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Prevention of False Capture of ILS Localisers

1. This AIC is issued in response to recent incidents by Air Carriers not capturing the Instrument Landing System (ILS) Localiser correctly when being vectored for an ILS Approach.
2. Investigations into the reason for this has determined that the crews of the aircraft have attempted to arm the Autopilot to capture of the localiser outside of the usable range of the localiser and the aircraft then subsequently captures a false Localiser.
3. This is also possible when capturing a false Glide Slope when intercepting the glide slope from above.
4. This procedure is extremely hazardous and crews should be cognisant of the increased risk of Controlled Flight Into Terrain (CFIT) when capturing a false course.

BACKGROUND

5. Incidents wherein a number of aircraft are reported to have deviated from course, after selecting APPROACH MODE on the Autopilot has highlighted the requirement for Flight Crew to ensure that the aircraft is positioned within the guaranteed area of coverage of ILS signals, before changing modes in order to not capture a false signal lobe emanating from the ILS Equipment.
6. The review of the occurrences pointed to the probability of the on-board equipment reacting to the receipt of a false course signal from the localiser, as the Autopilot was armed outside of the guaranteed coverage area of the localiser course.

GENERAL

7. Information on use of ILS Localisers can be found in ICAO ANNEX 10 Volume 1 Chapter 3
8. ILS Localisers can either provide positive guidance information over 360 degrees of azimuth, or such guidance only within a specified portion of the front coverage.
9. The majority of localisers provide coverage only within the front course of the localisers as per the requirements set out by ICAO below.

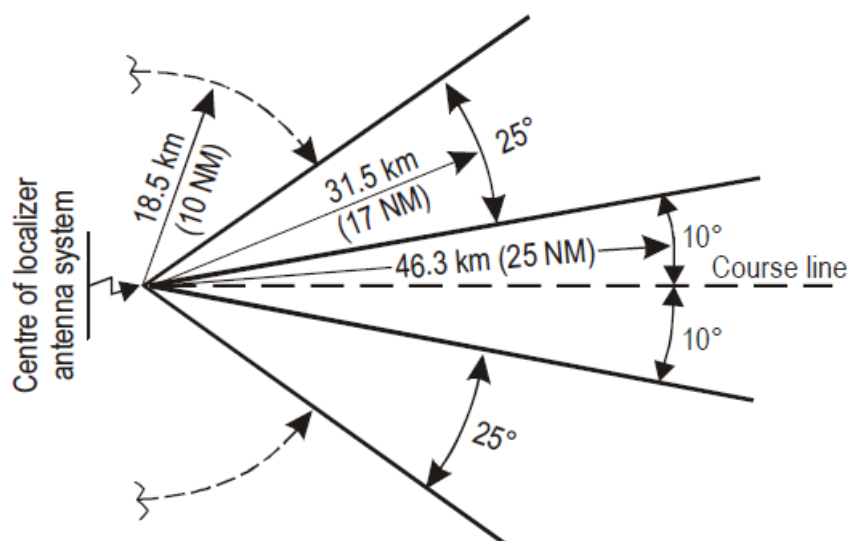
10. ICAO Annex 10 Vol 1 Chapter 3.1.3.3.1 States:

The localizer shall provide signals sufficient to allow satisfactory operation of a typical aircraft installation within the localizer and glide path coverage sectors. The localizer coverage sector shall extend from the centre of the localizer antenna system to distances of:

46.3 km (25 NM) within plus or minus 10 degrees from the front course line;

31.5 km (17 NM) between 10 degrees and 35 degrees from the front course line;

18.5 km (10 NM) outside of plus or minus 35 degrees from the front course line if coverage is provided.



When topographical features dictate or operational requirements and alternative navigation facilities permit, the following coverage may be provided:

11. FYWH and FYWB have been equipped with Thales ILS 420 and the Technical Manual support the above with the following statement:

The localizer signal is obtainable up to a distance of up to 25 nautical miles (approx. 46 km) for a sector of $\pm 10^\circ$, and it is obtainable up to a distance of 17 nautical miles (approx. 31 km) for a sector of $\pm 35^\circ$ relative to the course line and the LLZ-antenna.

12. The implication of the above is that any signal received outside of the parameters stated above will most likely be erroneous

LOCALIZER FALSE COURSE

13. False course captures may occur when the pilot prematurely selects APPROACH MODE from either heading (HDG) or lateral navigation (LNAV) MODE.

14. False Course Captures can occur when attempting to capture the Localiser too far outside of the coverage areas and also when attempting to capture too close inside of the approach fix.

15. In order to minimize the possibility of a false course capture during an ILS approach, pilots should use raw data sources to ensure that the aircraft is on the correct localizer course prior to initiating a coupled approach.
16. The following cockpit procedures are recommended:
 - (i) APPROACH MODE should not be selected until the aircraft is within 25 NM of the threshold and the aircraft is positioned within 10° of the inbound ILS course; and
 - (ii) pilots should: ensure that the heading is monitored for correct runway orientation; (B)
 - (iii) Pilots should be aware when the raw data indicates that the aircraft is approaching and established on the correct course; and
 - (iv) Pilots should be aware that, should a false course capture occur, it may be necessary to deselect and re-arm the APPROACH MODE in order to achieve a successful coupled approach on the correct localizer course.
17. If the localizer goes off the air, the “off” flag may remain out of sight or the flag and course deviation indicator may give erratic or erroneous indications. It is even possible that normal on-course cockpit indications may continue. Under normal circumstances, ATIS will advise pilots conducting an approach if there is equipment failure. However, if in doubt ask the ATC for confirmation

CONCLUSION

18. Crews should avoid arming the autopilot capturing of the localiser (Selecting APPROACH MODE) outside of the guaranteed capture area as illustrated above.
19. Crews should be aware that a false glide slope may also be encountered when attempting to capture the Glide Slope from above.