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Agenda Item 3: Air Navigation System Performance Improvement

3.1: Proposals to improve the efficiency of air navigation services contributing to LTAG

REVISION NO. 2

FLIGHT SAFETY AND WILDLIFE HAZARDS AND RISK MANAGEMENT

(Presented by Australia, Azerbaijan, Brazil, Cambodia, Fiji, India, Indonesia, New Zealand, Pakistan, Philippines, Singapore, Thailand, the United Kingdom, Airports Council International (ACI), Flight Safety Foundation (FSF) and International Air Transport Association (IATA))

EXECUTIVE SUMMARY

This paper seeks the endorsement of the Air Navigation Conference for the development of a best-practice guide on the systematic cross-disciplinary management of wildlife hazards and risks which also addresses the roles, responsibilities and accountabilities of government and industry stakeholders as they relate to wildlife hazards and risk management.

Action: The Conference is invited to:

- a) note the information contained in the paper;
- b) acknowledge, while significant documentary material exists within various disciplines, there is a substantial lack of coherence and understanding in how wildlife hazard and risk management is effectively and systematically managed, leading to inefficiencies; and,
- c) request the approval of the ICAO Council to agree to Recommendation 3.1/x in paragraph 3.5, to constitute a multi-disciplinary cross-panel expert working group (or task an enhanced existing group) to develop best practice guidance on a systemic approach to wildlife hazard, risk management and flight safety; akin to *Flight Safety and Volcanic Ash* (Doc 9974).

1. INTRODUCTION

1.1 Wildlife hazards to aviation are as old as aviation itself. While many related aspects have continued to develop and improve over time as thinking and technology have developed, the approach to wildlife hazard and risk management in aviation has remained steady if not stagnant – disproportionately burdening aerodromes with conducting *risk assessments*¹ rather than concentrating on hazard identification, hazard management and communication (threat assessment).

¹ This is reflected in the substantial material in *Airport Services Manual* (Doc 9137), under Annex 14 — *Aerodromes*, related to this single hazard (on WHM) while *Safety Management Manual (SMM)* (Doc 9859), under Annex 19 – *Safety Management*, does not cite a single specific hazard.

1.2 Wildlife hazards and risk management is a shared responsibility with each aviation stakeholder owning a part of the process but the aircraft operator/pilot being the party directly impacted by the threat and hence the ultimate authority for the informed assessment of risk and/or the acceptance of it.

2. DISCUSSION

2.1 Of ICAO's five strategic objectives, the first two objectives are to enhance global civil aviation safety and to increase the capacity and improve the efficiency of the global civil aviation system. The plans to achieve these objectives are outlined in ICAO's Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP). Together, these plans seek to ensure investments in the aviation system not only yield the effect we are desiring – minimization of risk while optimizing efficiency, but also that ineffective measures are minimized or even eliminated.

2.2 The GASP supports the implementation of the GANP by promoting the effective implementation of safety oversight and a safety management approach to oversight, including systematic wildlife hazard and risk management, to permit innovation in the air navigation system in a managed way. The purpose of the GANP is to seek to accommodate all airspace users' operations in a safe, secure and cost-effective manner while reducing aviation's environmental impact. To this end, the GANP provides a series of operational improvements to increase capacity, efficiency, predictability and flexibility while ensuring the interoperability of air navigation systems and the harmonization of procedures.

2.3 In order to achieve the outcomes sought through the GASP and GANP, a harmonized and systematic approach on wildlife hazards and risk management is essential, maximizing outcomes and minimizing resource impost. At the heart of achieving this approach is the effective application of risk-management and associated risk-based decision making leading to a safe and efficient aviation system.

2.4 In turn to accomplish this, the correct information needs to be provided to the correct stakeholders in a timely manner, avoiding any unnecessary delays or unhelpful information.

2.5 This approach occurs extremely well in many parts of the aviation system and across multiple disciplines from various Standard and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS). For example, aviation meteorological information, which is gathered and quantified by scientists (forecasters) for Meteorological Service Providers (Annex 3 — *Meteorological Service for International Air Navigation*) is transmitted via Aeronautical Information Services/Air Traffic Management (AIS/ATM) systems (Annex 10 — *Aeronautical Telecommunications*, Annex 11 — *Air Traffic Services* and Annex 15 — *Aeronautical Information Services*) to various locations, where ultimately the aircraft operator (Annex 6 — *Operation of Aircraft*) makes a risk-based/informed decision. This is not necessarily the case with respect to wildlife hazard and risk management.

2.6 It has been demonstrated that a systematic and successful approach is possible with the development and introduction of *Flight Safety and Volcanic Ash* (Doc 9974). This document has been very successful in its application and is currently in review and update by a multi-disciplinary/multi-panel task-group to ensure it continues to be as valuable a resource into the future.

Problem statement

2.7 Annex 14 — *Aerodromes* does not refer to nor require 'risk assessment'; instead, it specifically refers to 'wildlife hazard strike reduction' and requires active and passive management of the

hazard with a view to reducing the likelihood of wildlife becoming a threat to aviation – this is necessary and appropriate.

2.8 Over time, the subordinate materials to Annex 14 (*Airport Services Manual* (Doc 9137), Part 3 — *Wildlife Hazard Management and Procedures for Air Navigation Services (PANS)* — Aerodromes (Doc 9981)) have evolved beyond the requirements of the Annex. In doing so they have confused terminology and they have induced inefficiencies with the potential to impact safety to the extent that an apparent anomaly now exists regarding wildlife hazard and risk management in the aviation system. An anomaly that leads many to believe that the near sole responsibility and concern for wildlife hazard and risk management resides with aerodromes.

2.9 Annex 14 states ‘*Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.*’ — the emphasis here being on reduction of *likelihood*. By contrast, PANS-Aerodromes and Airport Services Manual, Part 3 stipulates that ‘*A wildlife safety risk assessment shall be conducted, covering the aerodrome and its vicinity*’. This may seem, on the surface, as appropriate, but it is a step well beyond likelihood. This situation is compounded by near-interchangeable use of the terms of hazard and risk throughout all these documents and contrary to Annex 19 – *Safety Management and Safety Management Manual (SMM)* (Doc 9859).

2.10 Another more telling example exists in PANS-Aerodromes; Attachment B to Chapter 3 (I-3-Att B-1) which states ‘*The risk assessment takes into account the probability of occurrence of a hazard and the severity of its consequences; the risk is evaluated by combining the two values for severity and probability of occurrence*’. This directly contrasts with the SMM, (Doc 9859) Chapter 9 and Figure 9-1 (cited by the PANS as the reference source) which states, ‘*Analyse the likelihood of the consequences occurring*’. The imperative here – the likelihood of a hazard occurring – is vastly different to the likelihood of an outcome (the consequence) from a wildlife encounter.²

2.11 Further, the risk associated with a single threat (i.e. the same wildlife species, at the same location) actually varies across different aircraft types (rotorcraft to light aircraft to turbo-prop to high-capacity jet). Therefore, the effort in making these assessments are consuming substantial resources at the aerodrome level and generating a false sense of safety for aircraft operators while providing no direct benefit to anyone; further compounding the earlier anomaly.

A path forward

2.12 To help address this dilemma and bridge the gap between the known hazard and the possible risk, a term such as “threat” is beneficial. The term features in *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) specifically in the area of threat and error management, where it says:

‘Threats are defined as events or errors that occur beyond the influence of the flight crew, increase operational complexity, and must be managed to maintain the margins of safety. During typical flight operations, flight crews have to manage various contextual complexities, for example, adverse meteorological conditions, airports surrounded by high mountains, congested airspace,

² It is noted that the Aerodrome Design and Operations Panel (ADOP) Wildlife Hazard Management Expert Group (WHM EG) has a current task-card to review and update Doc 9137 and Doc 9981 and align them with the guidance in the new *Manual on the ICAO Bird Strike Information System (IBIS)* (Doc 9332).

aircraft malfunctions, and errors committed by other people outside of the cockpit, such as air traffic controllers, flight attendants or maintenance workers.'

2.13 Wildlife hazard and risk management adapts perfectly into this concept. It is as simple as:

- a) the *hazard* is wildlife;
- b) the *threat* is wildlife in airspace potentially needed by aircraft for operations; and
- c) the *risk* is when aircraft are in critical airspace in the presence of wildlife.

2.14 Accordingly, and instead of substantial effort and expenditure of time and resources into risk-assessments by aerodromes, effort should be placed into quantifying the extent of the *threat* to operations and ensuring effective and consistent communication of this threat across the system (to all parties involved but specifically the ANSP and onwards to the aircraft operators and /or pilots) in a similar manner to the transmission of meteorology (MET) information. Thus, facilitating and, in fact, requiring the aircraft operator to actively consider the risk to their operation and aircraft and accordingly make an appropriate risk-based/informed decision.

3. CONCLUSION

3.1 While significant documentary material exists within various disciplines of the aviation system, there is a lack of coherence and understanding in how wildlife hazard and risk management is effectively and systematically managed, leading to inefficiencies.

3.2 The scope and application of SARPs and PANS is often single discipline centric and a possible contributor to the current situation. The intention of this paper is evolutionary rather than revolutionary and seeks to enhance and assist practices currently used within the ICAO framework, hence allowing all aviation *spheres* to move toward a better and more effective solution while still meeting the minimum required standards.

3.3 Wildlife hazard and risk management is a shared responsibility with each aviation stakeholder owning a part of the process but the aircraft operator/pilot being the party directly impacted by the threat and hence the ultimate authority for the assessment of risk and/or the acceptance of it.

3.4 While all stakeholders need to *consider* the potential for risk (i.e. the threat to aviation operations), the *ultimate responsibility* for the assessment of risk and acceptance lies with the aircraft operator/pilot themselves.

3.5 Accordingly, this paper seeks the Air Navigation Conference's endorsement to request the approval of the ICAO Council to:

Recommendation 3.1/x — Constitute a multi-disciplinary cross-panel expert working-group, to develop systemic best practice guidance on Wildlife Hazards, Risk Management and Flight Safety.

This group may be similar to that created to review *Flight Safety and Volcanic Ash* (Doc 9974) be it a new group or an enhanced existing group like the Wildlife Hazard Management Expert Group (WHM EG). The primary focus of the group would be on the

consideration of systematic cross-disciplinary management of wildlife hazards and risks, and the development of a best-practice guide to address the associated roles, responsibilities and accountabilities of aviation stakeholders.

The elements/parameters that may be considered are:

- a) the need for a system-based approach to wildlife hazard and risk management, including the delineation of hazard, threat and risk and the appropriate authority for the acceptance of risk;
- b) the opportunity to consider whether the application of prescriptive, hard limits (13km) surrounding airports that do not necessarily consider local factors or operational parameters is the most appropriate approach. This may lead to a move towards the development of and application of *critical* airspace, allowing for local/adapted flexibility while retaining a robust system-based approach to risk;
- c) a structured process assigning clear responsibilities for all stakeholders; and
- d) the need for holistic education and promotion, a shared understanding and acceptance of responsibilities for all involved stakeholders.

— END —