International Civil Aviation Organization

The Seventh Meeting of the Asia/Pacific Aerodrome Assistance Working Group (AP-AA/WG/7)

Bangkok, Thailand, 27 to 30 May 2025

Agenda Item 3: Aerodrome Certification and Safety Management System

- **Sharing of State's Practices in the evaluation of aerodrome SMS and areas of improvements**

SMS ORGANIZATION AT TRANS MALDIVIAN AIRWAYS – WORLD'S LARGEST SEAPLANE OPERATOR

(Presented by Maldives)

SUMMARY

This paper presents an overview of the Safety Management System (SMS) implemented by Trans Maldivian Airways (TMA) in the Maldives, highlighting unique operational challenges such as limited facility equipment, infrastructure constraints, environmental & aesthetic considerations, variability of water runways, including airspace congestion and restrictions, delayed emergency response and mitigation strategies especially being the world's largest seaplane operator.

1. INTRODUCTION

1.1 Seaplane operations constitute a critical component of air transport in the Maldives, serving as a primary mode of connectivity between Velana International Airport (VIA) and nearly 200 island resorts across the archipelago. The introduction of seaplane operations dates back to 1993 with the establishment of Maldivian Air Taxi (MAT), followed by the commencement of operations by Trans Maldivian Airways (TMA) in 2000. In 2013, the merger of MAT and TMA resulted in the formation of the world's largest seaplane fleet under the TMA brand. As of today, seaplane operations in the Maldives are conducted by three operators: TMA, Manta Air, and the national carrier, Maldivian. The total fleet comprises over 90 DHC-6 Twin Otter aircraft, collectively transporting approximately two million passengers annually.

1.2 Despite the strategic importance of seaplane operations in supporting the Maldivian tourism industry, they are subject to unique operational challenges. Unlike traditional land-based aviation, seaplane operations rely on open water for takeoff and landing, often in remote and infrastructure-limited locations. These operations are further influenced by variable meteorological conditions. The inherent risks associated with seaplane operations necessitate the support of an effective Safety Management System (SMS) tailored to the specific demands of the operation and water aerodrome.

2. DISCUSSION

2.1 The Safety Management System (SMS) of TMA extends beyond conventional flight operations to incorporate the SMS of water aerodromes operated by the same carrier. Unlike traditional land-based aviation, where aerodromes are managed by independent authorities, in Maldives, seaplane operators oversee the water aerodromes they utilize.

2.2 This integrated SMS approach is essential for ensuring consistent safety management across both aircraft operations and water aerodrome. However, it also presents significant challenges, as operators must manage and monitor multiple water aerodromes—often numbering in the tens—across geographically dispersed locations. Effective hazard identification and risk management across these aerodromes are essential to ensuring safe operations. The following are some of the key challenges and hazards, along with the measures implemented to manage them.

Limited Facility Equipment: Many water aerodromes lack reliable weather monitoring systems and have insufficient emergency response equipment, increasing operational risks. To mitigate these limitations, resorts share weather information with operators, ensuring flight crews receive timely updates. Regular emergency response exercises and an up-to-date Emergency Response Plan (ERP) at each resort enhance preparedness and enable a quick and effective response in emergencies. Strengthening coordination between operators and resorts remains key for continued safety.

Infrastructure Constraints: Seaplane operations in remote locations face limited infrastructure, including fuel farms, security screening, and restricted lagoon spaces, along with exposure to open seas, increasing operational challenges. Careful fuel planning ensures flight readiness, while close coordination with resorts helps minimize obstructions in the runway area, reducing the risk of runway incursions and enhancing overall safety. Additionally, resorts employ personnel to monitor parked aircraft, providing an added layer of security oversight in the absence of dedicated security infrastructure.

Environmental and Aesthetic Considerations also influence water aerodrome development. Efforts to improve landing areas, such as dredging, are often restricted due to environmental regulations and the need to maintain the pristine appearance of tourist destinations. Resort management often prioritizes conservation and guest experience over safety. Balancing aviation safety requirements with the priorities of the tourism industry requires ongoing dialogue, education, and joint planning efforts, especially during the initial water aerodrome implementation phase.

Variability of Water Runways: Water runways in the Maldives differ significantly due to the diverse geography of island resorts and changing environmental conditions; tidal patterns, swells, wind, etc. To ensure safe takeoff and landing, operators provide water aerodrome charts detailing the facility layout, hazards, and operational cautions. Aerodromes are also categorized based on their characteristics, with classification values aiding flight planning. NOTAMs (localized and issued by the operator) and pre-flight briefings further equip flight crew with the necessary information to adapt to site-specific conditions.

Delayed Emergency Response presents another critical challenge. The remote nature of many water aerodromes makes it difficult to mobilize rescue assets quickly. Rescue boats and emergency personnel are often stationed far from the landing or takeoff areas, leading to extended response times. Ensuring that mechanized dinghies are readily available at all water aerodromes would significantly improve emergency preparedness and response effectiveness. Additionally, having trained personnel capable of utilizing available resources is essential for the rapid evacuation of individuals and effective aircraft salvage.

Current SMS Practices and Mitigation Strategies

2.3 Seaplane operators have implemented comprehensive SMS practices to address the unique risks of water aerodrome operations. Risk assessments and feasibility studies are conducted before commencing operations at new sites, ensuring that site-specific hazards are identified and mitigated effectively. Crew training programs focus on adverse weather operations, emergency response protocols, and Crew Resource Management (CRM), ensuring that decision-making remains robust in critical situations. Regular emergency response drills, including scenarios involving ditching and water evacuations, further enhance coordination and preparedness.

2.4 Infrastructure development remains a key area for improvement. Installing navigation aids and weather monitoring systems at remote locations would significantly enhance safety.

2.5 The recent publication of water aerodrome regulations (effective 01st May 2025) would further strengthen safety oversight. These regulations specific for water aerodromes and seaplane operations would improve standardization across operators. Greater accountability from resort management, particularly in meeting aviation safety requirements, would further reduce risks. Further and enhanced coordination between the Ministry of Tourism, the Ministry of Transport & Civil Aviation, and the Civil Aviation Authority is essential in ensuring resorts comply with necessary safety standards.

CONCLUSION

2.6 The dynamic and challenging environment of seaplane operations requires a comprehensive and tailored approach to SMS implementation. While operators have made commendable efforts to manage risks, significant improvements can be achieved through regulatory support, infrastructure development, utilization of advanced technology and strengthened oversight. These measures will not only ensure the safety of seaplane operations but also contribute to the sustainable growth of this sector.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper; and discuss any relevant matters as appropriate

—END—