



ICAO

International Civil Aviation Organization

African Flight Procedure Programme

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AGENDA ITEM 5: Safety risk assessment process for designed flight procedures

(Presented by [KENYA])

<p>Summary</p> <p>This information paper presents Safety Risk Assessment process in flight procedure design which is a critical component of aviation safety, ensuring that flight operations are conducted with high standards and operational integrity. However, some challenges have been encountered in Safety Risk Assessment process particularly in the identification of hazards, analysis and development of mitigation measures. There is need for Africa Flight Procedure Programme (AFPP) to have a coordinated approach for the Safety Risk Assessment through assisting States to develop requisite expertise related to flight procedures domain.</p> <p>Action by the meeting in section 4</p>
<p>Reference(s):</p> <ul style="list-style-type: none"> • Annex 11- Air Traffic Services • ICAO Doc 9859 Safety Management System Manual • ICAO Doc 9906 Vol. 1 Quality Assurance Manual for Flight Procedure Design • ICAO Doc.8168 Vol 2 •
<p>Related ICAO Strategic Objective(s).</p> <p>This information paper relates to the Safety, Air Navigation Capacity and Efficiency, and Economic Development Strategic Objectives.</p>

1 Introduction

- 1.1.1 Annex 11 para 2.19.3 requires States to conduct safety risk assessments for activities potentially hazardous to civil aircraft and that appropriate risk mitigation measures are implemented.
- 1.2 Annex 11 para 2.29 requires that any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, be effected after a safety risk assessment has demonstrated that an acceptable level of safety will be met and stakeholders' engagement conducted.
- 1.2.1 The ICAO's safety risk assessment process for flight procedures involves identifying potential hazards, assessing the associated risks (probability and severity), and developing mitigation strategies.

- 1.2.2 Safety Assessment is a risk management process of the SMS that is used to assess safety concerns arising from deviations from standards and applicable regulations, of both operational or proposed flight procedures introduced within the airspace.
- 1.2.3 ICAO Doc 9906 Vol. 1 requires States to establish a quality system for the entire IFP process. One of the processes is the conduct of the Safety activities on any designed flight procedure.

2 Discussions

- 2.1.1 Safety risk assessment is a formal process by which an organization ensures that risks associated with a system change have been properly identified and mitigated prior to operationalization.
- 2.1.2 The safety assessment should not be performed by one individual, but should be conducted by a team comprised of all relevant stakeholders. This allows for diverse consideration of the all possible implications, interactions and possible hazards that may result from the operational use of a procedure.
- 2.1.3 Whereas the safety team are not trained as designers, they are required to have basic understanding of the design criteria to be able to provide objective feedback, and propose appropriate suggestions for improvement on the designed flight procedures.
- 2.1.4 The results and conclusions of a safety risk assessment of a flight procedure are usually described in a safety case which is presented to the Regulator during approval process.
- 2.1.5 In most cases the conduct of safety risk assessment depends on the interpretation of the safety team and who may sometimes have a different opinion with the designer, leading to invalidation of the flight procedures thus slowing the process Instrument Flight Procedure publication.

3 Safety risk assessment challenges

- 3.1.1 Using safety risk assessment as a hypothesis-driven approach presents several challenges. These include potential inaccuracy due to limited data and subjective biases, difficulty in predicting rare or extreme events, resource constraints, and the possibility of overlooking key stakeholders or information. Several cases of safety risk assessment session, designers have identified these challenge that result into the procedure being invalidated by the safety team. These are;
- 3.1.2 Complexity and Unforeseen Risks:
Identifying all potential hazards can be challenging, especially in complex systems or when unforeseen risks emerge.
- 3.1.3 Lack of Data and Information:
Insufficient data or information can make it difficult to accurately identify and assess hazards, particularly in areas with limited historical data or emerging technologies.

3.1.4 Subjectivity and Bias:

Human judgment and subjective interpretations can introduce biases into the hazard identification process, potentially leading to inaccuracies.

3.1.5 Predicting Rare Events:

Rare or extreme events are difficult to predict using historical data or models, as they may not be adequately represented in the data

3.1.6 Quantifying Uncertainty:

Accurately quantifying the likelihood and severity of potential harm can be challenging, especially when dealing with uncertain or complex scenarios.

3.1.7 Data Interpretation:

Interpreting and analyzing data to derive actionable insights can be difficult, especially with large volumes of data and complex relationships.

3.1.8 Prioritizing Risks:

Deciding which risks require the most attention and resources can be challenging, especially when dealing with numerous hazards and varying levels of risk.

3.1.9 Resistance to Change:

Individuals or organizations may resist implementing new controls or making necessary changes, especially if they perceive a disruption to their work or operations.

4 Action by the meeting

4.1.1 The Steering Committee meeting is invited to:

- a. Note the information in this WP.
- b. AFPP to consider organizing a workshop on Safety Risk Assessment on Flight Procedures where States can share experience on the best practices.
- c. AFPP to consider the inclusion of Safety risk assessment in the job training as part of Phase IV activities.
- d. Develop a pool of experts with competency in this domain.