



WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE B

Agenda Item 7: Operational safety risks
7.1 Facilitation of data-driven decision-making in support of safety intelligence to support safety risk management

INTERNATIONAL COLLABORATION ON INTEGRATED SAFETY ASSESSMENT MODELS

(Presented by the United States)

EXECUTIVE SUMMARY

In 2014, the U.S. Federal Aviation Administration (FAA) and EUROCONTROL agreed to cooperate in the development of a shared web-platform providing an integrated aviation risk model for safety performance evaluation. The harmonized models – Integrated Safety Assessment Model (ISAM) for FAA and Integrated Risk Picture (IRiS) for EUROCONTROL, recognize the importance of global concepts, implementation of safety risk assessment regionally and locally, and cost-effective development of robust safety analysis tools.

Action: The Conference is invited to agree to the recommendation in paragraph 3.2.

1. INTRODUCTION

1.1 Stakeholders require information on baseline aerospace system safety risks as part of their safety management program. In order for change in risk to be identified, a baseline must be established that characterizes risks in the system's current state. Stakeholders can monitor changes in risk relative to the baseline and determine whether any increase in risk is understood and acceptable or needs to be analysed further and addressed accordingly.

1.2 Integrated aviation safety risk assessment models, when implemented in a data rich, high-speed network environment, can provide an emergent risk monitoring capability. An integrated aviation safety risk model considers all elements of the system and their interfaces, for example: aircraft, aerodrome, air traffic management / air traffic control, infrastructure / technical operations, weather, and human factors. Identifying and analysing previously uncharacterized interactions between all actors in the system and their roles through integrated modelling make emergent risk monitoring possible.

1.3 When extended to commercial aviation, general aviation, remotely piloted aircraft systems, and unmanned aerial system operations, these integrated models capture risk throughout the airspace for all aspects of the aerospace system and its operation.

2. DISCUSSION

2.1 The FAA and EUROCONTROL are conducting joint development activities to result in a shared web-platform containing the ISAM and the IRiS model. A shared web-based platform allows multiple, geographically separated users to collaborate on and enrich aviation safety risk assessments and risk-based decision making within particular elements of the aerospace system and for international air navigation as a whole.

2.2 Integrated aviation safety risk models are valuable for FAA and Air Navigation Service Providers (ANSPs). FAA and ANSP members of EUROCONTROL must assess aviation safety risk to ensure the aerospace system is operating at an acceptable level of safety. While a given entity may be responsible for or concerned with a particular aspect of the system, it is important to understand how those aspects fit into the system as a whole through their functions, dependencies, and interactions. Because of this need to see beyond one system element in increasingly complex systems, integrated models are essential to understanding aviation safety risk.

2.3 Civil Aviation Authorities (CAAs) and ANSPs require similar information to conduct safety risk assessments in their airspaces. Safety risks are identified through data, that is, information that enables understanding of how a given part of the system is functioning. Historically, procuring data for modelling has had many challenges and limitations, such as proprietary considerations, lack of data gathering and preservation infrastructure, and no repeatable, predictable, and transparent methods available for organizing available data and conducting risk assessments. While the particulars of aerospace systems differ, the general components of the system and therefore of the high-level aspects of integrated modelling are the same. Therefore, CAAs and ANSPs can share their approaches to identifying available data sources and prioritizing data gathering for safety risk modelling and assessment.

2.4 The development of harmonized integrated safety risk assessment models is important to international air navigation. Understanding the similarities and differences between airspace systems allows for a sensible comparison of system changes and emerging risk now, spurring meaningful collaboration on safety risk identification, mitigation, and monitoring without conducting independent and duplicative analyses.

3. CONCLUSION

3.1 To ensure harmonized development of internationally applicable integrated aviation safety risk assessment models, the United States proposes continued cooperation regarding joint model development to coincide with formalized project plans.

3.2 The Conference is invited to recommend the continued joint development of these models that support and enable baseline risk quantification, safety risk assessment and forecasting to support risk-based decision making, accident and incident modeling, barrier analysis, sensitivity, and “what if?” analyses to ensure that primary safety considerations are addressed within the integrated safety risk assessment models.