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**COVERAGE OF ILS FACILITIES AND WARNING OF FALSE CAPTURE AND
SIGNAL DEVIATION AT HONG KONG INTERNATIONAL AIRPORT**

1. Introduction

- 1.1 Due to terrain, some of the Instrument Landing System (ILS) facilities at Hong Kong International Airport (HKIA) do not conform to the Standards and Recommended Practices promulgated by the International Civil Aviation Organisation (ICAO).
- 1.2 The aircraft on ILS approach should adhere to the on-course, on-glide path/elevation angle position since a more than half course sector deflection or a more than half course fly-up deflection combined with other allowable system tolerances could place the aircraft in the vicinity of the edge or bottom of the protected airspace where loss of protection from obstacles can occur.

2. Coverage of ILS Facilities

- 2.1 The non-standard coverage areas of ILS facilities at the HKIA are given in the AIP Hong Kong (VHHH AD 2.22, paragraph 10).
- 2.2 Flight crews of aircraft flying into the HKIA are reminded that the use of ILS signals outside of the coverage areas as specified in the AIP Hong Kong may lead to false capture or reverse sense indications.

3. False Capture of ILS Localizer

- 3.1 Flight crews of arrival aircraft at HKIA are advised to confirm the validity of the localizer capture by cross-checking with other sources of navigation information.
- 3.2 Certain combinations of localizer beam characteristics and modem receiver/autopilot combinations can cause premature localizer capture. Flight crews should exercise caution to possible false capture of localizer and flight check procedures should be designed to reduce the risk of this type of event by not allowing the Flight Director/Autopilot capture modes to be armed too early.
- 3.3 There were a number of events occurred recently involving B787 aircraft not being able to capture the ILS localizer at the HKIA during the approach and eventually descended below the Minimum Safety Altitude (MSA) without establishing on the localizer track. According to the Boeing Flight Crew Operations Manual Bulletin No. TBC-106, the failure to properly capture the localizer can take place at any airport and "in some reported events at Hong Kong, the airplane initially turned toward the localizer with a 20 to 30 degree intercept angle, but continued through the localizer on that track. When the airplane approached and captured the glideslope, "LOC" and "G/S" were annunciated on the Flight Mode Annunciation (FMA), the Autopilot Flight Director

System (AFDS) provided guidance to descend on the glideslope, even though the AFDS was not actually tracking the localizer.”

- 3.4 Therefore, air operators and flight crews of aircraft arriving at the HKIA shall remain vigilant and adhere to the approach and descent procedures as promulgated in the AIP Hong Kong. **Raw data should be monitored as appropriate.**

4. ILS Signal Deviation

- 4.1 The use of an ILS in its promulgated category is subject to the signal-in-space being adequately protected from interference due to the reflection from objects illuminated by the localizer or glide path beam. Moving objects, particularly large ones like aircraft on the runway or manoeuvring in close proximity to the runway, may disturb the localizer and/or glide path signal, resulting in signal fluctuation for the following landing aircraft.

- 4.2 There have been reported localizer fluctuations at HKIA, particularly during single runway mixed-mode operations. Such observations are not unique to HKIA. Various contributory factors, such as lateral symmetry of departing aircraft and its climb rate, size of departing aircraft, and distance of following landing aircraft to touchdown, can contribute to the possibility of such fluctuations.

- 4.3 In accordance with ICAO Annex 10, while critical areas and sensitive areas (CA and SA) of ILS are evaluated in a two-dimensional (horizontal) context, protection should actually be extended to volumes (i.e. three-dimensional – 3D), as departing aircraft and/or manoeuvring helicopters/aircraft can also cause disturbances to the localizer and/or glide path signal received by the following landing aircraft. Guidance from ICAO on how to establish such 3D ILS CA and SA and protect them, are not yet available.

- 4.4 During normal operations when ILS CAT I conditions are applicable, aircraft or vehicles entering the localizer and glide path sensitive areas could cause interference to the ILS signals that may result in significant localizer and/or glide slope signal deviations. Therefore, pilots should anticipate the possibility of this interference, closely monitor their ILS profile, particularly the rate of descent, and be prepared to take immediate appropriate actions if excessive disturbances are experienced.

- 4.5 During periods of Low Visibility Operations for ILS CAT II/III, ATC will implement special procedures (AIP Hong Kong, VHHH AD 1.1, paragraph 8). These include increased separation between arriving and departing aircraft and the protection of the localizer and glide path sensitive areas to prevent interference of the ILS signals in accordance with ICAO Doc. 9365 – Manual of All Weather Operations.

- 4.6 As per ICAO Annex 10 specifications, ILS signals for CAT II runways (i.e. 07L/07R/25L) below 50 feet Height Above Threshold (HAT) are not defined and thus are not assured in any scenario even when Low Visibility Procedures are not in force at HKIA. Air Operators should therefore review their policies and procedures with a view to mitigating any associated risk for use of ILS signals below 50 feet HAT for CAT II runways. Flight crews should also remain vigilant and be prepared to execute appropriate corrective actions when ILS signal fluctuation below 50 feet HAT is encountered during CAT II approach and landing.

5. Filing of Reports

- 5.1 If an ILS false capture or significant signal deviation is experienced, relevant ATC unit should be notified as soon as practicable and an Occurrence Report should be filed by using the Form DCA201 (available at <https://www.cad.gov.hk/english/applications.html>).
6. **AIC 12/20 is hereby superseded.**

This Circular is issued for information, guidance and necessary action
by direction of the Director-General of Civil Aviation
Victor LIU