServices & Forms » Singapore Aviation Accident/Incident Reporting System (SAIRS)
eServices & Forms
Aerial Photography Application
Aeronautical Information Services
Application for Aerial Activities
Air Operator's Certificate
Aircraft Maintenance Licensing & Examination
AIP Email Notification Service
Application Forms for Carriage of Dangerous Goods and Munitions of War by Air
Application of Commercial flights for Foreign Air Operators
CAAS Careers
Design Approval
e-Invoicing
Organisations Approval
Singapore Aviation Accident/Incident Reporting System (SAIRS)
Others
Singapore Aviation Accident/Incident Reporting System (SAIRS)
Background
Safety data collection, analysis and exchange are at the heart of the State Safety Programme (SSP) and Safety Management System (SMS). Safety management relies on the measuring and monitoring of safety indicators in order to identify areas of concern, and this in turn depends on the effective collection of safety data.
Mandatory Occurrence Reporting - SAIRS
The CAAS SAIRS is a mandatory reporting system and is independent from the Confidential Reporting System (SINCAIR) administered by Singapore Aircraft Accident Investigation Bureau, AAIB(S).
An occurrence report can be submitted to CAAS by filling up the respective SAIR form and email to caas_dfirs@caas.gov.sg or fax to (65) 6545 7615:
Are you looking for...
Aerial Photography Application
Flight Crew Exam
Topic
Revision/ Amendment/ Issue
For AOC Holders, GA Operators and Others
CAAS(AW)139
For SAR145 Organizations
CAAS(AW)152
Note: To use the following forms, please remember to enable macros
CAAS AFO File Number
Reporting Org File Number
Singapore Aviation Accident / Incident Reporting Form
(Reference to Advisory Circular AC AOC-28)
AMO File Number
(Reference to SAR 145.60 - Reporting of Unairworthy Conditions)
Date Defect Found (Local)
dd/mm/yyy
Time Defect Found (Local)
hh:mm
Reporting SAR 145 Org
Location of Occ
Airlines / Operator (Optional)
Component Name
Component P/N
P/N:
Component S/N
S/N:
Aircraft Registration (Optional)
Engine Model
Engine P/N
Engine P/N:
Engine S/N
Engine S/N:



State file number	Report identification	Occurrence class	State/area of occurrence	Location of occ	UTC date	Aircraft registration	Report status	Flight phase	Headline
AOC/11/03/22	SIA 4860	Incident	Unknown	During Cruise	12/03/2011	9V-SRO	Closed	En route	
AOC/11/03/23	SIA 4861	Incident	China	Shanghai	12/03/2011	9V-SRQ	Closed	Approach	
DG/11/03/01	DGOR 03/11	Incident	Singapore	Singapore Warehouse	08/03/2011		Initial notification		
AOC/11/03/24	SIA 4865	Incident	Singapore	Singapore	14/03/2011	9V-STJ	Closed	Approach	
AOC/11/03/25	SIA 4866	Incident	Indonesia	Bali	14/03/2011	9V-SRH	Closed	Landing	
AOC/11/03/26	SIA 4869	Incident	Bangladesh	Dhaka	14/03/2011	9V-STJ	Closed	Approach	
AOC/11/03/27	TGW 375-11	Incident	Singapore	Changi	14/03/2011	9V-TAN	Closed	Unknown	
AOC/11/03/28	TGW 376-11	Incident	Malaysia	Penang	14/03/2011	9V-TAU	Closed	Landing	
AOC/11/03/29	SIA 4871	Incident	Singapore	Singapore	15/03/2011	9V-STN	Closed	Approach	
AOC/11/03/30	SIA 4875	Incident	Singapore	Singapore	16/03/2011	9V-SVH	Closed	Approach	
AOC/11/03/32	SIA 4877	Incident	Singapore	Singapore	16/03/2011	9V-STH	Closed	Take-off	
AOC/11/03/33	SIA 4878	Incident	Unknown	During Cruise	16/03/2011	9V-SWH	Closed	En route	
AOC/11/03/34	TGW 378-11	Incident	Singapore	Singapore	13/03/2011	9V-TAQ	Closed	Unknown	
AOC/11/03/31	SIA 4876	Incident	Indonesia	Bali	04/03/2011	9V-SQH	Closed	Standing	
AOC/11/03/35	SIA 4879	Incident	Singapore	Singapore	16/03/2011	9V-STH	Closed	Approach	
AOC/11/03/36	SIA 4880	Incident	Indonesia	Jakarta	17/03/2011	9V-SYD	Closed	Landing	
AOC/11/03/37	SIA 4881	Incident	Taiwan Island	Taipei	17/03/2011	9V-STH	Closed	Approach	
AOC/11/03/38	SIA 4882	Incident	Singapore	Singapore	08/03/2011	9V-SRO	Closed	Unknown	
AOC/11/03/39	SIA 4885	Incident	Switzerland	Zurich	17/03/2011	9V-SKK	Closed	Standing	
AOC/11/03/40	SLK 4886	Incident	Indonesia	Mataram	17/03/2011	9V-SBE	Closed	Approach	
AOC/11/03/41	SIA 4887	Incident	Indonesia	Jakarta	17/03/2011	9V-SYD	Closed	Standing	
AOC/11/03/42	SIA 4889	Incident	Singapore	Changi Airport	18/03/2011	9V-SWA	Closed	Taxi	
AOC/11/03/43	SLK 4890	Incident	Singapore	Changi airport	18/03/2011	9V-SLG	Closed	Take-off	
AOC/11/03/44	SIA 4891	Incident	Malaysia	Kuala Lumpur	18/03/2011	9V-STH	Closed	Standing	
AOC/11/03/45	SIA 4892	Incident	Japan	Osaka	18/03/2011	9V-STP	Closed	Approach	
AOC/11/03/46	SIA 4897	Incident	Unknown	During Cruise	20/03/2011	9V-STQ	Closed	En route	
AOC/11/03/47	TGW 404-11	Incident	Malaysia	Penang	18/03/2011	9V-TAU	Closed	Take-off	


File View
Singapore, AOC/10/03/01/OTH
Occurrence Tree
Singapore, AOC/10/03/01/OTH
Narrative
Events
AIRBUS INDUSTRIES - A
History of flight
Management
Filing information
Headline
Birdstrike
State reporting
Singapore
Date entered
02/03/2010
State file number
AOC/10/03/01/OTH
Reporting org.
When
Local date
UTC date
28/02/2010
Local time
UTC time
Where
State/area of occurrence
Latitude of occ
Location of occ
Longitude of occ
Classification
Occurrence class
Incident
Occurrence category
BIRD: Birdstrike
Severity
Damage aircraft
None
Damage aerodrome
Third party damage
Injury level
Classification
Category
Occurrence Tree
Occurrence
Narrative (Unknown)
Management
Narrative
Narrative language
Unknown
Arial
8
B
飞机降落时，发生鸟击。检查发现机身没损坏。
Total

SAIR

Singapore Aviation Incident Report

(Airworthiness/Flight Operations Division)

Civil Aviation Authority of Singapore

Using ECCAIRS EXPORTER

CAAS Ref No.	**AOC/10/03/68/OTH**	**AOC Ref No.**	
Incident Title	Birdstrike		
Occ. Class/Status	Incident / Closed		
Date (UTC)	19/03/2010	**Time (UTC)**	8:04:00 AM
State of occurrence:	Myanmar		
Location	Yangon		
Reporting Organisation			

Occurrence categories
BIRD: Birdstrike

Narrative
Birdstrike during take-off run.

Sequence of events
1: Aircraft operation general - Aircraft collision obstacle - Aircraft collision - object aloft - Aircraft bird strike *during* **Powered aircraft - Take-off - Take-off run**

Aircraft Information					
Registration					
Make/Model	AIRBUS INDUSTRIES - A320				
Flight No					
Sector	From: Myanmar - VYYY (RGN): Yangon/Intl To: Singapore - WSSS (SIN): Singapore changi				
Injuries	**Fatal**	**Serious**	**Minor**	**None**	**Unknown**
Crew					
Pax					

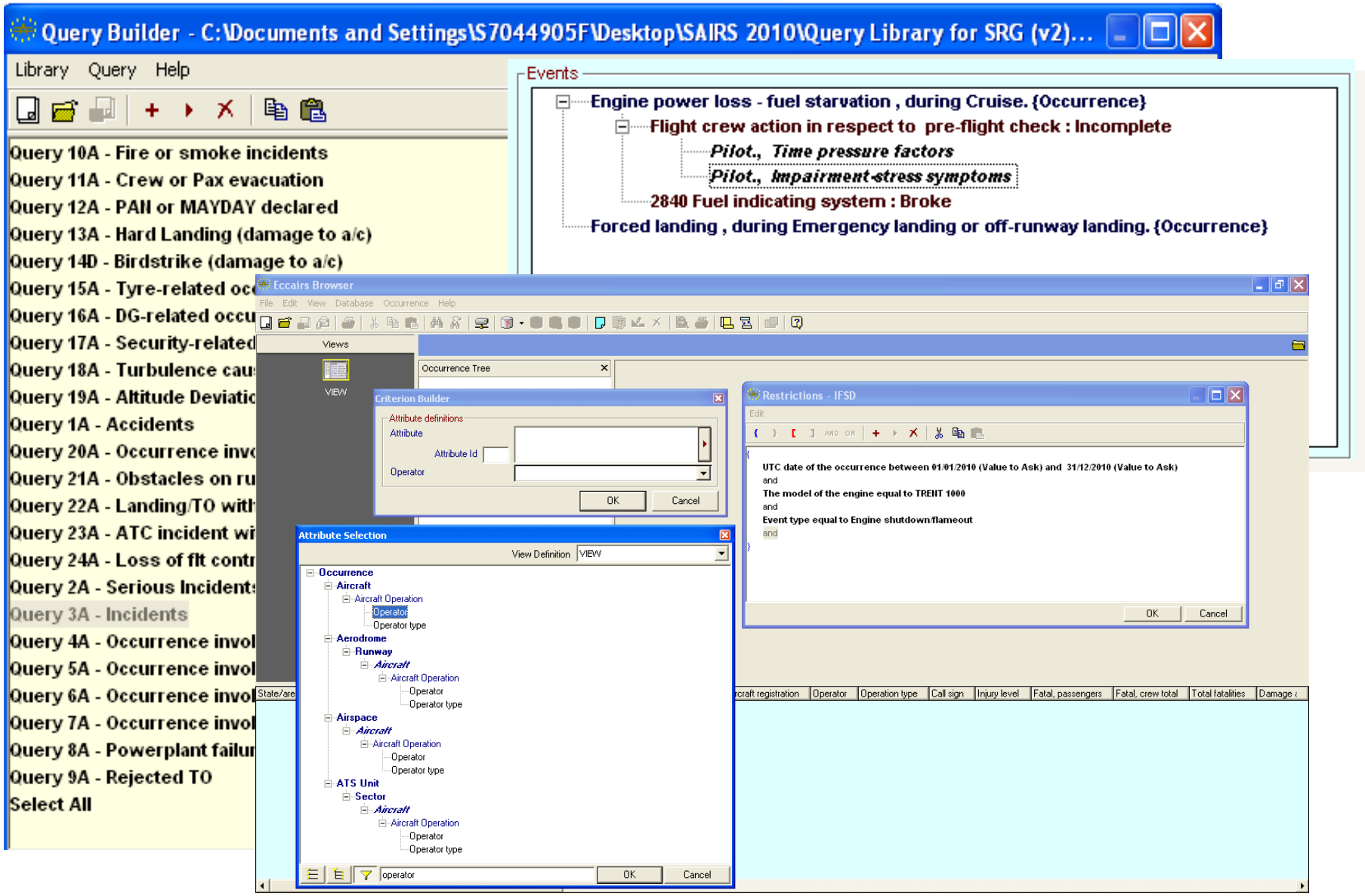
Safety Data Analysis

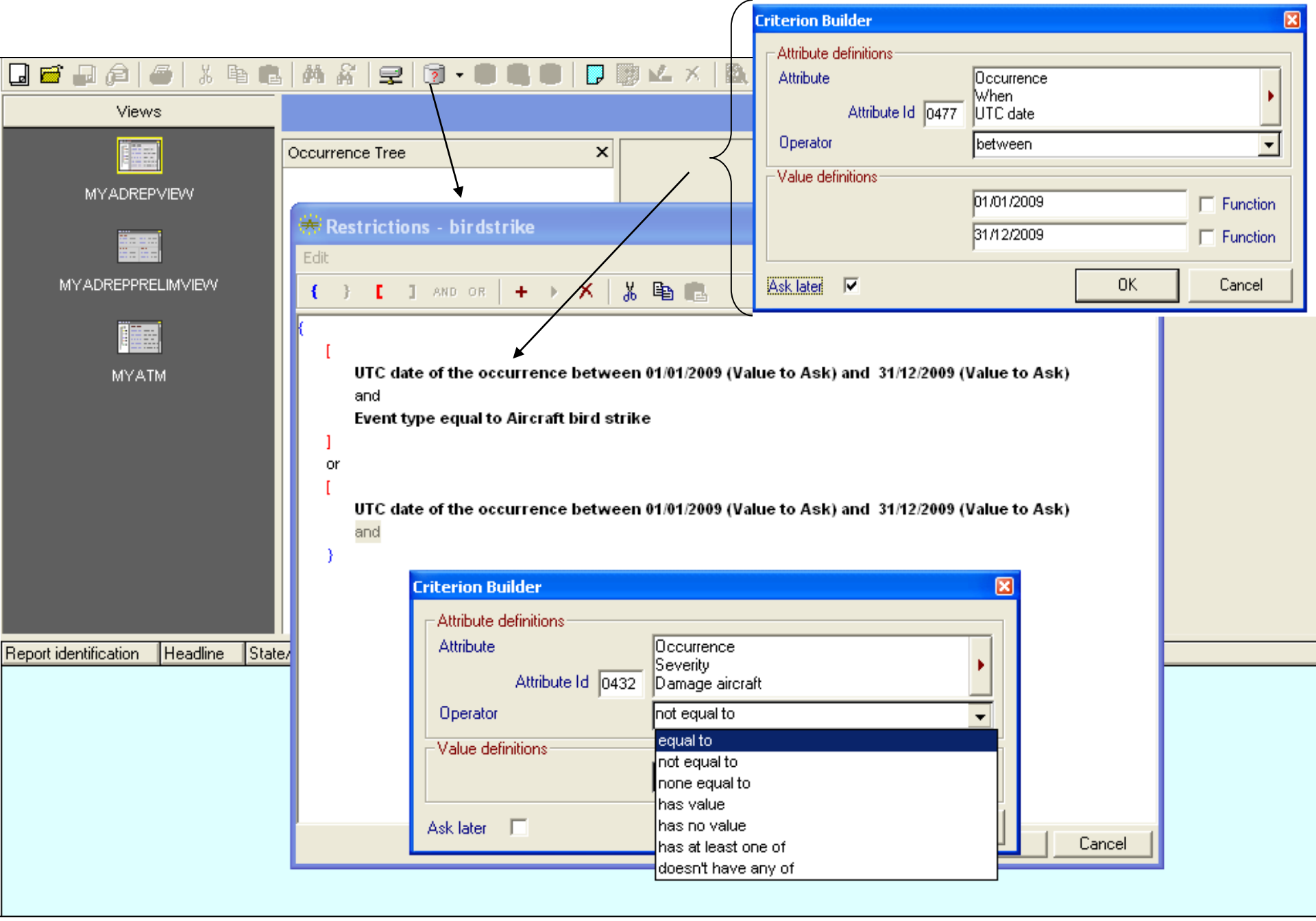
- Query builders
  - SSP safety indicators
    : high level / high consequence *(safety measurement)*
  - selected occurrences
    : low level / low consequence *(safety performance measurement)*

- Trending and Analysis
  - Alert Value
  - Safety Targets

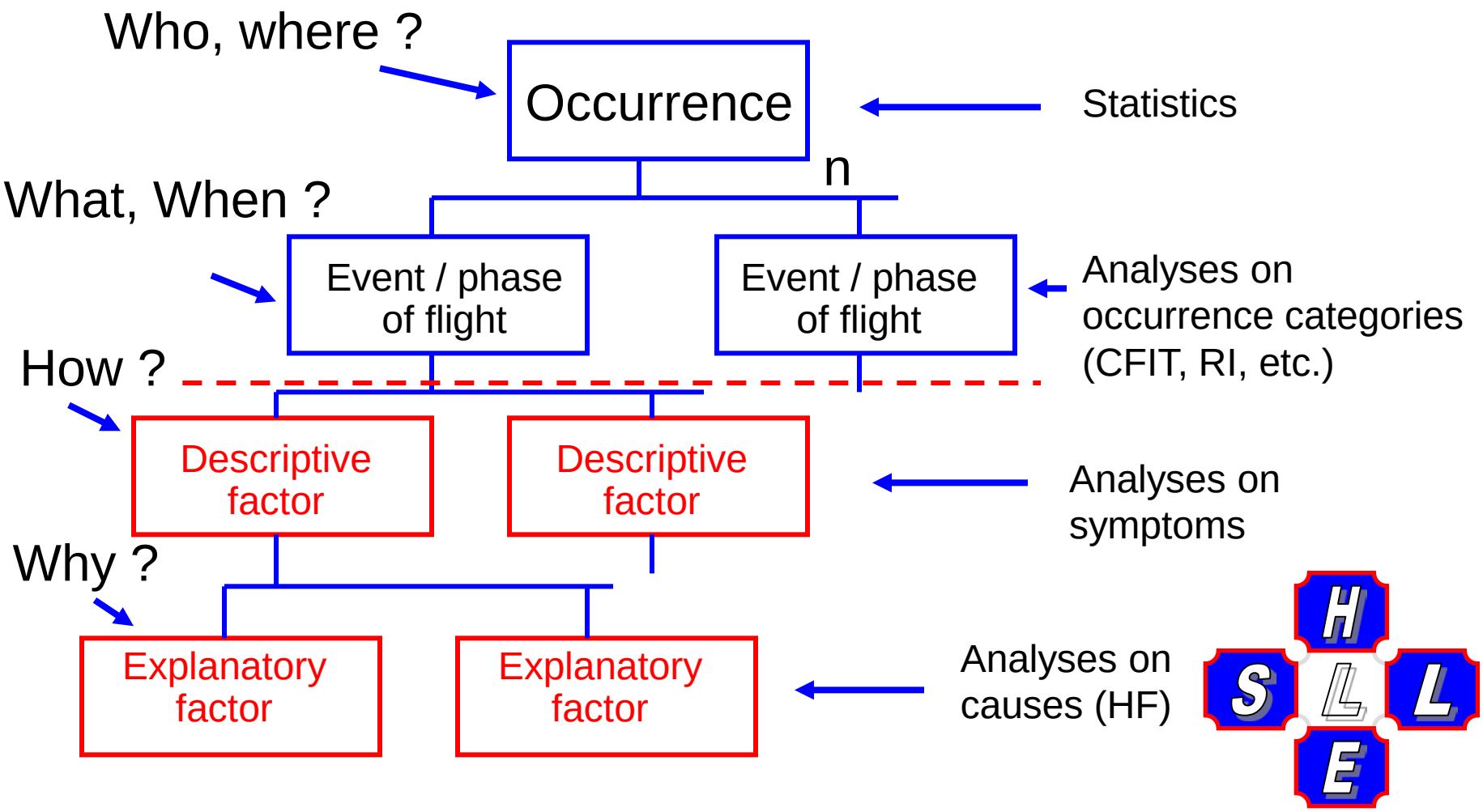
- Preventive actions / Safety Recommendation

Examples of Query Builders

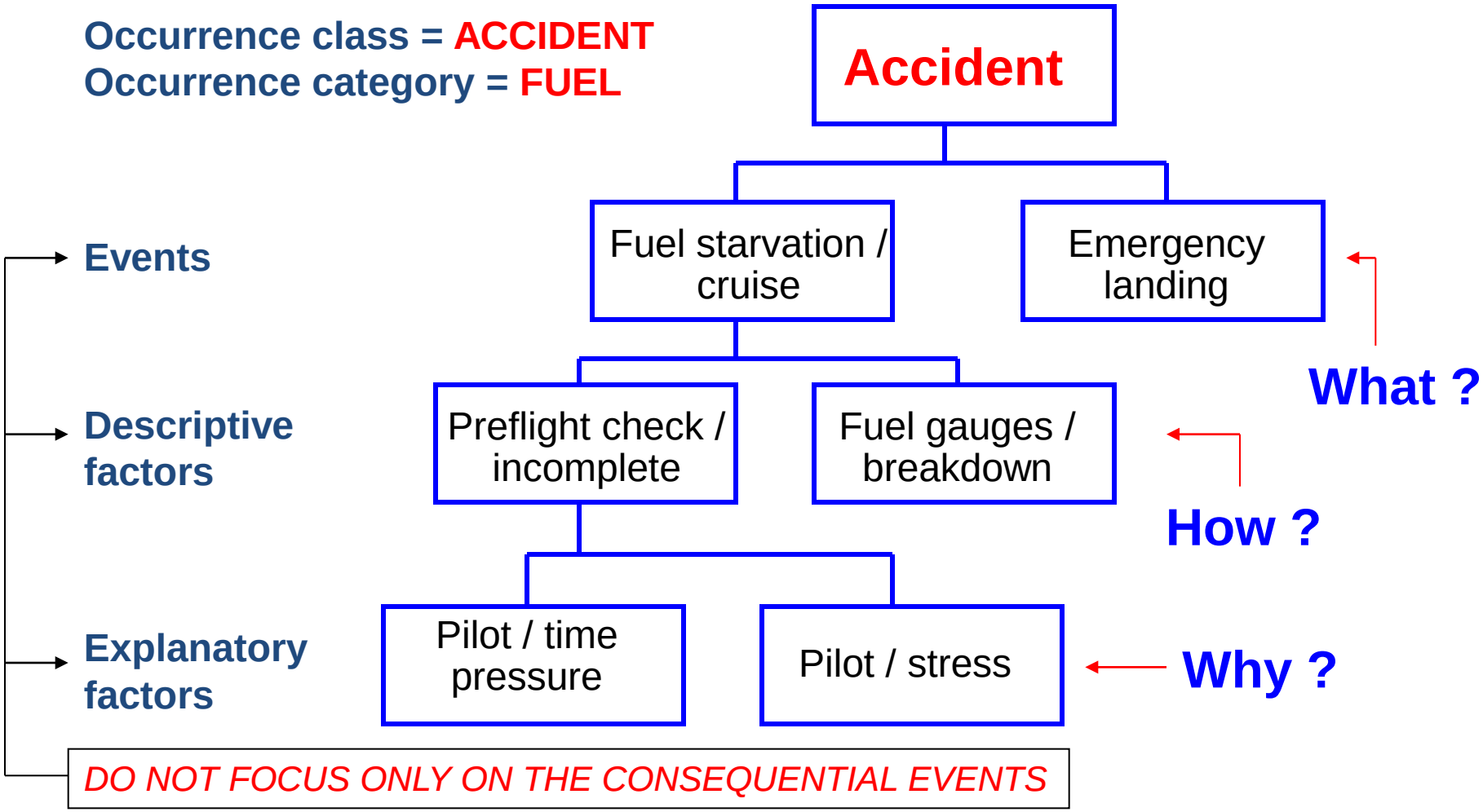



Criterion Builder
Attribute definitions
Attribute
Occurrence
When
UTC date
Attribute Id 0477
Operator
between
Value definitions
01/01/2009
Function
31/12/2009
Function
Ask later
OK
Cancel
Views
MYADREPVIEW
MYADREPPRELIMVIEW
MYATM
Occurrence Tree
Restrictions - birdstrike
Edit
AND OR
UTC date of the occurrence between 01/01/2009 (Value to Ask) and 31/12/2009 (Value to Ask)
and
Event type equal to Aircraft bird strike
or
UTC date of the occurrence between 01/01/2009 (Value to Ask) and 31/12/2009 (Value to Ask)
and
Criterion Builder
Attribute definitions
Attribute
Occurrence
Severity
Damage aircraft
Attribute Id 0432
Operator
not equal to
equal to
not equal to
none equal to
has value
has no value
has at least one of
doesn't have any of
Value definitions
Ask later
Cancel
Report identification
Headline

Investigation, Data and Analyses

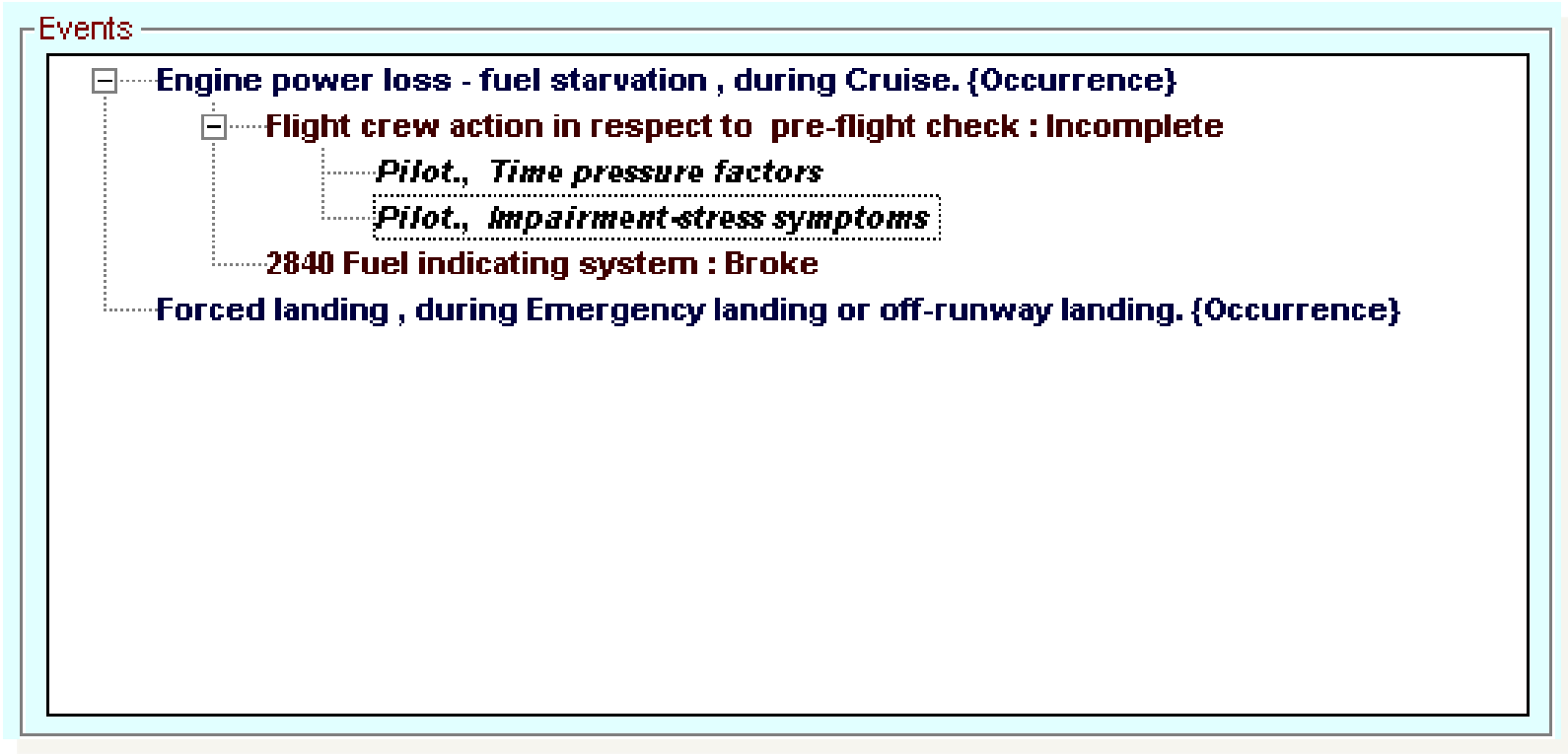


Fuel starvation example (1/2)

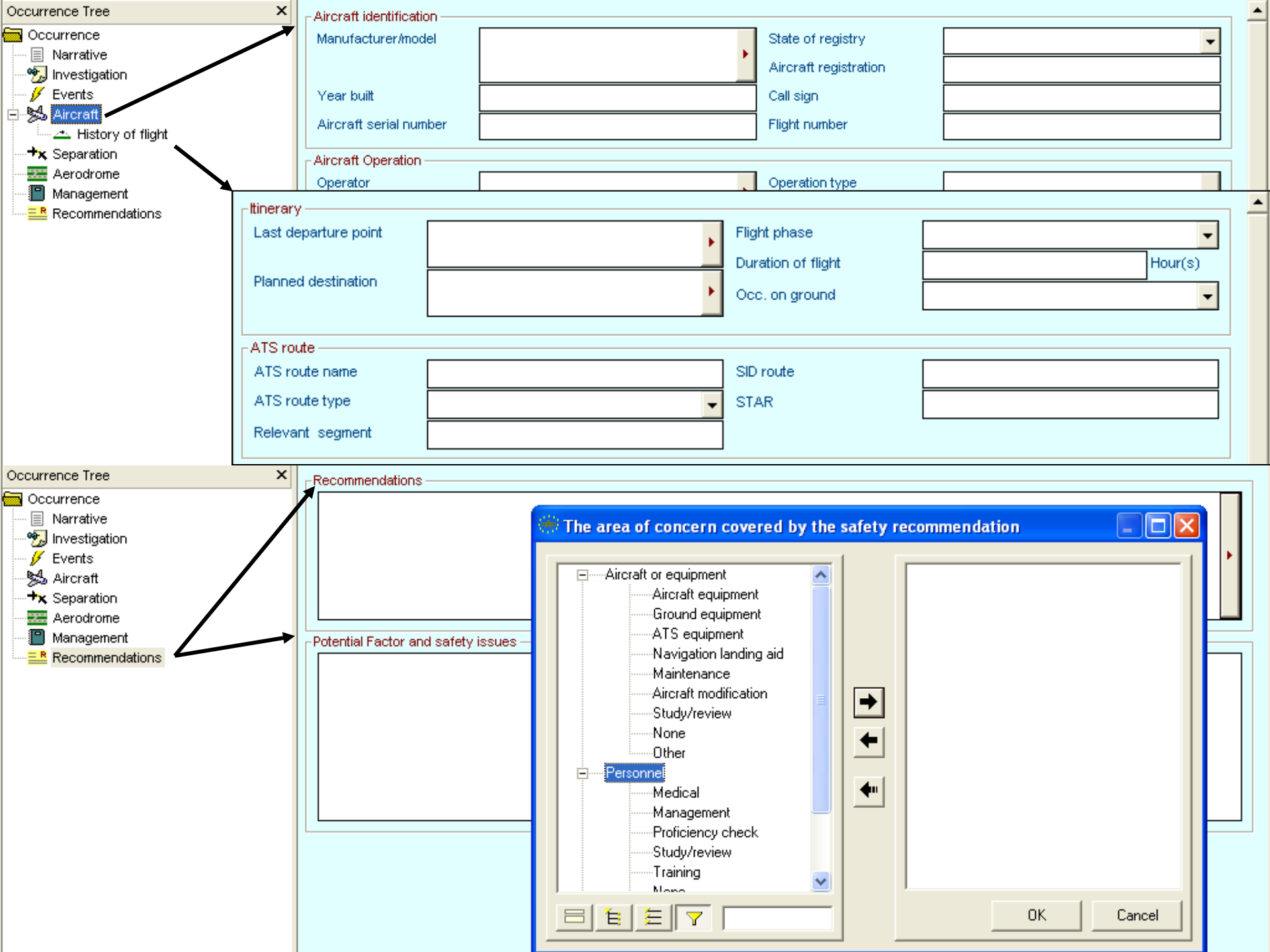


Fuel starvation example (2/2)

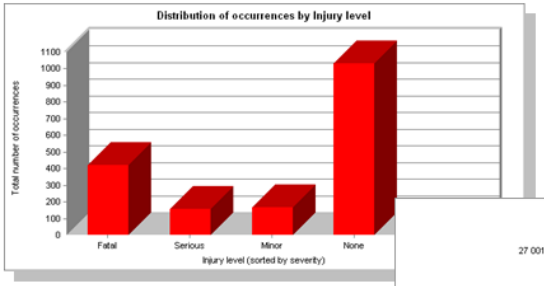
ECCAIRS Format:

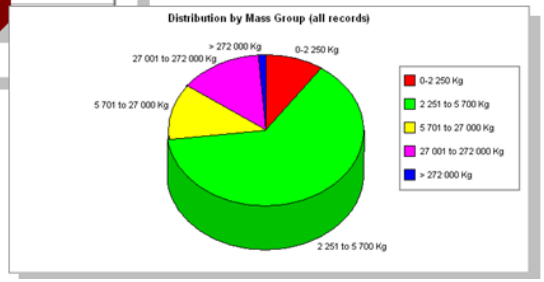


In ECCAIRS, use mouse right click to add, edit or remove items


Occurrence Tree
Occurrence
Narrative
Investigation
Events
Aircraft
History of flight
Separation
Aerodrome
Management
Recommendations
Aircraft identification
Manufacturer/model
State of registry
Aircraft registration
Year built
Call sign
Aircraft serial number
Flight number
Aircraft Operation
Operator
Operation type
Itinerary
Last departure point
Flight phase
Duration of flight
Hour(s)
Planned destination
Occ. on ground
ATS route
ATS route name
SID route
ATS route type
STAR
Relevant segment
Occurrence Tree
Occurrence
Narrative
Investigation
Events
Aircraft
Separation
Aerodrome
Management
Recommendations
Recommendations
Potential Factor and safety issues
The area of concern covered by the safety recommendation
Aircraft or equipment
Aircraft equipment
Ground equipment
ATS equipment
Navigation landing aid
Maintenance
Aircraft modification
Study/review
None
Other
Personnel
Medical
Management
Proficiency check
Study/review
Training
OK
Cancel

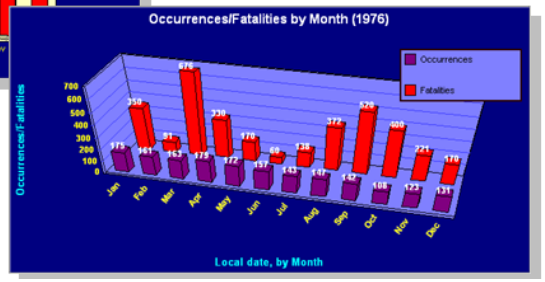
Graph Examples – Simple Graphs

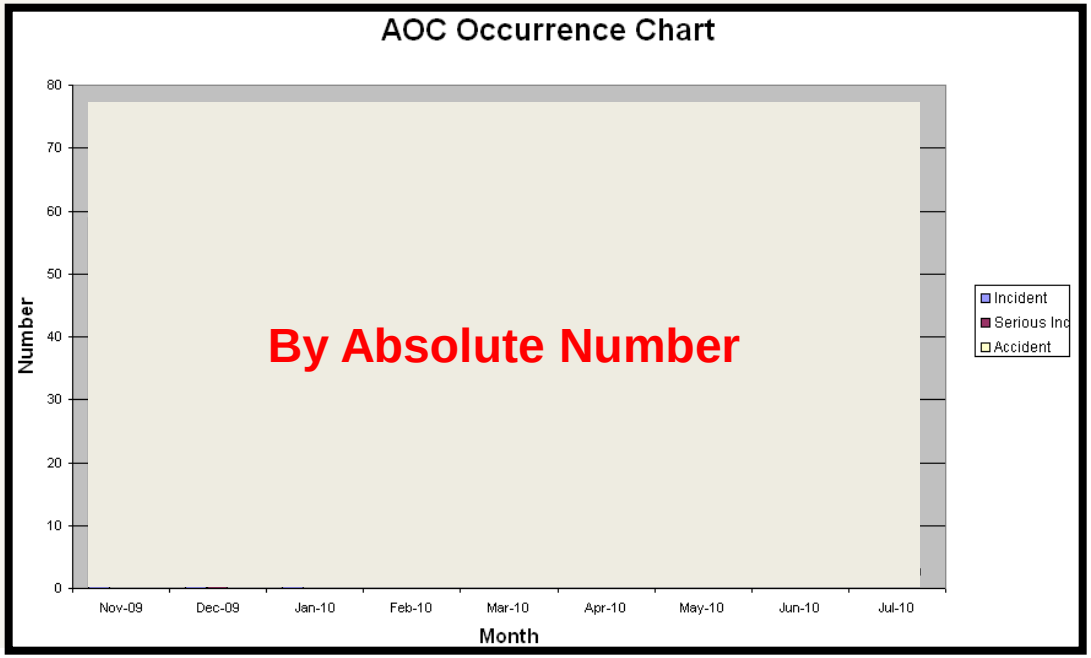


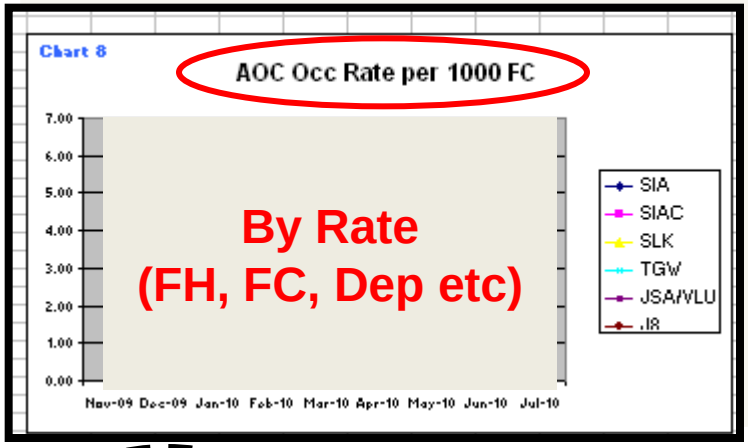


ECCAIRS GRAPHER

Graph Examples – Complex Graphs



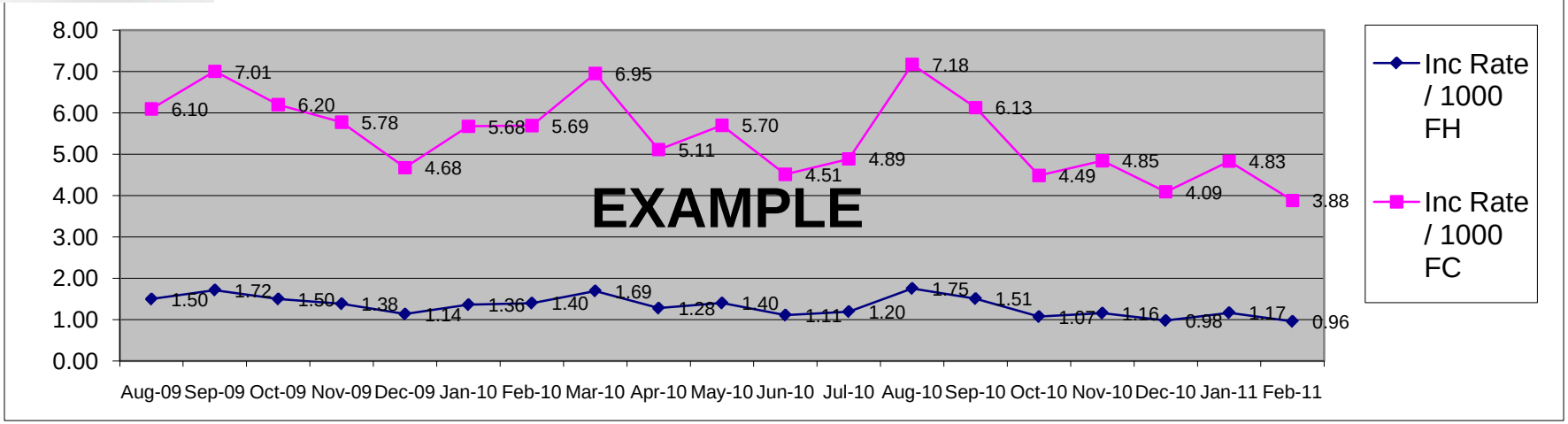




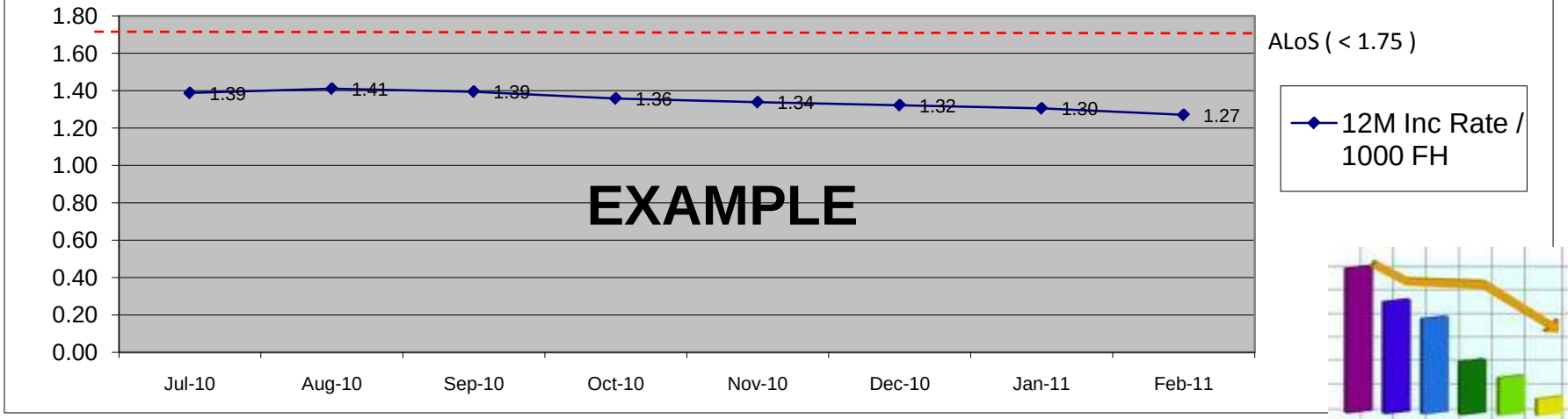
EXCEL GRAPHER

Data Analysis Overview

Combine Inc Rate Overview



Combine 12 Months Rolling Average Inc Rate Overview



Major Benefits

- Efficient and Effective System
  - supports management reporting
- Good accessibility of safety data
  - transparency
- Improved mandatory occurrence reporting process
- Capture Hazards
- Standardize Format – data sharing

Moving Ahead

- Safety sharing with industry on trends and lesson learnt
- Further enhancement to the system by including more scope / areas – new ECCAIRS version
- Integrates with Safety Oversight Management System (SOMS)
  - attain safety data at aggregate level
  - improve analysis and trending
- Support future Risk-based Oversight Assessment

Thank You