International Civil Aviation Organization

First Meeting of the APRAST – Accident Investigation Ad hoc Working Group (APRAST-AIG AWG/1)

(Bangkok, Thailand, 6-8 June 2012)

Agenda Item 8:   ACCIDENT AND INCIDENT DATABASE

COLLECTING AND ANALYSING AVIATION SAFETY DATA

(Australia / Australian Transport Safety Bureau)

SUMMARY

A mandatory accident and incident reporting scheme is a key component of a State's aviation safety system. It is critical that States have both the mechanism and discipline to record occurrences. For aviation safety data to be of most benefit, it should be collected and coded in a standardised way. To make proper use of the occurrence data, a State should have a program of data analysis to identify safety issues and trends. In addition, the notification and analysis of lower-level incidents is a key way for a State to move from a reactive accident investigation model to a more proactive approach to improving aviation safety.

1.   INTRODUCTION

1.1   Air safety investigation agencies are fundamentally information processing organisations. That is, they gather, collate, analyse, and report on safety related information.

1.2   Safety information comes through two main mechanisms. Firstly, through the in-depth investigation of individual accidents and serious incidents, and secondly, through the reporting of less serious incidents that do not warrant investigation. While there will always be a need for the thorough and detailed investigation of accidents and serious incidents, in a mature aviation safety system with a good reporting culture, the information received from the routine reporting of less serious incidents will be equally important. By collecting and analysing incident data a State can shift the balance from reactive accident investigation to a more proactive approach.

1.3   Annex 13 paragraph 8.1 states that a State shall establish a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies. Annex 13 paragraph 8.4 states that a State shall establish and maintain an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies obtained, including that from its incident reporting systems, and to determine any preventive actions required.

1.4   In addition, States are encouraged to foster regional arrangements, as appropriate, when implementing an accident and incident database as described in paragraph 8.4.

1.5   In some States, the mandatory reporting of aircraft accidents and incidents is to the independent air safety investigation agency, while in other States the reports go to the civil aviation regulatory authority. In either case, there needs to be a mechanism in place to ensure that appropriate safety information is passed from one organisation to the other. However, it is important that this transfer of accident and incident information does not compromise the work of either agency.

1.6   Two inter-related aspects of air safety data collection need to be given prominence. Firstly, there needs to be careful consideration as to what data should be collected, and secondly there must be processes in place to ensure data quality. These two aspects are inter-related in the sense that it can be more useful to collect a smaller set of high quality data, than a larger set of data that is of lesser quality.

1.7   In the past, many mandatory reporting schemes have concentrated on descriptive information – the what, where, and when of an accident or incident – rather than information that can help to determine why an accident or incident occurred. There can be a tendency to collect large amounts of data on the assumption that at some stage in the future it might be useful. However, the danger with this approach is that the focus can shift to collecting data for its own sake –'feeding the machine' - rather than analysing the data and making good use of it for safety benefit.

1.8   A key point is that when decisions are being made about what safety information should be collected and how it should be coded, careful consideration needs to be given to how the data will be analysed and used for safety.

2.   COLLECTION AND ANALYSIS OF AUSTRALIAN AVIATION SAFETY DATA

2.1   In Australia, aviation accidents and incidents are reported to the ATSB, the independent air safety investigation agency, rather than to the Australian civil aviation regulator, the Civil Aviation Safety Authority (CASA). Regulations under the Australian *Transport Safety Investigation Act 2003* mandate what occurrences must be reported, and these are categorised into Immediately Reportable matters and Routine Reportable matters.

2.2   In aviation, Immediately Reportable matters include accidents involving death, serious injury, destruction or serious damage an aircraft or property, or when an accident nearly occurred. An immediately reportable matter must be reported as soon as practicable.

2.3   A Routine Reportable matter is one that has not had a serious outcome and includes a non-serious injury or the aircraft suffering minor damage or structural failure that does not significantly affect the structural integrity, performance or flight characteristics of the aircraft and does not require major repair or replacement of the affected components. A Routine Reportable matter must be reported in writing within 72 hours.

2.4   Currently, the Australian *Transport Safety Investigation Regulations 2003* prescribe certain matters as being Immediately Reportable or Routine Reportable. For example, Immediately Reportable matters for air transport operations include an airprox, fire, uncontained engine failure, landing or taking off from a closed runway, fuel exhaustion, crew incapacitation, and more. Routine Reportable matters for air transport operations include a runway incursion, a TCAS RA or GPWS alert, failure of a navigation or communication aid, and more.

2.5   However, changes to the Australian regulations are planned that will take a less prescriptive approach to what must be reported. The problem with trying to be too prescriptive is that any number of different occurrences could happen during a flight and have an effect on safety, and at times it hasn't been clear whether an incident should be reported because it is not listed in the

regulations, even though safety was affected. The new regulations will describe broader categories of occurrences that must be reported.

2.6   Immediately Reportable matters will be those where there is an exposure to a serious risk of a death, serious injury or serious damage. The 'serious risk' category encapsulates situations where there has been a near miss, effectively an accident was only avoided through chance.

2.7   Routine Reportable matters will be those in which all the risks of a death, injury, damage to an aircraft or to property, were not eliminated, minimised or effectively managed, so far as reasonably practicable.

2.8   In 2011, the ATSB received approximately 14,600 aviation accidents and incident reports. As some occurrences were reported by more than one individual or organisation, these reports related to approximately 8,616 distinct accidents or incidents.

2.9   Each occurrence recorded in the ATSB database is coded as one or more 'occurrence types'. These occurrence types are used for quarterly analysis to identify emerging risks. When significantly more or less occurrences of a particular type are found from one quarter compared to the 5-year average, further investigation of the data is undertaken to discover the reason for the differences. The ATSB also uses the information to conduct research and trend analysis that might identify hazards and risks and makes the results available to highlight safety issues.

2.10   All ATSB aviation safety statistics are incorporated in a report which covers a rolling 10-year reporting cycle, updated on an annual basis. The report contains statistical information about the frequency of incidents, serious incidents, accidents, and fatal accidents for various operational types.

2.11   In addition, the ATSB looks at issues arising out of interactions between two or more operators, maintenance organisations and the regulator. Hence, there is a systemic focus to the ATSB's use of aviation safety data.

2.12   The ATSB is developing a system in which a potential consequence level is assigned to every occurrence in its database. Combining the potential consequence levels with frequency of occurrences will provide an occurrence risk index which can be used for tracking areas within aviation where trends for increasing critical or significant risks are present.

2.13   The ATSB is in the process of developing a publicly accessible and searchable database of accidents and incidents that will be available through the ATSB's website. Users will be able to search and export the data according to a range of variables including occurrence type, date, location, highest injury level, aircraft and engine type, aircraft maximum weight category, manufacturer and model, operation type, and airspace. The publically available database will not contain identifying information such as aircraft registration, owner name, or operator name.

2.14   Persons and organisations in the safety system with risk mitigation responsibilities will be able to draw on this information and combine it with other safety information they may access to improve safety. The objective is to learn from not just what is happening within an individual organisation, but also in the wider aviation industry.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a) Note the ICAO Annex 13 paragraph 8.1 requirement for States to establish a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies.

b) Consider ways in which States in the Asia Pacific region can develop a regional accident and incident database.

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