



## **ASSEMBLY — 40TH SESSION**

### **TECHNICAL COMMISSION**

#### **Agenda Item 28: Aviation Safety and Air Navigation Policy**

#### **CHALLENGES IN SAFETY PERFORMANCE MANAGEMENT**

(Presented by the Republic of Korea)

#### **EXECUTIVE SUMMARY**

According to Annex 19 – *Safety Management* to the Convention of International Civil Aviation, Member States are required to manage their safety performance as a part of their State Safety Programme (SSP). To assess and manage safety performance, the Republic of Korea (ROK) has established and implemented its safety performance management process and is working to further improve its effectiveness.

This information paper is intended to share the experience of establishing a safety performance management process in the ROK, especially related to operational safety risks, and to discuss ways to overcome the challenges States may face.

<i>Strategic Objectives:</i>	This information paper relates to Safety Strategic Objective.
<i>Financial implications:</i>	
<i>References:</i>	Annex 19 – <i>Safety Management</i> , 2 <sup>nd</sup> Edition Doc 9859 – <i>Safety Management Manual (SMM)</i> , 4 <sup>th</sup> Edition

### **1. INTRODUCTION**

1.1. Safety performance management is central to the function of the State Safety Programme (SSP). To assess safety performance, the Republic of Korea (ROK) has established its own Safety Performance Indicators (SPIs) in line with safety objectives and Acceptable Level of Safety Performance (ALoSP) and is making every endeavour to further improve it. This information paper is intended to share the experience of establishing a safety performance management process in the ROK, especially related to operational safety risks, and to discuss ways to overcome the challenges States may face.

### **2. SAFETY PERFORMANCE MONITORING IN THE ROK**

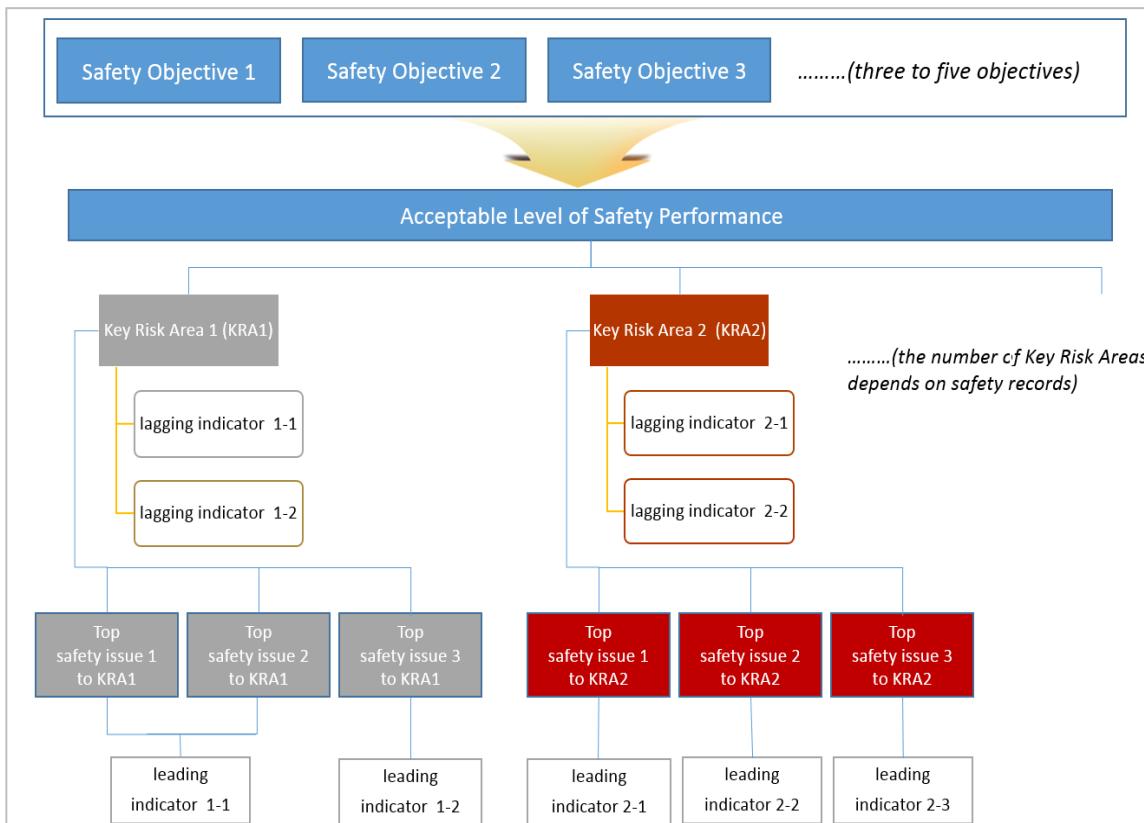
2.1. In an effort to achieve safety objectives in a systematic way, the ROK has established a

process for safety performance management; including operational safety risks based on its safety databases. Figure 1 shows the outline of the process used in the ROK for selecting and managing SPIs, related to operational safety risks; in line with safety objectives and ALoSP.

**2.2. Key Risk Areas.** In the ROK the starting point for defining key risk areas (KRAs) is derived from the outcomes of accidents and incidents; foremost seeking to prevent unsafe situations from happening. Most of KRAs are based on various types of possible occurrences; such as runway excursions and controlled flight into terrain (CFIT). A well-designed and updated accident and serious incident database, preferably one that uses the accident/incident data reporting (ADREP) taxonomy, is one of the most important pre-requisites to identifying KRAs; which are fundamental to SPI selection. Based on its latest accident and serious incident record over the last decade, the ROK has defined a total of nine different KRAs.

**2.3. Safety Performance Indicators.** A total of twenty-eight SPIs were selected and defined per each KRA, consisting of lagging and leading indicators as shown in Figure 1.

**Figure 1. An outline of the Safety Performance Management Process related to operational safety risks**



**2.4. Lagging Indicators.** Precursors related to each KRA were selected and defined as lagging SPIs. Safety data collected from accident or incident investigation and mandatory/voluntary safety reports served as references in selecting the SPIs of each area. For example, runway excursion and abnormal runway contact events were included in the safety risk area “Runway Excursion,” whereas diversion events with maintenance issues and In-flight shut-down events were classified as “System Component Failure.” Both the low probability/high severity indicators and the high probability/low severity indicators were selected for balanced monitoring of operational safety risks.

2.4.1. In the ROK, subsequent to using KRAs to select twenty-eight SPIs, some indicators were used to set the Safety Performance Targets (SPTs). Other indicators were reserved simply for monitoring trends, such as safety actions like rejected take-off, which did not entail setting SPTs for safety purposes.

2.4.2. Alert levels were set for indicators with SPTs based on the preceding 36 months of data, and trend monitoring, and analysis were conducted on a monthly basis. When an alert is triggered, further hazard analysis, risk assessment, and any necessary safety actions are required.

2.4.3. To achieve its safety objectives in cooperation with service providers, an effort to designate the twenty-eight SPIs as common SPIs is currently in the works. To successfully formalize the designation, the ROK is communicating with the industry partners in all sectors; including air operators, air navigation services providers, approved maintenance organizations, and airport operators. To encourage partners to recognize the benefit of safety performance monitoring, the monthly trend analysis of SPIs is being shared with the service providers. The ROK believes that establishing common SPIs is the starting point for the systematic connectivity between the SSP of the State and Safety Management System (SMS) of the service providers.

2.5. **Leading Indicators.** Leading indicators were also selected and defined per each KRA. Safety action to manage probable causes and contributing factors, namely top safety issues identified during the investigation of each accident and incident, were selected as leading indicators. The chosen leading indicators are currently in the trial phase, however expected to be officially introduced in the near future.

### 3. CHALLENGES

3.1. Even after ten years of concerted effort, the ROK is still facing challenges in the implementation of safety performance management.

3.2. **Defining SPI.** The description used in the reports effects the usefulness of the indicator being measured. Not every event with the same type of occurrence could become helpful safety data for each indicator, as the amount of risk varies by event. Specifying additional conditions which may clearly describe the amount of risk is essential for effective monitoring of SPIs. Learning from the trials and errors of past decades, the ROK continues its endeavour to improve its indicators for increased reliability.

3.3. **Integrated approach.** With compliance-based approaches used predominantly in the past, there is a general tendency to perform trend analysis and mitigating actions for a certain event within a single area; such as flight operation, airworthiness, and air traffic management. This tendency can be attributed to the habitual working practices in each area. However, the SSP requires States to use integrated approaches in safety activities to effectively control safety risks. To address the challenge of shifting approaches, the ROK has committed to strengthening the active role of the responsible team so that the practice of harmoniously promoting safety through cooperation can extend throughout the organization.

3.4. **Collecting safety data.** Collecting safety data for each SPI is another major challenge. The mandatory safety reporting system is a good tool to gather safety data for each SPI. However, it must be recognized that the establishment of a safety reporting system is not the final stage of problem-solving. The promotion of safety reporting systems depends on the safety culture and the enforcement policy of each State or organization. The ROK has amended its Aviation Safety Act accordingly to align with the amended ICAO Annex 19, *Appendix 3 – The principle for the protection of safety data, safety information and related sources*. The legislation is scheduled to be effective after a six-month grace

period. The related enforcement policy is currently under revision to reflect the upcoming new legislation. It will be a challenge for Korean authorities to ensure the new enforcement policy is properly implemented.

3.5. ***Risk Based Oversight.*** States are recommended to implement safety risk-based surveillance (SRBS) for effective prioritization and allocation of the State safety management resources. To get a clear picture of the service providers' safety abilities, particularly on their management of safety risk, development of safety risk profiles of each sector or individual service provider is essential. The ROK is faced with the challenge to connect and integrate State SPIs with the safety data and information included in each safety risk profile. The final aim of this project is to identify the priority inspection areas of greater safety concerns.

#### **4. CONCLUSION**

4.1. The ROK believes that a mature safety performance management system is expected to provide the States with the means to determine whether its activities and processes are working effectively to achieve its safety objectives and this function could be accomplished through well identified SPIs.

4.2. Therefore, ROK suggests Member States to share experiences and challenges in safety performance management, and to actively cooperate with each other for a globally harmonized improvement of safety performance management.

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