

**54th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 1: THEME TOPIC

*“The Challenge of Managing Outcome Focused and Risk Based
Regulations for Asia Pacific States”*

**MOVING TOWARDS A RISK-BASED
APPROACH IN SAFETY MANAGEMENT**

(Presented by Singapore)

SUMMARY

This paper identifies the key building blocks and the challenges in implementing a risk-based approach in safety management. It shares Singapore’s experience in implementing this, and offers suggestions on how to facilitate the Asia Pacific (APAC) Region in moving towards such an approach.

The Conference is invited to:

- a) Encourage ICAO to consider adopting a differentiated EI target commensurate with States’ level and complexity of aviation activities in the Global Aviation Safety Plan 2020-2022;
- b) Encourage ICAO and States to continue supporting existing capability-building efforts, such as COSCAPs and Combined Action Teams, to enhance States’ safety oversight capabilities;
- c) Request ICAO, where appropriate, to develop guidance material and tools to support a risk-based approach in safety management;
- d) Encourage States to share their knowledge and experience in adopting a risk-based approach in safety management, particularly in the area of SSP and SMS implementation; and
- e) Encourage States to share safety information and data to prioritise safety issues and efforts in the region.

MOVING TOWARDS A RISK-BASED APPROACH IN SAFETY MANAGEMENT

1. INTRODUCTION

1.1 The APAC Region will be a key driver of the strong growth in global air travel over the next decades. There is a need to manage this growth in a safe manner. While global accident statistics have improved, the APAC Region continues to contribute a fair share of accidents¹, and the rate of improvement in global accident rates has slowed down.

1.2 There is therefore a need for a more proactive approach to complement the traditional “compliance-based” approach, where safety is only assured through service providers’ regulatory compliance. Hence, ICAO has called for States to put in place robust and sustainable safety oversight systems, and to progressively evolve them into more sophisticated means of managing safety. In addition, States should build upon fundamental safety oversight systems to establish their State Safety Programme (SSP), which includes the requirement for the implementation of Safety Management Systems (SMS) by service providers.

1.3 A risk-based approach will be necessary. It will enable regulators and service providers to adopt a more targeted and proactive means to identify and address safety risks of their aviation activities, and prioritise resources to mitigate them so as to achieve an acceptable level of safety performance.

1.4 This paper outlines the building blocks and challenges in implementing a risk-based approach in safety management, including Singapore’s experience in this area, and offers suggestions on how to facilitate the APAC Region in moving towards such an approach.

2. BUILDING BLOCKS AND CHALLENGES OF IMPLEMENTING A RISK-BASED APPROACH

2.1 In Singapore’s experience, it is important to ensure a robust safety oversight system that not only complies with ICAO USOAP CMA requirements, but also keeps pace with industry developments. This is particularly necessary in an increasingly diverse and complex aviation environment.

2.2 The risk-based approach enables Singapore to tailor our surveillance activities according to the risk profile of a service provider or the activity concerned, thereby optimising our limited regulatory resources. SMS and SSP are key pillars in a risk-based approach in safety management. Since 2009, Singapore has required its service providers to implement SMS. This has enabled service providers to play a key role in managing safety risks and safety performance in a systematic manner.

2.3 Through this implementation, Singapore has identified several key success factors for a CAA to effectively implement a risk-based approach in safety management:

Enhanced regulatory capabilities

2.4 The level of expertise and competency required of service providers and regulators is significantly higher under a risk-based approach in safety management. There is hence a need to equip regulatory personnel with new capabilities, such as tools in safety risk assessment as well as methodologies in assessing effectiveness of a service provider’s SMS using the ‘Present-Suitable-Operating-Effective’ (PSOE) framework. To support the industry growth and development in Singapore, we have built a team of safety subject matter experts and inspectors who can adequately provide safety oversight of our aviation industry.

¹ Based on the ICAO Safety Report 2017.

2.5 Mind-set change is also necessary. There is a need for service providers and regulators to go beyond the “line-by-line” compliance checklist, and critically evaluate if an organisation is monitoring the relevant safety performance indicators and constantly reviewing them, to assess if adequate measures have been taken to address identified safety risks and hazards etc.

Effective data-management

2.6 Safety management at the service provider level is inadequate to provide a safety risk picture at the State level, if safety and hazard data are not systematically and holistically analysed across various operational domains.

2.7 Hence, a critical element of a risk-based approach in safety management is the availability and ability to analyse safety data. The richness of such data is paramount to ensure a meaningful analysis in identifying potential safety hazards and risks in the aviation system. In Singapore, we are enhancing data collection and analysis capabilities by investing in more sophisticated methodologies and tools (e.g. BowTie risk assessment, Hazard Identification and Risk Management), and training our personnel in their use. We are also leveraging IT advancements to enhance our safety oversight processes and activities, and the collection and analysis of safety data.

2.8 To make service providers comfortable to share information, we need to assure them that safety information will be used appropriately. Hence, Singapore is developing a Safety Information Protection policy to accord protection to safety data captured by, and safety information derived from, voluntary reporting systems and related sources. Through this policy, we aim to facilitate continued availability of safety information to support proactive safety improvement strategies. This would ultimately foster a more positive environment in promoting data-sharing between the regulator and service providers.

Industry Engagement

2.9 We have to continually engage the industry to review the relevance of our safety oversight system and regulations. Through such engagement and our safety management activities, we also identify key areas of risks in aviation operations, and work with industry to address them effectively. Therefore, for our officers, communication skills are also being sharpened to help them better engage the industry, and convey policy intent and the rationale behind regulations as well as audit outcomes in an effective manner.

3. FACILITATING A RISK-BASED APPROACH IN SAFETY MANAGEMENT IN THE APAC REGION

Risk-based approach to ensuring SARPs implementation

3.1 The ICAO USOAP CMA has provided an impetus for States build up their safety oversight capabilities. However, the USOAP CMA, in its present form, can be further enhanced to enable a more representative picture of global safety oversight, to reduce the burden on States, and to help States better focus on areas that are more safety-critical. ICAO has therefore formed the Group of Experts for a Structured USOAP CMA Review (GE USR) to examine USOAP CMA methodology, processes and tools, and to identify further improvements.

3.2 There remains wide disparities in safety oversight capabilities and safety standards in the APAC region, with many States still facing challenges in achieving the GASP objective of an overall USOAP EI score of at least 60%. This “one size fits all” approach does not fully take into account a State’s level and complexity of aviation activities or its resource availability. States with a low level of aviation activity could find the current EI target unnecessarily onerous, and overly burdensome if they face resource constraints. Conversely, for States with a high level of aviation activity, the current EI target could give a false sense of safety assurance.

3.3 A risk-based approach to ensuring SARPs implementation would be for ICAO to factor a State's level and complexity of aviation activities, and identify a target for risk areas i.e. USOAP Critical Elements (CEs) each State should focus its efforts and resources on. It could therefore be sufficient for a State with a narrow base of aviation operations and low traffic to achieve an EI score below 60% for the PEL, OPS, AIR, AGA and ANS CEs. On the other hand, a State with a broad base of operations and high traffic would be required to achieve a higher EI score well above 60%. ICAO has adopted such a risk-prioritisation modelling tool in generating the State Safety Briefing², and could consider formalising such as approach in the next edition of the GASP instead of the existing 60% EI global target.

Capability-building efforts

3.4 Adopting a risk-based approach in safety management requires both regulator and service providers to achieve a level of safety maturity. ICAO and regional resources, such as the COSCAPs for technical assistance and Combined Action Teams, have been effective to help States address gaps in their safety oversight systems. ICAO and States with the necessary capability, should be encouraged to support these capability-building efforts.

3.5 A risk-based approach in safety management involves a stepped change in the current approach. Guidance material and tools, in areas such as developing safety management capabilities, inspector training, collection and analysis of safety data and information, should be developed for States. For example, the comprehensive guidance material to implement Fatigue Risk Management Systems in ICAO Annex 6 SARPs was very helpful.

Sharing of safety information

3.6 States can contribute by sharing their knowledge and experience in implementation. Particularly in the area of SMS and SSP implementation, there should be emphasis on elements such as identification of safety risks and hazards, assessment of safety risks as well as formulation of measures to mitigate these risks.

3.7 States should also collaborate and share safety information. With good data across the region, prioritisation of safety issues in the APAC Region could be done. For instance, at the regional level, some States (namely Japan, the Philippines and Singapore) and industry stakeholders have committed to a demonstration project of a regional data collection, analysis and information sharing system for aviation (AP-SHARE). When implemented, AP-SHARE could potentially uncover safety vulnerabilities or hazards that would otherwise not be detected. The use of such information and data would certainly facilitate more informed action to address safety risks and hazards, not just at the regional level, but domestically as well.

4. ACTION BY THE CONFERENCE

4.1 The Conference is invited to:

- a) Encourage ICAO to consider adopting a differentiated EI target commensurate with States' level and complexity of aviation activities in the Global Aviation Safety Plan 2020-2022;
- b) Encourage ICAO and States to continue supporting existing capability-building efforts, such as COSCAPs and Combined Action Teams, to enhance States' safety oversight capabilities;
- c) Request ICAO, where appropriate, to develop guidance material and tools to support a risk-based approach in safety management;

² Available through ICAO's iSTARS.

- d) Encourage States to share their knowledge and experience in adopting a risk-based approach in safety management, particularly in the area of SSP and SMS implementation; and
- e) Encourage States to share safety information and data to prioritise safety issues and efforts in the region.

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