



International Civil Aviation Organization

**Third Meeting of the Asia Pacific Accident Investigation Group
(APAC-AIG/3)**

(Colombo, Sri Lanka, 23 - 24 June 2015)

Agenda Item 8: Other business

**THE IMPORTANCE OF INVESTIGATING SERIOUS INCIDENTS,
AND NOT JUST ACCIDENTS**

(Presented by Australia)

SUMMARY

The investigation of serious incidents is a key component of the work of a State/Administration's aviation safety investigation agency. ICAO Annex 13 Section 5.1.2 states that "The State of Occurrence shall institute an investigation into the circumstances of a serious incident when the aircraft is of a maximum mass of over 2,250 kg."

Investigating serious incidents is one of the main ways that a State/Administration can ensure that it develops and maintains the capability to respond to a major aircraft accident.

1. INTRODUCTION

1.1 Why investigate incidents?

1.1.1 The principle of investigating incidents, and not just accidents, is a well-established practice in mature safety systems. The argument is clear and strong - the same safety benefit can be achieved by investigating incidents without paying the economic and social cost associated with an accident.

1.1.2 ICAO Annex 13 defines 'incident' as "an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation", and 'serious incident' as "an incident involving circumstances indicating that there was a high probability of an accident". As Annex 13 states, the only difference between an accident and a serious incident is in the result.

1.1.3 Having and heeding good safety data is the key to improving aviation safety. The information that is obtained from serious incidents is extremely valuable. The concept of a 'close call' providing a 'free lesson' in safety cannot be overemphasised.

2. DISCUSSION

2.1 Incident investigation as part of major accident preparedness

2.1.1 In safe systems, such as aviation, major accidents are thankfully rare events. While this is very positive, one consequence is that a State/Administration can be lulled into a false sense of preparedness, in effect taking an approach to accident investigation that “We’ll deal with it when it happens”. This can be very counterproductive.

2.1.2 A State/Administration will only be able to respond adequately to a major aircraft accident if they are in a state of constant preparedness. There are two aspects to achieving that preparedness.

2.1.3 Firstly, the State/Administration must develop the capability for aircraft accident investigation. This requires appropriate underpinning legislation, an agency with sound organisational structure, the recruitment and training of specialist personnel, and the development of comprehensive policies and procedures. Equally important, though, is a second requirement, the need to continually exercise the capability once it has been developed. That will ensure that investigation capability doesn’t just exist on paper but is ready for immediate and effective implementation.

2.1.4 Investigating serious incidents is a key measure to maintaining the practical readiness of a State/Administration to investigate a major accident.

2.1.5 While investigation a serious incident will not involve crash-site activities, all other investigation activities will be equally relevant, including collecting and analysing information, dealing with stakeholders and other parties, writing reports, and developing recommendations. Indeed, the work of some serious incident investigations will be greater and more significant than some investigations that fall under the definition of ‘accident’.

2.1.6 Investigating serious incidents counters the perception that a State/Administration may have that the resources needed to maintain an independent aviation safety investigation agency will be underutilised in normal times.

2.2 ICAO requirements for investigating serious incidents

2.2.1 ICAO Annex 13 Section 5.1.2 states that “The State of Occurrence shall institute an investigation into the circumstances of a serious incident when the aircraft is of a maximum mass of over 2 250 kg.” Attachment C to Annex 13 lists example of serious incidents, with the proviso that the list is not exhaustive and only serves as guidance to the definition of serious incident. The examples include,

- Near collisions
- Controlled flight into terrain only marginally avoided
- Take-offs or aborted take-offs on a closed or engaged runway
- Landings or attempted landings on a closed or engaged runway
- Gross failures to achieve predicted performance during take-off or initial climb
- Fires and/or smoke
- Events requiring the emergency use of oxygen by the flight crew
- Aircraft structural failures including uncontained engine failures, not classified as accidents
- Multiple malfunctions of aircraft systems seriously affecting the operation of the aircraft

- Flight crew incapacitation in flight
- Fuel quantity or distribution situations requiring the declaration of an emergency
- Runway incursions classified as severe
- Take-off or landing incidents including under-shooting and runway excursions
- Occurrences which caused or could have caused difficulties controlling the aircraft
- Failures of more than one system mandatory for flight guidance and navigation
- The unintentional or emergency release of a slung load

2.3 **Examples of serious incidents investigated by the ATSB**

2.3.1 In the five year period from 2010 to 2014, the ATSB investigated 39 serious incidents involving high-capacity regular public transport operations.

2.3.2 The types of serious incidents investigated by the ATSB included occurrences related to,

- Loss of separation (14)
- Descent during approach (4)
- Weather factors (4)
- Incorrect weight, procedure, plan, or configuration (4)
- Fire and/or smoke (3)
- Vehicle runway incursion (3)
- Other (7)

2.3.3 The following examples of serious incidents investigated by the ATSB indicate the safety benefit that can result from such investigations. The full reports are available on the ATSB website (www.atsb.gov.au).

2.3.3.1 **ATSB Investigation AO-2010-081 –Stickshaker activation**

2.3.3.1.1 On 13 October 2010, a Boeing 717 on a passenger flight from Perth to Kalgoorlie, Western Australia experienced two stickshaker activations on approach to land. The stickshaker activations were primarily a result of an incorrect approach speed generated by the aircraft's flight management system (FMS). The flight crew had inadvertently entered the aircraft's operating weight instead of the aircraft's zero fuel weight into the FMS.

2.3.3.1.2 The investigation identified issues related to the load sheet layout, the take-off weight check procedure, validation of landing weight, and recurrent training. The aircraft operator took action to address those issues.

2.3.3.1.3 In January 2011, the ATSB released a research report titled 'Take-off performance calculation and entry errors: A global perspective' (AR-2009-052).

2.3.3.2 **ATSB Investigation AO-2011-086 – Descent below approach path**

2.3.3.2.1 On 24 July 2011, a Boeing 777 aircraft on approach to Melbourne Airport, Victoria, was observed by the tower controller to be lower than required. The tower controller asked the crew to check their altitude and subsequently instructed the crew to conduct a go-around. However, while the crew did arrest the aircraft's descent, there was a delay of about 50 seconds before they initiated the go-around.

2.3.3.2.2 The investigation found that the pilot in command may not have fully understood some aspects of the aircraft's automated flight control systems and probably experienced 'automation surprise' when the aircraft pitched up to capture the approach path.

2.3.3.2.3 In response to this occurrence, the aircraft operator took action including a review of the training in support of non-precision approaches and the provision of additional information relating to the use of the aircraft's autopilot flight director system.

2.3.3.3 **ATSB Investigation AO-2011-144 – Loss of separation**

2.3.3.3.1 On 8 November 2011, a loss of separation occurred between two Boeing 737 aircraft on converging tracks at 39,000 ft near Ceduna, South Australia. The procedural longitudinal separation standard of 20 NM was infringed, reducing to between 6 NM and 12 NM longitudinal separations between the aircraft.

2.3.3.3.2 The investigation found that the two controllers involved were experiencing a high workload due to a range of factors, including the number of tasks and their limited experience.

2.3.3.3.3 As a result of the occurrence, the airspace sectors involved were re-sectorised into three sectors to aid in workload management, and action was taken to determine a suitable workload model to monitor and forecast controller workload on a sector by sector basis.

3. **ACTION BY THE MEETING**

3.1 The meeting is invited to

- a) Note the Annex 13 requirement for, and the importance of, investigating serious incidents involving aircraft with a maximum mass of over 2,250 kg.; and
- b) Recommend ICAO APAC office to conduct a survey of APAC States/ Administrations to obtain information about the reporting and investigation of serious incidents involving aircraft with a maximum mass of over 2,250 kg

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