



FOURTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 26 August to 6 September 2024

- Agenda Item 2: Timely and safe use of new technologies**
2.2: Addressing safety risks related to evolving aviation technologies

A RISK-BASED APPROACH TO EMERGENCY PLANNING AT AIRPORTS WITH MULTI-RUNWAY OPERATIONS

(Presented by the United Arab Emirates)

EXECUTIVE SUMMARY

The paper emphasizes the importance of adopting a risk-based approach to emergency planning at airports with multi-runway operations. This paper aims to examine the rationale for the adoption of a risk-based thinking approach to emergency planning at large airports operating multiple runways. Emergency planning is crucial in ensuring the safety and security of airports, and a risk-based thinking approach provides a structured and proactive method to identify, assess, and mitigate potential risks and vulnerabilities. By incorporating risk-based thinking into emergency planning, airports can enhance their preparedness and response capabilities, leading to more effective and efficient emergency management.

Action: The Conference is invited to:

- a) take note of the working paper; and
- b) encourage ICAO to review aerodrome Standards and Recommended Practices (SARPs) and guidance material to consider risk-based approach for airports with multiple runways in dealing with highly complex emergencies.

1. INTRODUCTION

1.1 ICAO Standards and Recommended Practices (SARPs) have stipulated emergency planning requirements that all airports must adhere to, ensuring safety and efficiency to mitigate the consequences of an emergency happening at the airports. Airport emergency planning is the process of preparing an airport to cope with an emergency occurring at the airport or in its vicinity. The principal objective of airport emergency planning is to minimize the effects of an emergency, particularly in respect of saving lives and maintaining aircraft operations. The airport emergency plan sets forth the procedures for coordinating the response of different airport agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to the emergency.

1.2 The current emergency planning arrangements focuses on managing a singular emergency at airports, however, airports with multiple runways operations face unique challenges in emergency planning due to their sheer size and complexity. The nature of operations, including a high volume of flights and numerous stakeholders involved, can make compliance with ICAO's regulations daunting. Additionally, coordinating response efforts across different entities within the airport while addressing

various potential emergencies can be a mammoth task. The immense size of these airports complicates emergency planning efforts to maintain an effective and comprehensive response plan. Each runway may have unique risks based on its location, usage and surrounding infrastructure, requiring individualized attention within the overall emergency strategy. Another significant challenge lies in coordinating communication among different parties involved in an emergency response. This includes airport personnel and external agencies like local law enforcement agencies, fire departments, hospital services, airlines and other relevant stakeholders. Large-scale airport operations demand high synchronization between these groups to ensure swift and efficient responses to emergencies.

1.3 Adopting a risk-based thinking approach to emergency planning at these airports provides a safe and proactive approach to identify, assess, and prioritize risks based on their probability and potential impact. This approach allows airports to allocate their resources effectively, focusing on the most significant risks that require immediate attention. It also enables a continuous improvement cycle, where airports can monitor and review their emergency plans, update risk assessments, and learn from incidents and near misses to enhance their overall preparedness. By adopting risk-based thinking, airports can ensure that their emergency plans are grounded in a solid understanding of the potential risks they may face and are designed to minimise their impact. A risk-based thinking approach to airport emergency planning brings the following benefits:

- a) improves overall airport incident management governance framework;
- b) enhances safety management system at the airport;
- c) establishes safe and proactive culture of continuous improvements;
- d) assists with statutory and regulatory compliance;
- e) assures consistency of delivering of emergency response actions from on and off-airport agencies; and
- f) strengthen stakeholders' inter-operability, intra-operability and confidence.

1.4 The risk-based approach strategy covers all aspects of airport emergency preparedness, including risk assessment, response planning and continual improvement. It entails identifying potential hazards, determining their probability and impact, prioritising risks and developing risk criteria. It also includes the formulation of emergency response processes, the specification of roles and duties, the construction of communication protocols and the execution of training and drills. The work also emphasizes the importance of continuously monitoring and reviewing emergency plans, updating risk assessments as new information becomes available and learning from incidents and near misses to adopt essential adjustments. This work seeks to create a thorough and strong framework for airport emergency preparedness by addressing these essential areas.

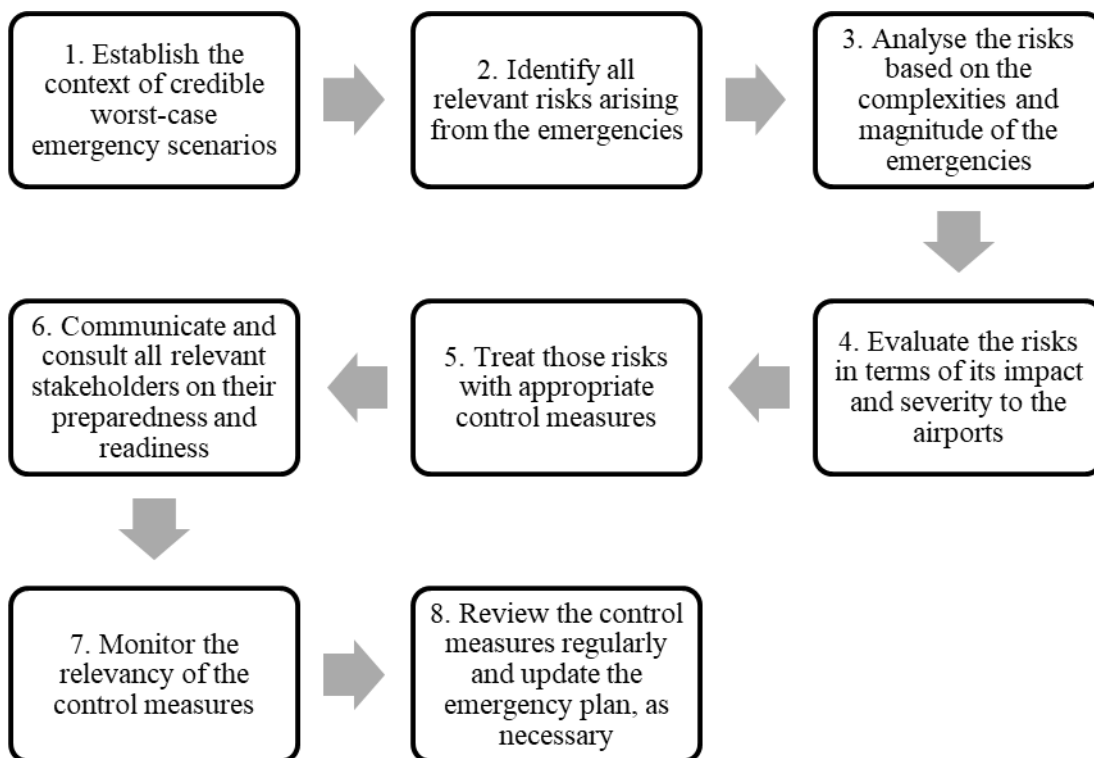
2. DISCUSSION

2.1 Multiple emergencies occurring at airports will cause severe strain to the incident management system, resources and personnel. If not meticulously planned, such situation may cause the overall incident management system to collapse. When planning for such emergencies, the emergency plan should not solely base on the provision of airport rescue and firefighting category of the airport but also consider other pertinent factors such as readiness of other agencies in dealing with these emergencies. A concept of emergency operations detailing the appropriate level of emergency response at the airport should

be developed. An emergency response model should be scalable and adaptable to any emergency without compromising the principal objective of an airport emergency planning.

2.2 Assessment in dealing with multiple aircraft emergencies at the airport should consider the emergency plan's adequacy to cope with another emergency situation occurring on the other operational runway/s whilst managing the first emergency at other runway. When conducting such assessment, the support and inputs from on and off airport agencies – air traffic services, airfield operations, ground handling companies, rescue and firefighting services, airport medical facility, local fire services, police, ambulance services, etc., are necessary.

2.3 Airports may consider applying the principles and guidelines outlined in the International Organization for Standardization (ISO) 31000, risk-based thinking framework to enhance emergency planning processes at these airports. This framework delves into the various aspects of risk-based thinking, including the identification and assessment of risks in emergency scenarios, the development of risk mitigation strategies and the continuous improvement of emergency preparedness measures. The research will consider the challenges and considerations specific to large airports, as well as the roles and responsibilities of stakeholders involved in the implementation of the risk-based thinking approach.



2.4 When developing a comprehensive airport emergency plan through a risk-based approach, airports should consider the following factors:

- a) design and layout of runways and taxiways;
- b) type/s and sizes of aircraft operations;
- c) airport rescue and firefighting service provisions – appliances, personnel, training, etc;
- d) on and off airport agencies' resources, personnel and equipment;
- e) locations and capacities of supplementary water supply;
- f) emergency alerting and notification system;
- g) communication system network, etc;
- h) location and capacities of emergency reception facilities;
- i) triage and medical care protocols;
- j) incident management framework, and
- k) personnel competency

3. CONCLUSION

3.1 In conclusion, the integration of a risk-based thinking approach into airport emergency planning is essential for enhancing safety, efficiency and coordination at large airports with multiple runways. By systematically identifying, assessing, and prioritizing risks, airports can allocate resources effectively and ensure continuous improvement in their emergency preparedness. This comprehensive strategy addresses the unique challenges posed by the complexity and scale of modern airport operations. By fostering collaboration among various stakeholders and implementing robust communication protocols, airports can significantly improve their incident management frameworks, thereby ensuring a swift and effective response to multiple emergencies. This approach ultimately strengthens the overall resilience and operational continuity of airport emergency management systems.

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