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Agenda Item 4: ICAO/ Member State / Industry Presentations

FLIGHT SAFETY FOUNDATION SAFETY PROJECT ACTIVITIES 2024

(Presented by Flight Safety Foundation)

SUMMARY

In 2024, the Flight Safety Foundation embarked on three projects that were identified as high priorities in the APAC Region; Airworthiness Needs Analysis Study, Upset Prevention and Recovery Training and Flight Path Management Training and Procedures. This paper presents FSF's progress and results to date including target dates for the completion of all three projects.

The meeting is invited to encourage States and industry to continue supporting the Flight Safety Foundation Asia Pacific Centre for Aviation Safety (AP-CAS) in its ongoing efforts in performing these projects; to urge States and ICAO to refer to the FSF AP-CAS Airworthiness Needs Analysis Study once finalized and report the final results of its other projects at the next DGCA conference.

1. INTRODUCTION

1.1 In January 2023, the Flight Safety Foundation, through its newly formed Asia Pacific Centre for Aviation Safety (AP-CAS), initiated a comprehensive regional safety assessment and analysis of aviation safety issues across key sectors of aviation in the Region. The analysis highlighted top risk occurrence categories which were validated and further supplemented through workshops involving States and industry stakeholders. The outcomes of this project were shared during the Thirteenth Meeting of the Regional Aviation Safety Group Meeting (RASG/13, December 2023, Hong Kong, China).

1.2 Effectively, the project served as a needs analysis for additional projects to be undertaken by AP-CAS, focusing on areas that represent a high safety risk in the region. The project revealed that the highest risk occurrence categories were for the most part, those identified in the Global Aviation Safety Plan (GASP) 2023-2025 and the APAC Regional Aviation Safety Plan (APAC-RASP). However, the assessment also identified new and emerging risk areas in the region, such as system component failure – non powerplant (SCF-NP) and system component failure power plant (SCF-PP), among others.

1.3 Additionally, the Centre has reached out to regional stakeholders to gather their insights on the needs for future projects. These insights have complemented the regional assessment in shaping the AP-CAS work program for 2024. As a result, three projects have been identified as high priorities

and are currently underway: The Airworthiness Needs Analysis Study, Upset Prevention and Recovery Training, and Flight Path Management Training and Procedures.

During the 59th Directors General of Civil Aviation Conference, the Flight Safety Foundation reported on its progress on these three projects. The Conference recognized the Flight Safety Foundation's (FSF) ongoing safety projects, including the Airworthiness Needs Analysis. The DGCA Conference invited FSF to present their findings to future APAC regional meetings.

1.4 This paper presents FSF's progress and results to date.

2.0 DISCUSSION

2.1 Project 1 - Upset Prevention and Recovery Training

2.1.1 Loss of Control in flight (LOC-I) has been the primary cause of commercial aviation fatalities throughout the world for over two decades. Despite global initiatives, including ICAO's 2014 'Manual on Aeroplane Upset Prevention and Recovery Training', LOC-I remains a significant concern in the Asia-Pacific Region. Recent data shows LOC-I as the second highest category for fatal accidents (by absolute number of accidents) and sixth highest overall when looking at all fatal/non-fatal accidents in the Region. LOC-I accidents in the Asia Pacific resulted in nearly half of all fatalities during the period from 2017 to 2023. This raises critical questions about the level of implementation of Upset Prevention and Recovery Training (UPRT) provided by airlines and Approved Training Organizations (ATO), as well as State's implementation of regulatory frameworks consistent with ICAO Standards and recommendations. Addressing these questions is crucial to enhancing UPRT standards and reducing the risk of LOC-I incidents in the Region.

2.1.2 The overall objective of the Upset Prevention and Recovery Training (UPRT) project is to evaluate the extent to which UPRT is currently integrated into the training curricula of Asia-Pacific Airlines' pilots initial, transition and recurrent airline training, as well as ab-initio training, across the region. This effort includes a survey of Asia-Pacific Airlines, associated Approved Training Organizations (ATO), many pilots employed by Asia-Pacific Airlines, and aircraft manufacturers (e.g. Airbus, Boeing). These surveys have been disseminated to the appropriate aviation respondents. This project will also seek to identify the availability of States' regulatory guidance to the industry on UPRT by assessing the results of the recently provided data from the ICAO Asia-Pacific Regional Aviation Safety Team (APRAST) surveys. Through the analysis of the surveys, an informed perspective of UPRT knowledge and skills of pilots in the Asia-Pacific Region as well as gaps and best practices will be attained. Ultimately, this project will seek to establish a means for airlines and approved training organizations to share the best regional practices. Throughout this project, the Flight Safety Foundation will work in close coordination with the ICAO (APRAST) Safety Enhancement Initiative (SEI) Working Group to avoid any duplication in the work already under way under safety enhancement initiative (i.e., (SEI) LOC/6).

2.1.3 It is envisaged that this project will be completed by the end of the first quarter of 2025. The analysis of the implementation of FPM training and procedures will result in a comprehensive report that highlights the strengths and weaknesses of current FPM practices within the Asia Pacific Region. The report will offer actionable recommendations and guidelines for enhancing FPM training and procedural effectiveness, contributing to the overall improvement of flight safety in the APAC Region.

2.2 Project 2 - Flight Path Management Training and Procedures

2.2.1 There are well known vulnerabilities associated with flight crew management of automation and associated loss of situation awareness. Various industry bodies, research institutions,

and regulators have developed reports, studies and recommendations to address these vulnerabilities focusing on the topic of "Flight Path Management" (FPM). Flight Path Management is a broad concept which encompasses both basic manual flying skills and the management and monitoring of today's advanced flight management equipment. Consistent application of FPM training and procedures across these interrelated areas is considered a means to address degradation of manual flight skills and automation complacency. Shortcomings in FPM can result in a loss of situational awareness that can lead to such high-risk occurrences as Loss of Control in Flight (LOC-I), Controlled Flight into Terrain (CFIT), Runway Excursions (RE) and Runway Incursions (RI).

2.2.2 The overall objective of this project is to evaluate the extent to which current Flight Path Management (FPM) principles and training are currently integrated into the training curricula of flight crew members for airline initial, transition and recurrent; standard operating procedures for line operations; and ab initio training, across the APAC Region. It will also review the regulatory and procedural framework of operators against international best practice to ensure that a properly trained crew will be able to properly manage all aspects of any flight where they are the crew.

2.2.3 It is envisaged that this project will be completed by the end of the first quarter of 2025. The analysis of the implementation of FPM training and procedures will result in a comprehensive report that highlights the strengths and weaknesses of current FPM practices within the Asia Pacific Region. The report will offer actionable recommendations and guidelines for enhancing FPM training and procedural effectiveness, contributing to the overall improvement of flight safety in the APAC Region.

2.3 Project 3 – Airworthiness Needs Analysis Study

2.3.1 During 2023, FSF AP-CAS performed a regional safety assessment, identifying emerging risks that were not previously addressed through such mechanisms as the ICAO Regional Aviation Safety Plan or the national aviation safety plans developed to date. It is notable that, when combining the occurrences categorized as system/component failure, non-powerplant (SCF NP) together with powerplant (SCF PP) occurrences, they comprised the greatest number of fatal and non-fatal accidents and serious incidents in the region during the analysis period (2017 to 2023). The combination of these two occurrence categories accounts for approximately one-fourth of all occurrences in the region over a seven-year period. Notably, the global increase in SCF-NP occurrences over the past five years is now reflected in the draft Global Aviation Safety Plan (GASP 2026-2028) which will be submitted to the ICAO Assembly in 2025 for approval.

2.3.2 The AP-CAS Airworthiness Needs Analysis study seeks to determine the issues that have contributed to the high number of SCF NP and SCF PP occurrences as reported by State accident investigation authorities. A review of the accident and serious incident reports, as well as preliminary reports, if available, is currently underway to identify factors that may contribute to shortcomings such as maintenance practices, instructions for continuing airworthiness, including possible shortages in skilled human resources, the flow of continuing airworthiness information etc.

2.3.3 Data has already been analysed concerning the nature of systems and powerplant failures using the Aviation Safety Network (ASN), (data pertaining to accidents and serious incidents). Fact sheets summarizing the analysis results for SCF-PP, SCF-NP data have been prepared. Additionally, a fact sheet on the *flow of continuing airworthiness information* has been created, as the analysis raised concerns about reporting levels by air operators, approved maintenance organizations and the State of Registry, as required by ICAO Annex 6 and Annex 8. Additional input through information exchanges, including surveys with the Association of Asia Pacific Airlines (AAPA), are currently underway to further supplement the analysis conducted so far.

2.3.4 The final report is expected to be completed by early 2025 and will outline the results, along with recommendations for next steps.

2.3.5 **Preliminary results.**

2.3.5.1 **SCF-NP** - Over a seven-year period, cabin pressure system failures have been the leading system component failures, non powerplant (SCF-NP) with 51% of all reported incidents the result of pressure system failures, followed by 31% hydraulic and landing gear system failures and 7% electrical system failures. Five events were the result of structural or corrosion related failures. 24% of all SCF-NP were attributed to poor maintenance practices or could have been prevented by adhering to manufacturers recommended scheduled maintenance as well as OEM bulletins. 37% of all serious SCF-NP events accidents or serious incidents were investigated during this reporting period.

2.3.5.2 **SCF-PP –** Over a seven-year period, turbine blade failures have been the leading critical component failure with 41% of all reported events followed by 32% for other component failures such as propeller shaft failures, pumps, gears, bearings etc. 67% of all SCF-PP accidents or serious incidents were investigated or in the process of being investigated during this reporting period. 41% of the events involved coordination with the engine manufacturers. In 35% of all SCF-PP events that were investigated, it was determined that poor maintenance practices were a contributing factor to the accident or serious incident.

2.3.5.3 **Flow of Continuing airworthiness information-** The Continuing Airworthiness of Aircraft in Service Circular (Cir) 95 (online version) contains useful information for States of Registry and States of Operator to ensure the continuing airworthiness of aircraft. It was created to facilitate sharing continuing airworthiness information between the State of Design, the State of Manufacture, and the State of Registry and to assist States to meet their continuing airworthiness responsibilities. Only twelve percent of the States in the APAC Region have updated CIR 95 at least once since 2014. When the Web platform was first launched in 2014, it was initially populated by ICAO with input received by States through a State Letter. At that time, forty-five percent of the APAC States were reflected with a focal point responsible for continuing airworthiness matters including an email address for contact. Today, only twenty-two percent of the original forty-five percent providing email contacts are valid. Therefore, only nine States in the APAC Region currently have valid email contact information on the Cir 95 platform.

2. ACTION BY THE MEETING

2.1 The Meeting is invited to:

a) encourage States and industry to continue supporting the Flight Safety Foundation Asia Pacific Centre for Aviation Safety (AP-CAS) in its ongoing efforts in performing these projects

b) Urge States and ICAO to refer to the FSF AP-CAS Airworthiness Needs Analysis Study once finalized and report the final results of its other projects at the next DGCA conference.

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