



WG OBJECTIVES:

- Develop and propose a common understanding of the characteristics of the safety performance measurement systems.
- Develop a common methodology for setting expectations regarding safety performance (SSP and SMS)

Work completed

Metrics WG finalized “**Measuring Safety Performance - Guidelines for Service Providers for service providers**”. The objective of this paper is to provide guidelines for the definition and implementation of a set of safety performance indicators. It promotes a process approach to developing and reviewing SPIs as an integral part of an organization’s SMS and proposes an approach to safety performance measurement aiming at increasing potential for effective safety management that considers systemic and operational issues.

The guidelines are available on Skybrary:

http://www.aviationsafetywiki.org/index.php/Measuring_Safety_Performance_Guidelines_for_Service_Providers

Work in progress / being finalised

The initial Metrics WG task of defining an overall framework/model for the measurement of safety performance from the perspective of the Regulator: “**SPMA concept**” is being finalized (it is now with the SMICG Steering Committee for a final review prior to publication).

The proposed safety measurement method is based on a foundation of three tiers of system behavior:

- **Tier 1:** Overall system outcomes including accident rates and significant safety issues (e.g., Controlled Flight into Terrain (CFIT), loss of control, runway incursions).
- **Tier 2:** Aviation service provider system behaviors (e.g., process performance of key systems such as training, maintenance, operational control, cabin safety).
- **Tier 3:** Aviation regulatory agency activities (e.g. certification, assurance of continuing operational safety, etc.).

The main principles underlying “**SPMA concept**” are provided below:

- Safety performance should be measured in terms of how well risk is managed throughout the system.
- A system of safety performance indicators needs to take into account the correlation of outcome and process measures to assess the capability to manage risk in the civil aviation system.
- Implementation and compliance with basic safety standards must be part of the safety management strategy and must, therefore, be part of the measurement strategy.
- An effective measurement strategy should provide a set of measures reflecting system failures (e.g. accidents, incidents, regulatory ‘violations’) as well as indicators of the proper functioning of the system.
- Measurement of safety performance must consider the role of the regulator to influence performance of product/service provider safety management processes and their impact on outcomes at the civil aviation system level.



- Measures must be available both for use by the States in evaluating service provider performance in terms of processes and outcomes but also of the oversight activities themselves.

The paper will propose a safety performance indicator framework as presented below. Detailed guidance on the three tiers, including examples of indicators will be provided.

| | A: Indicator usage | B: Outcome indicators | C: Process indicators | D: Inter-Tier correlations |
|---|--|---|---|---|
| Tier 1 INTEGRATED CIVIL AVIATION SYSTEM | Public information/ long term trending, identification of significant risk areas | (1) Accident rates, Incident rates, Fatalities (etc.) (2) Breakdown of event rates for significant risk areas | ∑ Safety Management capability (effectiveness of): <ul style="list-style-type: none"> Identifying common cause hazards Effectiveness of regulatory risk controls | n/a |
| Tier 2 SERVICE PROVIDER PERFORMANCE | Risk mitigation by operator and regulator "most wanted issues" (SMS/SSP) | per category of Service Provider: <ul style="list-style-type: none"> outcomes related to significant risk areas | SMS performance: <ul style="list-style-type: none"> SRM/compliance with regulatory specifications Ability to identify unique cause threats Effectiveness of risk control actions | Influence of Service Provider activities on safety outcomes |
| Tier 3 REGULATOR PERFORMANCE (ACTIVITIES) | Safety Risk Management by regulator (SSP) | <ul style="list-style-type: none"> Activities and initiatives to address specific risk areas Effectiveness or risk controls (correlation with Service Provider behaviors and aggregate outcomes) Effectiveness of risk control application (Oversight system performance – Design Assurance and Performance Assurance) | Safety risk management capability: <ul style="list-style-type: none"> Ability to identify common cause threats Ability to develop risk controls Ability to manage risk across organizational boundaries Resource allocation, Efficiency of safety risk controls (cost/benefit) | Influence of regulator activities on Service Provider behaviors Influence of regulator activities on safety outcomes |

Figure 1: Safety Performance Measurement Framework

Each level of the proposed framework is divided into two related dimensions: outcomes (column B) and processes (column C). Column D represents correlations between tiers of the model. Validity of the measures in Tiers 2 and 3 is based upon the correlation with the next tier above them. For example, the validity of measures of oversight activities is based upon the relationship between the measured oversight activities and their influence on service provider behaviors and outcomes.

Areas of future work

SMICG Metrics WG will initiate work on a document defining how the model is to be applied in the context of SSP/SMS implementation: "**SPMA process**". Once this second document has been finalized, the SPMA concept paper and the **Guidelines for Service Providers for service providers** will need to be reviewed to ensure overall consistency, while the main conceptual elements will remain unchanged. Terms of Reference for "**SPMA Process**" are provided in the attachment.

In parallel with drafting the "**SPMA Process**" paper the Metrics WG will initiate work on a new project "**future state of safety analysis process and sharing, including tools and methodology for analysis**" (working title). This will also focus on how to integrate data from different sectors. This new task will be progressed in close cooperation with the European Network of Safety Analysts SPI subgroup.

"**Measuring Safety Performance - Guidelines for Service Providers for service providers**" will be subject to periodic reviews to consider stakeholder feedback, in particular to review/complement the SPI examples.



NEW PROJECT TERMS OF REFERENCE

Project Nr: tbd
Priority ranking: High
ToR Issue: 01
Date: 18 June 2013

1. Subject: new project 'SPMA process'

2. Problem / Statement of issue and justification; reason for new project

In its October 2012 face-to-face meeting the Metrics WG agreed that the Safety Performance Measurement Approach should be delivered by way of two distinct, yet closely interrelated documents:

1. SPMA concept,
2. SPMA process – how to apply the concept

The SPMA concept paper (currently being finalised) proposes an approach to measuring safety performance that considers safety performance in terms of combined risk management capability by regulators and service providers. It promotes a three-tier model to measure the different aspects of safety performance, considering regulator activities (tier 3), service provider behaviours (tier 2) and final outcomes (tier 1). The interrelationship (correlation) between the tiers is explained.

The SPMA concept paper also provides some initial guidance for the choice of indicators at each tier.



3. Objective:

The expected outcome of this project is to complement the overall framework for the measurement of safety performance (SPMA) by a second SPMA document explaining how to apply the principles and three-tier model defined in 'SPMA concept' in the framework of SSP.

It will consider a process approach to implementing and maintaining a system to measure and drive safety performance at the level of regulators, as an integral part of safety management.

The SPMA process paper should also specifically address the following:

- sector specific guidance / application of the SPMA concept in different areas;
- performance metrics for the purpose of implementing performance based oversight principles;
- the difference between SPI and key SPI;
- the link between safety performance measurement at Service provider level and at State level;
- measuring the effectiveness of existing rules.

Presentation material (power point) shall be produced for the final paper.

4. Specific tasks and interface issues:

This project should be coordinated with any on-going or new SM-ICG project aimed at providing guidance for SSP implementation.

Following completion of the SPMA process paper it will also be required to review the SPMA concept paper, to ensure overall consistency.

The work of the EU Network of Analysts (NoA) SPI subgroup should be monitored.

Both papers, SPMA concept and SPMA process, should be provided to the ICAO SMP for consideration for its Phase II work. Therefore, the SPMA process paper should be available by mid-2014 latest.

5. Working Method:

The work will mostly be progressed remotely. Teleconferences will be scheduled on a monthly basis starting September 2013 to monitor progress.

A first draft should be discussed in the October 2013 face-to-face meeting.

All SM-ICG comments received on 'SPMA concept' should be duly considered.

Project lead:

- schedule, arrange logistics (meeting space, teleconference bridge, etc.), and announce the meetings and teleconferences;
- lead the meetings and teleconferences including setting agendas;
- help define workgroup goals and objectives;



- promote timely completion of workgroup tasks;
- provide technical and policy leadership at meetings and in the preparation of reports;
- inform and update the ICG chair regarding the workgroup efforts.

Team members:

- provide inputs to the paper;
- provide feedback on initial and intermediate draft versions;
- share lessons learned and information regarding the issues to be addressed;
- provide conduit between the workgroup and experts in their home organization and/or industry representatives in their home country.

6. Reference documents:

SPMA concept (being finalised)

Safety performance measurement – guidelines for service providers (being finalised)

7. Resources:

Project lead: tbd

Team members: tbd

8. Time scale, milestones:

Start: July 2013

First draft available for plenary review: December 2013

Submission to ICG Steering Committee: 1Q2014

Publication: 2Q2014