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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2020–0692; Project Identifier MCAI–2019–00140–E; Amendment 39–22016; AD 2022–08–13]

RIN 2120–AA64

Airworthiness Directives; Pratt & Whitney Canada Corp. Turboprop Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for all Pratt & Whitney Canada Corp. (P&WC) PT6A–34, –34B, –34AG, –114, and –114A model turboprop engines. This AD was prompted by several reports of low-time fractures of compressor turbine (CT) blades resulting in loss of power or in-flight shutdown (IFSD) of the engine. This AD requires replacement of certain CT vanes. This AD also requires removal from service of certain CT blades when these blades have been operated with certain CT vanes. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective May 27, 2022.

ADDRESSES:

Examining the AD Docket

You may examine the AD docket at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–0692; 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 mandatory continuing airworthiness information (MCAI), any comments received, and other information. The address for Docket Operations is 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: Barbara Caufield, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238–7146; fax: (781) 238–7199; email: *barbara.caufield@faa.gov*.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to all P&WC PT6A–34, –34B, –34AG, –114, and –114A model turboprop engines. The NPRM published in the **Federal Register** on August 17, 2020 (85 FR 49981). The NPRM was prompted by several reports of low-time fractures of CT blades resulting in loss of power or IFSD of the engine. In the NPRM, the FAA proposed to require replacement of certain CT vanes. The NPRM also proposed to require the removal from service of certain CT blades when these blades have been operated with certain CT vanes. The FAA is issuing this AD to address the unsafe condition on these products.

Transport Canada, which is the aviation authority for Canada, has issued Transport Canada AD CF 2019–30R1, dated December 17, 2019 (referred to after this as ''the MCAI''), to address the unsafe condition on these products. The MCAI states:

> There have been several reported events of low time CT blade fractures resulting in power loss/In-flight shutdown (IFSD) on post P&WC Service Bulletin (SB) 1669 configured PT6A–114 engines, featuring new CMSX–6 CT blades. In addition, relatively low time failures of Non-P&WC CT blades have also been reported on PT6A–34 and –114 series engines.
>
> In service data shows that these low time failures were reported on engines that had CT vanes installed that were repaired in accordance with repair specification number STI 72–50–254 held by Southwest Turbine Inc. (STI). Most of the affected engines are installed on single-engine powered aeroplanes and some events have resulted in the loss of the aeroplane and fatalities.
>
> Dimensional checks and operational testing of the subject STI repaired CT vane removed from an incident engine, revealed that it did not conform to the engine manufacturer's CT vane type design criteria. The noted variations and features in the STI repaired CT vane can cause airflow distortion and subsequent aerofoil excitation of the CT blades resulting in High Cycle Fatigue (HCF) failure of the CT blades. Test data indicates that the stress levels induced in CT blades by the adverse effect of subject airflow distortion exceeds the design requirements for CMSX–6 CT blades.
>
> An IFSD or loss of power on a single-engine powered aeroplane under certain conditions can lead to an unsafe condition as seen in some past events. [Transport Canada] AD CF–2019–30 was issued on 19 August 2019 to address the potential hazard of power loss/IFSD as a result of CT blade failures on engines with CT vanes installed that were repaired in accordance with repair specification number STI 72–50–254.
>
> This [Transport Canada] AD revision, CF–2019–30R1, is issued to update the background information and to clarify the affected P&WC CT blade Part Numbers (P/Ns).

You may obtain further information by examining the MCAI in the AD docket at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–0692.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from 13 commenters. The commenters were Southwest Turbine Inc. (STI), an individual commenter, and 11 anonymous commenters. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Revise Required Actions

STI requested that the FAA revise the reference in paragraph (g)(1)(i), Required Actions, of this AD from ''. . . non-STI-repaired CT vane'' to ''. . . non-STI 72–50–254 repaired CT vane. . .'' The commenter reasoned that this AD specifically addresses CT vanes repaired using STI Repair Specification STI 72–50–254 (STI 72–50–254). Therefore, operators should be allowed to install CT vanes not repaired using STI 72–50–254 and repaired within STI's current FAA rating. Additionally, STI reasoned that this change would mirror the language in the Corrective Actions, paragraph 1, of Transport Canada AD CF–2019–30R1.

The FAA agrees and updated paragraph (g)(1)(i) of this AD to refer to CT vanes not repaired using STI 72–50–254. This change places no additional burden on operators who are required to comply with this AD.

Request To Remove Engines From Applicability

STI requested that the FAA remove P&WC PT6A–34, –34B, and –34AG model turboprop engines from paragraph (c), Applicability, of this AD. The commenter reasoned that of the 20 P&WC CMSX–6 CT blade failures, only six blade failures occurred with STI 72–50–254 repaired CT vanes installed. Those six blade failures occurred on engines with CT vanes repaired using STI 72–50–254, which were installed in P&WC PT6A–114A model turboprop engines.

In addition, the commenter suggested that the only STI-repaired CT vane installed on engines that has experienced CT blade failures was CT vane part number (P/N) 3029051. The commenter continued that CT vane, P/N 3029051, is not eligible for installation in P&WC PT6A–34, –34B, and –34AG model turboprop engines, and therefore, these model engines should be removed from the applicability of this AD.

STI cited Docket No. FAA–2013–0766 (AD 2014–17–08, 79 FR 52172, September 3, 2014), which was superseded by AD 2014–17–08R1, (80 FR 24791, May 1, 2015), and the FAA's responses to public comments in the preamble of these ADs. While referencing these ADs, STI underlined specific portions of public comments involving the P&WC CMSX–6 CT blade being an unproven CT blade replacement that has experienced low-time failures and has been identified for removal in P&WC PT6A–34 model turboprop engines. STI indicated that the FAA acknowledged the failure mode in other P&WC engines, specifically including PT6A–34 turboprop engines, was well understood and stated there have been no failures of P&WC CMSX–6 CT blades in PT6A–34 turboprop engines with STI 72–50–254 repaired CT vanes. STI commented that, for these reasons, the STI 72–50–254 repaired CT vane rings cannot be the cause of PWC CMSX–6 CT blade failures in PT6A–34 series engines.

The FAA disagrees. The FAA recognizes that STI-repaired CT vane P/N 3029051 is not eligible for installation in P&WC PT6A–34, –34B, and –34AG model turboprop engines. The FAA notes, however, that an additional affected part-numbered STI-repaired vane is eligible for installation in P&WC PT6A–34, –34B, and –34AG model turboprop engines. In addition, CT blade failures have occurred with STI-repaired CT vanes installed in P&WC PT6A–34, –34B, and –34AG model turboprop engines and are susceptible to the unsafe condition of this AD. Further, Table 2 of Southwest Turbine Repair, Inc., STI 72–50–254, Revision 08, dated April 14, 2019, lists P&WC PT6A–34, –34B, –34AG model turboprop engines as eligible for this repair.

The FAA issued AD 2014–17–08 (79 FR 52172, September 3, 2014) and AD 2014–17–08R1 (80 FR 24791, May 1, 2015) to require replacement of P&WC IN100 CT blades with P&WC CMSX–6 CT blades. Although there have been failures of the P&WC CMSX–6 CT blades with CT vanes not repaired by STI, the FAA has found the failure rate of CT blades with CT vanes not repaired by STI to be approximately one-tenth of those that were repaired by STI.

Request To Restrict Applicability to Certain CT Blades

STI requested that the FAA revise paragraph (c), Applicability, of this AD to indicate removal of STI 72–50–254 repaired CT vanes should not apply to engines operating with pre-P&WC SB PT6A–72–1669 and pre-P&WC SB PT6A–72–1690 IN100 CT blades. The commenter reasoned that the MCAI and the NPRM addressed the unsafe condition of failure of P&WC CMSX–6 CT blades. The commenter stated that the AD should not require STI 72–50–254 repaired CT vanes to be removed when operated with P&WC IN100 CT blades.

The FAA disagrees with revising paragraph (c), Applicability, of this AD to limit the AD applicability to turboprop engines with certain CT blades installed. Although most CT blades failures have occurred with P&WC CMSX–6 CT blades installed, the FAA's data indicate that several P&WC IN100 CT blade failures occurred with STI-repaired CT vanes before incorporating procedures in P&WC SB PT6A–72–1669 and P&WC SB PT6A–72–1690. Consequently, this AD requires that any CT vane with P/N 3029051, 3032151, or 3123001 repaired in accordance with STI 72–50–254 be removed from service.

Request To Restrict Applicability by CT Vane Part Number

STI requested that the FAA update paragraph (c), Applicability, of this AD to indicate that only STI 72–50–254 repaired CT vanes P/N 3029051 or P/N 3123001 are affected by this AD. STI reasoned that all the P&WC CMSX–6 CT blade failures that they are aware of occurred in PT6A–114A engines operating with STI 72–50–254 repaired CT vane P/N 3029051. STI continued that there is no evidence that identifies discrepant conditions or CT blade failures with any other part numbered STI 72–50–254 repaired CT vanes.

The FAA disagrees that only STI 72–50–254 repaired CT vanes P/N 3029051 or 3123001 are affected by the unsafe condition addressed by this AD. The FAA has reviewed data that shows failures of another CT vane P/N in addition to the two P/Ns referenced by the commenter. In response to this comment, the FAA updated paragraph (g)(1)(i), Required Actions, of this AD to require the removal from service of any affected CT vane, P/N 3029051, 3032151, or 3123001, repaired in accordance with STI 72–50–254.

Request To Require Installation of Dampers/Dampeners

STI, an individual commenter, and two anonymous commenters suggested that the FAA require operators install under platform seals (dampers or dampeners) introduced by P&WC SB PT6A–72–1769, dated December 21, 2015. One commenter reasoned that of the 20 CMSX–6 CT blade fatigue failures that have occurred, none had occurred when dampeners were installed. Based on a study and testing by P&WC, the commenter determined that the dampeners appeared to have solved the ongoing problem of P&WC CMSX–6 CT blade failures, regardless of which CT vane was installed. The commenter suggested that the FAA withdraw the NPRM and replace it with an AD requiring the installation of the dampeners.

An anonymous commenter and an individual commenter referred to P&WC documentation in which P&WC indicated that failures of P&WC CMSX–6 CT blades in normal operation were caused by vibratory stress, and the previous generation of CT blades did not exhibit this problem. To reduce these vibratory stresses, P&WC introduced dampers. The two commenters suggested requiring dampers and CT vane clocking to reduce vibratory stresses.

The FAA disagrees with the suggestion to require operators to install under platform seals to address the unsafe condition. Although data suggest dampeners and clocking reduce vibratory stresses, dampeners and clocking do not eliminate the unsafe condition caused by the installation of the STI-repaired CT vanes.

Comments on Root Cause of CT Blade Failure

An individual commenter questioned whether Transport Canada CF–2019–30R1, the MCAI on which the FAA's NPRM is based, tested a representative sample of affected CT blades and

whether the root cause of the unsafe condition was determined accurately. The commenter suggested that the MCAI is based on testing of a single STI-repaired CT vane from an engine that suffered catastrophic CT blade failure during an engine test run following an overhaul. The commenter stated that P&WC engineers documented that the root cause of the CT blade failure was undetermined and that the STI-repaired CT vane was not a representative sample due to sustained damage.

An anonymous commenter noted that of the 16 P&WC CMSX–6 blade failures, 11 had P&WC CT vanes installed. The commenter stated that this equates to an approximate 70% failure rate with the P&WC CT vanes. The commenter questioned how a CT vane made by an alternate supplier can be blamed as the cause of these failures.

The FAA disagrees with these comments. The MCAI and this AD are not based exclusively on testing of a single STI-repaired CT vane. Transport Canada and the FAA reviewed data from 38 CT blade failure events prior to issuance of the MCAI and this AD. The relative rates of CT blade failure are not simply the ratio of the number of events, but also includes the number of engines with each part type installed. Although there have been failures of the P&WC CMSX–6 CT blades with non-STI repaired CT vanes installed, the FAA has found the failure rate of CT blades with non-STI repaired CT vanes to be approximately one-tenth of the failure rate of those that were repaired by STI.

Comments That the P&WC CMSX–6 CT Blades Are the Cause of Failures

Several anonymous commenters and an individual commenter cited the history of P&WC CMSX–6 CT blade failures and the resulting P&WC service bulletins involving procedures to inspect and replace the CT blades. The commenters stated these failures occurred with factory manufactured zero-time P&WC model engines and engines in operation with both P&WC CT vanes and STI-repaired CT vanes installed. According to an individual commenter, the evidence to condemn the STI-repaired CT vane would also apply to the P&WC CT vane. Considering that factory manufactured, zero-time P&WC engines have experienced CT blade failures, the commenters concluded that unsafe condition with these blades cannot be the result of a repair process.

Further, an anonymous commenter referenced a 2018 case in Dallas County, Texas involving P &WC. The commenter summarized the case to include blade development and problems encountered from coating cracks migrating into the base material, gap platform, vibratory stress near the operating rotational speed of the engine and other areas of concern with the CT blade development. The commenter recommended that the FAA review Analytical Summary D9297 (P&WC 008643–008680), and Analytical Summary E7739, dated September 24, 2013 (P&WC 008599–008617), which, the commenter states, both determined the problem to be the CT blade.

An anonymous commenter suggested that the FAA demand all documents relating to the process and development of the P&WC CMSX–6 CT blade to include testing, emails, minutes of meetings, and any sworn testimony given, prior to deciding on the proposed AD. The commenter suggested that the CT blade is the root cause of the failures, the manufacturer is dictating the AD, and the manufacturer is going after a competitor.

STI cited National Transportation Safety Board (NTSB) Report, No. WPR14FA024, dated October 14, 2015, which detailed an October 21, 2013 failure involving an STI 72–50–254 repaired CT vane. STI commented that NTSB made no findings that indicated STI 72–50–254 repaired CT vane contributed to the event.

An anonymous commenter stated they had a P&WC PT6A–114A model turboprop engine undergoing overhaul and 18 P&WC CMSX–6 CT blades failed the process compensated resonance testing per P&WC SB PT6A–72–1762. The commenter suggested that these failures indicate that there is a design flaw or quality escape with P&WC CMSX–6 CT blades.

The FAA does not agree with the commenters that there is an unsafe condition affecting the P&WC CT blades. The FAA has reviewed event reports, analyses, and test reports to make this determination.

Request To Consider Inaccuracy Tolerance

STI requested that the FAA consider an inaccuracy tolerance of 30% when reviewing test data. STI cited P&WC report E8093 that indicates a 30% variance in repeatability of non-intrusive stress measurement (NSMS) CT blade tip deflection of a P&WC CT vane. STI suggested that P&WC retest prior configurations to determine the cause of variation in repeatability.

The FAA disagrees to consider inaccuracy tolerance. P&WC examined three STI-repaired CT vanes via dimensional inspection, one of which was also tested using Non-intrusive Stress Measurement System (NSMS), and determined the STI-repaired CT vanes did not meet P&WC's type design criteria. The STI-repaired CT vane that P&WC tested had scratches not exceeding a depth of 0.5 mils that did not alter the dimensional aspects of the CT vane casting and assembly when measured and did not preclude the engine from running during the NSMS testing.

Question About the Number of CT Blade Failures

An anonymous commenter asked how many CT blade failures have occurred after incorporating P&WC SB PT6A–72–1768 and P&WC SB PT6A–72–1769. Another anonymous commenter asked how many CT blade failures on turboprop engines, equipped with CT vane P/N 3079351–01, which is the third generation of single crystal blade used by P&WC in the affected engines, have occurred after incorporating P&WC SB PT6A–72–1749.

The FAA notes that no known failures of CT blades have occurred after incorporating P&WC SB PT6A–72–1768, P&WC SB PT6A–72–1769, or P&WC SB PT6A–72–1749.

Comment About Repair Variation in P&WC CT Vanes

STI commented that P&WC regularly returns to service overhauled CT vanes that exhibit greater variation in repair than that of STI-repaired CT vanes. STI stated that P&WC's inspection requirements for new CT vanes are different than overhauled CT vanes, and deviating features found on P&WC's overhauled CT vanes are not inspected prior to release.

The FAA cannot confirm STI's comment regarding P&WC's returned-to service part variation. Most engine new-part inspection specifications differ from those for used or overhauled parts. As stated in an earlier comment reply, the FAA reviewed data from 38 CT blade failure events to address the unsafe condition in this AD. Although there have been failures of CT blades with CT vanes not repaired by STI, the FAA has found the failure rate of CT blades with CT vanes not repaired by STI is approximately one-tenth of those that were repaired by STI.

Comment About Original Equipment Manufacturer (OEM) Regulating the Regulators

Two anonymous commenters suggested that this AD is an example of the OEM regulating the regulators.

The FAA disagrees. The data reviewed by the FAA shows that CT blade stresses are significantly higher in engines with STI-repaired CT vanes,

compared to those with P&WC CT vanes installed. In addition, event data reviewed by the FAA shows that CT blade failure events are approximately 10 times greater in engines equipped with STI-repaired CT vanes as opposed to P&WC CT vanes.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed.

Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information

The FAA reviewed Southwest Turbine Repair, Inc., STI 72–50–254, Revision 08, dated April 14, 2019. This service information describes procedures for repair of the compressor turbine vane ring assembly.

Costs of Compliance

The FAA estimates that this AD affects 907 engines installed on airplanes of U.S. registry. The FAA estimates that 63 engines will need to replace the CT vanes and CT blades.

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
Remove and replace CT vanes	16 work-hours × $85 per hour = $1,360	$115,789	$117,149	$7,380,387
Remove and replace CMSX–6 CT blade set	16 work-hours × $85 per hour = $1,360	$90,271	$91,631	$5,772,753

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 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.

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:

2022–08–13 Pratt & Whitney Canada Corp.: Amendment 39–22016; Docket No. FAA–2020–0692; Project Identifier MCAI–2019–00140–E.

(a) Effective Date

This airworthiness directive (AD) is effective May 27, 2022.

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Pratt & Whitney Canada Corp. PT6A–34, –34B, –34AG, –114, and –114A model turboprop engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by several reports of low-time fractures of compressor turbine (CT) blades resulting in loss of power or in-flight shutdown of the engine. The FAA is issuing this AD to prevent failure of the CT blade. The unsafe condition, if not addressed, could result in failure of the engine, in-flight shutdown, and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) Within 250 flight hours (FHs) or 270 days after the effective date of this AD, whichever occurs first:

(i) Remove from service any CT vane, part number (P/N) 3029051, 3032151, or 3123001, repaired in accordance with Southwest Turbine Inc. (STI) Repair Specification STI 72–50–254 (STI 72–50–254) and replace with a non-STI 72–50–254 repaired CT vane.

(ii) Remove from service any CMSX–6 CT blade that has been operated on an affected engine with any CT vane repaired in accordance with STI 72–50–254.

(2) [Reserved]

(h) Installation Prohibition

After the effective date of this AD, do not install on any engine a CT vane, P/N 3029051, 3032151, or 3123001, that was repaired in accordance with STI 72–50–254.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO 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 ECO Branch, send it to the attention of the person identified in paragraph (j)(1) of this AD. You may email your request to: *ANE-AD-AMOC@faa.gov.*

(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

(1) For more information about this AD, contact Barbara Caufield, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238–7146; fax: (781) 238–7199; email: *barbara.caufield@faa.gov*.

(2) Refer to Transport Canada AD CF 2019–30R1, dated December 17, 2019, for more information. You may examine the Transport Canada AD in the AD docket at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–0692.

(k) Material Incorporated by Reference

None.

Issued on April 7, 2022.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2022–08562 Filed 4–21–22; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2021–0032; Project Identifier AD–2020–01314–P; Amendment 39–22013; AD 2022–08–10]

RIN 2120–AA64

Airworthiness Directives; Hamilton Sundstrand Corporation Propellers

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding Airworthiness Directive (AD) 2020–12–07 for certain Hamilton Sundstrand Corporation (Hamilton Sundstrand) 54H model propellers. AD 2020–12–07 required initial and repetitive eddy current inspections (ECI) of certain propeller blades and replacement of the propeller blades that fail the inspection. This AD was prompted by a report of the separation of a 54H60 model propeller blade installed on a United States Marine Corps Reserve (USMCR) KC–130T airplane during a flight in July 2017. This AD requires initial and repetitive ECI of all propeller blades installed on Hamilton Sundstrand 54H60 propeller hubs and replacement of any propeller blade that fails inspection. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective May 27, 2022.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of May 27, 2022.

ADDRESSES: For service information identified in this final rule, contact Hamilton Sundstrand, 1 Hamilton Road, Windsor Locks, CT 06096–1010; phone: (877) 808–7575; email: *CRC@collins.com*. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222–5110. It is also available at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2021–0032.

Examining the AD Docket

You may examine the AD docket at *https://www.regulations.gov*by searching for and locating Docket No. FAA–2021–0032; 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, any comments received, and other information. The address for Docket Operations is 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: Michael Schwetz, Aviation Safety Engineer, Boston ACO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238–7761; fax: (781) 238–7199; email: *9-AVS-AIR-BACO-COS@faa.gov*.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2020–12–07, Amendment 39–21142 (85 FR 36145, June 15, 2020), (''AD 2020–12–07''). AD 2020–12–07 applied to certain Hamilton Sundstrand 54H model propellers. Note that AD 2020–12–07 and the Hamilton Sundstrand service information reference 54H60 model propellers whereas this AD references 54H model propellers. Hamilton Sundstrand 54H60 model propellers are 54H model propellers with a 54H60 model propeller hub.

The NPRM published in the **Federal Register** on February 25, 2021 (86 FR 11473). The NPRM was prompted by a report of the separation of a 54H60 model propeller blade installed on a USMCR KC–130T airplane during a flight in July 2017. The USMCR investigation of this event revealed the Hamilton Sundstrand 54H60 model propeller blade separated due to corrosion pitting and a resultant intergranular radial crack that was not corrected at the last propeller overhaul. From this intergranular crack, a fatigue crack initiated and grew under service loading until the Hamilton Sundstrand 54H60 model propeller blade could no longer sustain the applied loads and ultimately the blade separated. The separation of the blade resulted in the loss of the airplane and 17 fatalities. The investigation further revealed that 54H60 model propeller blades manufactured before 1971 are susceptible to cracks of the propeller blade in the area of the internal taper bore. The applicability of AD 2020–12–07 was therefore limited to those Hamilton Sundstrand 54H60 model propellers blades with a blade serial number (S/N) below 813320, which are those propeller blades manufactured before 1971.

Since the FAA issued AD 2020–12–07, the manufacturer determined that all propeller blades installed on Hamilton Sundstrand 54H model propellers with a 54H60 model propeller hub are susceptible to intergranular corrosion cracking in the blade taper bore. As a result, the manufacturer published Hamilton Sundstrand Alert Service Bulletin (ASB) 54H60–61–A154, Revision 1, dated May 29, 2020 (ASB 54H60–61–A154), to expand the effectivity to include propeller blades with a blade S/N below 813320, all propeller blades if the propeller contains a propeller blade with a blade S/N below 813320, and all propeller blades that have not been overhauled within ten years. ASB 54H60–61–A154 also provides instructions for concurrent compliance with Hamilton Sundstrand ASB 54H60–61–A155, dated May 29, 2020, to ECI an expanded and deeper taper bore area. In the NPRM, the FAA proposed to require initial and repetitive ECI of all propeller blades installed on Hamilton Sundstrand 54H60 propeller hubs and replacement of any propeller blade that fails inspection. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

The FAA received comments from one commenter, Lynden Air Cargo, LLC (LAC). The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Remove ''All'' From Proposed AD Requirements

LAC noted that the proposed AD used the word ''all'' in reference to propeller blades in the preamble of the NPRM. LAC stated that this AD should not apply to newly manufactured (–2A)