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AW700-34-0278

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FROM: BOMBARDIER CUSTOMER SERVICES BUSINESS AIRCRAFT

ADVISORY WIRE

REFERENCE NO: AW700-34-0278

SUBJECT: Flight Director/Autopilot LOC Capture and Tracking Performance

EFFECTIVITY: Global Express aircraft (9002 to 9999)
Global Express XRS aircraft (9159 to 9999)
Global 5000 aircraft (9127 to 9999)

ATA: 34-61

This Advisory Wire contains Operational Information

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1.0 INTRODUCTION:

This Advisory Wire is to inform operators of a specific condition where late Automatic Flight Control System (AFCS) LOC (Localizer) capture and improper tracking performance have been observed.

2.0 DESCRIPTION:

During an Instrument Landing System Runway 05 (ILS RWY 05) approach into Toronto (CYYZ), the flight crew observed an unusually late AFCS capture and unstable tracking of the LOC beam. AFCS commanded deviations left and right of the LOC continued until the flight crew disengaged the Autopilot/Flight Director and manually flew the ILS approach using raw data information.
Post flight analysis has confirmed that the ILS LOC and Glide Slope (GS) information were correctly displayed on the Primary Flight Display (PFD), but the AFCS derived LOC capture and tracking guidance was incorrect. The discrepancy was due to the AFCS use of erroneous range to navaid data based on an incorrect navaid selection by the Flight Management System (FMS) out of the FMS Navigation database.

Background

For ILS instrument approaches, without collocated Distance Measuring Equipment (DME) stations, the AFCS utilizes distance information provided by the FMS to ensure the capture and tracking gain scheduling is appropriate. This information is based on the pilot programmed approach and destination information. When the VHF Navigation frequency is manually tuned by the pilots, the FMS conducts a frequency matching comparison prior to providing the distance information to the AFCS. During the Toronto ILS RWY 05 approach, the FMS incorrectly provided distance information to a corresponding Tactical Air Navigation (TACAN) station of the same frequency, which was 95 nm away from the ILS approach facility. This distance error resulted in the AFCS using incorrect gains which caused the

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observed abnormal capture and tracking performance. ILS approaches with co-located DME sites are not affected by the FMS providing the AFCS with potentially incorrect distance information.

The observed AFCS performance is believed to be an isolated occurrence unique to the approach in Toronto ILS RWY 05. However, discussions with the Vendor, Honeywell, and other operators have revealed that over the past years there may have been similar observations at other airports.

The following procedure may be used to ensure correct range information is always provided to the AFCS for all ILS approaches without co-located DME:

For all AFCS coupled ILS approaches (Flight Director or Autopilot) to a facility without co-located DME, it is recommended that the VHF NAV radio tuning be accomplished by allowing the FMS to Autotune the appropriate ILS frequency or alternately by using the FMS Tune-By-Ident feature.

By using the Autotune or Tune-by-Ident feature, the FMS will not search the database for corresponding navaid/frequency pairs but instead will automatically use the navaid associated with the identifier for the approach.

3.0 ACTION:

Bombardier recommends that Flight Crews should be aware of the above observation and follow the described procedure when using AFCS coupled ILS approaches without co-located DME.