International Civil Aviation Organization
Asia and Pacific Office

Twenty-second Meeting of the Asia Pacific Regional Aviation Safety Team (APRAST/22)

(Bangkok, Thailand, 30 September to 04 October 2024)

Agenda Item 5: Presentations – State /Industry / ICAO

FOCUSED DISCUSSION: SAFETY CULTURE AND THE ADVERSE IMPACTS OF HARDLINE ORGANIZATIONAL POLICY

(Presented by SEI WG in collaboration with Boeing)

SUMMARY

The SEI WG is introducing the idea of a "focused discussion" during the APRAST plenary to facilitate active participation by members and partners. It is not intended to replace the specific efforts of the individual APRAST working groups but rather emphasize the SEI WG's ongoing effort to share safety information with States/Industry via multiple communication mediums that don't require the full process of SEI development.

This focused discussion addresses the impacts of safety culture in relation to a recent OEM analysis on the difference between hard landings and firm landings and highlight the unintended safety hazards stemming from hardline organizational policies that put an overemphasis on preventing them. Subsequently, pilots are being penalized by the data being collected. This excessive focus, coupled with the fear of punitive action, has led to longer landing distances and a heightened risk of abnormal runway contact and runway excursion.

1. INTRODUCTION

1.1 ICAO Annex 19 requires that States promote a positive safety culture. Safety Culture is defined as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands. An organizational culture is influenced by a set of commonly shared beliefs, expectations, and values that guide the thinking and behavior of organization members. This culture is influenced from the top through the actions and behaviors of the senior management team, which permeate the workforce. In simple terms, Safety Culture is how people behave towards safety when no one is watching.

1.2 The topic of a positive safety culture has received much needed focus over the past several years. Specifically in the Asia Pacific region, several working papers and workshops have put a spotlight on the various subcomponents of a safety culture and its practicality. Examples include RASG-APAC/12 WP/24, APRAST/21 WP/10, and the most recent SSP implementation workshop held at ICAO Bangkok in August 2023.

1.3 However, as stated in APRAST/21 WP/10, safety culture can be an abstract concept difficult to grasp. It can be particularly difficult when trying to grasp a holistic view of the safety culture of independent organizations which share common goals such as a State regulator and operator connected by an overarching goal of safety.

1.4 The key to continuous improvements in aviation safety is to create a sustainable culture of safety through an open and transparent exchange of safety data and information between employees and management, and then between the State and the aviation community. This exchange of safety information must result in the transformation of accurate safety intelligence. Organizational policies informed by inaccurate safety intelligence can have adverse impacts on aviation safety.

1.5 A recent analysis by Boeing on hard landings versus firm landings demonstrates this concept. The analysis addresses the differences between hard landings and firm landings, the misconception that these types of landings are riskier than they are and highlights the unintended safety hazards stemming from hardline organizational policies that put an overemphasis on preventing them. This excessive focus has led to longer landing distances and a heightened risk of abnormal runway contact and runway excursion.

2. DISCUSSION

2.1 A Hard Landing occurs when the structural loads may have exceeded the design limit loads of the aircraft structure. For most Original Equipment Manufacturers (OEM), if the rate of descent (or sink rate) of the aircraft exceeds 10 feet per second (~3.1 meters per second), then the structural loads may have exceeded the design limit loads, depending on other parameters, such as CG, pitch attitude, ground speed, payload distribution, bank angle, etc.

2.2 The OEM Aircraft Maintenance Manual (AMM) provides guidelines for determining whether a structural inspection is necessary to ensure the aircraft's airworthiness. Accelerometer thresholds were initially introduced to help safely determine if a structural inspection could be waived. However, OEMs have become aware that the load factor is being misused as an indicator of a hard landing. Pilots have been penalized for "Firm" or "Slightly Harder than Normal" landings defined by the load factor.

2.3 Boeing conducted a study based on 570,000 flights by 737 NG/MAX operators. With regards to structural load limit, 99.97% of landings were found to be below the AMM Load Factor inspection threshold, which is itself conservatively below the threshold of a hard landing. It also suggested that the safety risks associated with hard landings are often perceived as greater than they actually are.

2.4 When punitive measures are disproportionately applied to "Firm" or "Sightly Harder than Normal" landings, it can inadvertently shift pilots' focus towards merely achieving a soft landing. This shift in focus may lead to unstable approaches, long flares, and missed touchdown zones, which can increase the risk of runway excursions. Such behaviour may be a consequence of rigid organizational policies cantered on load factor thresholds. Therefore, it is crucial for rule makers to consider the importance of a positive safety culture, with emphasis on a just culture, in order to balance the risks associated with hard landings and runway excursions.

2.5 To address these issues, it is recommended that the use of CG Load Factor to be avoided as a Safety Performance Indicator (SPI). Furthermore, airlines are discouraged from incorporating the use of CG load factor into various pilot performances scoring schemes.

2.6 As a reminder, RASG-APAC/5 originally approved in October 2015 a safety enhancement imitative safety output, CFIT/4, *Model Advisory Circular for the Establishment of a Flight Data Analysis Program (FDAP)*, for States/Administrations and Industry to develop and implement a non-punitive FDAP to promote compliance with the Annex 6 requirements. Recent revisions to the safety output, and approved at RASG-APAC/13, integrates safety management system (SMS) terminology to emphasize the critical connection between an SMS and the non-punitive programs that inform an SMS. In addition, it provided specific examples of a positive safety culture of an operator.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) Actively participate in a half-day focused discussion to ask questions and exchange ideas on the aforementioned concepts and risks with the goal of enhancing aviation safety in the region;

b) Share their perspectives, and views on the impact of a safety culture, to mitigate a disproportionate focus on hard landing at the extent of an increase to runway excursion risk; and

3.2 Provide feedback on the use and feasibility of the "focused discussion" mechanism for future APRAST plenaries to highlight specific safety topics and encourage open discussion.

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