

postcard on which the following statement is made: "Comments to Docket Number 94-ANE-08-AD." The postcard will be date stamped and returned to the commenter.

Availability of NPRM's

Any person may obtain a copy of this NPRM by submitting a request to the FAA, New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 94-ANE-08-AD, 12 New England Executive Park, Burlington, MA 01803-5299.

Discussion

On May 15, 1995, the FAA issued airworthiness directive (AD) 95-11-01, Amendment 39-9235 (60 FR 27023, May 22, 1995), applicable to Turbomeca Arriel 1 series turboshaft engines, to require repetitive checks for engine rubbing noise during gas generator rundown following engine shutdown, and for free rotation of the gas generator by rotating the compressor manually at a daily interval until installation of improved 2nd stage turbine nozzle guide vanes. That action was prompted by comments submitted by operators of the affected engines in response to a previous AD and the availability of improved design 2nd stage turbine nozzle guide vanes. That condition, if not corrected, could result in engine failure due to rubbing of the 2nd stage turbine disk on the 2nd stage turbine nozzle guide vanes, which could result in complete engine failure and damage to the helicopter.

The Direction Generale de L'Aviation Civile (DGAC), which is the airworthiness authority for France, notified the FAA that an unsafe condition may exist on Turbomeca Arriel 1 B, 1 C, 1 C1, 1 C2, 1 D, and 1 D1 turboshaft engines.

Since AD 95-11-01 was issued, the DGAC advises that it has received a report of an in-flight engine shutdown on an engine that had improved 2nd stage turbine nozzle guide vanes, modification TU 197, installed. In this particular event, a crack initiated in a machined slot located between the vanes on the inner ring. The crack propagated and resulted in separation of the inner ring. This failure mode is different than that experienced on engines that have premodification TU 197 2nd stage turbine nozzle guide vanes installed. Installation of modification TU 197 is identified as a terminating action to the repetitive checks for the current AD. As a result of this event, the proposed AD requires additional borescope inspections for engines that have modification TU 197 installed.

The DGAC has also determined that modification TU 76 should be replaced with modification TU 202 on Arriel 1 B, 1 D, and 1 D1 engines. The manufacturer has informed the FAA that modification TU 202 may have already been installed on all Arriel 1 B, 1 D, and 1 D1 engines installed on helicopters of U.S. registry. However, for completeness, the proposed AD requires the removal of modification TU 76 or TU 197 and replacement with modification TU 202 before further flight after the effective date of this AD, to cover any potential engines that may not have been modified already.

The proposed AD will also require replacement of the 2nd stage nozzle guide vanes, having modification TU 197, with modification TU 202 on all Arriel 1 A, 1 A1, 1 A2, 1 C, 1 C1, 1 C2, 1 E2, 1 K, 1 K1, 1 S, and 1 S1 engines at next engine shop visit after the effective date of the proposed AD, but no later than December 31, 2006. Installation of modification TU 202 constitutes terminating action to the repetitive checks and inspections.

The Arriel 1 E2, 1 K, 1 K1, 1 S, and 1 S1 engine models have also been added to the applicability section of the proposed AD since they are susceptible to the same problem.

Manufacturer's Service Information

Turbomeca has issued the following Arriel 1 service bulletins (SBs) and alert service bulletins (ASBs):

- SB No. 292 72 0181, Update 3, dated September 15, 1995, that describes procedures for checking for unusual noise during gas generator rundown on engine shutdown and after the last flight of the day.
- ASB No. A292 72 0212, Update 5, dated August 8, 2001, that describes procedures for post Module TU 197 initial and repetitive borescope inspections of the nozzle guide vanes for cracks.
- ASB No. A292 72 0150, Update 6, dated September 4, 2000, that describes procedures for replacing modifications TU 76 and TU 197 with modification TU 202.

The DGAC has classified ASB No. A292 72 0212, Update 5, dated August 8, 2001, as mandatory and issued AD DGAC 98-311 (A) R1, dated October 7, 1998, in order to assure the airworthiness of these Turbomeca engines in France.

Differences Between the Manufacturer's Service Information and This Proposed AD

Turbomeca SB No. 292 72 0181 allows 50 flight hours between checks for unusual noise during gas generator

rundown on Arriel 1 A, 1 A1, and 1 A2 engines with modification TU 76; and 1 C, 1 C1, 1 C2, 1 K, 1 K1, and 1 S engines before modification to TU 197 or TU 202. This proposed AD would require that the checks be performed during engine shutdown after the last flight of the day or after a 5 second ventilation.

Bilateral Agreement Information

This engine model is manufactured in France and is type certificated for operation in the United States under the provisions of section 21.29 of the Federal Aviation Regulations (14 CFR 21.29) and the applicable bilateral airworthiness agreement. Pursuant to this bilateral airworthiness agreement, the DGAC has kept the FAA informed of the situation described above. The FAA has examined the findings of the DGAC, reviewed all available information, and determined that AD action is necessary for products of this type design that are certificated for operation in the United States.

Proposed Requirements of This AD

Since an unsafe condition has been identified that is likely to exist or develop on other Turbomeca Arriel 1 A, 1 A1, 1 A2, 1 B, 1 C, 1 C1, 1 C2, 1 D, 1 D1, 1 E2, 1 K, 1 K1, 1 S, and 1 S1 turboshaft engines of the same type design that are installed on helicopters registered in U.S., the proposed AD would supersede AD 95-11-01 to:

- Add additional engine models to the applicability section, and
- Eliminate the installation of modification TU 197 as a terminating action to the repetitive checks, and
- Require additional inspections for engines that have modification TU 197 installed, and
- Require the replacement of modifications TU 76 and TU 197 with modification TU 202 on Arriel 1 B, 1 D, and 1 D1 engines before further flight, and
- Replacement of TU 197 with modification TU 202 as a terminating action to the repetitive checks and inspections.

Economic Analysis

There are approximately 487 engines of the affected design in the worldwide fleet. The FAA estimates that 47 engines installed on aircraft of U.S. registry would be affected by this proposed AD, that it would take approximately 4 work hours per engine to do the proposed inspections, including removal and installation of the gas generator module, and that the average labor rate is \$60 per work hour. Required parts would cost approximately \$18,600 per engine. Based on these figures, the cost per