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**DEVELOPING AN INTEGRATED APPROACH
TO SYSTEMATIC SAFETY OVERSIGHT IN STATES**

(Presented by the United States)

EXECUTIVE SUMMARY

States' safety management responsibilities with respect to oversight of aviation service providers include promulgating safety regulations, certification of aviation service providers' organizations and personnel, surveillance of compliance with safety Standards, and assurance of remedial actions where necessary. More recently, ICAO Standards have generalized the responsibilities of States into requirements for maintaining an overall level of safety performance. The State Safety Programme (SSP) provides a structured mechanism for meeting State responsibilities for safety management using a systematic, data-driven, risk-based approach. Further, the continuous monitoring approach (CMA) has been proposed as a means of providing a data-driven approach to monitoring and measuring States' safety performance and safety management capabilities, including safety oversight. In order to accomplish this approach in a systematic fashion, an integrated approach to oversight and safety management decision-making is essential.

This paper will explore means of mapping State oversight responsibilities defined in the eight critical elements of oversight into the SSP framework and further, how this framework will support assurance of State safety management capability through the CMA.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A.
<i>References:</i>	Doc 9734, <i>Safety Oversight Manual</i> Doc 9859, <i>Safety Management Manual (SMM)</i>

1. INTRODUCTION

1.1 Systems approaches to safety and a greater emphasis on organizational and managerial factors on the part of service providers and regulatory authorities have been growing over the past two decades. ICAO Doc 9734, *Safety Oversight Manual*, paragraph 2.4.7 (b) describes the characteristics of effective safety oversight including, "...a systematic approach to auditing to ensure that whole systems are considered where appropriate, not just isolated elements, activities or disciplines" and goes on to include employment of "...risk management strategies to assist in effective use of resources". Many authorities are now employing system safety concepts in their oversight systems.

1.2 Measures of safety and safety performance should focus on how well organizations are able to manage safety risk. This cannot be accomplished without a coherent, systemic framework for safety management and oversight in the State safety programme (SSP). This framework must allow for clear articulation of performance expectations on the part of the State's safety management processes as well as their interfaces with service providers' safety management systems. The CMA must have a systematic, data-driven basis for its measurements to be valid measures of safety performance.

1.3 To accomplish this effectively, an integrated, process-based approach to oversight and safety management decision-making is essential. Mapping State oversight responsibilities defined in the eight critical elements of oversight into the SSP framework can support assurance of State safety management capability using established process measurement techniques. A common understanding of the SSP among States will also facilitate harmonization between States.

1.4 ISO 9000, the international quality management standard, describes the process approach as "the ongoing control that it provides over the linkage between the individual processes within the system..." (ISO 9000:2008, para 0.2, pg. ix) where interrelated activities are managed in an integrated fashion. Thus, it will be advantageous to develop the SSP as an integrated, process-based system, wherein the functional responsibilities of oversight are integral elements of the management system.

1.5 Service providers' safety management systems (SMS), and particularly the interactions between the SSP and the network of SMSs in the State's air transportation system, must also be considered. It is in these interactions where the oversight functions become important so the performance of service providers is a key target of measurements of safety performance.

2. DISCUSSION

2.1 ICAO describes the State safety programme as a "management system for the management of safety by the State" (ICAO Doc 9859, *Safety Management Manual (SMM)*, para. 6.3.1), and "an integrated set of regulations and activities aimed at improving safety" (ICAO Doc 9859, para. 6.3.2). The SSP provides a structured mechanism for meeting State responsibilities for safety management using a systematic, data-driven, risk-based approach. It provides an approach to system safety that stresses performance of safety critical processes in service provider activities and in State oversight functions.

2.2 ICAO Doc 9859, para 6.3.6 states that “a State’s safety oversight function is part of an SSP and a fundamental component of its safety assurance component”. ICAO Doc 9734, para. 2.4.7 (a) goes on to state that, among others, “The characteristics of an effective State safety oversight system include ... a robust and effective approach to the management of safety, including the adoption of Safety Management Systems in the functional areas of regulation as well as in operation and service provision”.

2.3 The eight critical elements of oversight, as documented in ICAO Doc 9734 and elsewhere, define the principal functional responsibilities of a safety regulator. The SSP provides a set of systematic processes for managing those responsibilities. Currently, the eight critical elements are addressed in element 3.1 of the SSP framework. It will be beneficial to integrate oversight responsibilities into a comprehensive framework that delivers a more systematic approach to safety management. This will also facilitate more effective measurement of performance in the CMA

2.4 Safety management, both in the SSP and in service providers’ SMS has been defined in terms of four components that provide a framework for safety decision-making:

- a) Policy: setting objectives, planning, organizing, setting accountabilities, and overall safety administration;
- b) Safety Risk Management (SRM): gaining understanding of systems in the context of their operational environments, identifying hazards, analysis and assessment of risk factors, determining acceptability of risk and taking action to control risk;
- c) Safety Assurance (SA): taking action to gain confidence that appropriate risk controls are in place and functioning, including those risk controls delivered through the State’s safety regulations and oversight. Continuing operational safety is maintained through these performance monitoring, measurement, and preventive/corrective action processes; and
- d) Safety Promotion: provides communication, training and education of and among the organization’s members.

2.5 Critical element of oversight number three (CE-3) calls for “the establishment of a Civil Aviation Authority ...” or equivalent, designation of a Chief Executive Officer and other appropriate staff and “... stated safety regulatory functions, objectives and safety policies.” (ICAO Doc 9734, para 3.1.2). Thus, the policy section of the SSP and CE-3 are highly congruent.

2.6 ICAO Doc 9859 defines safety as (paragraph 2.2.4) “The state in which the possibility of harm to persons or property is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.”

2.7 CE-2 “Specific operating regulations” requires States to promulgate regulations to provide (ICAO Doc 9734, para. 3.1.2) “... standardized operational procedures, equipment and infrastructures (including safety management and training systems) ...”. ICAO Doc 9859 states (para. 6.3.6) “The SSP ... considers regulations as safety risk controls and requires, through its [SRM] component, that the process of rulemaking be done using principles of safety risk ...”.

2.8 The SRM component is used to develop appropriate risk controls. The typical instruments of risk control on the part of States are their regulations. Regulations that are based upon

identified hazards give service providers clear targets for attainment of the risk control intent of the State's regulations (ICAO Doc 9859, para. 6.3.6). Regulations become, in essence, design requirements for service providers' processes and products and set bounds on service provider's risk controls.

2.9 Once regulations are delivered to service providers, it is their responsibility to design systems which incorporate risk controls in the context of their unique operational environments, including compliance with regulations. ICAO Doc 9734 states (para. 2.3.5.1) "Operators or Service Provider are responsible for the safe, regular, and efficient conduct of aircraft operations, including compliance with any laws or regulations...".

2.10 The responsibility of the State's oversight authority at this point is one of assurance. Assurance that the service provider has incorporated appropriate risk controls into the design of their products, or processes becomes a basis for issuance of certificates, authorizations, approvals, or acceptances on the part of the authority. This assurance process provides a critical interface between the State SRM, service provider SRM, and State safety assurance.

2.11 CE-6 is described in ICAO Doc 9734 (para. 3.1.2) in terms of "... processes and procedures to ensure that personnel and organizations performing an aviation activity meet the established requirements before they are allowed to exercise the privileges of a license, certificate, authorization, and/or approval ...". Under SSP and SMS concepts, the "established requirements" would include both compliance with applicable prescriptive regulations as well as meeting the performance expectations of the SRM component of the service provider's SMS. Integration of certification processes into the safety management framework will provide a better framework for measurement and safety decision-making for both authorities and service providers.

2.12 Service providers must then maintain the requirements of the design. States have the responsibility to provide assurance of the continuing operational safety of service providers' operations. CE- 7, Surveillance obligations, is described as (ICAO Doc 9734, para. 3.1.2) "... processes such as inspections and audits to proactively ensure that [service providers] continue to meet the established requirements ...".

2.13 The objective of CE-7 is part of the State's safety assurance process. The interactions between design and performance as well as interactions of the components of the air transportation system are better addressed through an integrated safety management framework.

2.14 Both SRM and SA components of the SSP and SMS must include processes for resolution of safety concerns (CE-8). In the SRM component, the risk control/mitigation process performs this function. In the SSP, the design assurance and subsequent certification/authorization processes hold service providers accountable for safe, compliant designs. The authority requires the service provider to resolve problems in their process, service, or product designs before certificates or other authorization documents are issued.

2.15 Service providers are also required to monitor and measure the safety performance of their processes and products and to resolve performance shortfalls as part of their SMS. Likewise, the State's oversight system, through its performance assurance processes, reinforces the accountability for problem resolution on the part of service providers, including enforcement functions in the case that the service provider fails to effectively resolve safety problems.

2.16 The safety promotion component includes processes for personnel competency and training and communication of safety critical information. The first of these processes addresses the objectives of CE-4 which is described as (ICAO Doc 9734, para. 3.1.2) “The establishment of knowledge and experience requirements for the technical personnel performing oversight functions and the provision of appropriate training to maintain and enhance their competence at the desired level.”

2.17 The second of these processes, communication, is facilitated, in part, through provision of technical information. CE-5 is described as (ICAO Doc 9734, para. 3.1.2), “the provision of technical guidance ... tools ... and safety critical information, as applicable, to the technical personnel to enable them to perform their safety oversight functions ...”.

3. CONCLUSIONS

3.1 Safety management for States and safety oversight are parts of the same whole. Therefore, an integrated framework for oversight and safety management in the SSP will be beneficial in terms of safety performance measurement and safety management decision-making.

3.2 Monitoring, measurement and management of the SSP using the CMA should be based upon the process approach using established management system techniques.

3.3 Regulatory and oversight functions should be based on a systems approach rather than a “checklist approach” where requirements are defined and assessed in isolation from one another.

3.4 Measurement of the performance and effectiveness of a State’s regulatory structure and other oversight capabilities in the CMA should be based upon assessment of how well the processes underlying these activities relate to effective hazard identification and risk control.

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