



ICAO

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Agenda Item 4

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Agenda Item 4: Presentations – State / Industry / ICAO

FAILURE TO CAPTURE LOCALIZER GUIDANCE

(Presented by Hong Kong, China)

SUMMARY

This paper outlines the safety information on events involving the failure to capture the Instrument Landing System (ILS) localizer signal by B787 aircraft at the Hong Kong International Airport (HKIA) and shares the joint efforts made by the Civil Aviation Department (CAD) of Hong Kong, China and relevant industry partners in assessing the cause of the anomalies and measures mitigating the operational risks associated with such incidents.

1. INTRODUCTION

1.1 Instrument Landing System (ILS) approach procedures are the primary instrument approach procedure at the Hong Kong International Airport (HKIA). Through the use of such system, aircraft are able to track both the Localizer (LOC) and Glide Path (GP) signals and guide the aircraft towards the runway on the desired vertical and horizontal approach profile.

1.2 A number of events were recorded involving Boeing B787-series (B787) aircraft not being able to properly capture and follow the LOC guidance when conducting ILS approaches into HKIA and eventually overshoot when intercepting the LOC track.

2. DISCUSSION

2.1 From June 2019 to April 2020, there were seven (7) cases concerning B787 aircraft failing to properly intercept the LOC track during ILS Runway (RWY) 25 approach into HKIA. All aircraft were under positive control of the pilots while the Hong Kong Air Traffic Control (ATC) maintained continuous surveillance monitoring at all times. Direct communications between ATC and the pilots were maintained and standard ATC procedures had been followed.

2.2 Upon inquiry conducted by the CAD, it was noted that the ground based CNS equipment, including the ILS and the Air Traffic Management System (ATMS) were operating normally at the time the incidents occurred.

2.3 With collaborative efforts from industry partners such as the operators involved, the aircraft manufacturer and relevant National Civil Aviation Authorities (NCAAs), an aircraft Autopilot Flight Director System (AFDS) software issue has been identified to have contributed to these anomalies. While a fix is being formulated by the aircraft manufacturer, proactive actions were

thereby taken by the CAD to mitigate the risks involved and prevent recurrence, including alerting all relevant Hong Kong airspace operators and pilots operating into HKIA and temporarily amending ATC procedures, which were summarised as follows:-

- a) CAD has issued an internal safety alert to ATC Controllers reminding them on the special handling procedures;
- b) A reminder was issued to all B787 operators into HKIA informing them about the recent occurrences of B787 aircraft failing to properly capture the ILS LOC track at HKIA, and raising their attention that they should remain vigilant and adhere to the published procedures at all times, especially during the descent and approach phases;
- c) Aeronautical Information Circular (AIC) 09/20 on ‘Terrain Clearance for Arriving and Departing HKIA Traffic’ and AIC 12/20 on “Coverage of ILS Facilities and Warning of False Capture and Signal Deviation at Hong Kong International Airport” were published;
- d) A Notice to Airmen (NOTAM) (A0658/20) was also issued with a view to raise their awareness about the LOC capture anomalies of RWY 25 ILS/LOC for B787. In addition, a reminder was added in the HKIA Arrival Automatic Terminal Information Service (ATIS) message;
- e) As the aircraft manufacturer stated in the Flight Crew Operations Manual Bulletin that ILS LOC capture anomaly might occur when the aircraft approaches the LOC course at an angle of 40 degrees or more, CAD has implemented an ATC procedure to vector all B787 arriving HKIA on RWY 25 with a shallower intercepting angle to the LOC; and
- f) CAD has brought this issue to the attention of the ICAO with a view to share safety information to other States/Administrations.

2.4 It cannot be overemphasised that for airports built with surrounding terrain restrictions such as HKIA, deviations from the published approach procedures, if not picked up and corrected by pilots or ATC in a timely manner, may put the aircraft in the vicinity of the edge or bottom of protected airspace which may result in a loss of protection from obstacles or terrain.

2.5 Prior to the rectification of the software issue is available and effectively implemented, the situation will continue to be managed in a cautious manner and the CAD will maintain close monitoring of such anomalies and the associated trend.

2.6 According to the information from the aircraft manufacturer, the failure to properly capture LOC can take place at any airport and the software fix is expected to be available around Q1 2021. The associated safety risk to the affected air operators, Air Navigation Service Providers (ANSPs) and NCAAs is therefore recommended to be carefully and proactively managed

### **3. ACTION BY THE MEETING**

3.1 The Meeting is invited to:

- a) note the information contained in this paper;
- b) note the proactive actions taken by the CAD since the corresponding AFDS software fixes may take some time;

- c) recommend the ICAO to issue a State Letter to the States/Administrations on the hazard and promote sharing of safety information on similar incidents at other airports;
- d) recommend the States/Administrations to remind B787 aircraft operators and ANSPs to remain vigilant and adhere to the published procedures at all times;
- e) recommend States/Administrations/Industry to expedite the implementation of effective measures for mitigating the safety risk associated with the failure of LOC capture; and
- f) discuss any relevant matters as appropriate.

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