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AGENDA ITEM 3: AVIATION SAFETY

RISK-BASED SURVEILLANCE IN AERODROME

(Presented by Indonesia)

INFORMATION PAPER

SUMMARY

Indonesia implements a Risk-Based Surveillance (RBS) approach for aerodrome oversight, guided by ICAO and SMICG. It uses a Safety Risk Profile combining sector, organizational, operational, and performance risks, scored 1–100 to classify aerodromes as high, medium, or low risk. SMS maturity is assessed using the PSOE model (Present, Suitable, Operating, Effective. This integrated system enables the DGCA to prioritize surveillance, ensure continuous compliance, and enhance proactive risk mitigation

RISK-BASED SURVEILLANCE IN AERODROME

1. INTRODUCTION

1.1 In line with ICAO's safety oversight framework and the State Safety Programme (SSP), the Directorate General of Civil Aviation (DGCA) Indonesia has implemented a structured Risk-Based and Performance-Based Surveillance (RBS/PBS) approach in aerodrome oversight. This approach adopts guidance from ICAO Doc 9734, Doc 9859, and the Safety Management International Collaboration Group (SMICG) Risk-Based Surveillance Guidance for Regulators.

1.2 The purpose of implementing Risk-Based Surveillance is to optimize the efficiency of surveillance activities, prioritize surveillance based on risk, and ensure sustainable compliance with safety standards across all certified aerodromes in Indonesia.

2. DISCUSSION

2.1 **Overview of Risk- and Performance-Based Surveillance**

2.1.1 Surveillance programme in Indonesia is guided by the use of risk and performance profiles of aerodrome operators. The main objective is to ensure that the operator continuously meets the operational eligibility criteria as stipulated in the Aerodrome Certificate.

2.1.2 Surveillance programme is conducted by determining surveillance cycles based on:

- Frequency, aligned with the nature of the planned activities; and
- Scope, adjusted according to the complexity and risk level of the operator.

2.1.3 Risk and performance profiling allows the regulator to identify common systemic risks, in aerodromes operations.

2.1.4 The objective of surveillance activities is not only to verify compliance but also to:

- Understand how organizations manage their own safety risks;
- Assess whether their SMS is functioning effectively and delivering safety outcomes;
- Review performance indicators and safety targets set by the operator;
- Confirm the alignment of organizational targets with national safety objectives.

2.1.5 Surveillance results are communicated back to the aerodrome operator and integrated into the organization's updated safety risk profile. Positive results, showing equal or improved safety performance, may lead to reduced surveillance frequency.

2.2 Surveillance Methodologies: Risk-Based and Performance-Based Oversight

2.2.1 Safety oversight is conducted as a continuous activity, based on risk and performance profiles of aerodrome operators. Two main methodologies are used:

- Risk-Based Oversight (RBO), surveillance is prioritized based on the organization's safety risk profile, which includes not only operational risks but also safety performance indicators and historical surveillance outcomes. This may involve compliance checks based on regulations issued by the DGCA.

- Performance-Based Oversight (PBO), PBO evaluates the effectiveness of organizational systems, especially the Safety Management System (SMS) and Quality Management System (QMS), with a focus on actual safety performance and outcomes.

2.2.2 The implementation of RBO and PBO requires the development of a Safety Risk Profile (SRP), enabling DGCA to:

- Evaluate how organizations manage their internal safety risks, including high-risk areas identified under the SSP;

- Prioritize organizations that require more intensive oversight;

- Determine surveillance strategies (frequency and scope);

- Approve risk mitigation actions proposed by the operator.

2.3 Developing a Safety Risk Profile

2.3.1 The Safety Risk Profile is constructed based on a set of indicators grouped under Risk-Based Oversight, which reflect:

- Risks inherent to the aerodromes operation, and associated risk exposure;

- Risks inherent to the organization: complexity, size, structure;

- Risks inherent to the operating model: types of aircraft, operating environments (e.g., VMC, IMC etc.);

- Performance of the organization: audit findings, root cause analysis, responsiveness to corrective actions.

2.3.2 Based on these indicators, RBO classifies risk into three categories:

- Operational risks: internal process failures, insufficient personnel, inadequate procedures or equipment;

- Safety, health, security and environmental risks: e.g., airport surrounded by high-risk communities, wildlife hazards, disaster-prone areas;

- Strategic, business, and financial risks: organizational instability, governance transition, financial uncertainty.

2.3.3 The risk profile is quantified through a weighted scoring system on a scale of 1 to 100, taking into account the contribution of each indicator. This scoring yields a final classification:

- High Risk: >60

- Medium Risk: 31–60

- Low Risk: ≤30

2.3.4 This quantification enables DGCA to:

- Allocate oversight resources efficiently;
- Identify high-risk organizations proactively;
- Adjust oversight frequency and scope dynamically;
- Encourage continuous improvement in SMS implementation.

2.4 Integration with Performance-Based Oversight (PBO)

2.4.1 PBO focuses on evaluating the maturity of SMS based on the PSOE model (Present, Suitable, Operating, Effective):

- Present: SMS elements are documented;
- Suitable: SMS is appropriate to the organization’s size, complexity, and risk;
- Operating: SMS is actively implemented and monitored;
- Effective: SMS is achieving its intended safety outcomes.

2.4.2 SMS maturity scores are also translated into a numerical scale and included in the safety risk profile. Aerodromes with mature and effective SMS may receive lower oversight intensity.

2.4.3 The combination of RBO and PBO offers a comprehensive view of the organization's safety capability and risk exposure, supporting a balanced and targeted regulatory strategy.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this Paper.

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