BEA

Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

Use of ECCAIRS at the BEA

Olivier FERRANTE

www.bea.aero

A central tool for investigations

- Memory of accidents
- Statistics and safety indicators
- Safety analysis (for instance on similar accidents i.e. mid-air collisions, CFIT, runway incursions …)
- Dissemination and exchange of safety data
- Facilitate to identify recurrent safety causal factors or patterns in accidents
- Support of structured analysis
- Connected to the Safety Recommendations Information System

Outline

1. A common database
2. ECCAIRS at BEA
3. Architecture and encoding occurrences
4. ECCAIRS tools
5. Future enhancement
6. Conclusion

1. A common database

- Extracts from Directive 2003/42/EC [now Regulation (EU) No 376/2014] :
- "Contribute to improvement of aviation safety by ensuring that relevant information on safety is reported, collected, stored, protected and disseminated"
- "Accidents and serious incidents shall also be stored in these databases."
- "A mechanism shall be put in place to collect, evaluate, process and store occurrences"

1. ECCAIRS system

- European Co-ordination Centre for Accident and Incident Reporting Systems : Developed by the Joint Research Centre (JRC)

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

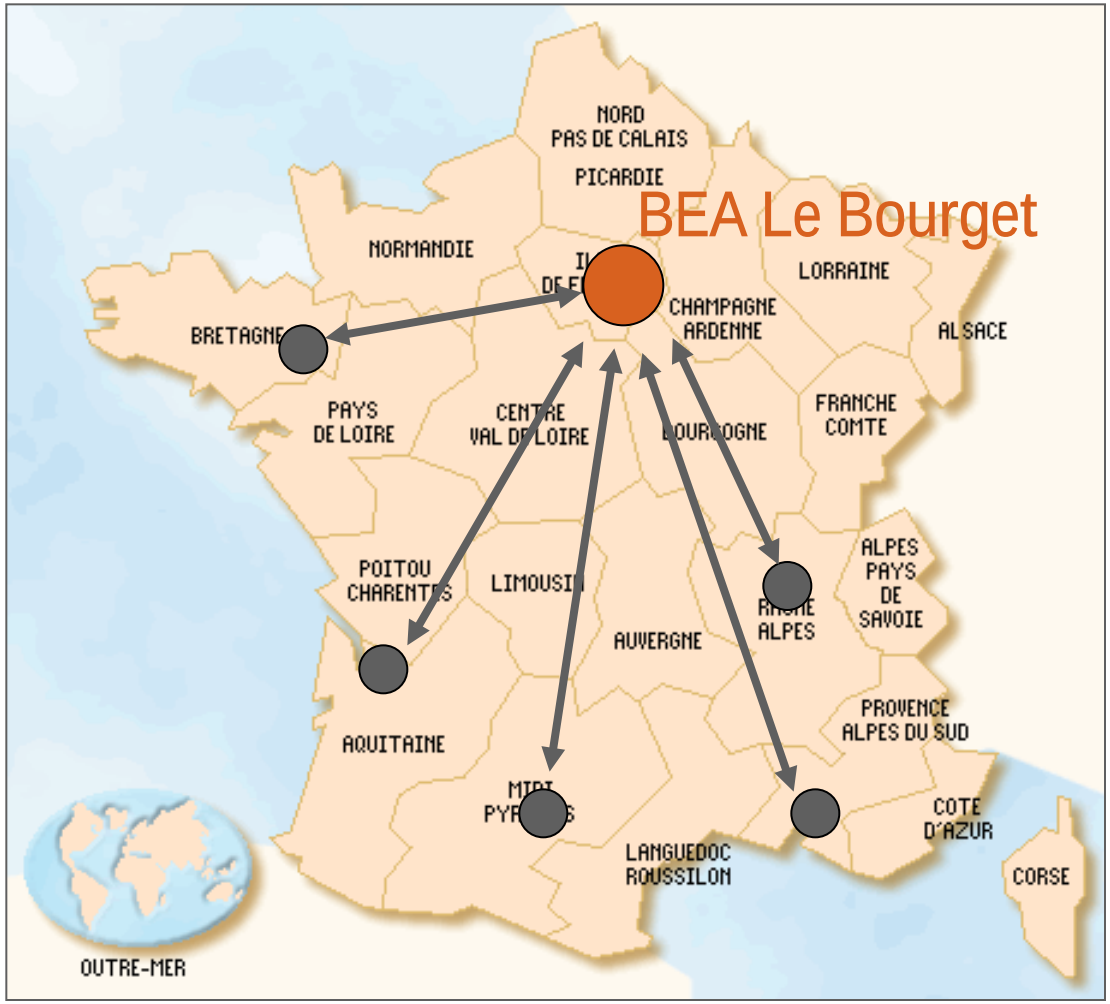
- Operated by BEA since 2004

- A coordinated network of national databases

- Adopted by ICAO in 2004

2. BEA and fields office

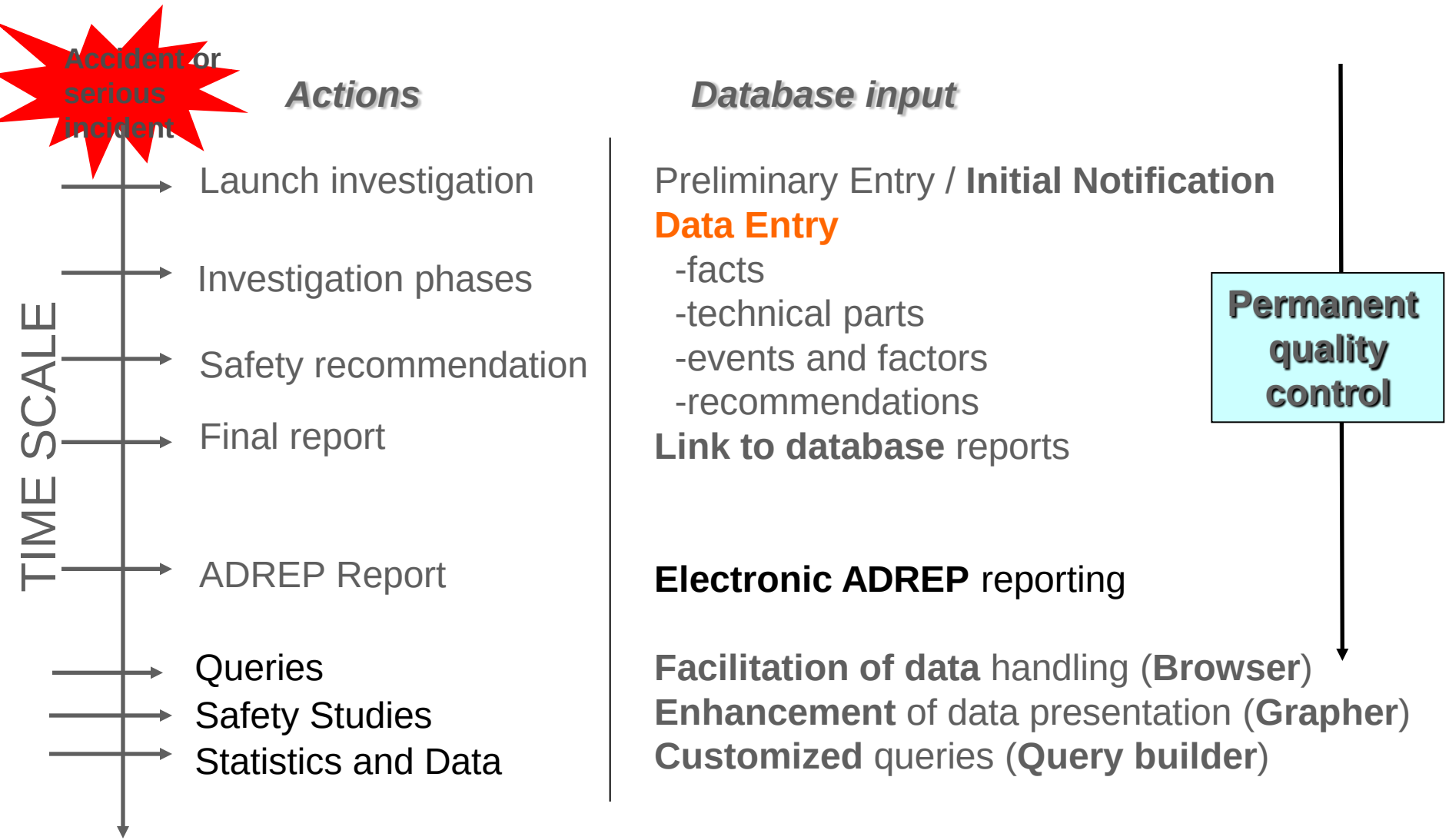
- ✓ **90 users of ECCAIRS**
- ✓ **Each department uses ECCAIRS**
- ✓ **5 field offices**
  - VPN connection



2. Activity at BEA

- More than 24 000 records in ECCAIRS
- About 600 records a year
- 150 reports published last year
- 1 meeting each morning
- Meeting to validate data
- Quality rules

2. ECCAIRS at BEA (central data source)



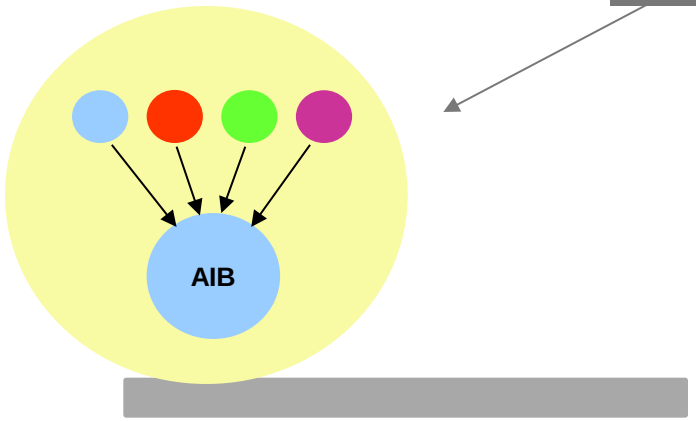
2. Official reportings

- ✓ Initial Notifications
- ✓ Preliminary reports
- ✓ Data reports

•Accidents MTOW > 2 250 kg
•Serious incidents MTOW> 5 700 kg

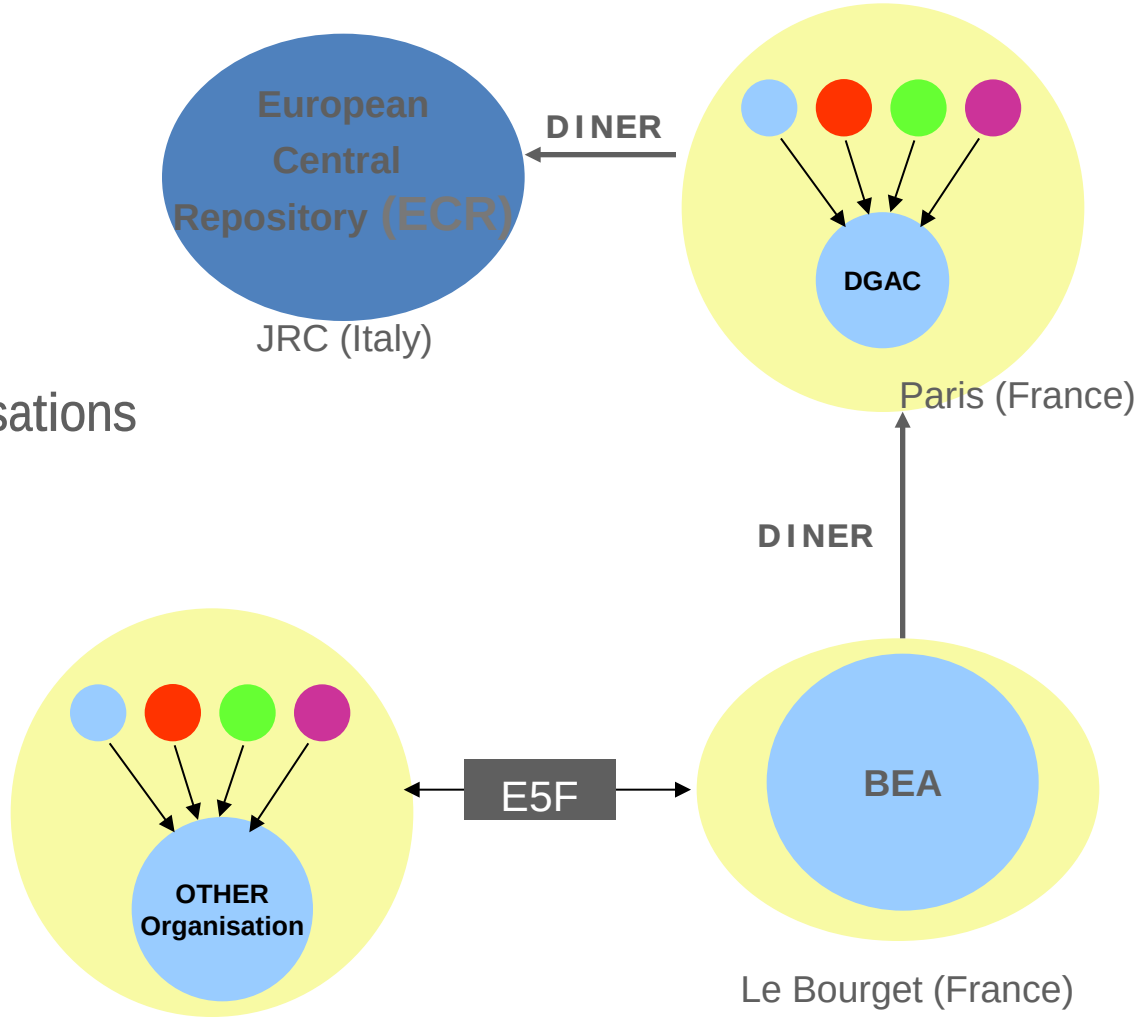
ECCAIRS file (E5F)

adrep@icao.int



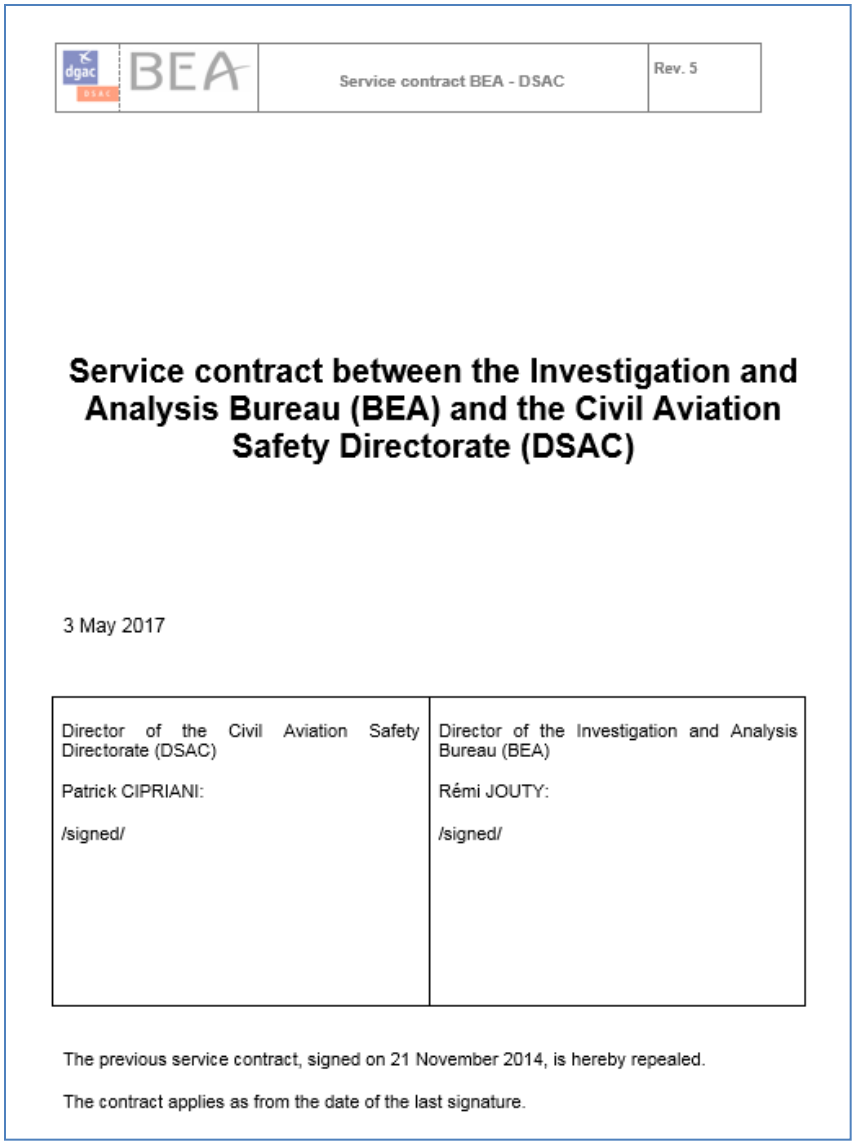
2. Data exchange

- ✓ Coordination with DGAC
  - Accidents, serious incidents
  - DINER application
- ✓ Data exchange with other organisations
  - Initial notifications
  - Final reports
  - ADREP reports
- ✓ Data dissemination
  - E5F files
  - Aggregated data



2. Relations with DGAC

- ✓ Data Coordination with DGAC is formalised in an advance arrangement
- ✓ ANNEX 2 contains ARRANGEMENTS FOR EXCHANGING SAFETY INFORMATION
- ✓ Note: This document was translated into English and is available for sharing



dgac DSAC | BEA | Service contract BEA - DSAC | Rev. 5

Service contract between the Investigation and Analysis Bureau (BEA) and the Civil Aviation Safety Directorate (DSAC)

3 May 2017

Director of the Civil Aviation Safety Directorate (DSAC)	Director of the Investigation and Analysis Bureau (BEA)
Patrick CIPRIANI:	Rémi JOUTY:
/signed/	/signed/

The previous service contract, signed on 21 November 2014, is hereby repealed.

The contract applies as from the date of the last signature.

2. Data Transmitted to the DGAC

- ✓ Preliminary Data on an occurrence subject to a French safety investigation or a foreign investigation notified to the BEA are uploaded on the BEA's website once a week and transmitted to the DGAC (DSAC)

- ✓ Criteria:

- Organisation (in charge of the investigation): BEA
- Local date (of the occurrence): As from 1 January 2005
- Status of the case: Preliminary or Closed
- Nature of the case: Investigation
- Event category: Accident or serious incident or incident

or

2. Data Transmitted to the DGAC

✓ Criteria:

or

- Organisation (in charge of the investigation): BEA
- Local date (of the occurrence): As from 1 January 2005
- Status of the case: Preliminary or Closed
- Nature of the case: No investigation
- Event category: Accident or serious incident

or

- Organisation (in charge of the investigation): foreign investigation body
- Status of the case: Closed
- Nature of the case: Investigation
- Occurrence category: Accident or serious incident or incident

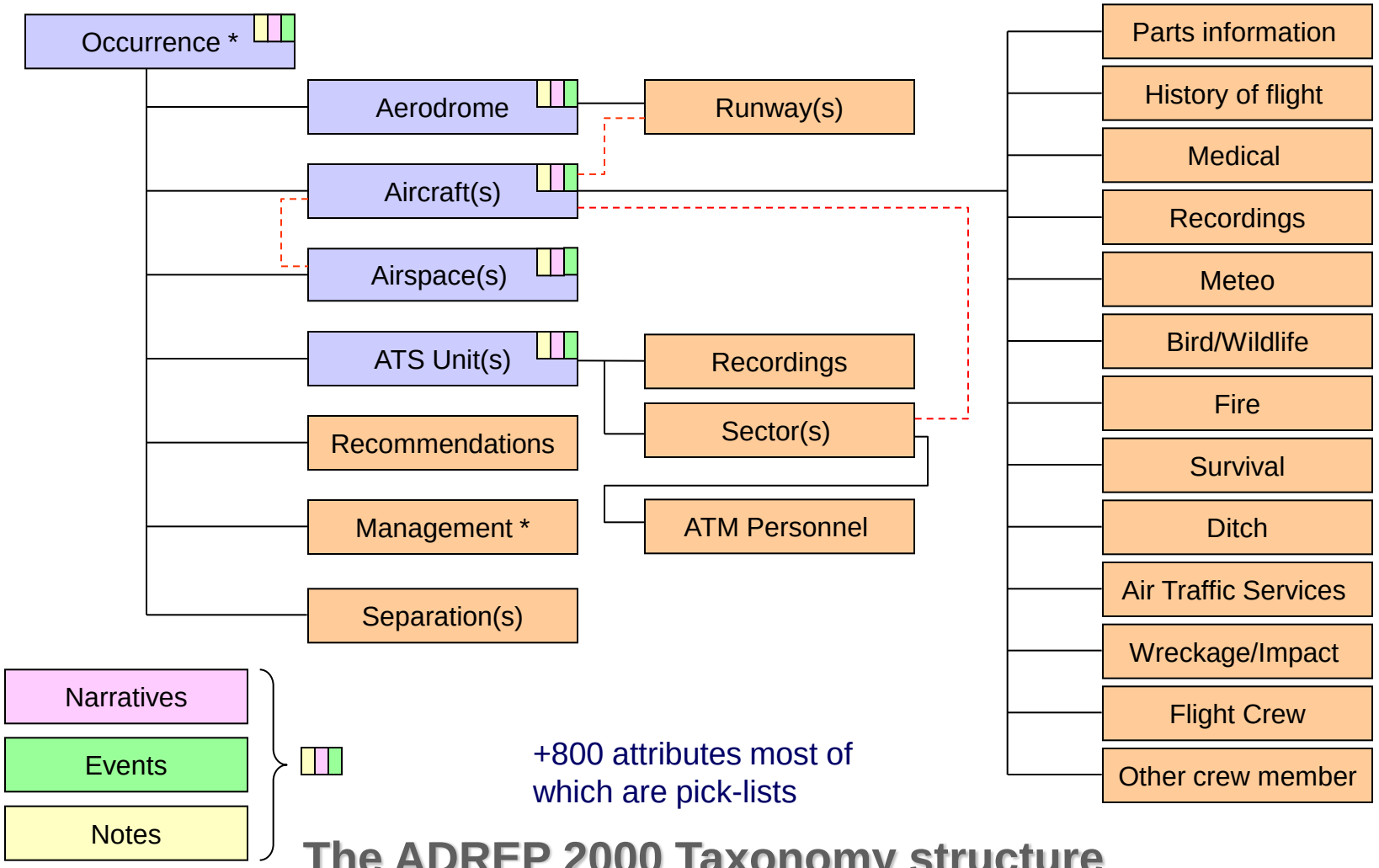
2. Data Transmitted to the DGAC

✓ Fields transmitted

For all occurrences for which the BEA is in charge, all ECCAIRS fields are transmitted to the DGAC, with the exception of:

- database access, Id 382
- date of access, Id 383
- date of amendment, Id 422
- case management, locked/unlocked since, Id 443
- case management, locked/unlocked, Id 442
- amendment of author identification, Id 421
- amendment note, Id 423
- note, Id 426
- person in charge of case, Id 446
- locked/unlocked status, Id 441
- subject of the note, Id 608
- type of access, Id 384
- subject of report, Id 495

3. ECCAIRS architecture



The ADREP 2000 Taxonomy structure

3. ECCAIRS Dictionary

A repository of information on the data stored in the system containing:

ICAO
ADREP 2000 taxonomy

Attributes

Structure, Definitions & Characteristics: valid values and data types

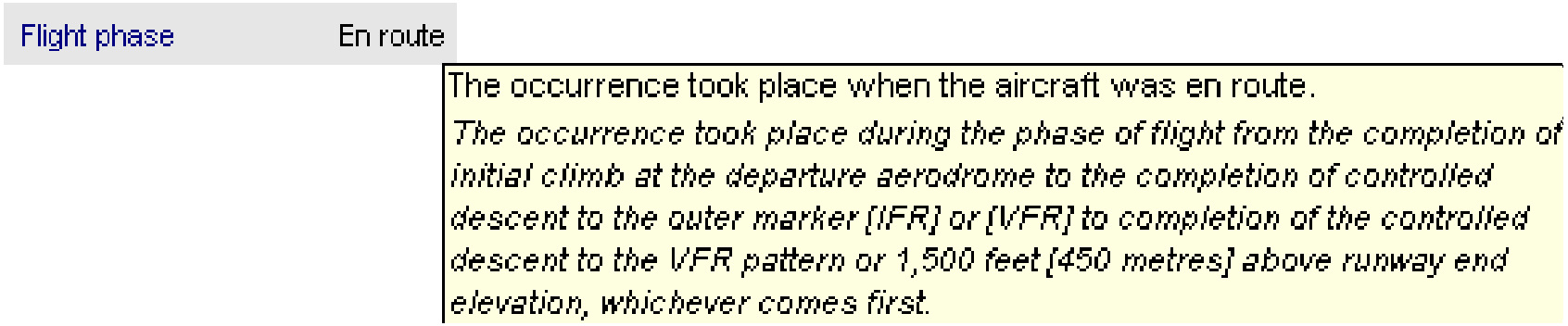
Attribute values

List and Definitions

Access to the dictionary:

- Via the dictionary browser
- Via the *browser* by putting the arrow over the attribute names or values

3. Access to definitions in the browser

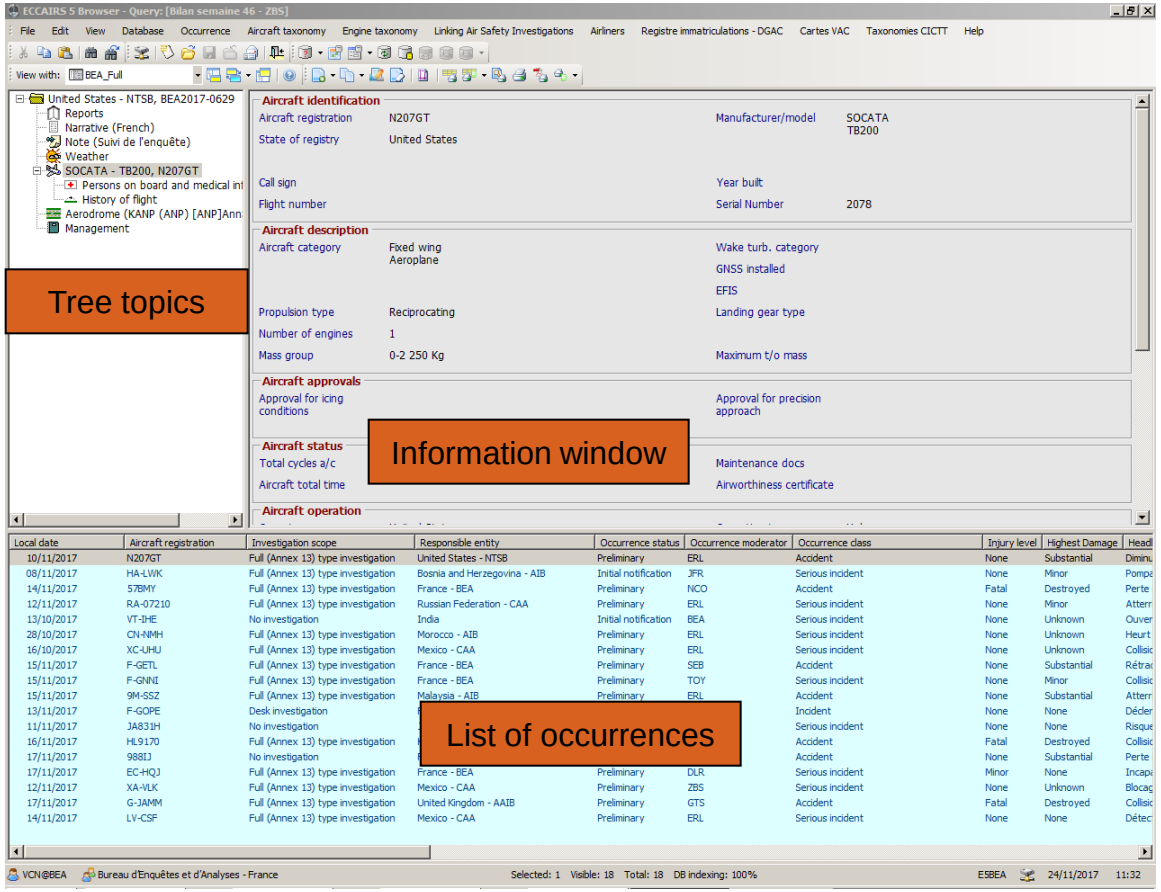


Pop-up window appears with text of definition

Data captured:

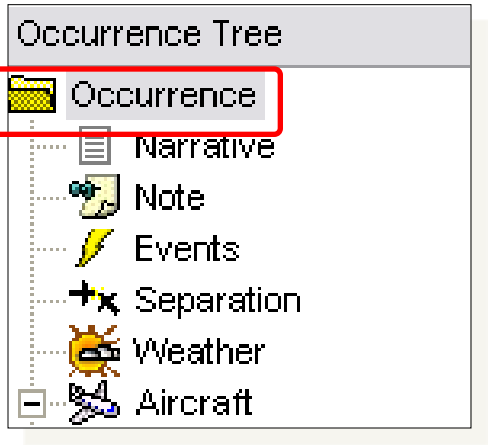
- Description: short term, must fit on paper / screens, may use abbreviations
- Detailed description: same information but with the possibility to use more space and more details
- Explanation: a detailed explanation of the term, if possible giving references to the documentation where the information/definition was obtained from

3. The browser user interface



- ✓ User-friendly tool
- ✓ Browser for reading, editing
- ✓ Check-list for an investigation

3. Enter Base Data



- Administrative & background data
  - File Number
  - State & Reporting Organisation
  - Report Source & Report Status
- Time & Space
  - Date and Time
  - State of Occurrence
  - Location (name or region)
- Severity levels
  - Aircraft damage
  - Injury level

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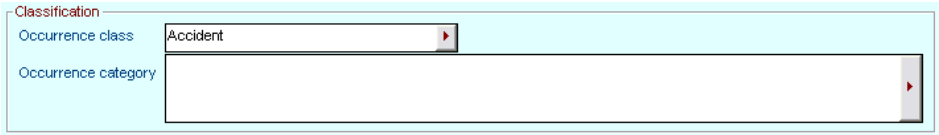
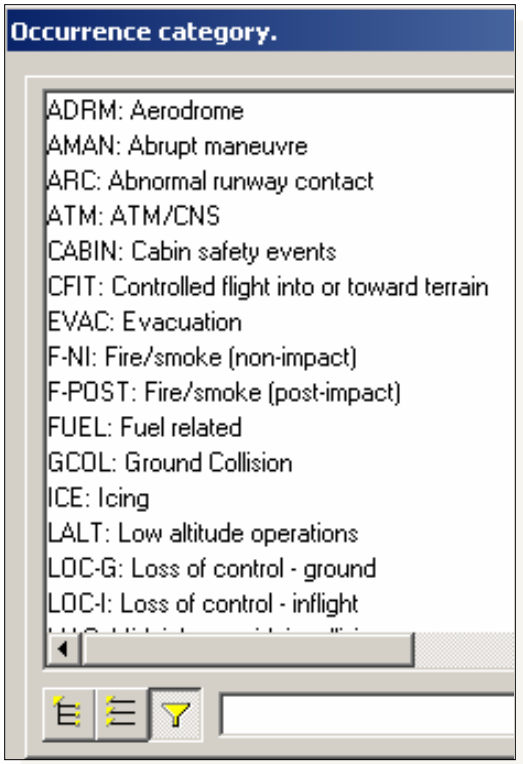
3. Occurrence Classification

- **Occurrence class (Annex 13)**
  - Accident, serious incident, incident



- **Occurrence category (CAST/ICAO)**
  - List and definitions provided by the Common Taxonomy Team
  - One ore more possible



- **ATM contribution**
  - Required for Eurocontrol reporting

- Events, phases of flight, descriptive factors, explanatory factors (will be described later)

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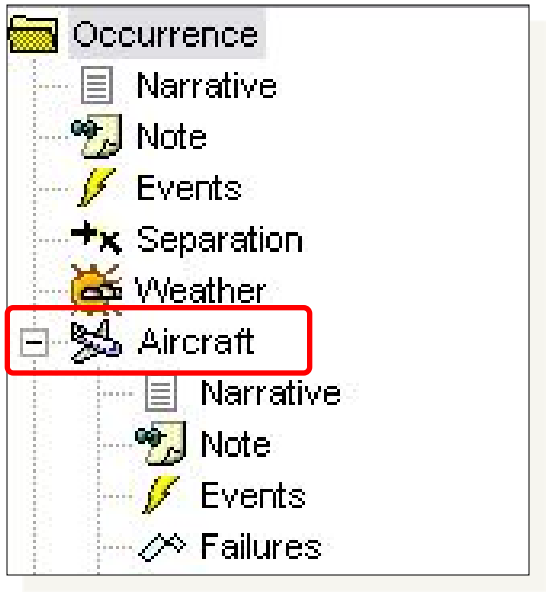
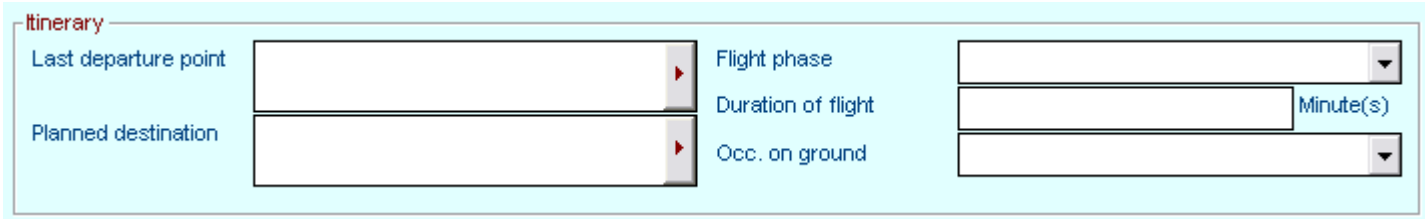
3. Add aircraft



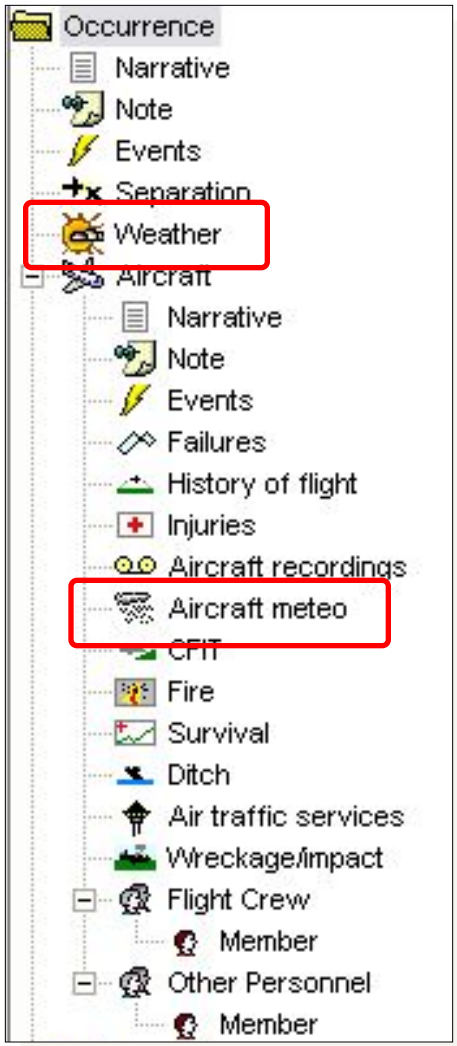
- Registration
- Manufacturer / model
- Aircraft characteristics*
  - Aircraft category
  - Number of engines
  - Propulsion type
  - Mass group
  - Landing gear type
- Type of operation
  - At least top level (Commercial, GA, Aerial work,…)
  - For operation type GA / Aerial work also enter Operator Type

3. History of flight

- Itinerary
- Flight phase
  Use the one related to the event that defines the occurrence
- Occurrence on ground ?
- Approach / landing information
- Information on person at controls
- Information on flight plan

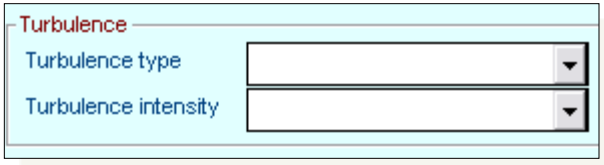


3. Weather



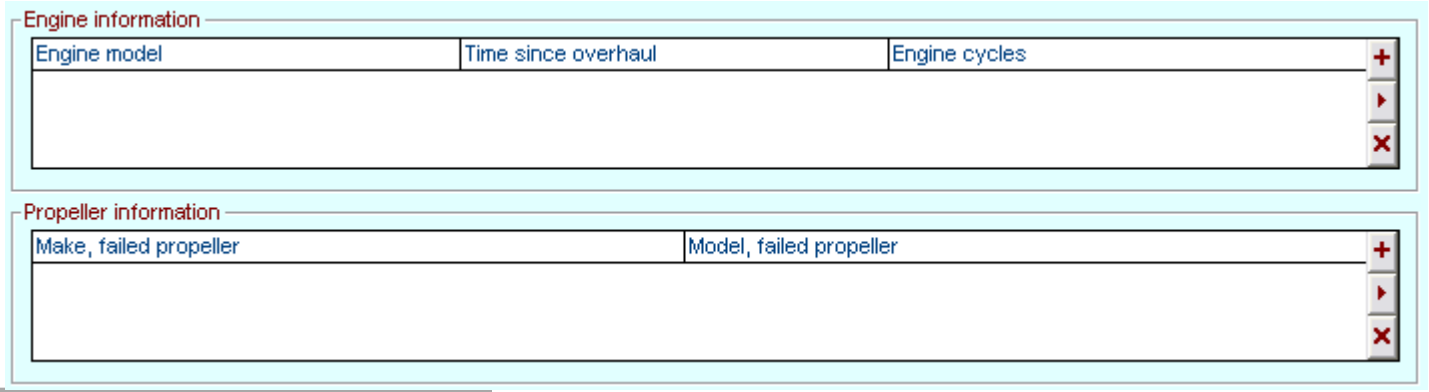
- Weather in general
  - Conditions for the area
  - Under the occurrence

- Aircraft meteo
  - Briefing
  - Winds
  - Visibility
  - Specific phenomena
    - icing, turbulence, wind shear, mountain wave



3. Parts / component failures / engine / propeller

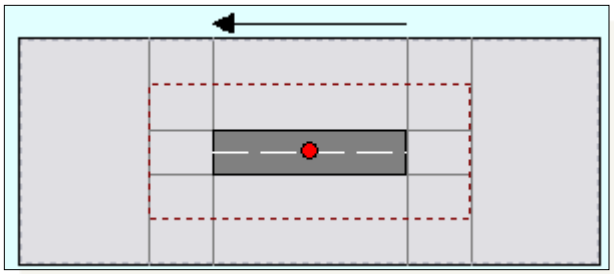
- When such failures can be established, record
  - Name of parts
  - Part numbers
- In any case, if available
  - Engine data (make/model, hours cycles)
  - Propeller data (make/model)



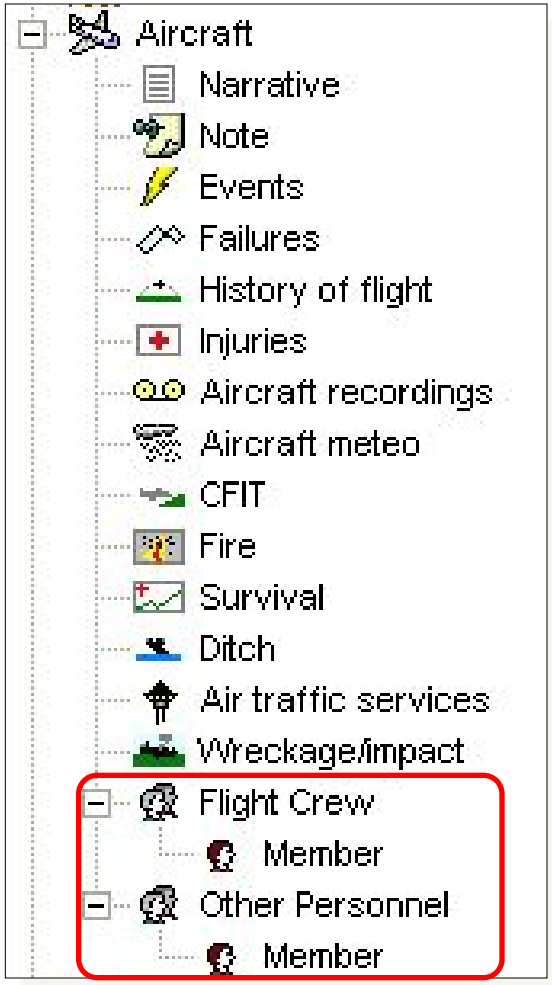
3. Wreckage and impact information

- Position of the wreckage
  - In relation to the aerodrome
- Description of the terrain
  - For example mountainous, water, etc.
- Details on the impact
  - Speed
  - Attitude
  - Impact angle

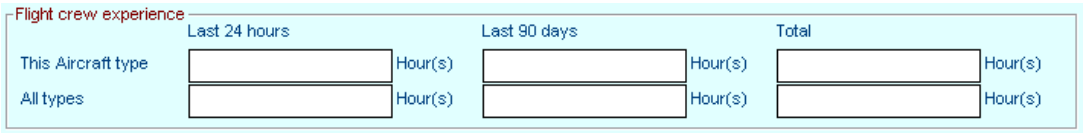
*** Position of aircraft or of wreckage**



3. Personnel information



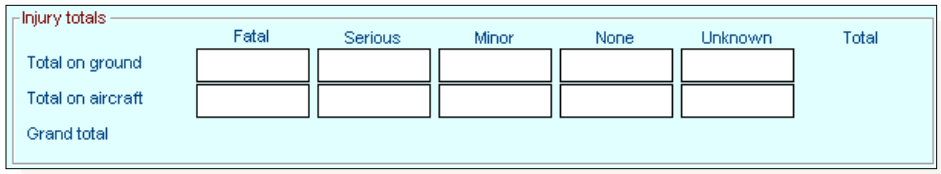
- Information on
  - Rest and duty time
  - Experience
    - On type
    - All aircraft
  - License/Ratings
- Both for Flight Crew and Other Personnel



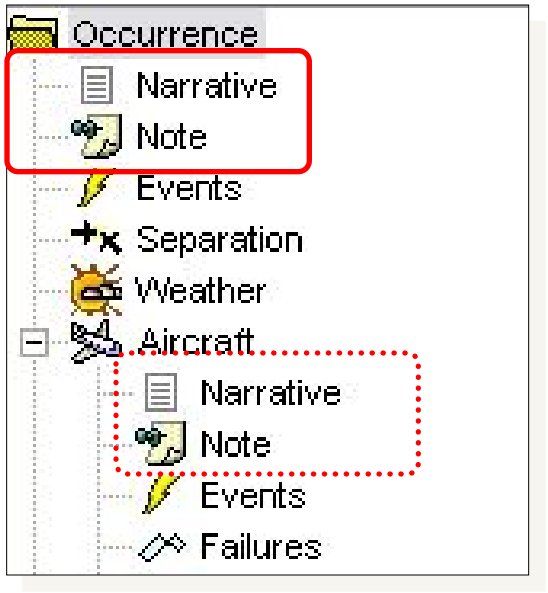
3. Injuries

- Injuries – persons on board
  - Injuries page under the aircraft
  - Severity of the injuries
  - Injuries by causes
  - Information on autopsies

- Totals are on the front page (under occurrence)
  - To be used for injuries on ground
  - Total on aircraft is calculated from Injuries on aircraft



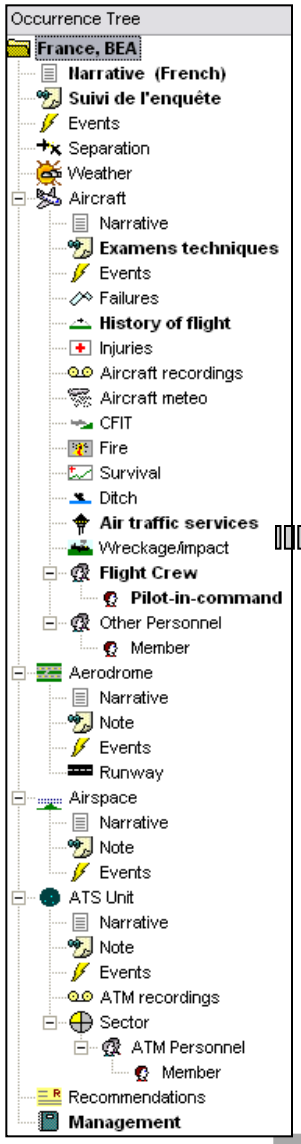
3. Narratives and notes



- Narrative*
  - Includes factual information, analysis and conclusions
  - With indication of the language used
- Note
  - To be used for comments or complementary information (not to be placed in the narrative)
  - With indication of the subject
- Narratives and notes are multiple instances
  - Different languages or subjects
  - Located at different places in the occurrence tree

*** Headline may be used also to enter a short description of the occurrence**

3. What kind of other information to collect?



If the WEATHER was relevant, enter
Details on meteorological conditions

If there were INJURIES to persons
Complete the injury details

If the occurrence involved an AERODROME, enter
Aerodrome data

If the occurrence involved a RUNWAY, enter
Runway data

If the occurrence involved a RUNWAY EXCURSION, enter
Runway data
Position where aircraft came to rest in relation to the runway used

If the occurrence involved an AIRPROX or SEPARATION issues
Provide basic data on all aircraft involved
Complete separation page with the details at hand (e.g. TCAS information)

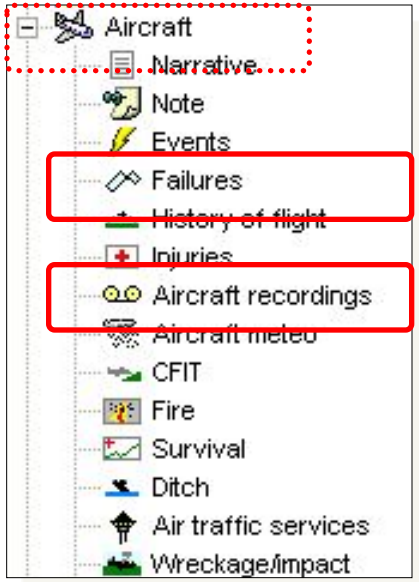
If the occurrence involved EVACUATIONS
Provide evacuation details

If the occurrence involved a FIRE / SMOKE ON BOARD an aircraft
Provide information on aircraft fire warning and protection systems

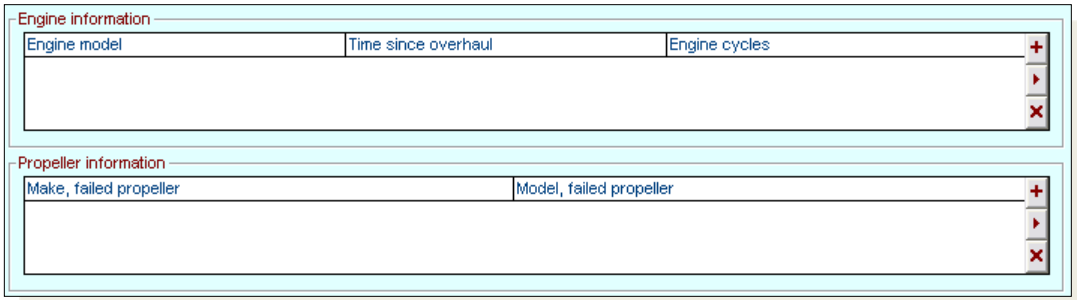
If the occurrence involved a FIRE ON or close to an AERODROME
Provide information on aerodrome fire fighting efforts

If the occurrence involved an ATS UNIT, enter
Details on the ATS unit
Workload data only if workload issues are involved
Functioning of warning systems (e.g. STCA)

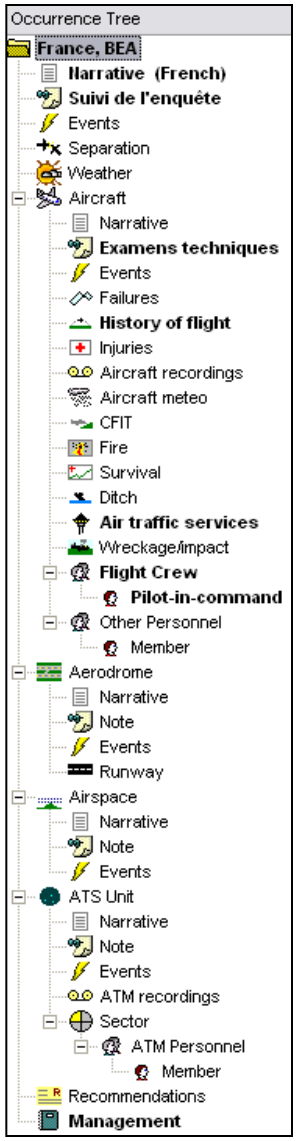
3. Example: Technical data



- Parts / components failures
  - Name of parts
  - Part numbers
  - More details is captured in the events section
- Recordings section
  - FDR/CVR
- In any case, if available
  - Engine data (make/model, hours cycles)
  - Propeller data (make/model)



3. In Summary



- Depends on each occurrence
  - Fire, CFIT, Separation, Runway excursion, Evacuation, ATS involved…
- Capture relevant information for future analysis and safety studies
- Align with the sections of the final report (Part 1)
- General rule
  - Attributes left blank (no entry) indicate that the data was not entered. The information may or may not be available
  - Attributes with contents "Unknown" indicate that the information requested was not available even though an effort may have been made to find it
- Finally, the topics tree represents the extent of the investigation
  - if the 'Show all nodes' option is not checked

3. Conclusion

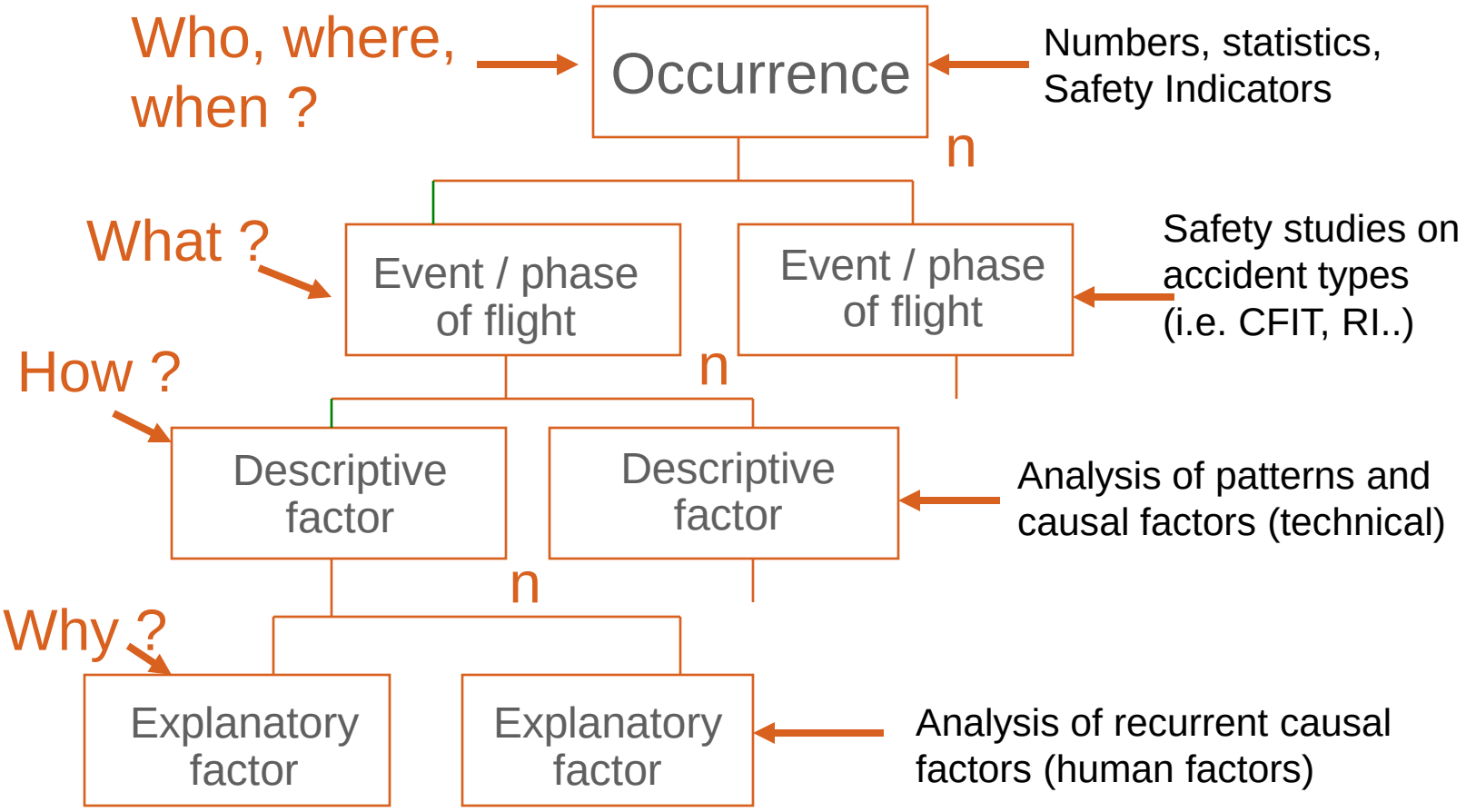
Two data categories

- Factual data
  - Start with preliminary view
  - Add information using more detailed views
  - Topics tree can serve as a “check list”
  - Sections of the final report
  - Data entry procedure and guidelines for data collection

– Analysed data
  - Section events and factors
  - Potential factors and safety issues
  - Recommendations

➢ Proposed encoding approach

3. Coding structure



4. ECCAIRS tools

- Reporting System

Repository manager	Manage views, users and theirs access
Taxnomy Browser	Access to the definitions of the taxonomy
Browser	Data entry and retrieval
Exporter (DM)	Data extraction and reporting
Data Exchanger (DM)	Data Saving / Loading
Grapher	Charting

- Related tools

RefXAC / RefXAD	Registration / Loc. Indicator database
WebDAS	Web based access
AWB	Aggregation analysis and reporting
Dexter	Data Entry Forms Designer
Batchelor (DM)	Execute jobs all at one time

- Supporting tools

DINER	Data Integration Network
MEPHISTO / T-REX	Data conversion platform

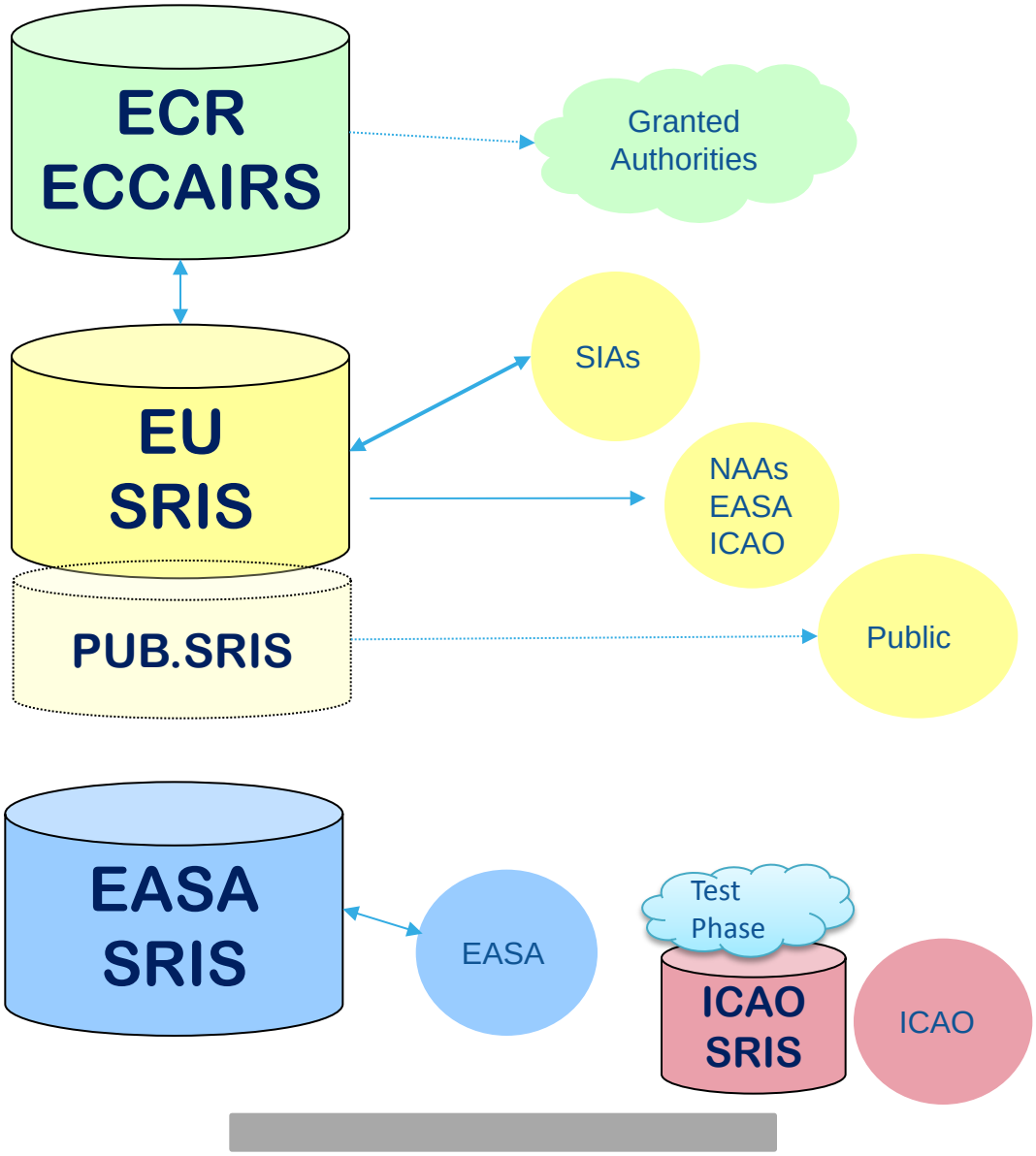
4. BEA internal developments

- ✓ Customization
  - ✓ Sections, views
  - ✓ Dictionaries
- ✓ Data extraction
  - ✓ Weekly reports (template)
  - ✓ Notification form (template)
  - ✓ Other templates
- ✓ Add-ins
  - ✓ State file number generation
  - ✓ Web Search Engine (AD, Registration, Aircraft/Engine taxonomies…)
  - ✓ Web map
- ✓ Linking other systems (Web services API)
  - ✓ BEA website
  - ✓ LISE

5. Future enhancements

- ECCAIRS 2.0
  - Central Database
  - Web-based
  - Focus on the Core functionalities
  - Open source technology
  - …

6. Overview (Introduction to SRIS)



ECCAIRS
SIAs / NAAs / EASA / ICAO

REG 2014/376	REG 2010/996
ECCAIRS	SRIS
Aviation Occurrences	Aviation Safety Recommendations
In production since 12/2007	In production since 12/2011

ECCAIRS Software

BEA

Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

Thank you

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