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# Webinar – AIG

## Process for investigating the various types of accidents

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# OBJECTIVE

**The purpose of this webinar is to study the elements to be considered when establishing a process for investigating the various types of accidents, as required by PQ 6.343**



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# Agenda

- ✈ Requirements of the Protocol Question (PQ)
- ✈ Gathering relevant information
- ✈ Defining the framework
- ✈ Developing the process



# Requirements of the Protocol Question (PQ)

PQ 6.343 - Has the State established and implemented:

- a) a process for investigating the various types of accidents, as well as
- b) guidance material to help determine the extent of an accident investigation depending on the circumstances of the accident and the safety lessons it expects to draw from the investigation?



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# Requirements of the Protocol Question (PQ)

## ✈ 1<sup>st</sup> Requirement:

A **process** for investigating the **various types of accidents**



# Requirements of the Protocol Question (PQ)

## ✈️ 1<sup>st</sup> Requirement:

A process for investigation

### ***Process***

***“a series of actions that you take in order to achieve a result”***

Cambridge Dictionary

Usually organized in a form of one or more procedures



# Accident investigation process

✈ Throughout the investigation, there are many activities that need to be carried out either by the IIC or the investigation team

# Example of accident investigation







# Accident investigation process

- ✈ Activities may be more or less complex depending on the characteristics of the accident (or incident)
- ✈ The investigation process must be planned in a way to assist the IIC in carrying out the activities at the level of complexity required by the investigation



# Accident investigation process

- ✈ The process should offer different routines for each activity whose degree of complexity varies according to the circumstances of the accident, like:
  - ✈ The appointment of a IIC only, or a large team
  - ✈ Going or not to the crash site
  - ✈ Interaction with other entities
  - ✈ Etc.



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# Requirements of the Protocol Question (PQ)

## ✈ 1<sup>st</sup> Requirement:

A process for investigating the **various types of accidents**

*Accidents may be grouped according to certain criteria, as: type of operation, category of the occurrence, category of aircraft, Injury level, damage, social repercussion, involvement of other States, presence of illegal activity, etc.*



# Requirements of the Protocol Question (PQ)

## ✈ In other words:

- ✈ A State needs to make plans to address the all foreseen\* situations an investigation may face
- ✈ These plans will form the investigation process

\* Foreseen under the State's civil aviation system



# Requirements of the Protocol Question (PQ)

## ✈️ 2<sup>nd</sup> Requirement:

Guidance material to help determine the **extent** of an accident investigation depending on the **circumstances** of the accident and the **safety lessons** it expects to draw from the investigation



- *In some situations, the determination of the extent can be predetermined (e.g. accidents caused by illegal interference, accidents with non-certified aircrafts, accidents caused by non-qualified person, etc.*
- *Other situations will require assessment during the investigation.*
- *Guidance has to be provided for both cases.*

Guidance material to help determine the **extent** of an accident investigation depending on the **circumstances** of the accident and the **safety lessons** it expects to draw from the investigation



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# Gathering relevant information

- ✈ Gather all information relevant to understanding the requirement:
  - ✈ the ICAO references to that PQ
  - ✈ the Guidance for Review of Evidence

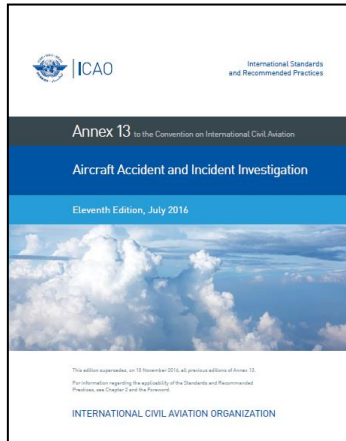




# ICAO references

| AIG 6.000 - Aircraft accident and incident investigation - Conduct of aircraft accident and serious incident investigations—Procedures                           |   |  |                        |   |  |
|--|---|--|------------------------|---|--|
| <p>STD<br/>A13<br/>5.1 &amp; 5.4<br/>RP<br/>A13<br/>5.4.2<br/>GM<br/>Doc 9756<br/>Part I, 2.6, 3.1 &amp; 3.2<br/>Part II, 1.1.3, 2.2.3 &amp; C4<br/>Doc 9962</p> | <p>AIG 6.343<br/>AO Results<br/>Click here to enter text.</p> | <p>Has [Choose Yes/No] been established and implemented:<br/>a) a process for investigating the various types of accidents, as well as<br/>b) guidance material to help determine the extent of an accident investigation depending on the circumstances of the accident and the safety lessons it expects to draw from the investigation?</p> | <p>[Choose Yes/No]</p> | <p>1) Review process and guidance material issued to help determine how the investigation will be conducted (including scope and depth of the investigation, and whether or not investigators will be deployed on site.<br/>2) Ensure that the process and guidance material established are sufficiently detailed and are customized to the system in place.<br/>3) Review evidence to confirm effective implementation.</p> | <p>[Choose S/NS/NA] <input type="checkbox"/></p> |

## ICAO REFERENCES ANNEX 13



### ACCIDENTS OR INCIDENTS IN THE TERRITORY OF A CONTRACTING STATE

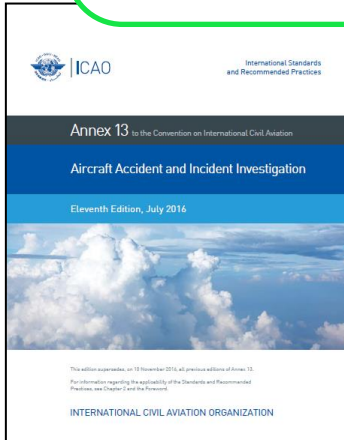
#### *State of Occurrence*

5.1 The State of Occurrence shall institute an investigation into the circumstances of the accident and be responsible for the conduct of the investigation, but it may delegate the whole or any part of the conducting of such investigation to another State or a regional accident and incident investigation organization (RAIO) by mutual arrangement and consent. In any event, the State of Occurrence shall use every means to facilitate the investigation.

### Delegation requires:

- Prior legal / regulatory provision
- A formal arrangement (such as MOUs)
- The establishment of appropriate procedures and guidelines

TERRITORY



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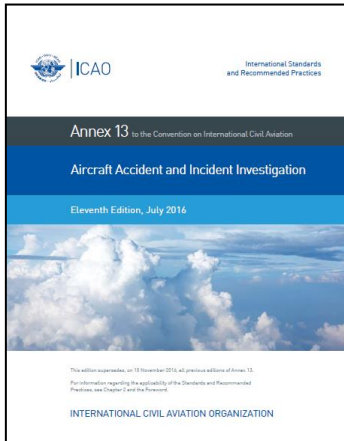
## ICAO REFERENCES ANNEX 13

### RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

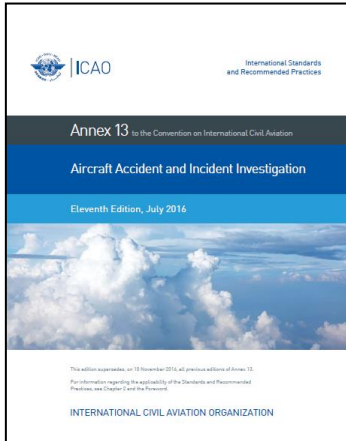
#### *General*

5.4 The accident investigation authority shall have **independence** in the conduct of the investigation and have **unrestricted authority** over its conduct, consistent with the provisions of this Annex. The investigation **shall normally include:**

- a) the gathering, recording and analysis of all relevant information on that accident or incident;
- b) the protection of certain accident and incident investigation records in accordance with 5.12;



## ICAO REFERENCES ANNEX 13



### RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

The investigation process will naturally reflect the presence or not of both independence and unrestricted authority

... have **independence** in  
... and have **unrestricted authority**

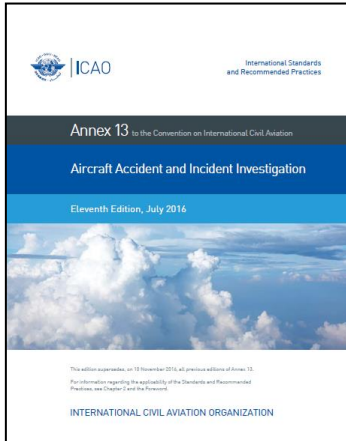
... the provisions of this Annex. The  
include:

... and analysis of all relevant information

... in accident and incident investigation

5.12;

## ICAO REFERENCES ANNEX 13



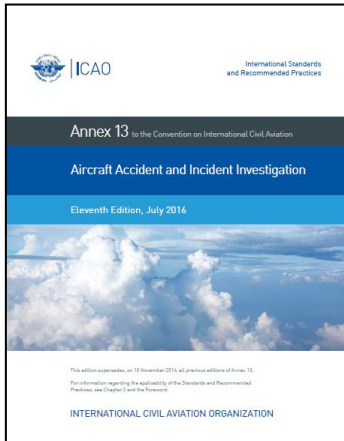
### RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

The lack of those elements has a direct impact in the approach of the investigations (specially in high profile accidents)

... have **independence** in  
... and have **unrestricted authority**  
... the provisions of this Annex. The  
include:  
... and analysis of all relevant information  
... in accident and incident investigation  
5.12;

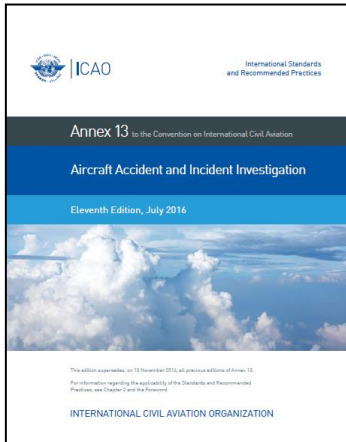
## ICAO REFERENCES ANNEX 13

### RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION



- General** The investigation process will differ depending on the circumstances of the accident (e.g. non certified aircraft)
- 5.4.1 The investigation process shall be conducted in the conduct of the investigation and the restricted authority over its conduct, consistent with the provisions of this Annex. The investigation **shall normally include:**
- a) the gathering, recording and analysis of all relevant information on that accident or incident;
  - b) the protection of certain accident and incident investigation records in accordance with 5.12;

## ICAO REFERENCES ANNEX 13



### RESPONSIBILITY CONDUCTING THE INVESTIGATION

#### *General*

5.4 ...

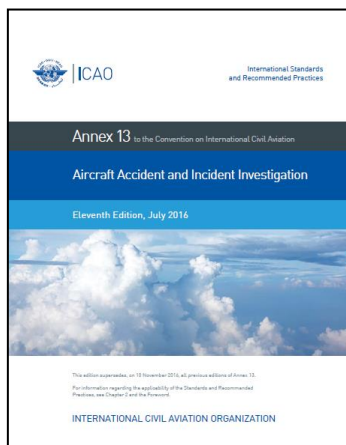
Where feasible, the scene of the accident shall be visited, the wreckage examined and statements taken from witnesses. The extent of the investigation and the procedure to be followed in carrying out such an investigation shall be determined by the accident investigation authority, depending on the lessons it expects to draw from the investigation for the improvement of safety.

The characteristics of the accident will determine which routines of the State's investigation process will be applied





## ICAO REFERENCES ANNEX 13

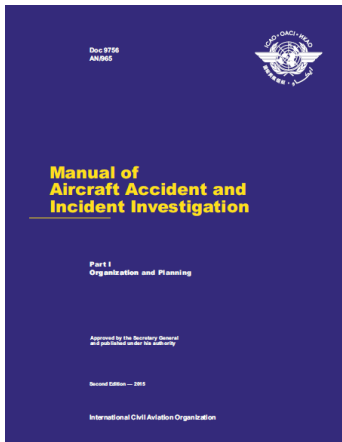


## RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

### *General*

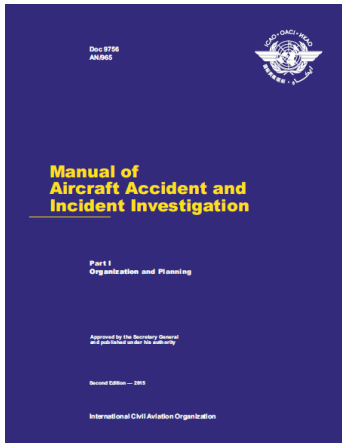
5.4.2 **Recommendation.**— *The accident investigation authority should develop documented policies and procedures detailing its accident investigation duties. These should include: organization and planning; investigation; and reporting.*

PROCESSES

ICAO REFERENCES  
DOC 9756, I

## 2.6 EQUIPMENT

2.6.1 Proper planning and preparedness are essential in facilitating the prompt arrival of investigators at an accident site and have considerable bearing on the efficiency of the investigation. In this regard, accident investigators should have their investigation field kits and essential personal items packed and ready so that they can proceed without delay to the accident site. Advance consideration should also be given to such details as inoculations, passport requirements and travel facilities. To protect against biological hazards such as blood-borne pathogens, investigators who work amongst wreckage are advised to have tetanus and Hepatitis B vaccinations (and any recommended boosters to maintain immunity) and to wear the necessary personal protective equipment.

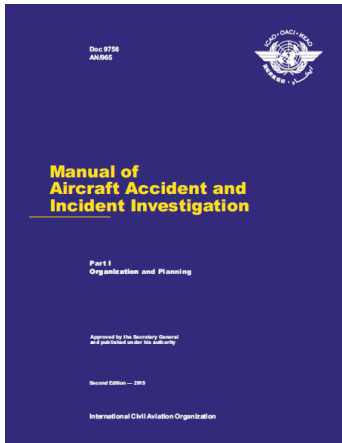
ICAO REFERENCES  
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**Not limited to the equipment to be used, but applicable to all the aspects related to the investigation**

## ICAO REFERENCES DOC 9756, I

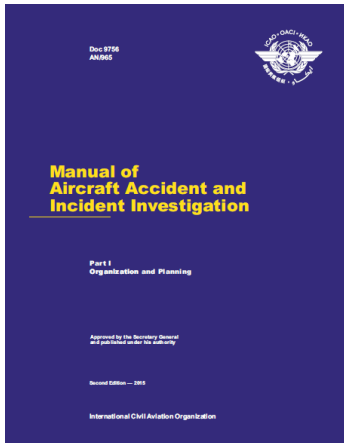


## 2.6 EQUIPMENT

2.6.2 Accidents and incidents are apt to occur anywhere: at airports, in mountains, swamps, deeply wooded areas, deserts, etc. Hardships are often encountered in reaching accident sites in remote areas, and it is therefore important that investigators be physically fit and that working gear be selected with due consideration to terrain and weather.

**Different environments mean  
different approaches**

## ICAO REFERENCES DOC 9756, I



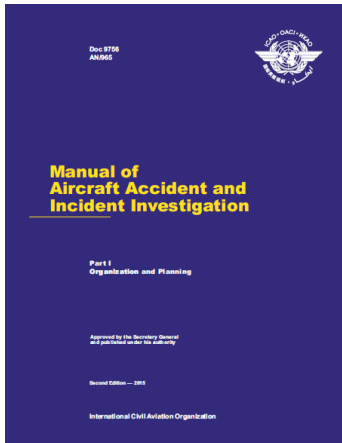
### 2.6 EQUIPMENT

2.6.3 Clothing should be comfortable and afford protection against the conditions or elements that may be encountered. Spare clothing may also be required. The most essential items of personal clothing are good footwear, a windproof and waterproof jacket and trousers, and appropriate headgear. The investigator should wear suitable boots which provide protection against the hazards at the accident site. Ideally, the boots should provide protection against crushing and piercing injuries and should be waterproof and oil resistant. The sole of boot with a heavy moulded tread is essential. Purpose footwear in difficult terrain has often been found suitable in dry, brown ground. Protective items, such as sun block, anti-glare spectacles and insect repellent, should also be available.

Different environments mean different approaches



## ICAO REFERENCES DOC 9756, I



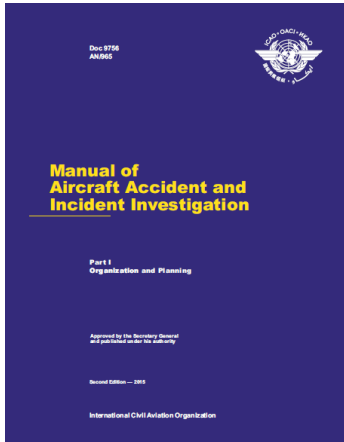
## 2.6 EQUIPMENT

2.6.4 Before proceeding to the accident site, investigators should have adequate supplies and equipment most appropriate to the territory to be covered (food, water, first-aid kit, camping gear, communication equipment, etc.) and should have a competent guide if it is necessary to enter wild or rugged terrain. They should anticipate the need for special equipment (i.e. snowmobiles and skis) and have ready access to this type of equipment so that there is no delay in procuring it. They should also be familiar with the use of such equipment.

**Different environments mean  
different approaches**



## ICAO REFERENCES DOC 9756, I

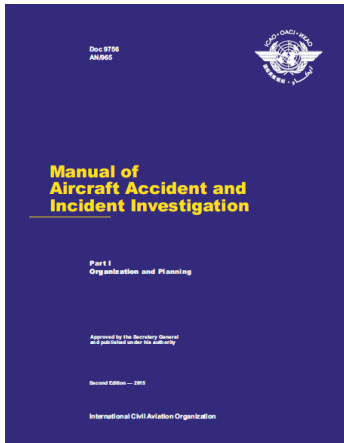


## 2.6 EQUIPMENT

2.6.5 The investigation field kit should contain sufficient equipment to enable examination of the wreckage, the plotting of impact points and wreckage patterns, parts identification and the recording of observations. The list of items in Appendix 1 to this chapter provides guidance on the type of equipment which might be selected for the investigation field kit.

**Different environments mean  
different approaches**

## ICAO REFERENCES DOC 9756, I

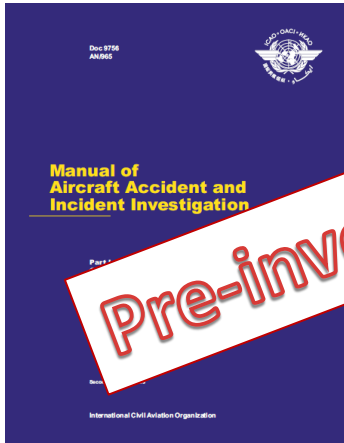


- Chapter 3, Section 3.1 provides guidance on the planning for management of the investigation, emphasizing the importance of:
- an early assessment of the potential magnitude of the tasks and the scope of the investigation to get an appropriate level of resources (human, financial, equipment, etc.)
  - the management of the investigation team by the IIC in major investigations
  - the need to have, in the case of incidents and non-major accidents, all the functions undertaken by one or two investigators or, alternatively, by an investigator and a specialist





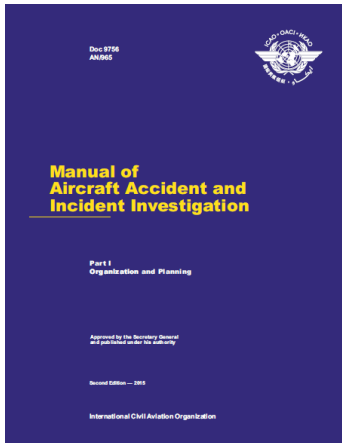
## ICAO REFERENCES DOC 9756, I



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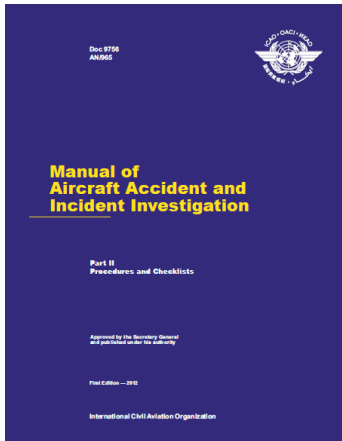
**Pre-investigation planning is essential in all cases**

## ICAO REFERENCES DOC 9756, I



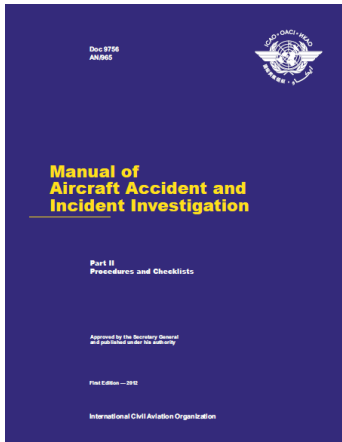
Chapter 3, Section 3.2 provides specific guidance on the effective management of a major investigation, presenting a system based on a comprehensive plan, checklists, and a method and flow charts to track the progress of the investigation

## ICAO REFERENCES DOC 9756, II



In Part II, paragraph 1.1.3, the Manual presents some factors that, among others, may impact the scope and complexity of the investigation:

- a) injuries, deaths and damage to equipment, third parties and the environment;
- b) identified and potential safety issues underlying the accident/incident;
- c) the likelihood of recurrence, the probability of adverse consequences, and the severity of adverse consequences;
- d) accident and incident history related to the type of operation, size and type of aircraft, the operator, manufacturer, and regulator; and
- e) actual and potential deviations from industry safety and operational regulations, standards, procedures and practices.

ICAO REFERENCES  
DOC 9756, II

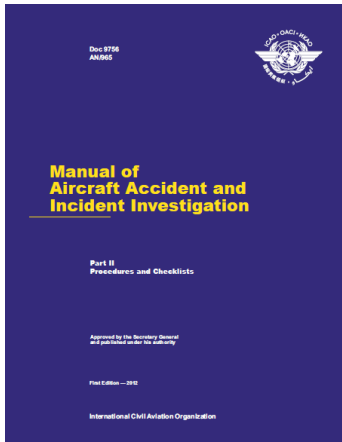
2.2.3 In some investigations, the apparent causes/contributing factors may become evident early in the investigation. In such situations, the subsequent prime investigative effort may then be channelled to good effect into a relatively narrow but specialized area. Nevertheless, it will still be necessary to investigate all factors that might have contributed to the accident and to eliminate those factors that did not. In situations wherein the causes are not readily apparent, the investigator must progress steadily through all aspects of the occurrence, and this type of situation may require substantive effort of many groups of investigators working in a balanced and coordinated manner.

## ICAO REFERENCES DOC 9756, II

### Chapter 4 MAJOR ACCIDENT INVESTIGATIONS

Chapter 4 bring relevant guidance on:

- The need maintain coordination with all the groups in order to maintain and manage the progress of the investigation during the post-field phase of the investigation
- The importance of timely and effective release of investigation information, including preliminary and other reports, interim statements, final reports and safety recommendations
- The Investigation Management System
- Major Accident Investigation Guide



## Manual on Accident and Incident Investigation Policies and Procedures

### ICAO REFERENCES DOC 9962



The guidance provided in this manual is intended for use by those States that do not have in place policies and procedures to meet the requirements of Article 26 of the Chicago Convention and the Standards and Recommended Practices (SARPs) of Annex 13. The content of this manual is consistent with, and is organized in accordance with, guidance materials contained in the:

Manual of Aircraft Accident and Incident Investigation (Doc 9756)

Part I — Organization and Planning

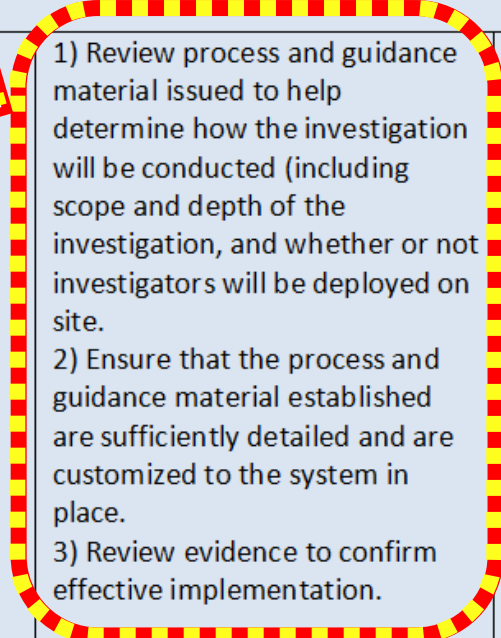
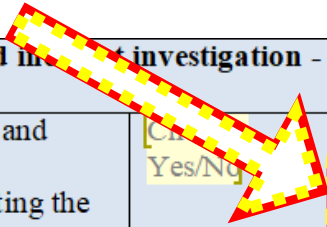
Part II — Procedures and Checklists

Part III — Investigation (in preparation)

Part IV — Reporting



# Guidance for Review of Evidence



| AIG 6.000 - Aircraft accident and incident investigation - Conduct of aircraft accident and serious incident investigations—Procedures |   |  |                 |  |   |
|--|---|--|-----------------|--|---|
| STD<br>A13<br>5.1 & 5.4<br>RP<br>A13<br>5.4.2<br>GM<br>Doc 9756<br>Part I, 2.6, 3.1 & 3.2<br>Part II, 1.1.3,<br>2.2.3 & C4<br>Doc 9962 | AIG<br>6.343<br>(CE-5)<br>ICAO<br>Results<br>Click<br>here to<br>enter<br>text. | Has the State established and implemented:<br>a) a process for investigating the various types of accidents, as well as<br>b) guidance material to help determine the extent of an accident investigation depending on the circumstances of the accident and the safety lessons it expects to draw from the investigation? | Click<br>Yes/No | <ol style="list-style-type: none"> <li>1) Review process and guidance material issued to help determine how the investigation will be conducted (including scope and depth of the investigation, and whether or not investigators will be deployed on site.</li> <li>2) Ensure that the process and guidance material established are sufficiently detailed and are customized to the system in place.</li> <li>3) Review evidence to confirm effective implementation.</li> </ol> | Choose S/NS/NA <input type="checkbox"/> |



# Guidance for Review of Evidence

- 1) Review process and guidance material issued to help determine how the investigation will be conducted (including scope and depth of the investigation, and whether or not investigators will be deployed on site.
- 2) Ensure that the process and guidance material established are sufficiently detailed and are customized to the system in place.
- 3) Review evidence to confirm effective implementation.





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# Agenda

- ✈ Requirements of the Protocol Question (PQ)
- ✈ Gathering relevant information
- ✈ Defining the framework
- ✈ Developing the process



# Defining the framework

- ✈ Selecting relevant criteria in accordance with the system in place
- ✈ Arranging the selected criteria to form classes of accidents
- ✈ Establishing the framework for the investigation process



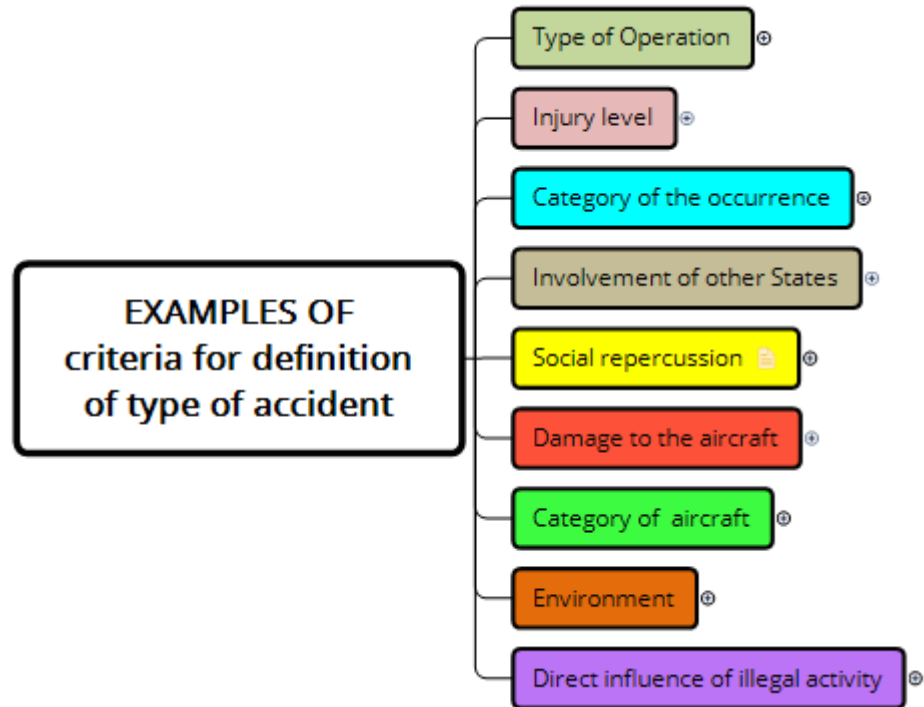
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# Selecting relevant criteria

- ✈ Criteria may be established based on several different aspects/circumstances
- ✈ Bear in mind the size and level complexity of your civil aviation system

# Selecting relevant criteria





# Selecting relevant criteria

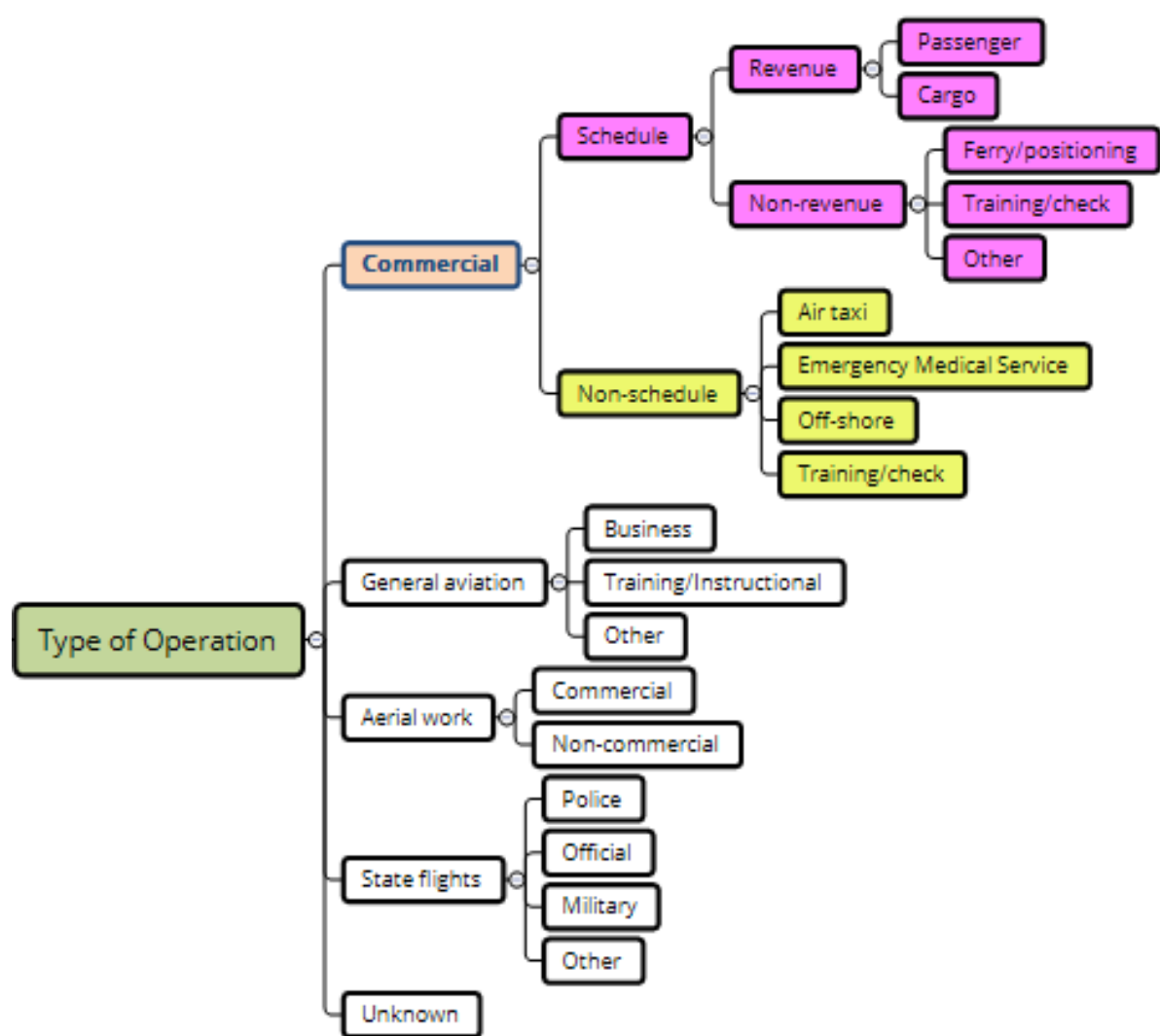
✈ Whenever available, use existing taxonomy

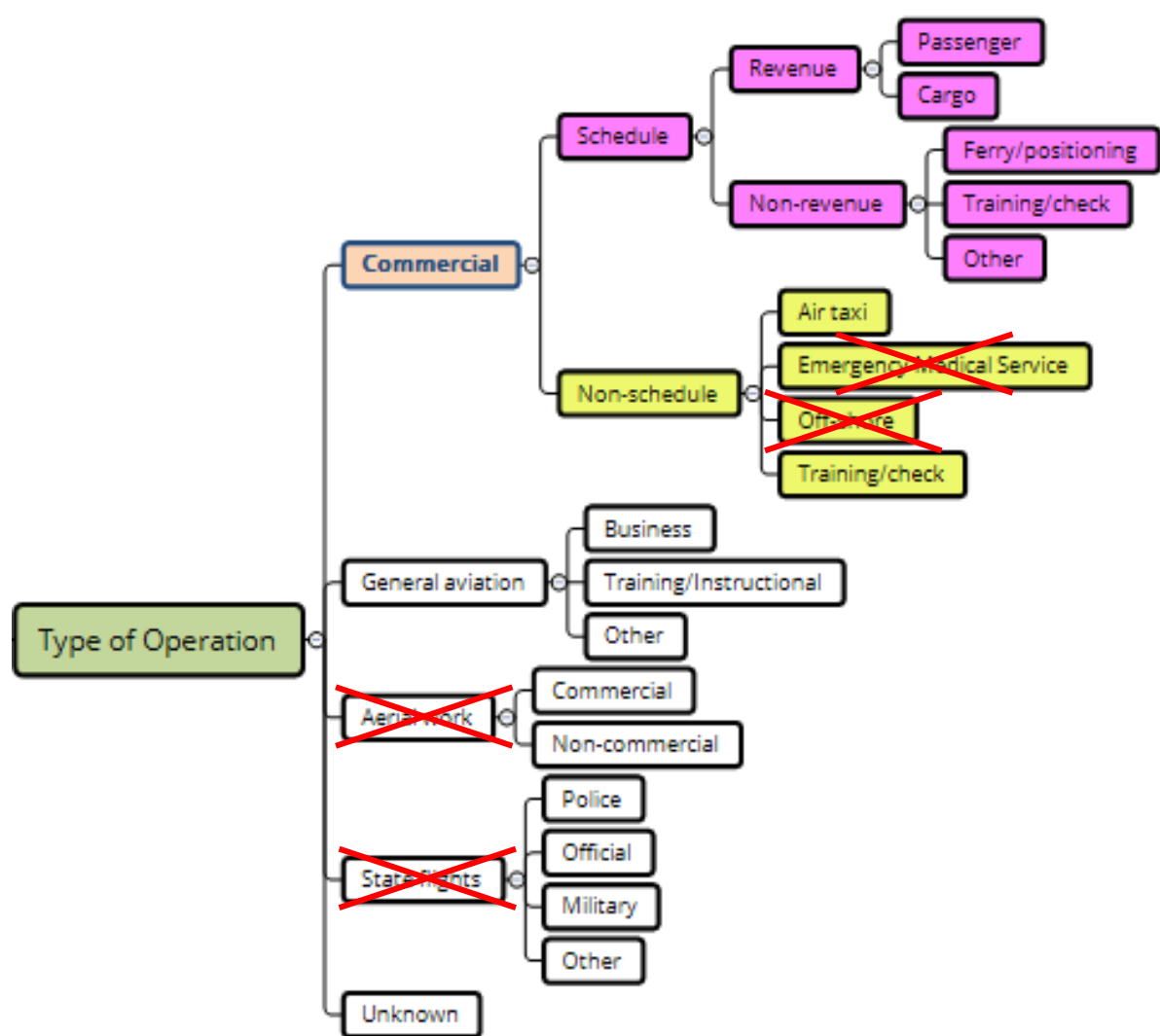
✈ Annex 6, Part I:

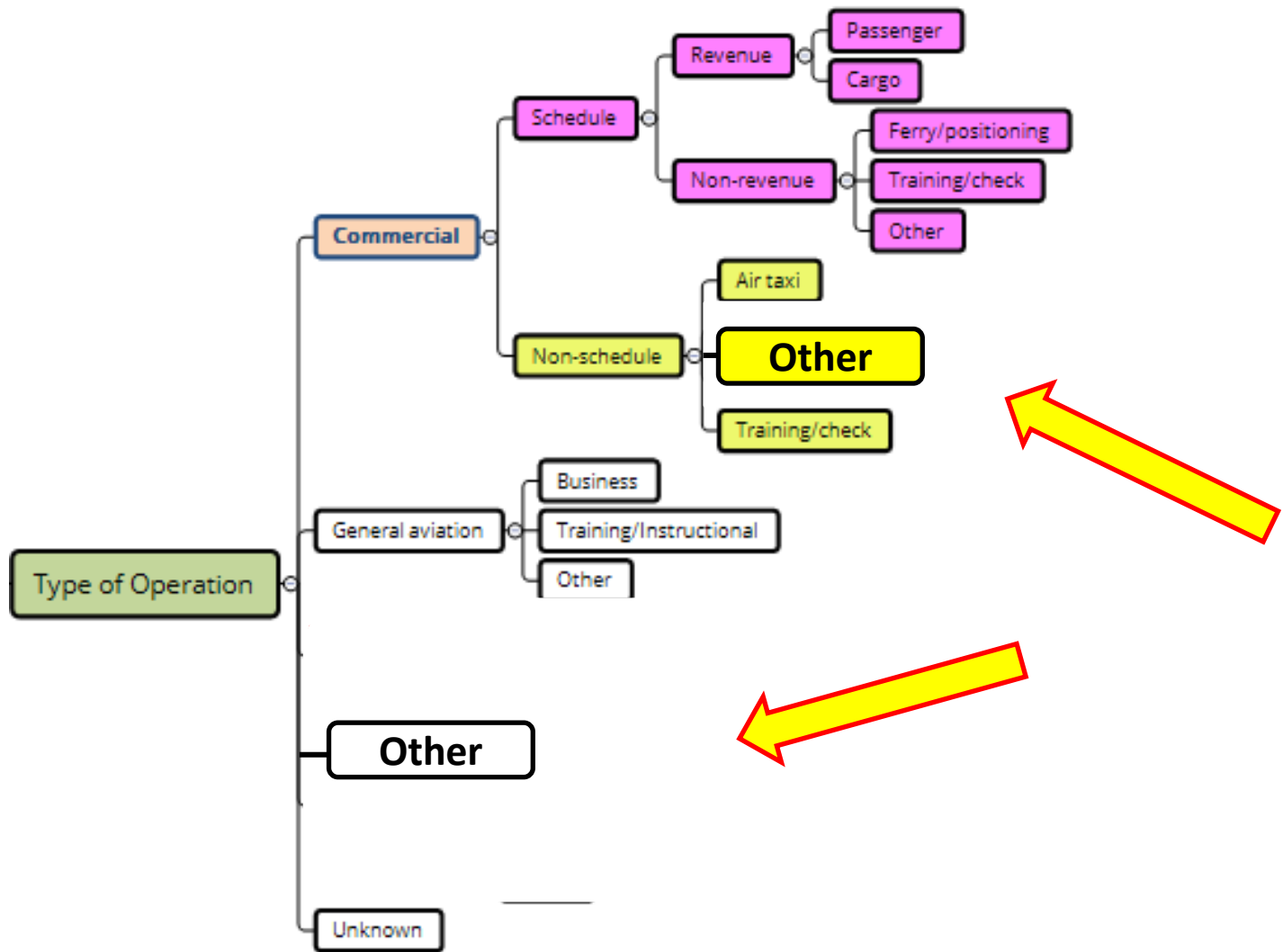
✈ Commercial air transport operation / general aviation operation

✈ ECCAIRS taxonomy:

✈ Occurrence category, injury level, damage aircraft, aircraft category, aviation operation









Category of the occurrence

- ADRM: Aerodrome
- AMAN: Abrupt manoeuvre
- ARC: Abnormal runway contact
- ATM: ATM/CNS
- BIRD: Birdstrike
- CABIN: Cabin safety events
- CFIT: Controlled flight into or toward terrain
- CTOL: Collision with obstacle(s) during take-off and landing
- EVAC: Evacuation
- EXTL: External load related occurrences
- F-NI: Fire/smoke (non-impact)
- F-POST: Fire/smoke (post-impact)
- FUEL: Fuel related
- GCOL: Ground Collision
- GTOW: Glider towing related events
- ICE: Icing
- LALT: Low altitude operations
- LOC-G: Loss of control - ground
- LOC-I: Loss of control - in-flight
- LOLI: Loss of lifting conditions en-route
- MAC: Airprox/ ACAS alert/ loss of separation/ (near) midair collisions
- RAMP: Ground Handling
- RE: Runway excursion
- RI: Runway incursion - vehicle, aircraft or person
- RI-O: Runway incursion - other
- RI-VA: Rwy incursion-vehicle or a/c
- SCF-NP: System/component failure or malfunction [non-powerplant]
- SCF-PP: powerplant failure or malfunction
- SEC: Security related
- TURB: Turbulence encounter
- UIMC: Unintended flight in IMC
- USOS: Undershoot/overshoot
- WILD: Collision Wildlife
- WSTRW: Windshear or thunderstorm
- OTHR: Other
- UNK: Unknown or undetermined

## Category of the occurrence

BIRD: Birdstrike

CFIT: Controlled flight into or toward terrain

MAC: Airprox/ ACAS alert/ loss of separation/ (near) midair collisions

RE: Runway excursion

RI: Runway incursion - vehicle, aircraft or person

OTHR: Other

UNK: Unknown or undetermined

EXAMPLE

EXAMPLE



## Selecting relevant criteria

- ✈ There are several possibilities of combination of aspects/circumstances
- ✈ Each State has to identify the ones most relevant taking into account the characteristics of the system in place



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# Selecting relevant criteria

✈️ Benchmarking with criteria adopted by other States can be useful



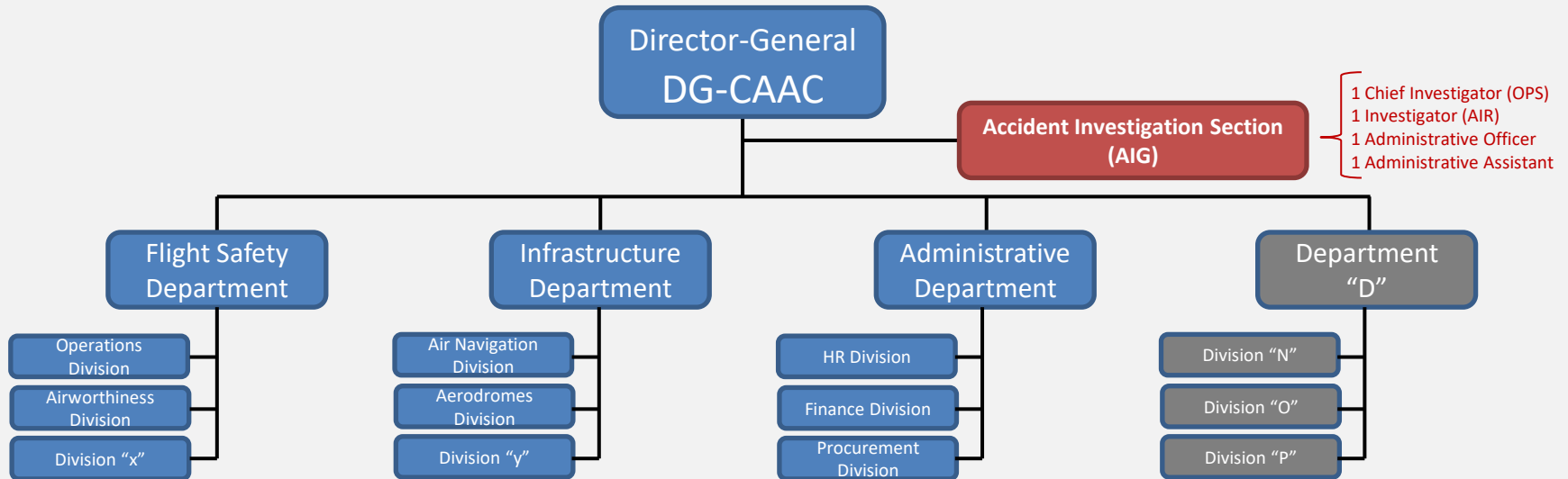
# Grouping accidents

- ✈ Form the groups of types of accidents based on the aspects/circumstances selected
  - ✈ Each group will have a differences in the process of investigation

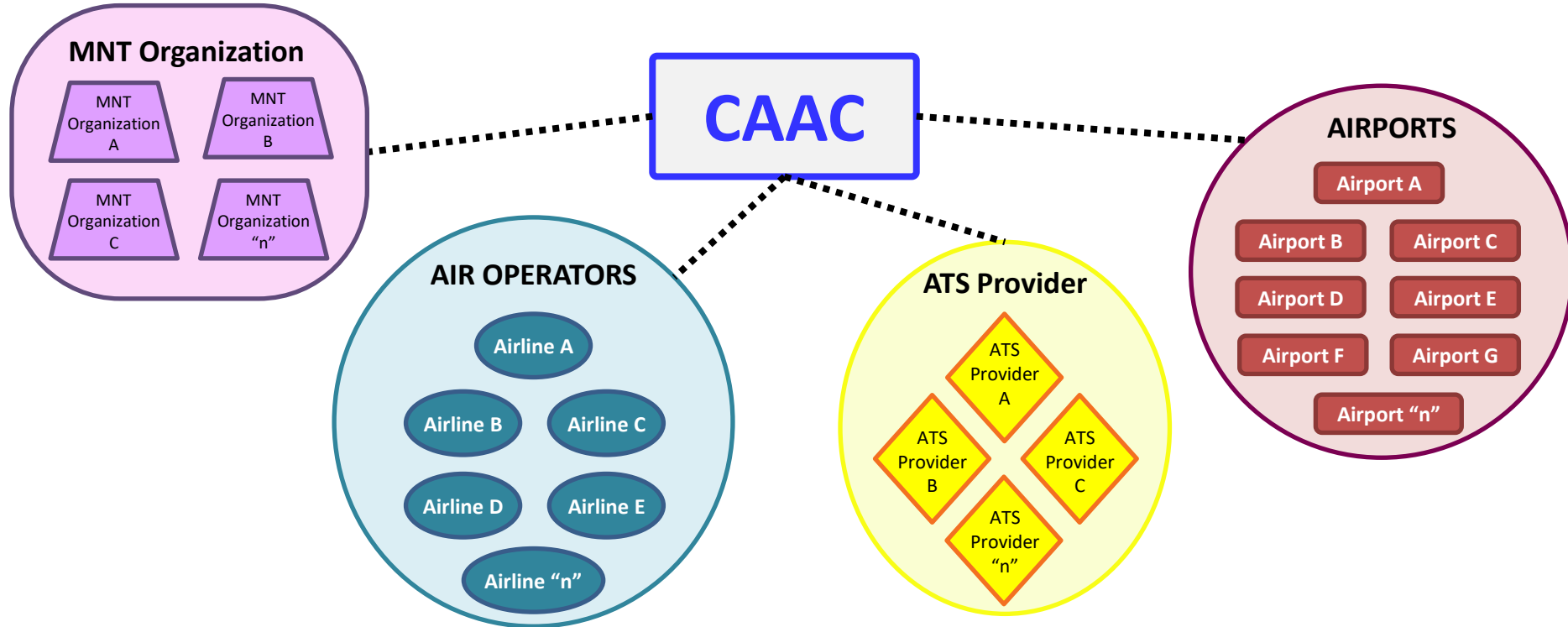


# Fictitious Scenario - Coronaland

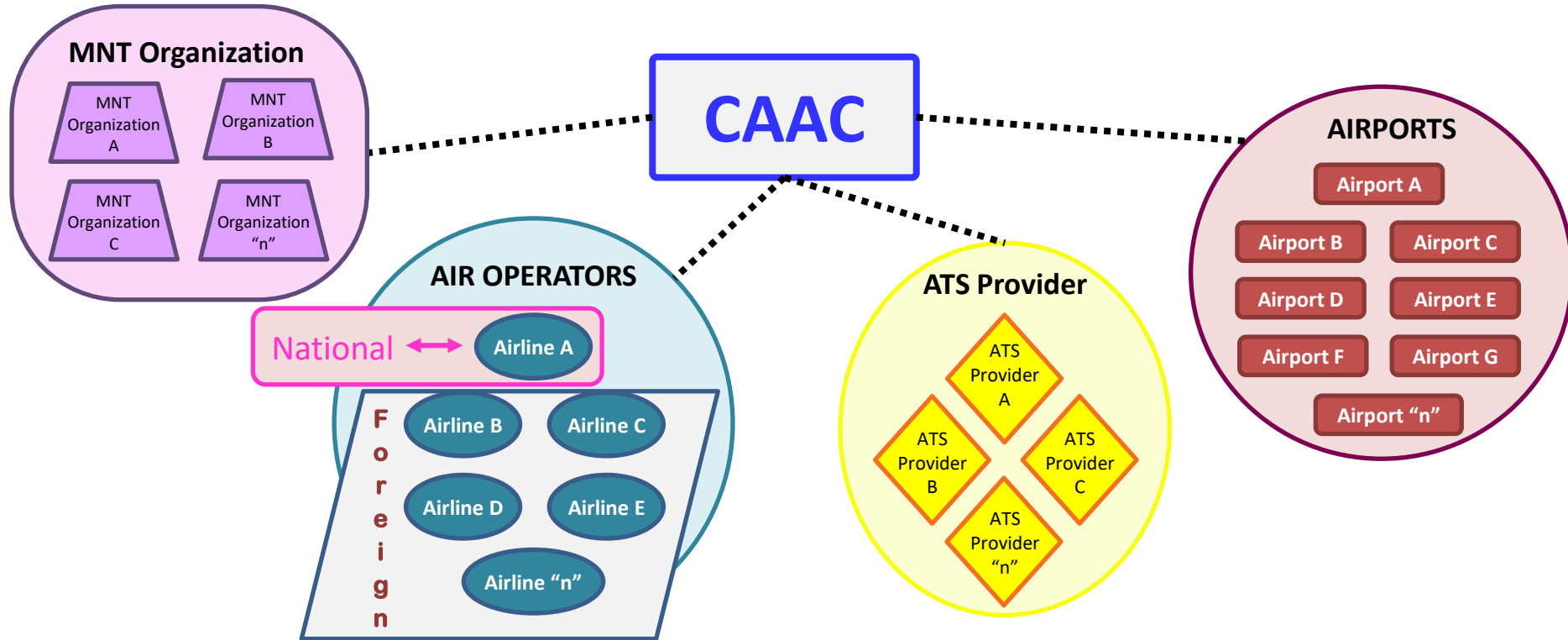
## Civil Aviation Authority of Coronaland (CAAC)



# Fictitious Scenario - Coronaland



# Fictitious Scenario - Coronaland







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# Fictitious Scenario - Coronaland

✈ Relevant aspects/circumstances for Coronaland:

✈ *Type of operation*

✈ *Injury level*

✈ *Involvement of other States*

✈ *Social repercussion*



# Fictitious Scenario - Coronaland

✈ Relevant aspects/circumstances

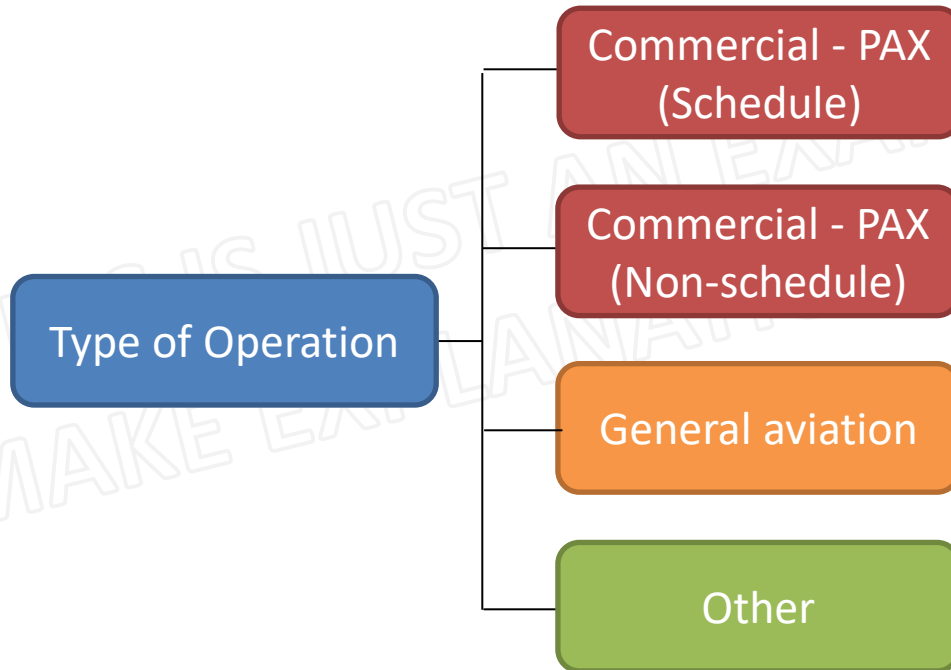
✈ Type of operation

✈

**THIS IS JUST AN EXAMPLE TO  
MAKE EXPLANATION EASIER!!!**

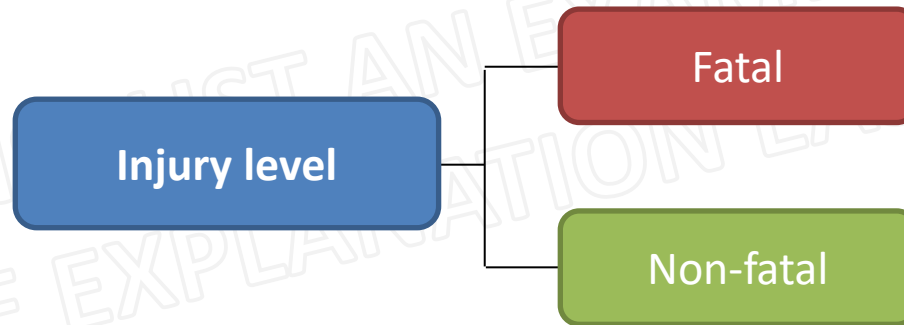


# Relevant aspects/circumstances for Coronaland



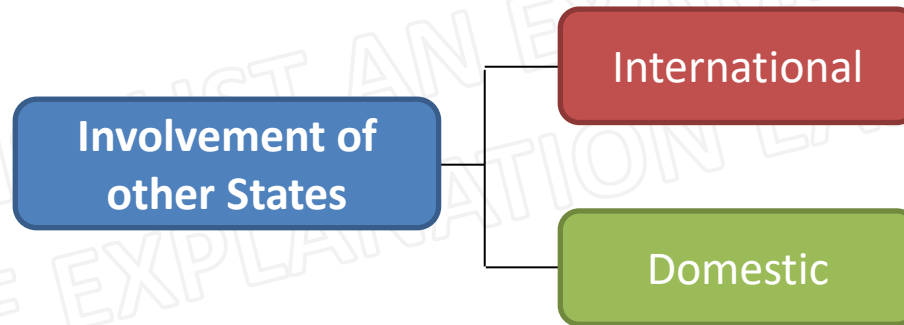


# Relevant aspects/circumstances for Coronaland





# Relevant aspects/circumstances for Coronaland

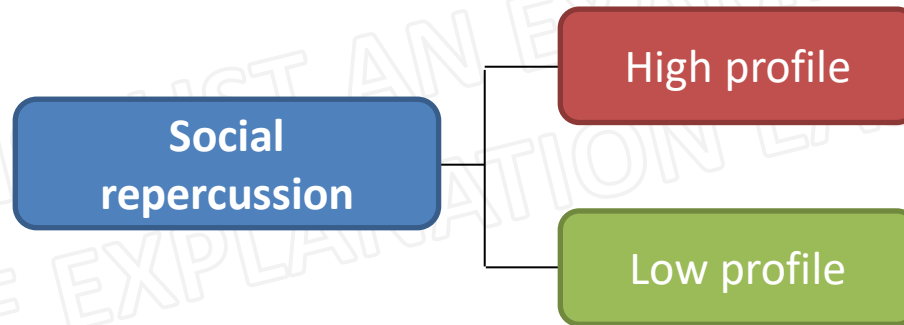




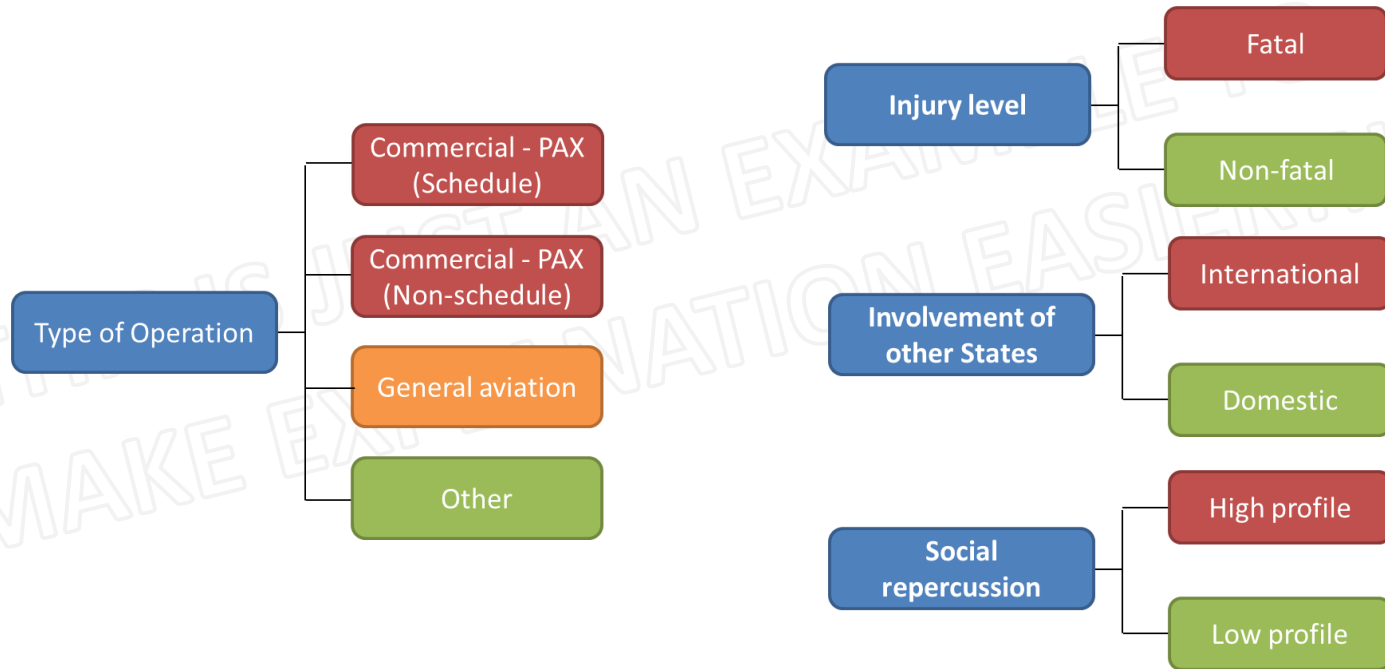
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# Relevant aspects/circumstances for Coronaland



# Relevant aspects/circumstances for Coronaland





# Forming classes of accidents

| Types of Accident |             | Social repercussion | Injury level                    | Type of Operation               | Involvement of other States |
|-------------------|-------------|---------------------|---------------------------------|---------------------------------|-----------------------------|
|                   | Class 1     | High profile        | Fatal                           | Commercial – PAX (Schedule)     | International               |
|                   | Class 2     | High profile        | Fatal                           | Commercial – PAX (Non-schedule) | International               |
|                   |             |                     |                                 | General aviation                |                             |
|                   | Class 3     | Low profile         | Fatal                           | General aviation                | Domestic                    |
| Non-fatal         |             |                     | Other                           |                                 |                             |
| Class 4           | Low profile | Non-fatal           | Commercial – PAX (Non-schedule) |                                 |                             |
|                   |             |                     | General aviation                | Domestic                        |                             |
|                   |             |                     | Other                           |                                 |                             |





# Framework for the investigation process

- ✈ Create a plan of investigation covering:
  - ✈ The main aspects of the investigation
  - ✈ The different approaches for each “Class” (group, type) of accident
  - ✈ Develop procedures and guidance to cover all the activities mentioned in your plan



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# Aspects to be planned\*

- ✈ Response to a received notification:
  - ✈ IIC only X Investigation Team
  - ✈ Sending investigators to actions on site
  - ✈ Parallel support activities from the State's AIG office
  - ✈ Special needs due to environment

**\*The list of aspects mentioned in this presentation is not exhaustive**



# Aspects to be planned

## ✈ Interaction with other stakeholders

- ✈ Other investigations (e.g. Police, Justice, CAA)

- ✈ Victims and families

- ✈ Press

**\*The list of aspects mentioned in this presentation is not exhaustive**



# Aspects to be planned

- ✈ Examination of parts and components
  - ✈ Arrangements with laboratories, workshops, etc.
  - ✈ When not to readout flight recorders

**\*The list of aspects mentioned in this presentation is not exhaustive**



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# Aspects to be planned

## ✈ Reporting

- ✈ Types of report

- ✈ Formats of report

**\*The list of aspects mentioned in this presentation is not exhaustive**



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**Please send any further question regarding this presentation to:**

**[fcamargo@icao.int](mailto:fcamargo@icao.int)**



This presentation will be available at the ICAO Secure Portal, in the group:

**NACC\_AIG\_REF**

Those who have not yet joined this group, it is highly recommended that they do so





# OBJECTIVE

**The purpose of this webinar is to study the elements to be considered when establishing a process for investigating the various types of accidents, as required by PQ 6.343**



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Asia and Pacific  
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THANK YOU