



Information Article

AIR ACCIDENT INVESTIGATION

'Snapshot' for Aircraft Operators, Airport Operators, GHAs - and so on



Relevance:

Major Aviation Emergency / Crisis Response Planning

General Awareness of the Global Air Accident Investigation Process

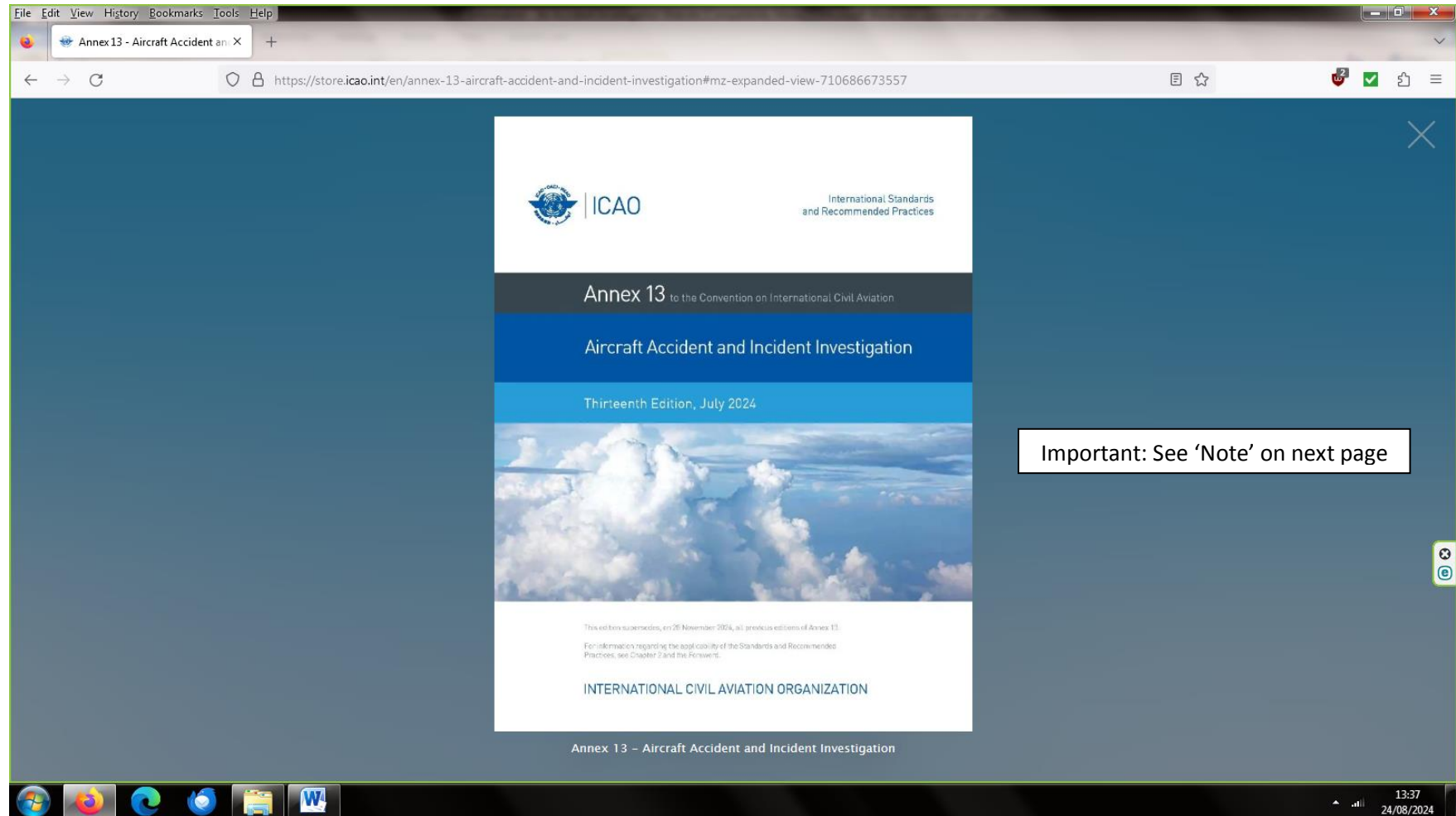


https://en.wikipedia.org/wiki/Air_France_Flight_447





Information Article (www.aviationemergencyresponseplan.com)





A Brief 'Snapshot' of - ICAO ANNEX 13 / Aircraft Accident and Incident Investigation

The causes of a relevant aircraft accident, serious incident or incident must typically be identified and 'managed' (as required) in order to (try to) prevent repeat occurrence. The identification of such causal factors is typically best accomplished via a properly conducted and effective investigation

The primary objective of such investigation is the potential, future prevention of the same / similar 'thing' happening again (i.e. not necessarily to apportion *blame* and / or *liability*)

ICAO Annex 13 provides international (International Civil Aviation Organisation - ICAO etc.) requirements etc. re the investigation of aircraft accidents and incidents. As such, it (together with any derivative / other relevant documents etc.) serves as a vital reference for those involved in so doing

For example, Annex 13 defines which States (*countries*) may participate in an aircraft accident investigation - e.g. the State(s) of '(the Accident etc.) **Occurrence**'; '(Aircraft) **Registration**'; '(Aircraft) **Operator**'; '(Aircraft) **Design**' and '(Aircraft) **Manufacture**' - together with the associated rights and responsibilities etc. of same

Note: This specific info article (you are reading it now) is based on the 12th edition of Annex 13 (July 2020). However, the latest edition (13th edition) became available in July 2024. The 'interested' reader might wish to consult the latter (13th edition) to see if there have been any relevant updates / changes etc. - compared to what has been documented herein (12th edition)

Annex 13 - Chapters 1 to 3

The above chapters cover definitions, applicability and general information. Chapter 3 includes e.g.:

- Objectives of an air accident investigation
- Independence of investigations (an ICAO Standard i.e. binding on all ICAO members)
- Protection of evidence; Custody (of evidence); Removal of aircraft (also an ICAO Standard)

Chapter 4

All States potentially involved in an investigation must be **promptly notified** (by whomever is required so to do) of an associated occurrence (aircraft accident / incident etc.). The procedure for same (including required format and content) is outlined in Annex 13 - Chapter 4, as follows:

NOTIFICATION of ACCIDENTS / SERIOUS INCIDENTS etc. (OCCURRING) IN THE TERRITORY OF ONE CONTRACTING STATE - re an AIRCRAFT OF ANOTHER CONTRACTING STATE (as appropriate)

State(s) so notified (by the **State of Occurrence**) must acknowledge receipt of same and provide (to State of Occurrence and State of **Registration** - as appropriate) all relevant information available to them re the aircraft, flight crew etc. involved - plus whether (or not) they intend to appoint an accredited representative(s) to the / any consequent investigation.

The following States shall be so notified accordingly (as appropriate + re the specific accident aircraft situation involved):





- State of Registration
- State of (aircraft) Operator
- State of (aircraft) Design
- State of (aircraft) Manufacture

'ICAO' shall also be notified **if** the aircraft involved has a mass (weight) of over 2250kg OR is turbojet powered

In circumstances where the **State of Occurrence** is / might **not** (for whatever reason) be aware of a **serious incident** occurrence (or otherwise an 'incident to be investigated'), the State of Registration or the State of the Operator (as / if appropriate), shall forward notification of same to said State of Occurrence and also to the State of Design and the State of Manufacture. See this page further below for what information should be included in such notification

IMPORTANT: The State of the Operator **shall, without delay** and by the **most suitable and quickest means available**, provide the States of Occurrence and Registration (as relevant) with details of any **dangerous goods** known to have been carried on board the involved aircraft

AIRCRAFT **ACCIDENT** / **SERIOUS INCIDENT** NOTIFICATION MESSAGE - ICAO ANNEX 13 FORMAT

The above message shall be in plain language and contain as much of the following as is readily available. It must not be delayed due lack of complete information (send latter later if appropriate):

For accidents: Start with the identifying abbreviation **ACCID** - and for serious incidents: **SINCID**

Aircraft Type and Manufacturer, Model, Nationality, Registration Marks and Serial Number

Name of Aircraft's Owner(s), Operator and Hirer (as appropriate)

Qualification of Pilot in Command (Aircraft Commander / Captain)

Nationalities of Crew and Passengers (as available)

Date and time (Local Time or GMT / UTC [clearly state which]) of occurrence

Last point of departure and next point(s) of intended landing of aircraft involved

Position of occurrence re an easily defined geographical feature + latitude and longitude

Number of **crew** on board + number killed and / or seriously injured (if any)

Number of **passengers** on board and the number killed and / or seriously injured (if any)





Number of * **other persons** killed and / or seriously injured (if any) as a direct result of occurrence

* Typically 'ground victims' - if any

Brief **Circumstances of occurrence** + extent of aircraft damage - as far as is known

Presence, description, location etc. of any **dangerous goods** carried on the accident aircraft

The following information should also be provided - as and when it becomes available:

- An indication as to what extent the investigation will be conducted (or is proposed to be delegated, if relevant) by the State of Occurrence
- Physical characteristics of the accident or serious incident area + an indication of access difficulties / special requirements necessary etc. to reach the accident site / wherever
- Identification of the originating authority + details of how to contact (24H) the investigator-in-charge + the accident investigation authority of the **State of Occurrence**

ACCIDENTS / SERIOUS INCIDENTS OCCURRING IN THE TERRITORY OF THE STATE OF REGISTRATION, IN A *NON-CONTRACTING STATE* OR *OUTSIDE THE TERRITORY OF ANY STATE*

Chapter 4 also outlines similar notification / response accountabilities where the **State of Registration** institutes an **investigation** re an aircraft accident and / or serious incident etc.

RESPONSIBILITY OF THE STATE of the OPERATOR, STATE of DESIGN and STATE of MANUFACTURE

See associated information provided on top section of previous page

Chapter 5

Following formal notification of the investigation to the appropriate authorities, Chapter 5 addresses the responsibilities for instituting and conducting any associated investigation

ACCIDENTS OR INCIDENTS IN THE TERRITORY OF A CONTRACTING STATE

Responsibility for instituting an investigation typically belongs to the State in which the accident or incident occurred (**State of Occurrence**). The latter usually conducts the investigation - but may delegate all or part of same to another State or 'regional accident / incident investigation organisation' - by mutual agreement and consent





ACCIDENTS OR INCIDENTS IN THE TERRITORY OF A **NON-CONTRACTING STATE**

When an accident / serious incident occurs in the territory of a non-Contracting State, which is **not** intending to conduct an investigation itself as per ICAO Annex 13 - the State of Registration (or, failing that) the State of the Operator **OR** the State of Design **OR** the State of Manufacture - should endeavour to institute / conduct such investigation **in co-operation with** the State of Occurrence (i.e. the non-contracting State) - BUT failing such co-operation, should **itself** conduct an investigation with whatever such information is available

ACCIDENTS OR INCIDENTS OUTSIDE THE TERRITORY OF **ANY STATE**

When the location of an accident / serious incident cannot be definitively established as being in the territory of any State - the associated State of Registration shall institute and conduct any necessary investigation. However, it may delegate the whole or any part of the investigation to another State, by mutual arrangement and consent

Note - *If the State of Registration is also a non-Contracting State* and does **not** intend to conduct an investigation in accordance with Annex 13, the State of the **Operator** (or, failing that, the State of **Design** or the State of **Manufacture**) should endeavour to institute and conduct said investigation. Note, however, that such non-contracting State may delegate the whole or any part of the investigation to another State - by mutual arrangement and consent

States nearest an accident location in **international waters** shall provide such assistance as they are able to and shall, likewise, respond to any requests made by the associated State of Registration

ORGANISATION and CONDUCT OF the INVESTIGATION

The **Manual of Aircraft Accident and Incident Investigation** (ICAO Doc 9756 - 2nd Ed. - 2015) provides guidance material for organising, conducting and controlling an air accident investigation - under the following general headings:

- **RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION**
- **RESPONSIBILITY OF THE STATE OF REGISTRATION AND STATE OF THE OPERATOR**
- **RESPONSIBILITY OF ANY OTHER STATE(S)**
- **PARTICIPATION IN THE INVESTIGATION:**
 - **PARTICIPATION OF THE STATES OF REGISTRATION, OPERATOR, DESIGN AND MANUFACTURE**
 - **PARTICIPATION OF OTHER STATES**
 - **ENTITLEMENTS OF ACCREDITED REPRESENTATIVES**
 - **PARTICIPATION OF STATES HAVING SUFFERED FATALITIES OR SERIOUS INJURIES TO ITS CITIZENS**





The investigation process itself **very generally** includes:

- Gathering, recording and analysis of all relevant information
- Protection of certain records
- Determination of the causes / contributing factors
- Formulating appropriate safety recommendations
- Issue of safety recommendations, as appropriateand
- Completion of the final report

Any investigation conducted in accordance with the provisions of this Annex shall be **separate from** any **judicial** and / or **administrative** proceedings which might be held to apportion blame and / or liability

States should ensure co-operation between their accident investigation authorities and judicial authorities - such that investigations are not impeded by administrative or judicial investigations / proceedings. Such co-operation may be achieved by means of e.g. legislation, protocols, agreements or other arrangements - and may include the following areas (list is not exhaustive):

- Access to accident site
- Preservation of and access to evidence
- Initial and ongoing debriefings of the status of each process involved
- Exchange of information
- Appropriate use of safety information
- Resolution of conflicts

Chapter 5 (of the document being read right now) also includes provisions re:

- The investigator-in-charge
- Flight recorders and 'ground based (e.g. Air Traffic Services; Military etc.) recordings'
- Autopsy and medical examinations
- Co-ordination with judicial authorities
- Informing relevant aviation security authorities (as required)
- Disclosure / protection of records
- Re-opening of an investigation

Clauses 5.18 to 5.26 provide information re who (which persons) can participate in a / the investigation, including '**accredited representatives**' and their advisors - as applicable

Note the requirements of the penultimate clause of Chapter 5 (Clause 5.27) i.e.

*'States which have a special interest in an accident by virtue of fatalities or serious injuries to its citizens - **shall be entitled to appoint an expert, who shall be permitted to:***

- *Visit the scene of the accident*
- *Have access to the relevant factual information (as approved for public release by the State conducting the investigation) - and information on the investigation progress*
- *Receive a copy of the Final Report*





The above entitlement will not preclude such State(s) from also assisting in the identification of victims and in meetings with survivors from any such State(s)

Note - guidance related to assistance to aircraft accident victims and their families was originally provided in ICAO publication 'Guidance on Assistance to Aircraft Accident Victims and their Families (**Circular 285 - AN/166**)

This largely ineffective document was (late 2013) superseded by the significantly better ICAO **Doc 9973 - AN/486 - 'Manual on Assistance to Aircraft Accident Victims and their Families'** (2013).

ICAO Annex 9 (Facilitation) - Chapter 8 (8.42 to 8.48) also provides more useful information on the above subject - including one **related / associated 'Standard'** (8.47) and one **related / associated 'Recommended Practice'** (8.48)

The last clause of Chapter 5 states - *'the State conducting the investigation should release at least, and in a timely manner (sometime during the first year of the investigation), established factual information and also an indication of the progress of the investigation'*

Chapter 6

This chapter contains the recommended practices dealing with the development and publication of the final report of an investigation. The recommended format for same can be found in Appendix 1 to ICAO Annex 13

Note the following highlights from Chapter 6 of the latter:

- States shall not circulate, publish or give access to a draft report or any part thereof - or any documents obtained during an investigation of an accident or incident - without the express consent of the State which originally conducted the investigation, unless such reports or documents have already been published or released by said latter State
- The State conducting the investigation shall send (transmit) a copy of the **draft** Final Report to the following States (as appropriate) - and inviting their significant and substantiated comments on the report as soon as possible:
 - The State that Instituted the Investigation
 - The State of Registry
 - The State of the Operator
 - The State of Design
 - The State of Manufacture
 - Any State that participates in the investigation as per Chapter 5
- If the State conducting the investigation receives comments within sixty days of the date of the transmittal of the draft Final Report, it shall (where appropriate) either amend the draft Final Report to include the substance of the comments received or, if desired by the State that provided comments, append the comments to the Final Report instead





- If the State conducting the investigation receives no comments within sixty days of such date, it shall issue the Final Report in accordance with clause 6.4 - unless an extension of that period has been agreed by the States concerned
- The **Final** Report of the accident investigation shall be sent with a minimum of delay, by the State conducting the investigation, to:
 - The State that instituted the investigation (if different)
 - The State of Registry (if different)
 - The State of the Operator (if different)
 - The State of Design (if different)
 - The State of Manufacture (if different)
 - Any State that participated in the investigation (if different)
 - Any State having suffered fatalities or serious injuries to its citizens
 - Any State that provided relevant information, significant facilities or experts
- In the interests of accident prevention, the State conducting the investigation of an air accident or incident shall make the Final Report publicly available as soon as possible and, ideally, within twelve months of commencing same
- If the report cannot be made publicly available within twelve months, the State conducting the investigation shall make an interim statement publicly available on each anniversary of the occurrence, detailing the progress of the investigation and any safety issues raised
- When the State which has conducted an investigation into an accident or an incident (involving an aircraft of a maximum permitted mass of over 5,700 kg) has released a Final Report - then that State shall additionally send a copy to the ICAO
- At any stage of an accident or incident investigation - the authority of the State conducting same shall recommend (in a dated, transmittal correspondence to the appropriate authorities, including those in other States) any preventive action that it considers necessary **to be taken promptly** - in order to enhance aviation safety
- Precedence for the issue of Safety Recommendations from an accident/ incident investigation is given to the investigating State. In the interests of safety, however, other States also so participating shall be entitled to issue safety recommendations after co-ordinating with said investigating State
- A State conducting an investigation of an accident or incident shall address, when appropriate, any safety recommendations arising out of its investigations - in a dated transmittal correspondence - to the accident investigation authorities of other State(s) concerned and, when ICAO documents are involved, to ICAO
- A State issuing a 'safety recommendation of global concern (SRGC) shall advise ICAO of same - together with associated responses - via dated transmittal correspondence, regardless of not of whether the SRGC was originally addressed to ICAO





- A State which receives a safety recommendation(s) shall inform the 'proposing' State, within 90 days of the date of the transmittal correspondence, of the preventive action(s) taken or under consideration OR the reason(s) why **no** action will be taken
- A State conducting an investigation or any other State issuing a safety recommendation shall implement appropriate procedures to record associated responses received
- A State which receives a safety recommendation(s) shall implement procedures to monitor the progress of associated actions taken

Chapter 7

Computerised databases greatly facilitate the storing and analysing of information on aircraft accidents and incidents. The sharing of such safety information is regarded as vital to accident prevention

ICAO operates a computerised database known as the **Accident / Incident Data Reporting** (ADREP) system, which facilitates the exchange of safety information amongst Contracting States

Chapter 7 of ICAO Annex 13 addresses the reporting requirements of the ADREP system, which is by means of a Preliminary and (a separate [updating/ formal]) Accident / Incident Data Report

Chapter 8

Chapter 8 of Annex 13 deals with **accident prevention measures**

The provisions of this chapter cover incident reporting systems, both mandatory and voluntary - and the necessity for a non-punitive environment for the voluntary reporting of safety hazards

The chapter then goes on to address database systems and a means to analyse the safety data contained in such databases in order to determine any preventive actions required

Finally, it recommends that States promote the establishment of safety information sharing networks to facilitate the free exchange of information on actual and potential safety deficiencies

The processes outlined in Chapter 8 form part of an ICAO sponsored world-wide **safety management system** (SMS) - aimed at reducing the number of accidents and serious incidents

* Note:

For context and clarity purposes only, the following extract has been taken from Amendment 14 (dated July 2013) to ICAO Annex 13 (10th Edn) i.e. we are referring here to an **earlier edition** of Annex 13 (i.e. **NOT** the one you are reading about right now [latter is 12th Edition - dated July 2020] or the 13th edition of mid-2024). This has been done for the purposes of historical clarity re this matter:

‘.....Consequential to the creation of (**new document**) ICAO Annex 19, the content of ICAO Annex 13 (Chapter 8) had been substantially reduced. Only **Standard 8.4** and **Recommendation 8.8** were retained (in **subsequent** versions of Annex 13) + some editorial amendment - where relevant





***Standard 8.4 had become Standard 8.1** (“A State shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies to determine any preventive actions required”)*

***Recommended Practice 8.8 had become Recommended Practice 8.3** (“In addition to safety recommendation arising from accident and incident investigations, safety recommendations may result from other diverse sources, including safety studies. If safety recommendations are addressed to an organisation in another State, they should also be transmitted to that State’s investigation authority”)*

***A new Recommendation 8.2 had been added** (“State authorities responsible for the implementation of the associated SSP (State Safety Programme) should have access to the accident and incident database [referenced in 8.1] to support their safety responsibilities”’)*

Appendix 2

Protection of Accident and Incident Investigation Records

Appendix 2 is worth reading - even if only to gain some idea of the sometimes competing interests of protecting accident and incident records 100% - versus having access to them for some other lawful purpose e.g. as might be relevant to an **associated judicial investigation**, which could well assign blame and liability

Attachment C

Examples of Events which might typically be classified as ‘**Serious Incidents**’

The term “**serious incident**” is defined as:

An incident (associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked) **which involves circumstances indicating that there was a high probability of an accident**

The incidents listed below are typical examples of those likely to be classified as ‘serious.’ **The list is not exhaustive** and serves only as guidance to the better understanding of what might be termed a ‘serious incident’

- Near collisions requiring an avoidance manoeuvre to avoid a collision **OR** an unsafe situation **OR** otherwise when an avoidance action would have been appropriate
- Collisions not classified as **accidents**
- Controlled flight into terrain only marginally avoided
- Aborted take-offs on a closed or engaged runway, on a taxiway or unassigned runway
- Take-offs from a closed or engaged runway, from a taxiway or unassigned runway
- Landings or attempted landings on a closed or engaged runway, on a taxiway or unassigned runway or on unintended landing locations such as roads
- Dragging during landing of - a wing-tip, an engine pod or any other part of an aircraft - when / if not classified as an accident
- Retraction of landing gear or a ‘wheels-up’ landing, when / if not classified as an accident





- Gross failures to achieve predicted performance during take-off or initial climb
- Fire and / or smoke in the cockpit, in the passenger compartment, in cargo compartments OR engine fires, even though such fires were extinguished by the use of extinguishing agents
- Events requiring emergency use of oxygen by the *flight crew*
- Aircraft structural failures or engine disintegrations (including uncontained turbine engine failures) not classified as an accident
- Multiple malfunctions of one or more aircraft systems seriously affecting operation of aircraft
- Flight crew incapacitation in flight (a. for single pilot ops; b. for multi-pilot ops in which flight safety was compromised due significantly increased workload for remaining crew)
- Fuel quantity level or distribution situations requiring declaration of an associated emergency by the pilot e.g. insufficient fuel, fuel exhaustion, fuel starvation, inability to use all usable fuel on board etc.
- Runway incursions classified as severity A. (The ICAO Manual on the Prevention of Runway Incursions (Doc 9870) contains information on such severity classifications)
- Take-off or landing incidents e.g. under-shooting, over-running, running off the side of runways etc.
- System failures (including loss of power / thrust), weather phenomena, operations outside the approved flight envelope - or other occurrences which could have caused difficulties controlling the aircraft
- Failures of more than one system - in a redundancy system which is mandatory for flight guidance and navigation
- The unintentional or, as an emergency measure, intentional release of an under-slung load or any other load carried external to the aircraft

Above list was current as at 2021

Attachment E

Guidance for the Determination of Aircraft Damage (with regards to the latter being classified as an accident or an incident)

- If an engine separates from an aircraft - the event **is** categorized as an **accident** - even if damage is confined to the engine
- If structural damage is such that an aircraft depressurises or cannot be pressurised - the occurrence **is** categorised as an **accident**
- A loss of engine cowls (for the fan or core) or reverser components, which does not result in further damage to the aircraft, is **not** considered to be an accident
- Occurrences where compressor or turbine blades or other engine internal components are ejected through the engine **tail pipe** - are **not** considered to be accidents





- A collapsed or missing radome is **not** considered to be an accident - unless there is related substantial damage in other structures or systems
- Missing flap, slat and other lift augmenting devices, winglets, etc. - which are permitted for dispatch under the configuration deviation list (CDL), are **not** considered to be accidents
- Concerning retraction of a landing gear leg or wheels-up landing, resulting in skin abrasion only..... If the aircraft can be safely dispatched after minor repairs or patching - and subsequently undergoes more extensive work to effect a permanent repair, then the occurrence would **not** be classified as an accident
- The removal of components for inspection following an occurrence - e.g. the precautionary removal of an undercarriage leg following a low-speed runway excursion, while involving considerable work, is **not** considered to be an accident unless significant damage is found
- Occurrences involving emergency evacuation are **not** considered to be accidents unless *someone* involved receives a *serious* injury / injuries as a result and / or the aircraft has otherwise sustained *significant* damage

Note 1 - Regarding aircraft damage which adversely affects the structural strength, performance or flight characteristics - the aircraft may have landed safely, but cannot be safely dispatched on a further sector without repair

Note 2 - If the aircraft can be safely dispatched after minor repairs and subsequently undergoes more extensive work in order to make a permanent repair - such occurrence would not be classified as an accident.

Likewise, if the aircraft can be dispatched under the Configuration Deviation List with the affected component removed, missing or inoperative, the repair would not be considered as a major repair and consequently the occurrence would not be considered to be an accident

Note 3 - The cost of repairs or estimated loss (such as provided by insurance companies) may provide an indication of the damage sustained - but should **not** be used as the sole guide as to whether the damage is sufficient to count the occurrence as an accident. Likewise, an aircraft may be considered a "hull loss" because it is uneconomic to repair, without it having incurred sufficient damage to be classified as an accident





FURTHER USEFUL INFO - as produced by a *real* Air Accident Investigation Authority (i.e. the UK)

Following the below links will take the reader to the relevant sections of the UK's 'Air Accident Investigation Branch - **AAIB**' website - which is part of the UK Government's 'Department for Transport - DfT'

The first site linked to immediately below relates to a document explaining the authority, roles & responsibilities of the AAIB - and is targeted at **Aircraft Operators**

Aircraft Accidents & Serious Incidents - Guidance for Airline Operators - Dec 2013

<https://www.gov.uk/government/publications/aircraft-accidents-guidance-for-airline-operators>

The next site linked to immediately below relates to a document explaining the authority, roles & responsibilities of the AAIB - aimed this time at **Emergency Services**

Aircraft Accidents – AAIB Guidance & Briefing Notes for Emergency Services - Dec 2008 & Sep 2018

<https://www.gov.uk/government/publications/aircraft-accidents-guidance-for-emergency-services-and-airfield-operators>

https://assets.publishing.service.gov.uk/media/5f687b1de90e072b9a2780b4/AAIB_Briefing_Note_Hi_Res.pdf

The last site linked to below provides an example of a form which is targeted at surviving accident victims. The aim of using such a questionnaire is to aid the accident investigation process - where relevant / applicable

Passenger Questionnaire - 2014

<https://www.gov.uk/government/publications/aaib-passenger-questionnaire>





Below is the UK AAIB's Equivalent of the 'ICAO format' Accident Notification Message - as shown (starting page 4) of *this* info article:

What the AAIB need to know

Notification

A person reporting an accident or serious incident should provide / be asked to provide the following information:

(Notification should not be delayed if all of the following is not available initially)

- Aircraft type (e.g. Boeing 737, Airbus A320 etc.)
- Aircraft registration (letters and / or numbers)
- Name of aircraft owner or operator
- Number of persons on board (crew / passengers / supernumerary etc.)
- Names of the crew and, if known, others on board (e.g. as might be shown on a passenger manifest)
- Date and time of the accident / incident in UTC
- Aircraft's last departure point and its next intended destination(s)
- Type of flight (passenger, cargo, survey, positioning etc.)
- Location of accident
- Extent of any injuries to the occupant(s) and / or others (e.g. ground victims)
- Nature of the occurrence and phase of flight (e.g. take-off, landing etc.)
- Extent of damage to the aircraft
- Details of any dangerous goods on-board
- Confirmation that the CVR & FDR have been isolated

The AAIB would rather have early notification of something (which later turns out *not* to require AAIB action) than late notification (of something that *does* require action)

