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[4910-13]

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 33

**[Docket No FAA-2020-0816; Special Conditions No. 33-20-01-SC]**

**Special Conditions: Safran Helicopter Engines, S.A., Arrano 1A Turboshaft Engine Model;**

#### **30-Minute All Engines Operating Power Rating**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Safran Helicopter Engines, S.A.

(Safran Helicopter Engines), Arrano 1A turboshaft engine model. This engine model will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for aircraft engines. This design feature is a 30-minute All Engines Operating (AEO) power rating. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** This action is effective on Safran Helicopter Engines on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Send comments on or before [INSERT DATE 45 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** Send comments identified by docket number FAA-2020-0816 using any of the following methods:

- *Federal eRegulations Portal:* Go to <http://www.regulations.gov> and follow the online instructions for sending your comments electronically.

- *Mail*: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier*: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax*: Fax comments to Docket Operations at 202-493-2251.

*Privacy*: The FAA will post all comments it receives, without change, to <http://regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket website, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the *Federal Register* published on April 11, 2000 (65 FR 19477-19478).

*Docket*: Background documents or comments received may be read at <http://www.regulations.gov> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Tara Fitzgerald, FAA, AIR-6A2, Engine and Propeller Standards Branch, Aircraft Certification Service, 1200 District Avenue, Burlington, Massachusetts, 01803-5213; telephone (781) 238-7130; facsimile (781) 238-7199; e-mail [tara.fitzgerald@faa.gov](mailto:tara.fitzgerald@faa.gov).

**SUPPLEMENTARY INFORMATION:** The FAA has determined, in accordance with 5 U.S.C. Code 553(b)(3)(B) and 553(d)(3), that notice and opportunity for prior public comment are unnecessary because substantially identical special conditions have been previously subject to the public comment process in several prior instances such that the FAA is satisfied that new comments are unlikely. For the same reason, the FAA finds that good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment.

Special Conditions Number	Company and Model
No. 33-021-SC <sup>1</sup>	Light Helicopter Turbine Engine Company CTS800-4AT Turboshaft Engine
No. 33-010-SC <sup>2</sup>	Pratt and Whitney Canada, Inc. PT6C-67E Turboshaft Engine
No. 33-009-SC <sup>3</sup>	Pratt and Whitney Canada Corp. PW210S Turboshaft Engine

### Comments Invited

The FAA invites interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

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<sup>1</sup> 82 FR 60854, December 26, 2017

<sup>2</sup> 76 FR 56097, September 12, 2011

<sup>3</sup> 76 FR 40594, July 11, 2011

The FAA will consider all comments received by the closing date for comments. The FAA may change these special conditions based on the comments received.

## **Background**

On August 30, 2019, Safran Helicopter Engines applied for a type certificate for the Arrano 1A turboshaft engine model. The Arrano 1A turboshaft engine model has an annular inlet integrating inlet guide vanes, a two-stage centrifugal compressor driven by a single-stage high pressure turbine, a reverse flow combustion chamber and a single-stage low pressure turbine (power turbine) driving a reduction gearbox located at the front of the engine and an exhaust pipe. The Arrano 1A turboshaft engine model will incorporate a novel or unusual design feature, which is a 30-minute AEO power rating. Regulations pertaining to a 30-minute AEO power rating have not been incorporated into part 33. These special conditions provide the requirements for the 30-minute AEO power rating for the Arrano 1A turboshaft engine model. Safran Helicopter Engines has requested this 30-minute AEO power rating to support helicopter search and rescue missions that require hover operations at high power. The use of the 30-minute AEO power rating will require special conditions to address the use of this 30-minute AEO power rating and its effects on the Arrano 1A engine model.

## **Type Certification Basis**

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.17, Safran Helicopter Engines must show that the Arrano 1A turboshaft engine model meets the applicable provisions of 14 CFR part 33, dated February 1, 1965, as amended by amendments 33-1 through 33-34.

If the Administrator finds that the applicable airworthiness regulations (e.g., 14 CFR part 33) do not contain adequate or appropriate safety standards for the Safran Helicopter Engines, Arrano 1A turboshaft engine model because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

### **Novel or Unusual Design Features**

The Arrano 1A turboshaft engine model will incorporate a novel or unusual design feature, which is a 30-minute AEO power rating. This rating will be used to support helicopter search and rescue missions that require hover operations at high power.

### **Discussion**

The type certification basis for the Arrano 1A turboshaft engine model does not contain adequate airworthiness standards for a 30-minute AEO power rating. Therefore, special conditions are necessary to provide additional safety standards for rating definition, instructions for continued airworthiness (ICA), and endurance testing.

The 30-minute AEO power rating is generally intended to be used for hovering at increased power for search and rescue missions at power levels higher than the maximum continuous rating, up to rated takeoff power. These special conditions address the effects on the engine during the use of the 30-minute AEO power for up to 30 minutes. The 30-minute AEO power rating time limitation applies to each instance the 30-minute AEO power rating is used.

There is no limit to the number of times the 30-minute AEO power rating can be used during any one flight and there is no cumulative time limitation.

In accordance with § 33.4, the applicant must prepare ICAs. Those ICAs must include instructions to address the unknown usage of the 30-minute AEO power rating and its effect on engine deterioration for the Arrano 1A turboshaft engine model. Safran Helicopter Engines must assess the usage and publish ICAs with airworthiness limitations section limits in accordance with the usage to prevent excessive engine deterioration. Because the Arrano 1A turboshaft engine model has a continuous one engine inoperative (OEI) rating and associated limitations equal to or higher than the 30-minute AEO rating, the test time performed at the continuous OEI rating may be credited toward the 25 hours of operation endurance test requirement set forth in these SCs. However, test times spent at other rating elements of the § 33.87 endurance test, such as takeoff or other OEI ratings (that may be equal to or higher), may not be counted toward the required 25 hours endurance test set forth in these SCs. Therefore, special conditions are issued under the provisions of 14 CFR 11.19, 21.16, and 21.17. Safran Helicopter Engines must demonstrate compliance to the safety standards specified in the special conditions.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

## **Applicability**

As discussed above, these special conditions are applicable to the Safran Helicopter Engines, Arrano 1A turboshaft engine model. Should Safran Helicopter Engines apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

## **Conclusion**

This action affects only certain novel or unusual design features on the Arrano 1A turboshaft engine model. It is not a rule of general applicability.

## **List of Subjects in 14 CFR Part 33**

Aircraft, Engines, Aviation Safety, Reporting and recordkeeping requirements.

## **Authority Citation**

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

## **The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the Safran Helicopter Engines, Arrano 1A turboshaft engine model.

In addition to the general definitions in § 1.1, the following definition applies to these special conditions: “Rated 30-minute All Engines Operating (AEO) power” means the approved brake horsepower developed under static conditions at the specified altitude and temperature, and within the operating limitations under part 33, and limited in use to periods not exceeding 30 minutes.

In addition to the airworthiness standards in 14 CFR part 33, the following special conditions apply:

(a) Section 33.1, Applicability, and Section 33.3, General. As applicable, all documentation, testing and analysis required to comply with the part 33 type certification basis must account for the 30-minute AEO rating, limits, and usage.

(b) Section 33.4, Instructions for Continued Airworthiness. In addition to the requirements of § 33.4, the instructions for continued airworthiness must:

(1) Include instructions to ensure that in-service engine deterioration due to the rated 30-minute AEO power usage will not exceed that assumed for establishing the engine maintenance program and all other approved ratings, including one engine inoperative (OEI), are available (within associated limits and assumed usage) for every flight.

(2) Validate the adequacy of the maintenance actions required under paragraph (b)(1) of these special conditions.

(3) Include in the airworthiness limitations section any mandatory inspections and serviceability limits related to the use of the 30-minute AEO power rating.

(c) Section 33.7, Engine ratings and operating limitations. In addition to the ratings and operating limitations required to be established by § 33.7(a) and (c), a rated 30-minute AEO power and operating limitations must be established relating to the following:

(1) Horsepower, torque, shaft speed (r.p.m.) and gas temperature.  
(2) The rated 30-minute AEO power and associated limitations must not exceed the rated takeoff power and associated limitations.

(d) Section 33.29, Instrument connection. If dependence is placed on instrumentation needed to monitor the rating's use, the applicant must make provision for the installation of that instrumentation, specify the provisions for instrumentation in the engine installation instructions, and declare them mandatory in the engine approval documentation.

(e) Section 33.87, Endurance Test. In addition to the requirements of § 33.87(a) and (d), the overall test run must include a minimum of 25 hours of operation at rated 30-minute AEO power and limits, divided into periods of not less than 30 minutes, but not more than 60 minutes at rated 30-minute AEO power, and alternate periods at maximum continuous power or less.

(1) Each § 33.87(d) continuous OEI rating test period of 60 minutes duration, run at power and limits equal to or higher than the 30-minute AEO power rating, may be credited toward this requirement. Note that the test time required for the takeoff or other OEI ratings may not be counted toward the 25 hours of testing required at the 30-minute AEO power rating.

Issued in Burlington, Massachusetts, on August 20, 2020.

Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.

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