



International Civil Aviation Organization

Third Meeting of the Asia Pacific Regional Aviation Safety Team (APRAST/3)
(Bangkok, Thailand, 7 – 10 May 2013)

Agenda Item 4: State/Industry Presentations

**SHARING OF INFORMATION ON POTENTIAL PRECURSORS
TO AIR ACCIDENTS**

(Presented by Singapore and Macao, China)

SUMMARY

Global air accident rates have decreased over the last decade. In view of this and the projected increase in air traffic, it is even more important but yet more challenging for the aviation community to keep accident rates as low as possible. Information and data sharing is key. While accident rates continue to be tracked and shared globally, it would be useful to expand tracking and sharing to include events that could be potential precursors to air accidents. This will help States and the region identify pertinent safety risks and thereby focus resources and interventions to tackle areas of concern.

1. INTRODUCTION

1.1 Global accident rates have decreased over the last decade. This has been made possible in part by the sharing and availability of information and data on accidents and serious incidents, enabling aviation stakeholders to identify areas of focus and make the necessary safety interventions. However, with lower accident rates and the expected significant growth in air traffic over the next twenty years, it is even more important but yet more challenging for the aviation community to keep accident rates as low as possible. More needs to be done to ensure that traffic growth takes place in a safe manner.

2. DISCUSSION

2.1 The increasing focus on safety management is a significant movement towards improving safety in a proactive manner. One of the central tenets of safety management is the management of safety risks through data collection and analysis. However, while many States individually collect a wide range of information and data on safety incidents and events, currently only those pertaining to accidents and serious incidents are formally shared and made available globally through the ICAO ADREP system. This may not be sufficient going forward for ensuring a high level of safety.

2.2 The sharing of accident and serious incident information and data by States globally has allowed international organisations and stakeholders to analyse them and put in place safety defences to prevent recurrence. As the aviation system grows, States will increasingly need to look into information and data on incidents and events to identify safety risks and develop and implement safety interventions to address or reduce the risks. Although individual States may collect and analyse their own data, there are some limitations:

- (a) Firstly, many States in the Asia Pacific region do not have a large scale of operations, and as such collect a limited amount of incident data. The relatively small data set available makes it difficult for these States to identify trends and come to a firm conclusion on the safety interventions that should be taken. While ICAO encourages States to take a data-driven approach under the State Safety Programme, the limited data makes it difficult to fully adopt this approach at the State level.
- (b) Secondly, there are certain types of events where a complete picture can only be built if data is shared amongst States. An example is unstabilised approaches. The risk of a runway excursion at an aerodrome is proportional to the number of unstabilised approaches into the aerodrome. However, unstabilised approaches that do not result in a go-around would not be known to an ANSP or aerodrome. Through sharing of such data provided by airline operators to their State of the Operator or State of Registry, States with aerodromes where the airlines operate at would have a more complete picture of the situation at their aerodromes useful for assessing safety risks and drawing up intervention measures as necessary.

2.3 Hence, there may be value to identify a set of events and occurrences for which information and data could be shared among and made available to States. One possible approach is to look at the main accident types, and identify the events and occurrences that could be potential precursors to such accidents. For example, unstabilised approaches, which could be a potential precursor to runway excursions.

2.4 According to ICAO and IATA, runway excursions, runway incursions, controlled flight into terrain (CFIT) and loss-of-control in flight (LOC-I) are the main accident types that should be focused on, given that they account for over 50% of the accidents in this region from 2002 - 2011. There are numerous causal and/or contributing factors of such events, and it would be useful to give priority to tracking and sharing information and data on those which are potential precursors. Annex 1 details these accident types and the events that are potential precursors to these accident types.

2.5 Singapore and Macao, China presented a proposal at the RASG/2 meeting in New Delhi in October 2012 to track such precursors to accidents at the regional level, in order to provide States within the Asia Pacific a better sense of the state of safety within the region, so that the appropriate intervention measures can be taken.

2.6 Considering the above, it would be useful for APRAST to do a study on the identification, collection, monitoring and sharing of information and data on a common set of events that could be potential precursors to accidents, starting with those related to the top safety risks in this region. APRAST, comprising both States and the industry, is in a unique position to discuss and decide on a common set of events and an appropriate mechanism for stakeholders, including States, air operators and other service providers, to share information and data on a voluntary basis and when ready to an independent body to collate and analyse in a de-identified manner for the sole purpose of enhancing safety. APRAST could leverage on its State and industry members to provide the necessary

expertise to mine and analyze the information and data, in addition to that on accidents and serious incidents, to determine the safety risks relevant to this region and its sub-regions. States in the region and the various regional or sub-regional working groups could then make use of the information and analysis to focus resources and interventions on areas of concern. The sharing of the information and analysis would also allow the APRAST to monitor the effectiveness of the various initiatives, for example the Safety Enhancement Initiatives (SEIs) carried out by APRAST.

2.7 The meeting may recall that one of the tasks of the Asia Pacific Safety Reporting and Programme Ad hoc Working Group (AP-SRP AWG) is to gather safety information from different available sources to determine the main aviation safety risks in the APAC regions. The AP-SRP AWG could do a detailed study on the identification, collection, monitoring and sharing of information and data on a common set of events that could be potential precursors to accidents, starting with those related to the top safety risks in this region. This could include devising an appropriate mechanism for stakeholders to share safety information and data with the AP-SRP AWG.

3. ACTION BY THE MEETING

3.1 The meeting is invited to :

- (a) Note the benefits of sharing of information and data on events that could be potential precursors to accidents;
- (b) Consider whether the list of potential precursors to accidents listed in **Annex 1** are appropriate as a starting point for adoption by the APAC region; and
- (c) Direct the AP-SRP AWG to do detailed study on the identification, collection, monitoring and sharing of information and data on a common set of events that could be potential precursors to accidents, starting with those related to the top safety risks in this region. This could include devising an appropriate mechanism for stakeholders to share safety information and data with the AP-SRP AWG.

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Main Accident Types and Potential Precursors

Runway Excursions and Incursions

Analysis by IATA had shown that runway excursions and incursions are the most common accident types in this region, accounting for 34% of the accidents in 2011. The Flight Safety Foundation (FSF) had found that nearly 80% of all runway excursions take place during the landing phase. FSF also indicated that the leading contributory factors to landing runway excursion accidents are the lack of go-arounds resulting from unstabilised approaches, followed by long landing, landing gear malfunctioning and ineffective braking arising from unfavourable runway conditions such as wet/contaminated runway. For takeoff runway accidents, rejected take-off and pilot directional control are among the highest contributory factors.

Potential Precursors to Runway Excursion:

- Unstable approach;
- Windshear during approach to landing; and
- Rejected take-off.

Potential Precursors to Runway Incursion:

- Taxi Error.

Controlled Flight into Terrain

The European Commercial Aviation Safety Team had established that CFIT is the second most fatal accident type for commercial air transport airplanes from 1998 to 2007. In this region, CFIT accidents made up over 30% of the fatal accidents from 2002 - 2011. The majority of fatal CFIT accidents occur during the approach phase (nearly 70%). Some contributory factors leading to CFIT include absence of TAWS, EPGWS failures and radio altimeter failures. Human factors such as non-adherence to Standard Operating Procedures, inappropriate low altitude manoeuvring and lack of situational awareness are often also cited as the common causal factors.

Potential Precursors:

- GPWS activation;
- Unstable approach; and
- Unintentional flight deviation.

Loss-of Control in flight (LOC-I)

LOC-I is the most significant aircraft accident category and has resulted in the highest number of fatalities among the worldwide commercial jet fleet over the last decade. In its research, NASA found that LOC-I is one of the most complex accident categories given the many causal and contributing factors that interact to result in a LOC accident. Some of the main risk factors are inadequate flight crew monitoring of aircraft systems and of each other, misuse/misunderstanding of aircraft automation, inadequate manual flying skills and inappropriate flight crew response to systems failure.

Potential Precursors:

- Windshear; and
- Stick Shaker / Stall Warning Activation.

In addition to the list of precursors listed above, Singapore tracks the following potential precursors to air accidents that can have severe consequences. They form part of the safety indicators under our State Safety Programme. The meeting may wish to consider their applicability to the APAC region.

Mid-air Collision

Potential Precursors:

- Loss of separation;
- TCAS-RA activation; and
- Unintentional flight deviation.

Ground Collision

Potential Precursors:

- Vehicle cutting across path of aircraft;
- Towing error;
- Pushback error; and
- Taxi error.

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