

**59th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 3: AVIATION SAFETY

**FLIGHT SAFETY FOUNDATION –
ASIA PACIFIC CENTRE FOR AVIATION SAFETY –
SAFETY PROJECT ACTIVITIES 2024**

(Presented by Flight Safety Foundation, co-sponsored by Singapore, AAPA and IFALPA)

SUMMARY

The Flight Safety Foundation Asia Pacific Centre for Aviation Safety (AP-CAS) has embarked on three safety projects which have been identified as of high priorities in the Asia Pacific (APAC) region, namely, an Airworthiness Needs Analysis Study, Upset Prevention and Recovery Training Study and Flight Path Management Training and Procedures Study. This paper presents the progress and results to date including target dates for the completion of all three projects.

The conference is invited to encourage States and industry to continue supporting the AP-CAS ongoing efforts in performing these projects.

FLIGHT SAFETY FOUNDATION – ASIA PACIFIC CENTRE FOR AVIATION SAFETY – SAFETY PROJECT ACTIVITIES 2024

1. INTRODUCTION

1.1 In January 2023, the Flight Safety Foundation, through its newly formed Asia Pacific Centre for Aviation Safety (AP-CAS), conducted a comprehensive regional safety assessment and analysis of aviation safety issues across key sectors of aviation in the APAC 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 58th DGCA Conference (DP/3/07 58/7 refers).

1.2 Effectively, this 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 mirrored 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 The 13th Regional Aviation Safety Group Meeting (RASG/13, December 2023, Hong Kong, China) encouraged the Flight Safety Foundation and AP-CAS to conduct further analysis of occurrences related to SCF-NP and SCF-PP. 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 work program for 2024. As a result, three projects have been identified as of high priority and are underway: Airworthiness Needs Analysis Study, Upset Prevention and Recovery Training, and Flight Path Management Training and Procedures.

2. 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 publication of ICAO's 2014 'Manual on Aeroplane Upset Prevention and Recovery Training', LOC-I remains a significant concern in the APAC 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 APAC region 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 Recommended Practices. 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 training, as well as ab-initio training, across the region. The project will seek to identify the availability of States' regulatory guidance to the industry on UPRT. This effort will include a survey of Asia-Pacific airlines, associated approved training organizations, many pilots employed by these airlines, aircraft manufacturers (e.g. Airbus, Boeing) as well as those States' civil aviation authorities. Through the analysis of the surveys, FSF will attain an informed perspective of the health of UPRT knowledge and skills of pilots in the APAC region as well as gaps and best practices. Ultimately, this project will seek to establish a means for airlines and approved training organizations to share regional best practices. Throughout this project, the Flight

Safety Foundation will work in close coordination with the ICAO Asia Pacific Regional Aviation Safety Team (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 Upset Prevention and Recovery Training will result in a comprehensive report that highlights the strengths and weaknesses of current UPRT practices within the APAC region. The report will offer actionable recommendations, guidelines and best practices for enhancing UPRT effectiveness, contributing to the overall improvement of flight safety in the region. The results of the project and recommendations will be communicated to airlines, approved training organizations, and civil aviation authorities in the 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). FPM 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 FPM principles and training are currently integrated into the training curricula of airlines’ pilot 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.

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 APAC 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 In the 2023 regional safety assessment of the region, AP-CAS identified emerging risks that were not previously addressed through such mechanisms as the APAC Regional Aviation Safety Plans or the national aviation safety plans developed to date. It is notable that the combination of system/component failure, non-powerplant (SCF NP) and powerplant (SCF PP) occurrences comprised the greatest number of fatal/non-fatal accidents/serious incidents in the region during the analysis period (2017 to 2023). The combination of SCF NP and SCF PP accounts for approximately one-fourth of all occurrences in the region over a seven-year period. The RASG-APAC/13 meeting encouraged the Flight Safety Foundation to conduct further analysis of occurrences related to SCF-NP and SCF-PP and determine the underlying issues that may have contributed to the high number of occurrences related to the failures of or malfunctions on aircraft within the region that have led to accidents and serious incidents.

2.3.2 The AP-CAS Airworthiness Needs Analysis study seeks to identify underlying factors that may contribute to shortcomings such as maintenance practices, instructions for continuing airworthiness, design/production issues, including possible shortages in skilled human resources, and the flow of continuing airworthiness information. The study is well underway, and data have already been analyzed concerning the nature of systems and powerplant failures using the Aviation Safety

Network (ASN) (data pertaining to Accidents and Serious incidents). Fact sheets have been prepared that summarize the results of the analysis of SCF-PP, SCF-NP data. In addition, a fact sheet has been prepared for the *Flow of Continuing Airworthiness Information* since the analysis has given rise to concerns on the level of reporting by air operators, approved maintenance organizations and State of Registry as required by ICAO Annex 6 and 8. Additional input through exchanges with the International Air Transport Association (IATA), Association of Asia Pacific Airlines (AAPA), Federal Aviation Administration (FAA), European Union Aviation Safety Agency (EASA) as well as OEMs are currently underway that would be helpful to further supplement and perhaps validate the analysis performed thus far.

2.3.3 The final report is expected to be completed by the third quarter of 2024 and will outline the findings concerning the underlying issues contributing to SCF-NP and SCF-PP in the region and provide conclusions and recommendations.

2.3.4 Preliminary results.

2.3.4.1 **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.

2.3.4.2 **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.

2.3.4.3 **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.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) encourage ICAO, States and industry to continue supporting the Flight Safety Foundation in its ongoing efforts in advancing the aforementioned projects including participating in the projects' surveys, discussions and workshops;
- b) urge States and ICAO to note the preliminary indications of the Airworthiness Needs Analysis and refer to the final outcomes of the Airworthiness Needs Analysis Study when finalized; and

- c) request AP-CAS to report the results of its projects at the next DGCA conference.

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