



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**EIGHTH MEETING OF THE STEERING COMMITTEE OF THE REGIONAL
AVIATION SAFETY GROUP FOR AFRICA-INDIAN OCEAN (RASC/8)**

From 29 to 30 August 2022

Agenda Item 4: Potential Significant Safety Concerns (SSCs) related to Air Navigation Services (ANS); and proposed mitigation measures.

(Presented by the Secretariat)

SUMMARY
<p>This paper outlines potential ANS- related SSCs, with respect to calibration of NAVAIDS and validation of Instrument Flight Procedures and Design. The paper also highlights possible mitigation measures to address the potential SSCs.</p>
<p>REFERENCE(S):</p> <ul style="list-style-type: none">- Annex 11 — <i>Air Traffic Services</i> (Amdt. 51, 15th edition, 2018)- Doc 8168 — <i>Procedures for Air Navigation Services: Aircraft Operations (PANS-OPS)</i>- Doc 9906 – <i>Quality Assurance Manual for Flight Procedure Design</i>- ICAO Annex 10, Volume I – Radio Navigation Aids- ICAO Doc 8071 – Manual on Testing of Radio Navigation Aids- Quality Assurance Manual for Flight Procedure Design (Doc 9906), Volume 5 — Validation of Instrument Flight- USOAP CMA 2020 Protocol Questions—Air Navigation Services — ANS (7.234, 7.247, 7.393)
<p>Related ICAO Strategic Objective(s): A – <i>Safety</i>, B – <i>Air Navigation Capacity and Efficiency</i>,</p>

1. INTRODUCTION:

1.1 Provisions of International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs) stipulated in Annex 10 to the Chicago Convention, and the Guidance Materials contained in Doc 8071- Manual on Testing of Radio Navigation Aids, require

that each Radio Navigation and Visual Aids operated for Air Navigation Services shall be calibrated/tested/inspected periodically.

1.2 Radio Navigation Aids and Visual AIDS, to be calibrated include:

- a) Non-visual ground-based Radio Navigation Systems: VHF Omnidirectional Range (VOR), Distance Measurement Equipment (DME), Non-Directional Beacon (NDB), Instrument Landing System (ILS) for Category I/II/III operations, VHF Marker Beacon (OM/MM/IM).
- b) Visual Aids: Precision Approach Path Indicator (PAPI), Visual Approach Slope Indicator Systems (VASIS).

1.3 The expediency of the instrument flight procedure of Ground NAVAIDs is assessed as part of the flight validation activity conducted in accordance with Quality Assurance Manual for Flight Procedure Design (Doc 9906), Volume V – Validation of Instrument Flight Procedure.

2. DISCUSSION:

2.1 Calibration is used to authenticate navigational aids signals and bring them to specifications in tandem with ICAO SARPs. Therefore, it's a requirement that ground-based navigation systems and visual aids used by airplanes be calibrated. Annex 10 (Aeronautical telecommunications), Volume I, Chapter 2, paragraph 2.7.1, the State requires that periodic ground/flight tests for radio navigation aids of all types be done in accordance to the relevant provisions of Chapter 3 of the same Annex.

2.2 Air Navigation Service Providers (ANSPs) must ensure that flight inspection of a commissioned Ground NAVAID be completed within the period of 14 calendar days prior to the due date of flight inspection. Identification of non-calibrated commissioned ground NAVAID is considered as significant safety concern (SSCs) under the framework of the ICAO Universal Safety Oversight Audit Programme (USOAP).

2.3 Where a flight inspection cannot be conducted within the 14 days grace period due to unforeseen circumstances e.g. technical and/or operational issue, the ANSPs shall submit a proposal to the regulatory Authority requesting for approval for an extension of the Flight Inspection period. Periodic flight inspections for NAVAID equipment may be extended by the regulatory Authority as follows:

- a) For Instrument Landing Systems (ILS), a period of extension up to 3 months;
- b) For Very High Frequency Omnidirectional Range (VOR), as homing facility function, a period of extension up to 3 months;
- c) For Distance Measuring Equipment (DME) as homing facility function, a period of extension up to 3 months;
- d) For Very High Frequency Omnidirectional Range (VOR) as en-route facility function, a period of extension up to 6 months;
- e) For Distance Measuring Equipment (DME) as en-route facility function, a period of extension up to 6 months;

- f) For Non-Directional Beacon(NDB) as locator, a period of extension up to 3 months;
- g) For Non-Directional Beacon (NDB) as homing/check point, period of extension up to 6 months.
- h) For Precision Approach Path Indicator (PAPI), a period of extension up to 3 months.
- i) For Visual Approach Slope Indicator System (VASIS), a period of extension up to 6 months.

2.4 During the extension of Flight Inspection Period, the ANSP shall conduct periodic Ground Checks, submit the Ground Check results of related facilities to the Authority as reference to review and evaluate the performance of facility during the proposed extension period, continue to conduct the maintenance activities in accordance with the maintenance plan for the facility, as well as recording of the test results; and monitor the readings of critical parameters to indicate that the equipment consistently meets performance requirements; and issue a NOTAM stating that the status of facility as operational but ground checked only and awaiting flight Check. When issuing the NOTAM, the ANSP shall indicate the validity period of the NOTAM according to the approval issued by the Authority.

Potential triggers of SSC under the USOAP: Calibration of NAVAIDS

- 2.4.1 State's failure to ensure that requirements for flight inspection are established and periodic flight inspections are provided for radio navigation aids, including failure to:
- a) establish a mechanism to ensure effective implementation,
 - b) establish flight inspection regulations and procedures, and
 - c) maintain flight inspection reports.

Potential triggers of SSC under the USOAP: Calibration of NAVAIDS

- 2.5 State's failure to ensure that requirements for flight inspection are established and periodic flight inspections are provided for radio navigation aids, including failure to:
- a) establish a mechanism to ensure effective implementation,
 - b) establish flight inspection regulations and procedures and maintain flight inspection reports.

Potential triggers of SSC under the USOAP: validation of Instrument Flight Procedures and Design

- 2.6 State's failure to ensure that instrument flight procedures (IFPs) are reviewed periodically (including validation) to ensure that they continue to comply with changing criteria and meet user requirements, including failure to:
- a) establish mechanism to ensure effective implementation.
 - b) maintain documentation regarding periodic reviews done and to ensure their ongoing validity in terms of minimum obstacle clearances; and
 - c) adhere to maximum interval for review of five years.

2.7 State's failure to ensure that all IFPs comply with measures that control the quality of the process (including obstacles check), including failure to:

- a) establish mechanism to ensure effective implementation.
- b) maintain reports and results of flight validations (including assurance that adequate obstacle clearance has been provided).
- c) implement a mechanism to ensure that IFP packages also include a list of relevant obstacles and identification and description of controlling obstacles

3. ACTION BY THE MEETING:

3.1. The meeting is invited to:

- a) take note of the above information
- b) request RASG-AFI to urge States/Organizations to take proactive and mitigation measures and avert possible SSCs when:
 - i. flight calibration of Radio Navigation Aids and Visual Aids are not carried out in accordance with the State calibration plan.
 - ii. instrument flight procedures (IFPs) are not reviewed periodically (including validation) to ensure that they continue to comply with changing criteria and meet user requirements; and
 - iii. IFPs do not comply with measures that control the quality of the process (including obstacles check).

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