



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2018-0977; Product Identifier 2018-CE-041-AD; Amendment 39-21123; AD 2020-10-05]

RIN 2120-AA64

Airworthiness Directives; Rockwell Collins, Inc. Flight Management Systems

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Rockwell Collins, Inc. (Rockwell Collins) flight management systems (FMS) installed on airplanes. This AD was prompted by reports of the flight management computer (FMC) software issuing incorrect turn commands when the altitude climb field is edited or the temperature compensation is activated on the FMS control display unit. This AD requires disabling the automatic temperature compensation feature of the FMS through the configuration strapping units (CSU) and revising the airplane flight manual (AFM) Limitations section. The FAA is issuing this AD to address the unsafe condition on these products.

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

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Rockwell Collins, Inc., Collins Aviation Services, 400 Collins Road NE, M/S 164-100, Cedar

Rapids, IA 52498-0001; telephone: 888-265-5467 (U.S.) or 319-265-5467; fax: 319-295-4941 (outside U.S.); email: techmanuals@rockwellcollins.com; internet: <https://portal.rockwellcollins.com/web/publications-and-training>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust, Kansas City, Missouri 64106. For information on the availability of this material at the FAA, call (816) 329-4148. It is also available on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0977.

Examining the AD Docket

You may examine the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0977; 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 final rule, the regulatory evaluation, any comments received, and other information. The address U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Avi Acharya, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, 1801 Airport Road, Room 100, Wichita, Kansas 67209; phone: 316-946-4192; fax: 316-946-4107; email: avishek.acharya@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain part-numbered Rockwell Collins Pro Line 4 and Pro Line 21 FMSs. The NPRM published in the *Federal Register* on December 6, 2018 (83 FR 62736).

The NPRM was prompted by a flight inspection on a Bombardier Model CRJ-200 airplane, during which Nav Canada, which is Canada's civil air navigation service provider, observed the FMS map displaying an incorrect turn for the Fort St. John airport instrument landing system runway 29 missed approach while using temperature compensation. Nav Canada assumed this was only an issue with the map display and reported the incident to Rockwell Collins. Rockwell Collins subsequently determined that an error in the design of the Pro Line 4 and Pro Line 21 FMC software causes changes to the procedure-defined turn direction when the procedure has been significantly modified. The FMS removes the planned database turn direction when the flight crew edits the altitude climb field, and the flight crew may not notice the change during climb. The FMS also removes the planned database turn direction if the flight crew uses the temperature compensation to edit the altitude climb field, which may go unnoticed by the flight crew with the increased workload involved with a missed approach procedure. Editing the altitude or using temperature compensation does not change the flight segment. However, due to the design error, the software thinks the flight segment has changed. The change of the planned turn direction can occur for either left or right turns.

The FMS commanding incorrect turn direction may result in a collision or controlled flight into terrain.

The NPRM proposed to require disabling the automatic temperature compensation feature of the FMS through the CSU and revising the AFM Limitations section. The FAA is issuing this AD to address the unsafe condition on these products.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Remove Requirement to Disable Temperature Compensation

Bombardier Commercial Aircraft (Bombardier) and Endeavor Air (Endeavor) requested the FAA remove paragraph (g), which proposed to require disabling the automatic temperature compensation feature on the CSU. These commenters stated that disabling this feature would also disable the temperature compensation calculator, which would increase crew workload and introduce error by necessitating that pilots manually calculate this information.

While the FAA agrees that performing manual temperature compensation calculations or using standard cold temperature altitude correction charts increases flight crew workload, the FAA finds that these are acceptable piloting tasks. The FMS and its built-in temperature compensation feature are not required under the FAA's airworthiness standards; rather, the temperature compensation feature of the FMS is an aid to the flight crew. Additionally, disabling the temperature compensation feature is necessary to address the unsafe condition. The FAA did not change the AD based on this comment.

Request to Revise the Language of the AFM Limitation Requirement

Bombardier, Endeavor, and Collins Aerospace (Collins) requested the FAA revise the AFM Limitations for altitude edits. The NPRM proposed to require the limitation in Rockwell Collins Service Information Letter (SIL) FMC-XX00-18-1, dated June 27, 2018, which prohibits editing altitudes on departure, approach, and missed approach procedures. The commenters requested the FAA change the limitation to only prohibit editing altitudes on departure and missed approach procedures, and eliminate the limitation for approach procedures. Collins stated that following this limitation during approach prior to the missed approach could adversely impact Vertical Navigation (VNAV) safety and crew workload because it results in misleading VNAV alerts and displays prior to the missed approach point.

The FAA agrees. Rockwell Collins has revised the SIL and issued SIL FMC-XX00-18-1, Revision 1, dated February 5, 2019, which contains the limitation language requested by the commenters. This final rule requires revising the AFM to add the information in SIL FMC-XX00-18-1, Revision 1, dated February 5, 2019.

Request to Reduce the Compliance Time for the AFM Revision

Endeavor requested the FAA reduce the time to revise the AFM from 12 months to 30 days.

The FAA does not agree. The FAA considered the variety of aircraft types and operations that would be affected by this AD and determined a 12-month compliance time is appropriate for both the AFM revisions and the requirement to disable the temperature compensation feature. The FAA did not change this AD based on this comment because 12 months after the effective date of this AD is necessary to allow the owner/operator a reasonable amount of time to perform the hardware modification. The AFM limitations cannot be implemented without the hardware change.

Request to Withdraw the NPRM

WR Ryan stated that this matter is not serious enough to warrant an AD. The commenter also stated that this issue is being exaggerated, as Collins will eventually fix the problem. The FAA infers the commenter wants the FAA to withdraw the NPRM.

The FAA does not agree. The FAA issues an airworthiness directive when it finds an unsafe condition exists in a product and the condition is likely to exist or develop in other products of the same type design. The FAA has determined the FMS design error is an unsafe condition. While an operator may choose to comply with the service information released by Rockwell Collins, not all operators are required to do so. In order for the corrective actions in a service document to become mandatory, and to correct the unsafe condition identified in the NPRM, the FAA must issue an AD. The FAA did not change this AD based on this comment.

Revise the Costs of Compliance

WR Ryan stated the FAA estimated labor costs of \$85 per work hour in the NPRM, while the majority of maintenance shops charge labor rates of \$120 or more an hour. The FAA infers the commenter wants the FAA to revise the labor rate in its estimated cost of complying with the AD.

The FAA does not agree with this comment. The labor rate of \$85 per work-hour is provided by the FAA Office of Aviation Policy and Plans for the FAA to use when estimating the labor costs of complying with AD requirements. The FAA did not change this AD based on this comment.

Authority to Issue the AD/Extension of Comment Period

Bombardier stated the FAA's Wichita ACO Branch lacks the legal authority under 49 U.S.C. 44701 to issue an AD addressing a component and requiring changes to an AFM. Bombardier requested the FAA's Wichita ACO Branch coordinate the proposed AD with the FAA's New York ACO Branch and consider whether the AD should instead address the aircraft. Bombardier disagreed with the FAA's proposed AD because Transport Canada, the responsible authority for the state of design for its airplanes, has already issued an AD covering this same unsafe condition. Alternatively, Bombardier requested an extension to the NPRM commenting period to allow Bombardier and the New York ACO Branch to provide input to the Wichita ACO Branch.

The FAA does not agree. Although Canada is the state of design for Bombardier products, the United States is the state of design for Rockwell Collins products. Under the authority of 49 U.S.C. 44701 and the FAA's regulations regarding ADs (14 CFR part 39), the FAA issues an AD addressing a product (aircraft, engine, propeller, or appliance) that has an unsafe condition if the condition is likely to exist or develop in other products of the same type design. The FMS is an appliance, as that term is defined in 14 CFR 1.1, that may be installed in multiple aircraft types. Contrary to Bombardier's suggestion, 49

U.S.C. 44701 does not require the FAA to adopt the Transport Canada AD. Rather, 49 U.S.C. 44701(e)(5) permits the FAA to either accept a foreign AD (under certain conditions) or issue an FAA AD if determined necessary for safety. The Transport Canada AD for this issue applies only to Bombardier airplanes. The FAA determined corrective action is necessary for U.S. operators of all aircraft with an FMS installed.

The FAA also notes that its Wichita ACO Branch did not issue the NPRM. The NPRM was coordinated with all appropriate FAA offices and subsequently issued by the Deputy Director of the Policy and Innovation Division (AIR-601) of the FAA's Aircraft Certification Service. The FAA has not changed the AD based on this comment.

Request to Revise Preamble Information

Collins requested the FAA replace some of the information in the preamble with text from Rockwell Collins Operational Service Bulletin 0166-17R5. Collins stated the description in the NPRM does not accurately describe the issue. According to Collins, the design error is that the FMS removes the planned turn direction if the crew manually edits or uses temperature compensation to edit the altitude climb field. In addition, Collins stated the FMS does not always turn in an incorrect direction, but rather only when the shortest turn differs from the planned turn.

The FAA partially agrees. For clarification purposes, the FAA has revised the referenced text in accordance with Collins' comment. However, the FAA disagrees with replacing the referenced text with the description from Rockwell Collins Operational Service Bulletin 0166-17R5. The specific language requested by the commenter is a detailed engineering description of the FMS design error that is appropriate for a service bulletin.

Support of AD Action

The Air Line Pilots Association and an anonymous commenter supported the NPRM.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously. The FAA determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Related Service Information under 1 CFR part 51

The FAA reviewed Rockwell Collins Service Information Letter, CSU-XX00-18-1, dated June 27, 2018. The service letter contains procedures for disabling the automatic temperature compensation option in Pro Line 4 and Pro Line 21 FMC systems. The FAA also reviewed Rockwell Collins Service Information Letter FMC-XX00-18-1, Revision 1, dated February 5, 2019. The service letter provides instructions for revising the Limitations section of the AFM by adding prohibitions on editing altitudes for specific Pro Line 4 and Pro Line 21 Flight Management Systems. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Costs of Compliance

The FAA estimates that this AD affects 2,855 products installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
CSU strapping change	2 work-hours X \$85 per hour = \$170	Not applicable	\$170	\$485,350
Revision to the AFM Limitations section	.5 work-hour X \$85 per hour = \$42.50	Not applicable	\$42.50	\$121,337.50

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.

The FAA is 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) Will not affect intrastate aviation in Alaska, and
- (3) 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.

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):

2020-10-05 **Rockwell Collins, Inc.**: Amendment 39-21123; Docket No. FAA-2018-0977; Product Identifier 2018-CE-041-AD.

(a) Effective Date

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

(b) Affected ADs

None.

(c) Applicability

This AD applies to Rockwell Collins, Inc. (Rockwell Collins) Pro Line 4 and Pro Line 21 Flight Management Systems installed on airplanes, certificated in any category, that has a flight management computer (FMC) with a Rockwell Collins part number (RCPN) listed in paragraph (c)(1) of this AD and with a configuration strapping unit (CSU) listed in paragraph (c)(2) of this AD.

(1) FMC-3000 RCPN 822-0883-031, -036, -038, -040, -041, -053, -054, -056, -057, -058, -059, -060, -081, -082, -083, -084; FMC-4200 RCPN 822-0783-022, -025, -028, -032, -036, -039, -040; FMC-5000 RCPN 822-0891-021, -027, -028, -034, -040; or FMC-6000 RCPN 822-0868-074, -075, -082, -083, -084, -085, -087, -089, -090, -109, -110, -111, -112, -113, -114, -116, -117, -122, -123, -127, -130, -132, -133, -134, -139.

(2) CSU-3100 RCPN 822-1363-002, CSU-4000 RCPN 822-0049-002, or CSU-4100 RCPN 822-1364-002.

Note 1 to paragraph (c) of this AD: To determine the CSU and FMC unit RCPN, refer to the aircraft manufacturer or applicable STC holder maintenance instructions for accessing them.

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 3460, Flight Management Computing Hardware System.

(e) Unsafe Condition

This AD was prompted by reports of the FMC software issuing incorrect turn commands when the altitude climb field is edited or when the temperature compensation is activated. The FAA is issuing this AD to prevent the FMC from issuing an incorrect turn direction command. The unsafe condition, if not addressed, could result in a collision or controlled flight into terrain.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Disable Temperature Compensation

Within the next 12 months after [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] (the effective date of this AD), disable the automatic temperature compensation feature on the CSU by following steps (2) through (6) of the Instructions in Rockwell Collins Service Information Letter CSU-XX00-18-1, dated June 27, 2018.

(h) Revise the Airplane Flight Manual Limitations

Within the next 12 months after [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] (the effective date of this AD), revise the airplane flight manual by adding the information from step 2 of the Aircraft Flight Manual Recommendation in Rockwell Collins Service Information Letter FMC-XX00-18-1, Revision 1, dated February 5, 2019, into the Limitations section of the AFM.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Wichita ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (j) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

For more information about this AD, contact Avi Acharya, Aerospace Engineer, Wichita ACO Branch, FAA, 1801 Airport Road, Room 100, Wichita, Kansas 67209; phone: 316-946-4192; fax: 316-946-4107; email: avishek.acharya@faa.gov.

(k) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rockwell Collins Service Information Letter CSU-XX00-18-1, dated June 27, 2018.

(ii) Rockwell Collins Service Information Letter FMC-XX00-18-1, Revision 1, dated February 5, 2019.

(3) For service information identified in this AD, contact Rockwell Collins, Inc., Collins Aviation Services, 400 Collins Road NE, M/S 164-100, Cedar Rapids, IA 52498-0001; telephone: 888-265-5467 (U.S.) or 319-265-5467; fax: 319-295-4941; email: techmanuals@rockwellcollins.com; internet: <https://portal.rockwellcollins.com/web/publications-and-training>.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust, Kansas City, Missouri 64106. For information on the availability of this material at the FAA, call (816) 329-4148. In addition, you can access this service information on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0977.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fedreg.legal@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on May 14, 2020.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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