

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-28413; Directorate Identifier 2007-NE-25-AD; Amendment 39-15826; AD 2009-05-02]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-80C2 and CF6-80E1 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for General Electric Company (GE) CF6-80C2 and CF6-80E1 series turbofan engines with fuel manifolds part numbers (P/Ns) 1303M31G12 and 1303M32G12, installed in drainless fuel manifold assemblies (introduced by GE Aircraft Engines (GEAE) Service Bulletins (SB) CF6-80C2 S/B 73-0253 and CF6-80E1 S/B 73-0026). This AD requires removing the loop clamps that hold the fuel manifold to the compressor rear frame (CRF) damper brackets, inspecting the fuel manifold for wear at each clamp location, and replacing the clamps with new, zero-time parts. This AD also requires revising the Airworthiness Limitations Section (ALS) of the Instructions for Continued Airworthiness (ICA) and air carrier's Continuous Airworthiness Maintenance Programs (CAMP) to require repetitive fuel manifold inspection and loop clamp replacement. This AD results from reports of fuel leaks during engine operation. We are issuing this AD to prevent fuel leaks that could result in an under-cowl fire and damage to the airplane.

DATES: This AD becomes effective March 31, 2009.

ADDRESSES: The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT: Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: Robert.green@faa.gov; telephone (781) 238-7754; fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed AD. The proposed AD applies to GE CF6-80C2 and CF6-80E1 series turbofan engines with fuel manifolds P/Ns 1303M31G12 and 1303M32G12 installed in drainless fuel manifold assemblies. These drainless fuel manifold assemblies were introduced by GEAE SBs CF6-80C2 S/B 73-0253 and CF6-80E1 S/B 73-0026. We published the proposed AD in the Federal Register on September 7, 2007 (72 FR 51388). That action proposed to require removing and discarding the loop clamps that assemble the fuel manifolds to the CRF damper brackets, inspecting the fuel manifolds for wear at each clamp location, and replacing the clamps. That action also proposed to require revising the ICA ALS and air carrier's CAMP to require repetitive fuel manifold inspection and loop clamp replacement during each inspection.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Request To Clarify Inspection Requirements

GE and two air carriers request that we clarify that the AD inspection requirements are specific to the drainless fuel manifold configuration, which was introduced by GEAE SB CF6-80C2 S/B 73-0253 (-80C2) and SB CF6-80E1 S/B 73-0026 (-80E1).

We agree. We changed the AD to clarify the applicability and inspection requirements.

Request for a Phase-in Period

FedEx Express requests that we add a phase-in period for engines that might not have been part of a repetitive inspection program before the effective date of the AD. The commenter states that these engines would immediately fall out of compliance with the AD if they exceed the 7,500 flight-hour time-since-new (TSN) threshold for new, zero-time loop clamps, assuming the loop clamps were installed at the last shop visit. The commenter states that their fleet is almost entirely configured with drained manifold assemblies. They have not experienced any significant wear, and likely will have several engines exceeding the specified flight-hour life limit in the AD.

We partially agree. As we stated in the first comment response, this AD applies only to drainless manifold assemblies, so that portion of FedEx's comment is not relevant to this AD. The need for a phase-in period is valid. We received another comment on that point and we changed the AD to accommodate the concerns. That discussion follows below.

Incorrect Service Bulletin Reference

GE, the Air Transport Association, Boeing Commercial Airplanes, and seven carriers point out that the proposed AD incorrectly referenced SB GEAE CF6-80C2 S/B 73-0226, for the manifold inspection. The appropriate SB is CF6-80C2 S/B 73-0326.

We agree. We changed the reference in the AD.

Comment That Clamp Wear Is Also Applicable to Drained Fuel Manifold Assemblies

Air New Zealand Ltd and KLM Royal Dutch Airlines comment that the clamp wear problem is also applicable to fuel manifolds P/N 1303M31G10 and P/N 1303M32G10 installed in the drained fuel manifold assembly, pre-SB CF6-80C2 S/B 73-0253 configuration.

We do not agree. We are aware of only one leak found from loop clamp wear on a drained fuel manifold assembly, which was on a CF6-80C2 series turbofan engine. Considering the service history of the drained fuel manifold assembly, a mandatory inspection is not warranted at this time. We did not change the AD.

Request To Apply the Re-Inspection Interval to Engines That Have Had New, Zero-Time Loop Clamps Installed On-Wing

Air New Zealand Ltd and KLM Royal Dutch Airlines note that the proposed AD requires a 7,500 flight-hour re-inspection interval for first-run engines and engines that have new, zero-time loop clamps installed at last shop visit. The commenters request that we apply the same re-inspection interval to engines that have had new, zero-time loop clamps installed on-wing. Air New Zealand states that they have been replacing loop clamps with new, zero-time loop clamps when they perform on-wing inspections of the fuel manifolds.

We agree. We changed the AD to include on-wing replacement of loop clamps.

Request for Credit for Installing Loop Clamps On-Wing

All Nippon Airways requests that the AD initial inspection state that the 7,500 re-inspection interval for first-run engines or engines that have had new, zero-time loop clamps previously installed, apply regardless of previous inspection per GEAE SB CF6-80C2 S/B 73-0326 or SB CF6-80E1 S/B 73-0061. The commenter points out that the proposed AD does not recognize that operators were replacing the loop clamps on-wing.

We agree. We changed the AD to clarify that the re-inspection requirement is not preempted by compliance with existing SB inspection recommendations.

Request To Consider Using Room Temperature Vulcanizing (RTV) Rubber Compound

Air India requests that we consider allowing the use of red, room-temperature vulcanizing (RTV) rubber compound (Specification A15F6B6; RTV 106; MIL-846106), between the loop clamps and fuel manifold when the loop clamps are replaced with new, zero-time parts at inspection. Air India states that they have applied RTV rubber compound on the inner diameter of loop clamps where they have observed wear on other engine tubing. GE previously recommended using RTV rubber compound on the low-pressure turbine cooling manifolds, and Air India now uses it at other locations.

We do not agree. We have no data or experience to justify use of RTV rubber compound in this application. We did not change the AD.

Recommendation To Use Fiberglass Tape

The Air Transport Association and American Airlines recommend that we revise the proposed AD to allow the optional use of fiberglass tape on the fuel manifolds under the loop clamps. The commenters state that using the tape will eliminate the wear and reduce the effects of vibration by improving the fit of the clamps on the fuel manifolds. American Airlines states that they have been installing the fiberglass tape on their fuel manifolds at the time of inspection and loop clamp replacement since the beginning of their program. They believe the tape is essential to preventing fuel manifold wear.

We do not agree. We reviewed the data GE provided and concluded that using fiberglass tape may contribute to the fuel manifold wear. GE has also stated that they no longer recommend fiberglass tape for this application. We did not change the AD.

Request for a Unique Compliance Recommendation and Re-Inspection Interval

Lufthansa Technik AG and a private citizen request a unique compliance recommendation and re-inspection interval for engines that had been previously inspected and or reassembled with new, zero-time loop clamps, with fiberglass tape between the loop clamps and fuel manifolds. Lufthansa Technik AG states that they have observed less wear when using the fiberglass tape.

We do not agree. As previously noted, GE has stated that they no longer recommend fiberglass tape for this application. We did not change the AD.

Request To Not Remove Fiberglass Tape

Lufthansa Technik AG and GE Aviation request that we revise the fuel manifold inspection to not require removal of tape between the loop clamp and fuel manifold, unless wear is observed on the tape. GEAE SB CF6-80C2 S/B 73-0326, dated March 5, 2003, introduced the option of installing fiberglass tape on CF6-80C2 series engines. Lufthansa Technik AG states that if there is no wear found on the tape, then there will be no wear on the fuel manifold. Removing and replacing all tape at the time of inspection will add additional unnecessary work-hours to the inspection.

We do not agree. As noted earlier, the tape may contribute to the wear, and GE no longer recommends fiberglass tape for this application. GE's comment was in anticipation of a future design change with Teflon tape between the loop clamps and fuel manifolds. We did not change the AD.

Request That the AD Recognize the Use of Teflon Tape

GE Aviation and five air carriers request that the AD recognize the use of Teflon tape between new, zero-time loop clamps and fuel manifolds. The commenters request that we allow these engines to continue in service until the next inspection, without limit or penalty. The air carriers state that they have already been installing Teflon tape between new, zero-time loop clamps and fuel manifolds.

We do not agree. We have no data or experience to make a determination for reducing or extending the inspection and loop clamp replacement intervals because of installing Teflon tape between the loop clamps and fuel manifolds. GE has certified new fuel manifolds with PTFE tape installed at the loop clamp locations. These parts have the same inspection and loop clamp replacement requirements as the original parts. We did not change this AD.

Request for Clarification of Compliance Inspection Schedule

Lufthansa Technik AG and Virgin Atlantic Airways request that we clarify whether a poorly fitting loop clamp, with or without tape, would compromise the compliance inspection schedule in the AD.

We respond that it would not compromise the compliance inspection schedule in the AD. We concluded that replacing the loop clamps every 7,500 flight-hours (FH) was appropriate based on a GE Weibull analysis of the engine fleet, the first five fuel leak failures, and the accrued operation of 1,289 engines that had no leaks. The data was from first-run engines, which encompasses typical production loop clamp stack-up variations without tape. None of the subsequent leaks and failures occurred with less time than the proposed AD inspection compliance interval of 7,500 FH. We did not change the AD.

Request To Specify Flight Hours Time-Since-Last-Inspection or Flight Hours Time-Since-Last-Shop Visit

Japan Airlines International requests that for clarification, the initial inspection schedule should specify FH time-since-last-inspection or FH time-since-last-shop visit as of the issue date of the AD.

We partially agree. The initial inspection schedule is defined relative to the last inspection or replacement of the loop clamps with new clamps. However, for those engines that exceed the 1,750 and 4,500 FH thresholds, the determination is made as of the effective date of the AD. We changed the AD to clarify this.

Request To Offset the Initial Inspection Schedule

Japan Airlines International requests that we offset the initial inspection schedule to accommodate the scheduling of maintenance.

We do not agree. The time for scheduling maintenance varies among operators. Defining a generic inspection threshold to accommodate this variation would introduce risk that the inspection schedule would be ambiguous. We did not change the AD.

Propose an Additional Inspection Category

Japan Airlines International proposes an additional inspection category for operators inspecting the manifolds at intervals longer than the GE-recommended 4,500 FH interval. The commenter proposes that in these cases, operators would initially replace the loop clamps and inspect the fuel manifolds using their existing inspection schedule or within 4 months, whichever occurs first. The commenter states that they currently inspect affected fuel manifolds at 6,000 FH intervals, and based on the wording in the proposed AD, engines would be immediately in violation of the inspection requirements once the AD is effective.

We partially agree. The commenter points out the need to include a transitional period for operators who are inspecting the fuel manifolds at intervals longer than the earlier GE inspection SB recommendation, which is engines operating with more than 4,500 FH time-since-last-inspection or time-since-last-shop visit. We changed the AD to include a four-month transition period, to bring these engines into compliance.

Request To Permit Alternate Methods of Measuring

Japan Airlines International and GE Aviation request that we permit alternate methods of measuring the depth of wear in fuel manifolds, such as ultrasonic wall thickness measurement. The commenters note that the proposed AD requires using a pinpoint micrometer to measure depth of wear. Because of limited access at the top of the installed engine, the commenter states it is not possible to use a pinpoint micrometer.

We partially agree. GE does not have a procedure for ultrasonic inspections of the fuel manifolds for depth of wear. However, we agree that equivalent measuring techniques are acceptable. We eliminated the requirement to use a pinpoint micrometer.

Request for Clarification of the Use of Part Manufacturer Approval (PMA) Loop Clamps

Japan Airlines International requests clarification on the use of PMA loop clamps. The commenter asks if the proposed AD also applies to PMA loop clamps, part number VL1039GE2-10.

Yes, the AD applies to PMA loop clamps. They are also susceptible to deteriorating and causing fuel leaks. We changed the AD to include a reference to PMA loop clamps.

Question on Compliance Time Selection

KLM Royal Dutch Airlines questions the selection of the proposed AD compliance time of 1,750 FH time-since-last-inspection (TSLI). The commenter asks why we did not base the compliance recommendation on the low-time TSLI fuel manifold leak event for an engine with used loop clamps, which is 350 FH. The commenter also asks why we did not use the next lowest-time fuel manifold leak event, which is 2,000 FH TSLI. The commenter cites data presented by GE at the CF6 Technical Symposium on May 9 through May 10, 2007.

We do not agree. Since 2005, the fuel manifold leak failure rate has increased. There were four leak events in 2006, six in 2007, and six to date in 2008. Thirteen of the events are known to have occurred before the GE-recommended 4,500 FH re-inspection interval. The average TSLI for the thirteen failures is 2,250 FH. The 350 FH leak is a low-time event relative to the other failures and is believed to be unique. The 1,750 FH TSLI compliance requirement was based on the next-lowest TSLI leak event at the time, which was after the GE CF6 Technical Symposium. We did not change the AD.

Question on Why the Compliance Time Is Extended

KLM Royal Dutch Airlines questions why the proposed AD extends the 1,750 FH TSLI compliance time to 4,500 FH TSLI or 4 months after the effective date of the AD, for engines with used clamps or clamps of unknown heritage that have already accumulated more than 1,750 FH. The commenter is concerned that this 4-month compliance period will increase the probability of a fuel manifold leak event.

We do not agree. The proposed inspection and loop clamp replacement schedule for engines that already exceed the 1,750 FH threshold is an effort to transition the engine fleet to new loop clamps within a reasonable period of time. This will be achieved either through the original GE-recommended 4,500 FH schedule or within 4 months, whichever comes first. We did not change the AD.

Question on GE's Risk Assessment

KLM Royal Dutch Airlines questions why we disregarded GE's risk assessment that justified the 4,500 FH inspection interval.

We did because GE's risk assessment predicted fuel manifold leak events within the 4,500 FH inspection intervals. As previously noted, the leaking fuel could ignite resulting in an under-cowl fire and damage to the airplane, which is unacceptable.

Recommendation That We Eliminate Revising the Air Carrier's Approved CAMP and ALS of Chapter 5

The Air Transport Association and U.S. Airways recommend that we eliminate the requirement to revise the air carrier's approved CAMP and ALS of Chapter 5 in the CF6-80C2 and CF6-80E1 Instructions for Continued Airworthiness (ICA) from the proposed AD. The commenters state that GE has indicated it is developing new-design fuel manifolds to eliminate the repetitive maintenance required by this AD.

We do not agree. The AD requires GE to revise the ALS of the ICAs, and air carriers to revise their CAMP, to specify the repetitive inspections and loop clamp replacements for the drainless fuel manifold assemblies with fuel manifold P/N 1303M31G12 and P/N 1303M32G12. The AD would not be applicable to a new design. We did not change the AD.

Request To Change the Proposed AD Discussion

GE Aviation requests that we change the proposed AD Discussion to state that abrasive dirt and debris collecting between the worn loop clamps and fuel manifolds can result in fuel manifold wear with loop clamps that appear serviceable.

We partially agree. The deterioration of the loop clamp and possible accumulation of dirt and debris between the loop clamp cushion and fuel manifold might contribute to fuel manifold wear, but if so, it is a secondary factor. The root cause of the fuel manifold wear is fuel manifold vibration during engine operation. We did not change the AD.

Request To Consider the Probability of an Under-Cowl Fire

GE Aviation requests that we consider a longer inspection/replacement interval, and requests that we consider the probability of an under-cowl engine fire if we use 4,500 flight-hours instead. GE Aviation requests that we consider an intermediate compliance time that is supportable by industry if the 4,500 FH does not sufficiently reduce the risk of an under-cowl fire. GE states that our proposed 1,750 FH TSLI interval will reduce the average time between inspections from 15 months to less than 6 months, and increase the number of engines that will need to be inspected per week during the transition by a factor of 2.5. This will severely burden industry's maintenance capacity. GE also states that the additional work required to bring engines that already exceed the 1,750 FH into compliance, during the 4-month grace period, will make the burden worse.

We partially agree. The commenter did not consider first-run engines or engines that have already had new, zero-time loop clamps installed during either last shop visit or an earlier in-service inspection. We also note that despite the GE 4,500 FH TSLI SB recommendation, one fuel leak event occurred in 2005, four occurred in 2006, and six fuel leak events occurred in 2007. Nine of these 11 events occurred within the recommended 4,500 FH interval. We agree that the lack of a calendar compliance period with the 1,750 FH threshold could result in an immediate maintenance scheduling problem and we changed the AD to include the 4-month compliance period with the 1,750 FH threshold to facilitate the transition.

Request To Revise Costs of Compliance

Japan Airlines International and GE Aviation request that we revise the Costs of Compliance. GE Aviation estimates that 2 work-hours are required to inspect the loop clamps and fuel manifolds. Japan Airlines estimates that based on their experience, 8 work-hours are required for the inspections.

We do not agree. In recognizing the possible work-hour variations from operator to operator, we believe that 4 work-hours is a valid average. We did not change the AD.

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

We estimate that this AD will affect 350 CF6-80C2 series turbofan engines installed on airplanes of U.S. registry. We also estimate that it will take about 4 work-hours per engine to perform the actions, and that the average labor rate is \$80 per work-hour. Required parts will cost about \$162 per engine. Based on these figures, we estimate the total cost of the AD to U.S. operators for a once-through-the-fleet manifold visual inspection and loop clamp replacement to be \$168,700.

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

We have determined that 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); 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.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration 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:



2009-05-02 General Electric Company: Amendment 39-15826. Docket No. FAA-2007-28413; Directorate Identifier 2007-NE-25-AD.

Effective Date

- (a) This airworthiness directive (AD) becomes effective March 31, 2009.

Affected ADs

- (b) None.

Applicability

- (c) This AD applies to:

(1) General Electric (GE) CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A8, -80C2A5F, -80C2B1, -80C2B2, -80C2B4, -80C2B6, -80C2B1F, -80C2B1F1, -80C2B1F2, -80C2B2F, -80C2B3F, -80C2B4F, -80C2B5F, -80C2B6F, -80C2B6FA, -80C2B7F, -80C2B8F, -80C2D1F, -80C2L1F, -80C2K1F turbofan engine models with fuel manifold part numbers (P/Ns) 1303M31G12 and 1303M32G12, installed in drainless fuel manifold assemblies (introduced by GE Aircraft Engines (GEAE) Service Bulletin (SB) CF6-80C2 S/B 73-0253). These engines are installed on, but not limited to, Boeing 747, 767, MD11, and Airbus A300-600 and A310 airplanes.

(2) This AD also applies to GE CF6-80E1A1, -80E1A2, -80E1A3, -80E1A4, -80E1A4/B turbofan engine models with fuel manifold P/Ns 1303M31G12 and 1303M32G12, installed in drainless fuel manifold assemblies (introduced by GEAE SB CF6-80E1 S/B 73-0026). These engines are installed on Airbus A330 airplanes.

Unsafe Condition

- (d) This AD results from reports of fuel leaks during engine operation. We are issuing this AD to prevent fuel leaks that could result in an under-cowl fire and damage to the airplane.

Compliance

- (e) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

Removal and Replacement of Loop Clamps and Fuel Manifold Inspection Compliance Times

- (f) Using Table 1 of this AD, Schedule for Inspections and Replacements, accomplish the following actions in the intervals indicated in the table: remove and discard all loop clamps, P/N J1220G10, or part manufacturer approval (PMA) equivalent, that hold the fuel manifold to the compressor rear frame (CRF) friction damper brackets. Inspect the fuel manifold for wear at each clamp location as specified in paragraphs (g) and (h) of this AD. Replace the discarded loop clamps with new, zero-time clamps.

Table 1–Schedule for Inspections and Replacements

If:	Then replace clamps and inspect within:
(1) The engine was previously inspected using GEAE SB CF6–80C2 S/B 73–0326, dated March 5, 2003, for CF6–80C2 engines; or GEAE SB CF6–80E1 S/B 73–0061, dated April 14, 2003, for CF6–80E1 engines.	1,750 flight hours (FH) time-since-last-inspection (TSLI) or within 4 months after the effective date of this AD.
(2) Used loop clamps or clamps of unknown heritage were installed at last shop visit.	1,750 FH time-since-last-shop-visit or within 4 months after the effective date of this AD.
(3) The engine is a first-run engine or is an engine with zero-time, new loop clamps previously installed on-wing or at shop visit.	7,500 FH time-since-new or since zero-time, new loop clamps were installed (regardless if previously inspected per GEAE SB CF6–80C2 S/B 73–0326 or GEAE SB CF6–80E1 S/B 73–0061).
(4) The engine has already exceeded the 1,750 FH initial inspection threshold on the effective date of this AD, but has fewer than 4,500 flight hours TSLI.	4,500 FH TSLI, or 4 months after the effective date of this AD, whichever occurs first.
(5) The engine has already exceeded the 4,500 FH initial inspection threshold on the effective date of this AD.	4 months after the effective date of this AD.

Inspection of Fuel Manifold P/Ns 1303M31G12 and 1303M32G12

(g) Remove any tape at any clamp location. Visually inspect the full circumference of the manifold for wear at each clamp location. If any wear is found, follow paragraph (h) of this AD.

(h) When the fuel manifold shows any signs of wear, determine the depth of the wear as follows:

(1) Measure the outside diameter of the tube adjacent to the worn area.

(2) Measure the worn area at the smallest diameter.

(3) Subtract the measurement of the worn tube diameter from the unworn diameter measurement.

Allowable wear is 0.0035 inch.

(4) Replace fuel manifolds with wear greater than 0.010 inch before further flight.

(5) Replace fuel manifolds with wear greater than 0.0035 inch but less than 0.010 inch, within 50 flight cycles.

Revise Air Carrier's Continuous Airworthiness Maintenance Program (CAMP) and Airworthiness Limitation Section (ALS)

(i) Within 30 days of the effective date of this AD, revise the air carrier's approved CAMP and Instructions for Continued Airworthiness (ICA) Chapter 5, Airworthiness Limitation Section for the CF6-80C2 and CF6-80E1 series engines to require:

(1) Repetitive inspections of fuel manifolds, P/Ns 1303M31G12 and 1303M32G12, installed in drainless fuel manifold assemblies introduced by CF6-80C2 S/B 73-0253 and CF6-80E1 S/B 73-0026, as detailed in paragraphs (g) and (h) of this AD, at 7,500 FH intervals.

(2) Mandatory removal of all loop clamps that hold the fuel manifold, P/Ns 1303M31G12 and 1303M32G12, to the CRF damper brackets, at each inspection.

(3) Replacement of all loop clamps with new, zero-time loop clamps, at each inspection.

Alternative Methods of Compliance

(j) The Manager, Engine Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

Related Information

(k) GEAE SB CF6-80C2 S/B 73-0326, dated March 5, 2003, and GEAE SB CF6-80E1 S/B 73-0061, dated April 14, 2003; and the following GE engine manuals pertain to the subject of this AD:

- (1) CF6-80C2 Engine Manual GEK 92451.
- (2) CF6-80C2L1F Engine Manual GEK 112213.
- (3) CF6-80C2K1F Engine Manual GEK 112721.
- (4) CF6-80E1 Engine Manual GEK 99376.

(l) Contact General Electric Company via Lockheed Martin Technology Services, 10525 Chester Road, Suite C, Cincinnati, Ohio 45215; telephone (513) 672-8400; fax (513) 672-8422, for the service information identified in this AD.

(m) Contact Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: Robert.green@faa.gov; telephone (781) 238-7754; fax (781) 238-7199, for more information about this AD.

Issued in Burlington, Massachusetts, on February 17, 2009.
Thomas A. Boudreau,
Acting Manager, Engine and Propeller Directorate,
Aircraft Certification Service.