

Safety Information Bulletin

Airworthiness – Operations

SIB No.: 2023-09

Issued: 27 July 2023

Subject: Erroneous Computation of Flight Path Acceleration and Potential Vertical Speed

Ref. Publications:

Northrop Grumman LITEF GmbH Service Bulletin (SB) 145130-0023-845 for LCR-100 Attitude and Heading Reference Units (AHRU); SB 153121-0001-845 for LCR-110 Global Navigation Satellite System (GNSS) Aided Inertial Reference Units (GIRU); and SB 154200-0002-845 for LCR-350B AHRU.

Applicability:

Northrop Grumman LITEF GmbH LCR-100 AHRU, having Part Number (P/N) 145130-1000-XXX, P/N 145130-1002-XXX, P/N 145130-1003-XXX, P/N 145130-1004-XXX, P/N 145130-1005-XXX, P/N 145130-1006-XXX, P/N 145130-2000-XXX, P/N 145130-2001-XXX, P/N 145130-2010-XXX, P/N 145130-2011-XXX or P/N 145130-3000-XXX;
LCR-110 GIRU, having P/N 153121-1000 013 2315 or P/N 153121-1001 013 2315;
and LCR-350B AHRU, having P/N 154200-2000 001 1001.

Note 1: The suffix '-XXX' for the LCR-100 AHRU can be any combination of numbers as specified in the applicable SB.

Description:

During analysis of flight test data, it was determined that the output data for potential vertical speed deviated from expectations. Investigation showed that this anomaly was caused by an erroneous algorithm for the calculation of flight path acceleration, which is used in the calculation of potential vertical speed and is also an output from LCR-100, LCR-110 and LCR-350B units. Accordingly, output data for flight path acceleration may also be erroneous.

No occurrences have been reported of erroneous data output for potential vertical speed or flight path acceleration during actual aircraft operations. However, it is concluded that flight path acceleration data and potential vertical speed data of certain ARINC 429 output labels are erroneous during turns and during straight or level flight with accelerations in backward direction (decelerations). These output labels should not be used.

The affected parameters are non-ETSO functions.

At this time, the safety concern described in this SIB is not considered to be an unsafe condition that would warrant Airworthiness Directive (AD) action under Regulation (EU) [748/2012](#), Part 21.A.3B, or a Safety Directive (SD) action under Commission Regulation (EU) [965/2012](#), Annex II, ARO.GEN.135(c).

This is information only. Recommendations are not mandatory.



Recommendation(s):

This SIB is issued for awareness, informing type certificate (TC) and supplemental type certificate (STC) holders, airframe and system manufacturers, aircraft owners, operators and maintenance staff about an erroneous computation of the flight path acceleration and potential vertical speed in the applicable AHRU and GIRU.

TC and STC holders are recommended to analyse whether aircraft equipment connected to the LCR-100, LCR-110 and LCR-350B ARINC 429 output busses use any of the affected ARINC 429 labels defined in para. B of the applicable SB. If none of the affected ARINC 429 labels are used by the aircraft equipment, no further action is necessary.

It is requested to report the analysis results to EASA. If aircraft functions are affected, TC and STC holders are also requested to inform all operators accordingly.

For further action, it is recommended to contact NG LITEF GmbH, contact details for which are provided below.

Contact(s):

For further information, contact the EASA Safety Information Section, Certification Directorate, E-mail: ADs@easa.europa.eu.

For copies of the applicable SB, or further technical/operational information, contact Northrop Grumman LITEF GmbH, Customer Service Commercial Aviation, Loerracher Str. 18. 79115 Freiburg, Germany, telephone +49 (761) 4901-734, E-mail: ahrs.support@litef.de.

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