



EASA

European Aviation Safety Agency

New ECCAIRS Taxonomy and Application in Safety Analysis

John Franklin, EASA
12 May 2015

Your safety is our mission.

An agency of the European Union



TE.GEN.00409-001



Scope

- New ECCAIRS Taxonomy Update
 - Background
 - New Occurrence Categories
 - New Structure for Event Types
 - Update to Data Quality Rules and Coding Guidelines
- Application of Taxonomy to Safety Analysis
 - What we hope to do with the Taxonomy
 - Importance of good data
 - Streamlining data flow and improving information available for analysis



Background - Context and Challenges

- Regulation (EU) 376/2014
 - Introduces ECCAIRS/ ADREP compatibility
 - NoA Data Flow WG have developed concept of the Reduced Interface Taxonomy (RIT)
 - Used as the basis for:
 - Data transfer format between organisations and NAAs
 - Standardised reporting at EU Level – 7 Reports
 - GA Report, Flight Ops, Aerodrome, ATM, Birdstrike, Dangerous Goods, Technical
- Need for better data to identify safety risks to support the European Aviation Safety Plan



Background - Context and Challenges

- Many analysis challenges around current taxonomy
- ECCAIRS Taxonomy based on ICAO ADREP
- Event Types - Current structure

- Event Types

What?

5 Levels – 1200 fields

- Descriptive Factors

How?

6 + 3 Levels – 1500+ fields

- Modifiers

- Explanatory Factors

Why?

5 + 3 Levels – 1300 fields

- Modifiers

Human and Organisational Factors often only found in the Explanatory Factors

Analysis and SPI Monitoring of the whole thing is 22 Levels and 4000 fields



Change 1 - Occurrence Categories

- Latest release includes the 2 new CICTT Occurrence Categories – After analysis of OTHER
- Medical (MED)
 - Provides a specific category for occurrences involving illnesses of persons on board an aircraft
 - Not for injuries which should be coded as the relevant other category (CABIN, SEC, TURB, WSTRW)
- Navigation Errors (NAV)
 - Occurrences involving incorrect navigation of aircraft in the air
 - Use with MAC/ Airprox if relevant



New Event Types

- Built on initial work in CAST/ ICAO Common Taxonomy Team and ECCAIRS Taxonomy WG
- Causal and Contributory Factors included in an expanded set of Event types
- Although Descriptive and Explanatory Factors will remain in the taxonomy
- Event Types could replace use of Descriptive and Explanatory Factors
 - Total fields reduced from 4000 to 2400
 - Specific events are at only 4 levels of detail



Top level (Level 1)

- Consequential Events (Outcomes)
- Equipment Events
- Operational Events
- Personnel Events
- Organisational Events



Consequential Events (Outcomes)

- Damage and Injuries Outcome Events
 - Types of damage to aircraft
 - Impairment/ medical/ injuries
- Flight Operations Outcome Events
 - Cargo and Loading (e.g. dropped load)
 - Declared Emergencies
 - Effect on Operations (e.g. Aircraft return, diversion)
 - Other Outcomes (e.g. Rejected Take – Off)



Equipment Events

- Covers equipment/ technical failure events
- Structure – Equipment area/ domain, system, sub-system, type of failure
- Addition of type of failure is the cause of the increase in the size of the Event Types taxonomy
 - Aerodrome and ATM Equipment Events
 - Aircraft General Explosions/Fire/Fumes/Smoke Outcome Events
 - Aircraft Equipment Events by ATA Chapter and Sub Chapter



Operational Events

- Range of operational events by domain
- Includes communication and environmental encounters
 - Aerodrome and Ground Aids
 - Air Navigation Services Events
 - Aircraft Flight Operations
 - Sailplane/Glider Specific Events
 - Aircraft Maintenance and Repair
 - Aircraft Design Events (to be developed)
 - Aircraft Production Events (to be developed)



Personnel Events

- Goal is capture specific Human Factors elements of an occurrence
- Developed by building on CICTT Human Factors Taxonomy and HFACS
 - Personnel Experience and Knowledge Events
 - Physiological Events
 - Situational Awareness and Sensory Events
 - Personnel Task Performance Events



Organisational Events

- Develop to capture specific organisational aspects of occurrences
 - Regulatory Events
 - Organisational Management Events
 - Organisational Documentation and Publications Events



Future Taxonomy Work Development

- Short Term – Summer 2015
 - Finalises the taxonomy to meet the needs of Regulation (EU) 376/2014
 - Changes to Aircraft Category and Operation Type
 - New Helicopter Mass Group – for EU Analysis
 - Additional fields for management of reports
- Rest of 2015 – Improvement to Coding Guidelines and Data Quality Rules
- 2016 – Total Review of ECCAIRS Taxonomy

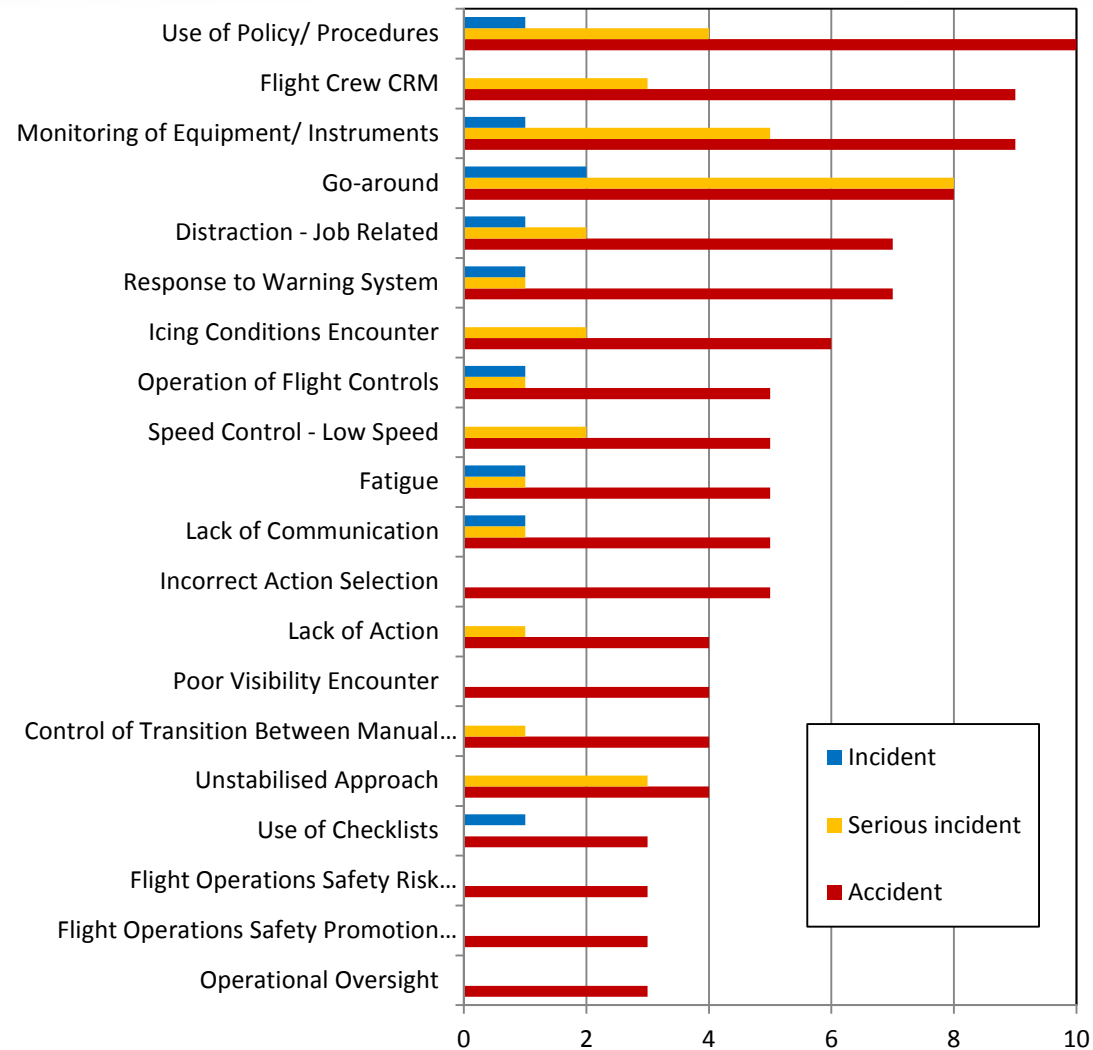


Application of Taxonomy for Analysis

- Data (and hence the taxonomy) is a vital building block for:
 - Safety Risk Management process for the EASp
 - Informing SSp of the EASA Member States
 - Providing organisations with information for SMS
 - Make safety promotion material for individuals
- To do this – we need meaningful data
- Best information in Initial Reports
- Coded data in the European Central Repository



Example: LOC-I study, first results





Risk Portfolio – CAT Fixed Wing

CAT – Fixed Wing		SYS	Outcomes								EME
Safety Issue			RE/ARC	MAC	LOC-I	CFIT	RI	Fire	SCF	GCOL	
Operational	Survivability and Evacuation		•		•		•	•		•	
	Inadequate recognition and recovery from aircraft warning system (e.g. aircraft upset)		•	•	•	•					
	Inadequate handling of go-arounds		•		•						
	Management of extreme weather conditions		•		•	•	•			•	
	Erroneous data parameters		•		•						
	Improper fuel management		•			•			•		
	Birdstrikes		•								
	Improper management of separation between aircraft				•						
	Inadequate ground handling activities (e.g. de-icing)				•		•			•	
	Improper loading and dangerous goods handling				•			•	•		
Technical	Incorrect installation during maintenance and documentation errors		•	•	•	•	•	•	•	•	
	ILS false/disrupted signal capture		•		•				•		
	Contamination of Controls or Control Surfaces		•		•				•		
	Unsuitability of recording devices	•			•						
Human	Technical failure in flight		•	•	•	•	•	•	•		
	Crew impairment	•	•	•	•	•	•	•		•	
	Inadequate CRM or Communication	•	•	•	•	•	•	•		•	
	Inadequate monitoring of flight parameters/ automation modes		•	•	•	•					
	Inadequate knowledge of aircraft systems and associated procedures	•	•	•	•	•					
	Inadequate crew awareness in unexpected or unfamiliar scenarios		•	•	•						
Organisational	Inadequate operational procedures and oversight	•			•						
	Improper management of single pilot operations in CAT	•									



Developing Initiatives for Data Quality

- Improved occurrence investigation at the operator level – results in new taxonomy
- Streamlined data flow and reporting
 - Regulation (EU) 376/2014 for occurrence reporting
 - Tools and ECCAIRS compatible reports could be used to help the Accident Investigation community
- Application of Coding Guidelines and Data Quality Rules across all data providers
- Improve quality of the ECR for decision making



EASA

European Aviation Safety Agency

Any Questions?

Your safety is our mission.

An agency of the European Union

