[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2017-0522; Product Identifier 2015-SW-068-AD; Amendment 39-19621; AD 2019-07-10]

RIN 2120-AA64

Airworthiness Directives; Northrop Grumman LITEF GmbH LCR-100 Attitude and Heading Reference System Units

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for Northrop Grumman LITEF GmbH LCR-100 Attitude and Heading Reference System (AHRS) units installed on various aircraft. This AD requires removing certain LCR-100 AHRS units from service. This AD was prompted by test results showing loss of or invalid data. The actions of this AD are intended to prevent an unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Northrop Grumman LITEF GmbH, Customer Service—Commercial Avionics, Loerracher Str. 18, 79115 Freiburg, Germany; telephone +49 (761) 4901-142; fax +49 (761) 4901-773; email ahrs.support@ng-litef.de. You may review the referenced service information at

the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy, Room 6N-321, Fort Worth, TX 76177.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2017-0522; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the European Aviation Safety Agency (EASA) AD, the economic evaluation, any comments received, and other information. The street address for Docket Operations (phone: 800-647-5527) is U.S. Department of Transportation, Docket Operations Office, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Nick Rediess, Aviation Safety Engineer, Boston ACO Branch, Compliance and Airworthiness Division, 1200 District Avenue, Burlington, Massachusetts 01803; telephone (781) 238-7763; email nicholas.rediess@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

On June 5, 2017, at 82 FR 25742, the Federal Register published our notice of proposed rulemaking (NPRM), which proposed to amend 14 CFR part 39 by adding an AD that would apply to airplanes and helicopters with a Northrop Grumman LITEF GmbH LCR-100 AHRS unit part number (P/N) 145130-2000, 145130-2001, 145130-7000, 145130-7001, or 145130-7100 installed that uses analog outputs for primary flight information display or autopilot functions without automatic output comparison. A

primary flight information display includes any device that displays to the pilot primary flight information such as attitude, airspeed, and altitude. Such displays include primary flight displays, standby instruments, and multifunction displays that provide a secondary display of primary flight information. The NPRM proposed to require removing these LCR-100 AHRS units from service and to prohibit installing them on any aircraft.

These units are often used to supply attitude and heading data to Primary Flight Displays (PFDs), autopilots, and other avionics. Northrop Grumman LITEF GmbH discovered erroneous behavior of an AHRS unit when the unit's continuous built-in test detects a failure and then does not correctly reset. When this occurs, the analog outputs of attitude and heading data freeze and the transmission of digital outputs of attitude and heading stops. The effect of the errors (display of misleading information, providing an alert if the attitude and heading data is frozen) depends on how the AHRS unit outputs are used in a particular installation. For instance, if the AHRS unit analog outputs are used by a PFD without any automatic comparison with another source of data, the PFD will display misleading information, which could lead to loss of control of the aircraft. Other installations using the analog outputs might include an automatic comparison feature that detects and provides an alert if the attitude and heading data is frozen. A similar situation would occur in installations that use the digital outputs since the erroneous behavior would be detected. The NPRM proposed to only apply to installations of the AHRS units using analog outputs for the display of primary flight information or for input to an autopilot without automatic output comparison since these installations do not provide any warning indication of the erroneous behavior.

The proposed requirements were intended to prevent an AHRS unit's analog outputs of attitude and heading data freezing without detection or warning, which could result in misleading attitude and heading information, anomalous autopilot behavior, and loss of control of the aircraft.

The NPRM was prompted by AD No. 2015-0093, dated May 27, 2015, issued by EASA, which is the Technical Agent for the Member States of the European Union, to correct an unsafe condition for the Northrop Grumman LITEF GmbH LCR-100 AHRS units. EASA advises that laboratory tests of the AHRS units discovered that when the built-in test detects failures and resets the system, the units are not executing the system reset properly, which results in a freeze of analog attitude and heading output data without detection or warning to the pilot. EASA states that installations vary, but if there is no automatic comparison of analog output to detect unit failure, this condition, if not corrected, could lead to undetected attitude and heading errors, possibly resulting in loss of control of the aircraft.

The NPRM also advised that the proposed AD would affect AD 2010-26-09 (75 FR 81424, December 28, 2010) ("AD 2010-26-09"), which applies to Sikorsky Model S-76A, B, and C helicopters with an AHRS unit P/N 145130-7100 installed. Since the NPRM proposed to require the removal of P/N 145130-7100, compliance with the proposed would make AD 2010-26-09 no longer valid for those Sikorsky helicopters.

Since the NPRM was issued, the FAA's Aircraft Certification Service has changed its organizational structure. The new structure replaces product directorates with functional divisions. We have revised some of the office titles and nomenclature throughout this Final rule to reflect the new organizational changes. Additional

information about the new structure can be found in the Notice published on July 25, 2017 (82 FR 34564).

Comments

After our NPRM was published, we received comments from one commenter.

Request

The commenter suggested we made an error in the Discussion section where it states, "A similar situation would occur in installations that use the digital outputs since the erroneous behavior would be detected." The commenter states the loss of digital data would be detected, and therefore the sentence should state instead that a similar situation would not occur.

We disagree. The commenter is correct that an installation that uses digital outputs would detect the erroneous behavior and provide an alert. The "similar situation" referred to is the alert provided by installations that use analog outputs with automatic comparison, which also detect the attitude and heading data becoming frozen. Because both types of installations detect the erroneous behavior, they result in a similar situation. We did not change the AD based on this comment.

FAA's Determination

We have reviewed the relevant information, considered the comment received, and determined that an unsafe condition exists and is likely to exist or develop on other products of these same type designs and that air safety and the public interest require adopting the AD requirements as proposed.

Differences Between this AD and the EASA AD

This AD only applies to certain part-numbered AHRS units that use analog

outputs for primary flight information display or autopilot functions without automatic output comparison. The EASA AD applies to all of these part-numbered units regardless of the type of installation. The EASA AD requires inserting a temporary revision into the flight manual for analog without automatic output comparison installations until the AHRS unit is replaced with a modified unit. This AD does not require temporarily revising the flight manual. The EASA AD requires replacing the AHRS units with particular part-numbered modified units, while this AD requires removing the AHRS units from service instead.

Related Service Information

We reviewed Northrop Grumman LITEF GmbH Service Bulletin No. 145130-0017-845, Revision D, dated April 1, 2015 (SB 145130-0017-845). SB 145130-0017-845 specifies returning the applicable part numbered AHRS units to certain repair stations for modification. The modified AHRS units, which have new part numbers, have an additional watchdog circuit in the electronic board that eliminates frozen analog outputs and digital output interruptions.

Costs of Compliance

We estimate that this AD affects 50 aircraft of U.S. Registry. We estimate that operators may incur the following costs in order to comply with this AD. Labor costs are estimated at $85 per work-hour, and typical installations consist of two AHRS units. Replacing two AHRS units takes about 4 work-hours and $62,630 for required parts, for a total cost of $62,970 per aircraft and $3,148,500 for the U.S. fleet.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

(1) Is not a "significant regulatory action" under Executive Order 12866;

(2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979);

(3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction; and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared an economic evaluation of the estimated costs to comply with this AD and placed it in the AD docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2019-07-10 **Northrop Grumman LITEF GmbH LCR-100 Attitude and Heading Reference System:** Amendment 39-19621; Docket No. FAA-2017-0522; Product Identifier 2015-SW-068-AD.

(a) Applicability

This AD applies to airplanes and helicopters, certificated in any category, with a Northrop Grumman LITEF GmbH LCR-100 Attitude and Heading Reference System (AHRS) unit part number (P/N) 145130-2000, 145130-2001, 145130-7000, 145130-7001, or 145130-7100 installed using analog outputs for primary flight information

display or autopilot functions without automatic output comparison. Aircraft known to have the subject AHRS units installed include but are not limited to the following:

(1) Dornier Luftfahrt GmbH Model 228-100, 228-101, 228-200, 228-201, 228-202, and 228-212 airplanes;

(2) Learjet Inc. Model 31A airplanes;

(3) Pilatus Aircraft Ltd. Model PC12, PC-12/45, and PC-12/47 airplanes;

(4) Polskie Zaklady Lotnicze Sp. z o.o. Model PZL M28 05 airplanes;

(5) Textron Aviation Inc. (type certificate previously held by Cessna Aircraft Company) Model 560XL airplanes;

(6) Bell Helicopter Textron Canada Limited Model 407 helicopters;

(7) Bell Helicopter Textron Inc. Model 412 and 412EP helicopters; and

(8) Sikorsky Aircraft Corporation Model S-76A, S-76-B, and S-76C helicopters.

(b) Unsafe Condition

This AD defines the unsafe condition as the AHRS unit's analog outputs of attitude and heading data freezing without detection or warning. This condition could result in misleading attitude and heading information, anomalous autopilot behavior, and loss of control of the aircraft.

(c) Affected ADs

This AD affects AD 2010-26-09, Amendment 39-16548 (75 FR 81424, December 28, 2010) ("AD 2010-26-09"). Accomplishing a certain requirement of this AD terminates the requirements of AD 2010-26-09.

(d) Effective Date

This AD becomes effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(e) Compliance

You are responsible for performing each action required by this AD within the specified compliance time unless it has already been accomplished prior to that time.

(f) Required Actions

(1) Within 25 hours time-in-service (TIS), remove the AHRS unit from service.

(2) Removal from service of P/N 145130-7100 terminates the requirements of AD 2010-26-09 (75 FR 81424, December 28, 2010).

(3) Do not install an AHRS unit P/N 145130-2000, 145130-2001, 145130-7000, 145130-7001, or 145130-7100 on any aircraft.

(g) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Boston ACO Branch, FAA, may approve AMOCs for this AD. Send your proposal to: Nick Rediess, Aviation Safety Engineer, Boston ACO Branch, Compliance and Airworthiness Division, 1200 District Avenue, Burlington, Massachusetts 01803; telephone (781) 238-7763; email nicholas.rediess@faa.gov.

(2) For operations conducted under a 14 CFR part 119 operating certificate or under 14 CFR part 91, subpart K, we suggest that you notify your principal inspector, or lacking a principal inspector, the manager of the local flight standards district office or certificate holding district office, before operating any aircraft complying with this AD through an AMOC.

(h) Additional Information

(1) Northrop Grumman LITEF GmbH Service Bulletin No. 145130-0017-845, Revision D, dated April 1, 2015, which is not incorporated by reference, contains additional information about the subject of this AD. For service information identified in this AD, contact Northrop Grumman LITEF GmbH, Customer Service—Commercial Avionics, Loerracher Str. 18, 79115 Freiburg, Germany; telephone +49 (761) 4901-142; fax +49 (761) 4901-773; email ahrs.support@ng-litef.de. You may review a copy of the service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy, Room 6N-321, Fort Worth, TX 76177.

(2) The subject of this AD is addressed in European Aviation Safety Agency (EASA) AD No. 2015-0093, dated May 27, 2015. You may view the EASA AD on the Internet at http://www.regulations.gov in Docket No. FAA-2017-0522.

(i) Subject

Joint Aircraft Service Component (JASC) Code: 3420, Attitude and Directional Data System.

Issued in Fort Worth, Texas, on April 16, 2019.

Lance T. Gant,

Director, Compliance & Airworthiness Division,
Aircraft Certification Service.
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