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Subject: Incidents caused by operational use of ILS signals radiated during testing and maintenance procedures

Action required: To note information and guidelines provided hereunder, and take action as appropriate

Sir/Madam,

1. I have the honour to draw your attention to a number of incidents which have occurred in recent years resulting from the operational use of instrument landing system (ILS) signals being radiated during ILS testing and maintenance procedures, specifically for phasing and modulation balance testing. Such signals may be perceived onboard aircraft as “on-course” and/or “on-glide-path” indications regardless of the actual position of an aircraft within the ILS coverage and with no flag or alarm indication in the cockpit. The use of ILS localizer and/or glide path signals for approach guidance during these testing and maintenance procedures can therefore result in false indications to the flight crew and has the potential to cause a controlled flight into terrain (CFIT) accident.

2. Standards in Annex 15 — *Aeronautical Information Services* (Chapter 5, paragraph 5.1.1.1) and Annex 11 — *Air Traffic Services* (Chapter 3, paragraph 3.7 and Chapter 4, paragraph 4.3.8), and guidance material in the *Manual on Testing of Radio Navigation Aids* (Doc 8071), Volume I (Fourth Edition, Chapter 1, paragraphs 1.6 and 1.8) provide for a notification of the ILS facility status in order to prevent the operational use of an “unusable/unserviceable” facility. There have been, however, occurrences when the facility status notification has not reached the flight crew or the air traffic control unit concerned, or this notification has not been complied with due to shortcomings in the notification procedures or human error.

3. In order to address the aforementioned issue through improvements to the current practices of testing and maintenance of ILS, an amendment to Doc 8071, Volume I, which was developed with the assistance of the Testing of Radio Nav aids Study Group (TRNSG), is being processed. It draws particular attention to testing and maintenance procedures involving test signals that can result in false indications to the flight crew. It also emphasizes the need for coordination of these procedures with air traffic control (ATC) and for the timely promulgation and distribution of relevant information by a NOTAM before the procedures commence.

4. However, full prevention of the type of incidents in question involves a combination of measures which would protect the system from single points of failure. May I therefore request you to invite the appropriate authority(ies) and/or organization(s) in your State, as well as operators under your jurisdiction, to review current practices and procedures as necessary to ensure that ILS will not be used for normal flight operations when test signals are being radiated or the executive monitoring function of the facility is inhibited for testing/maintenance purposes.

5. It is highly desirable to eliminate the possibility for any operational use to be made of the ILS guidance during the testing by administratively removing (e.g. by a NOTAM) the localizer and the glide path from service simultaneously. If this is not feasible for operational reasons, a deferral of testing should be considered. However, in case the localizer needs to remain in service while the glide path undergoes testing and the testing cannot be delayed, sufficient measures should be implemented to ensure that users are aware of the potential for false indications from the glide path facility.

6. In all circumstances, the basic protective measures should include as a minimum:

- a) NOTAM phraseology that is specific about the possibility of false indications to the flight crew from the radiated test signals and clearly prohibits their use (suggested NOTAM wording - "RUNWAY XYZ ILS NOT AVBL DUE MAINTENANCE (or TESTING); DO NOT USE; FALSE INDICATIONS POSSIBLE");
- b) confirmation by maintenance personnel that such a NOTAM has been issued by the Aeronautical Information Services before the testing procedures begin;
- c) prior to beginning the tests, suspension or alteration to an unusual tone/sequence of the transmission of the unique Morse Code facility identification on the localizer, if the localizer should radiate solely for testing purposes; and
- d) a requirement that ATC advise, by automatic terminal information service (ATIS) and/or by a voice advisory, each pilot on an approach to the affected runway, emphasizing the possibility of false indications.

7. Additional protective measures may be appropriate, especially during phasing and modulation balance conditions for the localizer or the glide path (Doc 8071, Volume I, paragraphs 4.2.15, 4.2.37, 4.3.14, 4.3.39, 4.3.62 and 4.3.63 refer). Accordingly, when the phasing and modulation balance tests are being performed the following options may be exercised :

- a) when the tests are being performed on the localizer, remove the glide path from service by turning the signals off (to provide a glide path flag indication to the pilot); and

- b) when the tests are being performed on the glide path, remove the localizer from service by turning the signals off (to provide a localizer flag indication to the pilot).

Note. — If the b) option is exercised, the ATC voice advisories required in 6 d) above become redundant.

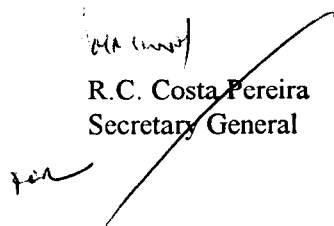
8. In addition, it is essential to ensure that protective measures (in addition to the coordination and promulgation process) are put in place to guard against single points of failure. One highly desirable measure is the installation of remote ILS status-indicating equipment such that it is visible to the air traffic controller issuing approach clearances.

9. It is imperative that all personnel directly engaged in the flight inspection, maintenance or installation of aeronautical navigation aids should be adequately qualified, trained, and experienced for their job functions. Accordingly, management systems should include written procedures for ensuring the continued competence of such personnel through regular assessment. Initial and recurrent training programmes for aeronautical navigation aid specialists should include a detailed explanation of maintenance procedures and their effect on the integrity of the radiated signal.

10. Finally, aircraft operating manuals should strictly prohibit the use of a radio navigation facility which is notified to be out of service even though its cockpit indications might appear to be normal. The facility identification check by the flight crew is an essential means for achieving this purpose.

11. It would be appreciated if you also remind the national accident investigation authority of the need to report to ICAO, in accordance with Annex 13 — *Aircraft Accident and Incident Investigation*, any serious incidents, particularly those which had the potential of developing into a CFIT accident.

Accept, Sir/Madam, the assurances of my highest consideration.


R.C. Costa Pereira
Secretary General

