

22nd COSCAP Southeast Asia Steering Committee Meeting (SCM/22)

(Diamond Hotel, Manila, Philippines, 19-20 June 2025)

Discussion Paper 2 (DP-2)

Agenda Item 10 : Updates from Safety Partners

Outcomes of the Flight Safety Foundation's Asia Pacific Centre's Airworthiness Needs Analysis

(Presented by Flight Safety Foundation-FSF)

EXECUTIVE SUMMARY

This paper presents the results of an Airworthiness Needs Analysis Study conducted by the Flight Safety Foundation in the Asia Pacific region, highlighting 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 occurrence categories comprised the greatest number of non-fatal accidents and serious incidents in the region during the analysis period (2017 to 2023), as well as a top global risk occurrence category for non-fatal accidents and serious incidents. The study underscored an urgent need for State enhancements in continuing airworthiness oversight, improved coordination between States and air operators, and a revitalized approach to continuing airworthiness information sharing.

Action: The COSCAP Southeast Asia Steering Committee is invited to:

- a) note the findings and recommendations outlined in this paper.
- b) note the need for COSCAP Member States to update and validate contact details in the AIN, ensuring reliable communication channels for airworthiness reporting and establish systems to monitor and manage fault defect reporting from operators and MROs; and
- c) support the involvement of COSCAP SEA in the Flight Safety Foundation envisioned follow-up activities aimed to enhance States' ability to oversight continuing airworthiness, as outlined in paragraph 4.2 and 4.3 below.

1. INTRODUCTION

1.1 ICAO established the Cooperative Development of Operational Safety and Continuing Airworthiness Programme in Southeast Asia in 2001. Although its original mandate only covered the flight safety domain, its current scope encompasses all aviation safety related areas, including safety oversight (legislation and organization; personnel licensing and training; aircraft operations; aircraft airworthiness, air navigation services and aerodromes), accident and incident investigation and safety management. Since the inception of the COSCAPs, Continuing Airworthiness has always figured prominently in the work programme of COSCAP-SEA.

1.2 It is notable that, when combined the occurrences the System/Component Failures-SCF NP and SCF PP occurrences, comprised the greatest number of non-fatal accidents and serious incidents in the region during the analysis period (2017 to 2023) based on absolute numbers. The combination of these two occurrence categories accounts for approximately one-fourth of all occurrences in the region over a seven-year period. Non-fatal accidents are often survivable events, provided pilots take appropriate actions, underscoring the critical role of training and operational preparedness. Notably, the global increase in SCF-NP occurrences over the past five years is now reflected as one of the targets in Goal 1 of the draft Global Aviation Safety Plan (GASP 2026-2028) which will be submitted to the ICAO Assembly in 2025 for approval.

1.3 In January 2024, the Flight Safety Foundation, through its Asia Pacific Centre for Aviation Safety (AP-CAS), initiated a comprehensive regional airworthiness needs analysis. This study aimed to identify underlying issues contributing to System Component Failures or Malfunctions — Non-Powerplant (SCF-NP) and System Component Failures or Malfunctions—Powerplant (SCF-PP) in the Asia Pacific region. Additionally, the study assessed the effectiveness of the flow of continuing airworthiness information among regulatory authorities, air operators, and maintenance organizations. The analysis, conclusions, and recommendations will inform and enable aviation stakeholders and FSF AP-CAS to prioritize their regional engagement, including, but not limited to, outreach, technical assistance, and training activities.

2. DISCUSSION

2.1 The study has been completed, and the final report will be made available to APAC States shortly after this meeting. The project deliverables included the collection and organization of all relevant safety data that could contribute to the analysis, taking into consideration ICAO Universal Safety Oversight Audit Program (USOAP) results, Flight Safety Foundation Aviation Safety Network (ASN) information on accidents and serious incidents, ICAO Online Airworthiness Information Network – AIN (i.e., system replacing Circular 95) and other information gathered by engaging with safety partners.

2.2 The study focused on identifying the underlying factors associated with the high number of SCF-NP and SCF-PP in the Asia Pacific Region as reported by State accident investigation authorities. Data concerning the nature of failures, as identified during the AP-CAS Regional Safety Assessment, was further supplemented by engaging with a cross section of airlines, maintenance and repair organizations (MROs), OEMs, as well as regulators from various States of Design. The study identified some of the underlying factors that may contribute to shortcomings in areas such as maintenance practices, instructions for continued airworthiness, potential shortages in skilled human resources, training of maintenance personnel as well as the flow of continuing airworthiness information.

2.3 The ICAO Online Airworthiness Information Network (AIN, formerly ICAO Circular 95) 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. When analysing how airworthiness related events were reported to 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 AIN. Analysis indicated substantial underutilization, with only 12% of 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.

2.4 A survey was also conducted with airlines in the region, with the support of AAPA, that facilitated participation by reaching out to both member and non-member airlines to ensure broader industry representation to enhance this analysis. The outcomes of this analysis for SCF-NP, SCF-PP, and the flow of continuing airworthiness information have been compiled into Fact Sheets and form an integral part of the final report. The report, along with the Fact Sheets, have been shared with AAPA, IATA, FAA, EASA, and ICCAIA and the valuable inputs received have been incorporated into the report.

3. FINDINGS

3.1 SCF-NP (System Component Failures or Malfunction– Non-Powerplant)

3.1.1 SCF-NP accounted for a significant proportion of non-fatal accidents and serious incidents, with cabin pressure system failures (48 percent), hydraulic and landing gear failures (34 percent), and electrical failures (9 percent) being the most common issues. Inadequate maintenance practices were identified as contributing factors in 24 percent of these occurrences, often preventable through adherence to manufacturers recommended scheduled maintenance and OEM bulletins.

3.1.2 Fifty-six percent of APAC States have low Effective Implementation (EI) scores in key airworthiness oversight areas, including technical personnel qualifications, certification and approvals, surveillance obligations, and resolution of safety concerns.

3.1.3 These results indicate areas requiring increased safety oversight to address systemic issues such as defect rectification and control, MEL compliance, recurring defects, root cause analyses, and maintenance program approvals. Furthermore, inadequacies in regulatory surveillance, including MEL approvals and monitoring of reliability programs, contribute to recurring issues that may impact operational safety.

3.2 SCF-PP (System Component Failures or Malfunction – Powerplant)

3.2.1 Turbine blade failures (41 percent) and other critical component failures (32 percent) were the most common component failures of SCF-PP incidents involving reported accidents and serious incidents. Inadequate maintenance practices were identified as contributing factors in 35 percent of investigated SCF-PP events, and 41 percent of these events were coordinated with engine manufacturers for corrective actions. Despite a decline in global SCF-PP events, the APAC region continues to report the highest number of occurrences, averaging nine per year.

3.2.2 Survey data conducted with the support from AAPA highlighted persistent challenges in engine component failures, parts shortages, and operational disruptions, with 70 percent of respondents experiencing significant aircraft downtime due to component unavailability.

3.3 Flow of Continuing Airworthiness Information

3.3.1 The AIN remains underutilized, with only 12 percent of APAC regulators consistently updating their information since its launch in 2014. Additionally, only nine APAC States had valid email contact information on the platform. Outdated or missing contact details for continuing airworthiness matters hinder effective communication and coordination between the State of Design, State of Registry, and operators. Gaps in regulatory oversight impact fault defect reporting and root

cause analyses and may limit the ability of regulators to monitor and mitigate airworthiness concerns effectively.

4. CONCLUSION

4.1 The study underscores the urgent need for State enhancements in SCF-NP and SCF-PP oversight, improved coordination between States and air operators, and a revitalized approach to continuing airworthiness information sharing. Strengthening engagement with ICAO's airworthiness reporting tools and implementing structured training for regulators and operators will be critical in ensuring a more effective and proactive approach to airworthiness management in the region.

4.2 The following recommendations are included in the final report of the Airworthiness Needs Analysis Study:

4.2.1 Regulators identifying SCF-NP and SCF-PP events among their air operators should enhance safety oversight to address systemic issues, including defect rectification and control, MEL compliance, recurring defects, root cause analyses, and maintenance program approvals.

4.2.2 Regulators with low EI scores or with an increase in reported SCF-NP and SCF-PP events should provide specialized training for their inspectors, focusing on defect rectification and control, MEL compliance, recurring defects, root cause analyses, and maintenance program approvals.

4.2.3 ICAO RASG-APAC should consider recognizing SCF-NP as well as SCF-PP as additional occurrence categories of importance in its APAC Regional Aviation Safety Plan (RASP) and develop safety enhancement initiatives (SEIs) including the SEI Outputs to help reduce aviation risk.

4.2.4 ICAO should reassess the AINs usability and accessibility by conducting a user experience review to identify challenges States have faced in entering and retrieving information. ICAO should also provide technical assistance and a streamlined interface to encourage broader participation. Consideration should be given to modernize and simplify the AIN platform, making it more user-friendly and widely adopted. States should be encouraged to adopt electronic systems for airworthiness reporting and provide technical assistance where necessary. Finally, ICAO should consider developing targeted training and guidance materials to help States understand the importance and use of AIN. The conduct of regional workshops and webinars to ensure regulatory personnel are aware of AINs benefits and functionalities could promote the use of the AIN.

4.2.5 Operators and MROs in collaboration with their regulators should adopt protocols to ensure consistency in reporting. Training programs focused on Service Difficulty Reporting (SDR) completion and root cause analysis are essential to enhance the quality of submissions.

4.2.6 Regulators, operators, and MROs should establish or enhance existing mechanisms for continuous feedback to improve fault detection and resolution. Operators and MROs should implement or strengthen internal systems to systematically analyze and address recurring issues, ensuring that data shared with regulators and OEMs is accurate, comprehensive, and actionable.

4.2.7 Regulators should actively update and validate contact details in the AIN, ensuring reliable communication channels for airworthiness reporting and establish systems to monitor and manage fault defect reporting from operators and MROs.

4.2.8 Regulators should strengthen regulatory safety oversight by prioritizing the integration of SDR reviews into their State Safety Program (SSP) frameworks. This involves analysing collected data to identify trends, resolve recurring issues, and implement risk management strategy.

4.3 The Flight Safety Foundation's Asia Pacific Centre for Aviation Safety (AP-CAS) is considering the development of a series of focused workshops to address the data-driven recommendations outlined above. While the Centre is well suited to analyze needs, develop workshop materials, and support the initial validation of workshops, it is not equipped to support the ongoing implementation of the workshops needed to ensure that all States and industry stakeholders within SEA can avail themselves of the training. AP-CAS will be actively seeking the involvement of key stakeholders in the region, including the COSCAP-SEA, to both participate in the initial development and validation of the envisioned workshops, as well as to contribute to making the workshops widely available to stakeholders within the region.

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