



WORKING PAPER

ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 25: Other issues to be considered by the Technical Commission

**STRENGTHENING GLOBAL AIRWORTHINESS OVERSIGHT:
ADDRESSING SYSTEM COMPONENT FAILURES AND GAPS IN
SAFETY INFORMATION EXCHANGE**

(Presented by the Flight Safety Foundation and co-sponsored by Singapore and the United Kingdom)

EXECUTIVE SUMMARY

This paper presents the results of an Airworthiness Needs Analysis Study conducted by the Flight Safety Foundation which, although initially focussed on the Asia Pacific region, identified challenges that reflect global trends. The study highlights systemic issues related to System Component Failures – Non-Powerplant (SCF-NP) and Powerplant (SCF-PP), and the flow of continuing airworthiness information. When combined, SCF-NP and SCF-PP represent the top global risk occurrence category for non-fatal accidents and serious incidents. The study identified underutilization of ICAO's Online Airworthiness Information Network (OAIN), deficiencies in Service Difficulty Reporting (SDR), and a lack of root cause analysis integration within both regulatory and industry processes

Action:

- a) encourage States and Regional Aviation Safety Groups (RASGs) to include both SCF-NP and SCF-PP in their regional aviation safety plan (RASPs) and (national aviation safety plans (NASPs), particularly where these categories represent elevated risk;
- b) request ICAO to support States in strengthening root cause analysis capabilities through guidance, training, and the integration of investigation techniques within both safety management system (SMS) and State Safety Programme (SSP) frameworks;
- c) urge States to review and enhance oversight functions related to maintenance programme approvals, minimum equipment list (MEL) oversight, recurring defect analysis, and SDR systems in alignment with ICAO Annexes 6, 8, and 19;
- d) request ICAO to revamp and modernize the Online Airworthiness Information Network (OAIN), improve usability, and promote its routine use by all Contracting States for maintaining up-to-date continuing airworthiness contact information and procedures;
- e) invite States to prioritize capacity-building efforts to address USOAP-identified deficiencies in airworthiness surveillance and information reporting; and
- f) consider actions aimed at strengthening State safety oversight capabilities by modernizing airworthiness information systems and enhancing root cause analysis capabilities through both SSPs and SMS.

¹ English, Arabic, Chinese, French, Russian and Spanish versions provided by the Flight Safety Foundation.

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	Not applicable.
<i>References:</i>	Annex 8 – <i>Airworthiness of Aircraft</i> Doc 10004, 2026-2028 Global Aviation Safety Plan Circ 95, <i>The Continuing Airworthiness of Aircraft in Service</i> A40-WP/200, <i>Ensuring the availability of accurate continuing airworthiness information</i> Asia Pacific Centre for Aviation Safety (AP-CAS) Airworthiness Needs Analysis Study

1. INTRODUCTION

1.1 In February 2025, the Flight Safety Foundation’s Asia Pacific Centre for Aviation Safety (AP-CAS) released the findings and recommendations of its Airworthiness Needs Analysis Study. The study analyzed seven years of accidents and serious incidents (2017–2023) related to System Component Failures or Malfunctions (SCF) and the flow of continuing airworthiness information.

1.2 While the study initially focused on the Asia Pacific (APAC) region, its findings reveal that the challenges observed are not unique—they reflect similar global trends. A subsequent review of worldwide data, using the Foundation’s Aviation Safety Network, confirmed that SCF-NP (non-powerplant) and SCF-PP (powerplant) occurrences, when combined, accounted for the highest number of non-fatal accidents and serious incidents globally. Furthermore, issues in regulatory safety oversight and deficiencies in the global airworthiness reporting system extend beyond the APAC region, highlighting a call to action for the entire aviation community.

2. DISCUSSION

2.1 The APAC Airworthiness Needs Analysis study identified that SCF-NP events accounted for a significant proportion of non-fatal accidents and serious incidents, with cabin pressure system failures, hydraulic and landing gear failures, and electrical failures being the most common issues. Similarly, SCF-PP events predominantly involved turbine blade failures and other critical powerplant component failures.

2.2 When analyzing how these events were reported to a regulatory authority as States of Registry as well as to the State of Design and original equipment manufacturers (OEM), the study found substantial gaps in the use of the ICAO Online Airworthiness Information Network (OAIN, formerly *The Continuing Airworthiness of Aircraft in Service* (Circ 95)). The OAIN was developed by ICAO as a web-based tool to facilitate the sharing of mandatory continuing airworthiness information between States, supporting obligations under Annex 8. It was intended to provide a standardized, accessible platform to ensure that critical contact and procedural information related to continuing airworthiness remains current and available to all Member States. Analysis indicated substantial underutilization, with only 12 per cent of Asia and Pacific (APAC) regulators consistently updating their airworthiness information since the platform's launch in 2014. Outdated or missing contact details further hindered communication and coordination among States, impeding timely management of continuing airworthiness matters.

2.3 Global accident and serious incident data were consistent with the APAC findings: SCF-NP and SCF-PP, when combined, represent the top risk occurrence category worldwide (based on absolute numbers), demonstrating that these risks are not confined to the Asia Pacific but form part of a broader pattern affecting aviation safety globally.

2.4 Factors that may lead to recurring system component failures or malfunctions such as weaknesses in aircraft maintenance programs, handling of recurring defects, defect rectification and control, and minimum equipment list (MEL) approval processes, require careful review and continuous improvement by regulators, air operators, and approved maintenance organizations (AMOs). While the global USOAP effective implementation score stands at 81 per cent, a closer examination of specific oversight areas linked to system component failures reveals concerning gaps that warrant urgent attention.

- a) Thirty-five percent of States received a “not satisfactory” response to the protocol question assessing whether the airworthiness inspectorate conducts surveillance of air operators’ reliability programmes.
- b) Forty-seven percent of States received a “not satisfactory” result for the protocol question assessing whether the airworthiness inspectorate takes action when an operator’s reliability programme indicates a degraded level of safety.
- c) Twenty-five percent of States received a “not satisfactory” rating regarding the airworthiness inspectorate’s ability to review and approve the airworthiness-related elements of an operator’s MEL.

2.5 The issue of OAIN underutilization is not new. During the 40th Session of the ICAO Assembly, Member States acknowledged the operational safety implications of outdated or missing contact information in the OAIN. In response to a working paper presented by the United States, the Assembly recognized the importance of ensuring that the OAIN is kept accurate and current. It supported the development of a Universal Safety Oversight Audit Programme (USOAP) protocol question to promote regular updates by States and tasked ICAO and its Regional Offices with supporting this effort. While ICAO has since taken steps to improve the platform and encourage State participation, the problem remains largely unresolved. Globally, 71 per cent have not updated their airworthiness information since the platform’s launch in 2014. More concerning, only 13 per cent of States have provided updates since 2024, underscoring persistent challenges in maintaining accurate and up-to-date airworthiness contact and reporting information. This lack of engagement undermines the effectiveness of global airworthiness information sharing, delays safety interventions, and hampers accident prevention efforts. These concerns are further reinforced by ICAO USOAP results, which reveal systemic deficiencies in regulatory oversight related to defect reporting and continuing airworthiness communication. Notably, 30 per cent of States received a “not satisfactory” result on the protocol requiring the implementation of a system to transmit information on faults, malfunctions, and defects to the organization responsible for the type design or modification, as required under Annex 8 — *Airworthiness of Aircraft*.

2.6 The recognition of SCF-NP as an emerging safety priority in the draft 2026-2028 Global Aviation Safety Plan (GASP) is a positive step forward. If endorsed at the 42nd Session of the ICAO Assembly, this will cement SCF-NP as a global risk category of occurrence, requiring focused safety enhancement initiatives and consideration by regional aviation safety groups (RASGs) as well as states for their national aviation safety plans (NASPs). However, considering the information provided in this paper and based on the study performed by FSF, RASGs as well as States should also consider integrating SCF-PP into their plans, in particular if the occurrence category is considered high for the region or for their State.

2.7 **Root cause analysis and defect reporting**

2.7.1 A key finding of the study was the widespread absence of robust root cause analysis in investigation reports involving system component failures. Many serious incident investigations lacked sufficient analysis of underlying causal factors, limiting the ability to identify meaningful preventive actions and reducing the overall effectiveness of safety interventions. This underscores the need for greater emphasis on structured and comprehensive root cause analysis in serious incident investigations.

2.7.2 Additionally, the study highlighted persistent challenges in the application of service difficulty reporting (SDR) and fault defect reporting—issues that are not unique to the region but observed globally. A recurring concern was the inconsistent integration of root cause analysis within reporting frameworks, which diminishes the ability to understand contributing factors and mitigate future operational risks. Closely linked to this issue is the need for a more structured application of safety investigation techniques within both the safety management systems (SMS) of air operators and, where implemented the SMS of approved maintenance organizations (AMOs), as well as the State Safety Programme (SSP) frameworks of regulatory authorities. These investigations should aim to establish both causal and contributing factors, thereby strengthening organizational learning, supporting proactive risk management, and enabling States to better identify systemic safety trends.

3. **CONCLUSION**

3.1 SCF-NP and SCF-PP – have emerged as leading global safety concerns, accounting for the highest number of non-fatal accidents and serious incidents in recent years. The findings from the APAC region, validated through global data, underscore persistent weaknesses in oversight, defect reporting practices, and the flow of continuing airworthiness information.

3.2 In particular, deficiencies in root cause analysis, underutilization of the OAIN, and low USOAP implementation scores in critical airworthiness oversight areas require urgent attention. Strengthening regulatory capacity, improving operator and AMO reporting practices, and enhancing the usability of global airworthiness information systems are essential steps to address these risks effectively.

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