



# Federal Aviation Administration

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## Memorandum

Date: March 29, 2007

From: Manager, Engine and Propeller Directorate, Aircraft Certification Service,  
ANE-100

To: SEE DISTRIBUTION

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Subject: **ACTION**: FAA Certification Policy for Turbine Engine Lubricating Oils Qualified to AS5780 - [ANE-2006-33.7-3]

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### 1. Purpose

The purpose of this memorandum is to clarify Federal Aviation Administration (FAA) certification policy for Aircraft Certification Offices (ACOs) for approval of turbine engine models to operate with lubricating oils qualified to Society of Automotive Engineers (SAE) specification AS5780, "Specification for Aero and Aero-Derived Gas Turbine Engine Lubricants". In addition, this memorandum addresses approval of changes to previous AS5780 qualified oils. General guidance for approval of fuels, oils and additives is in Advisory Circular (AC) 20-24B. This memorandum provides guidance specific to AS5780 qualified turbine engine lubricating oils.

### 2. Background

a. AC 20-24B provides guidance for engine manufacturers and engine owners and operators who seek FAA approval for use of a particular fuel, oil, or additive on their specific engine model. It provides guidance for certification of a single engine model, or a family of engine models, to operate on a fuel or oil that is identified by a technical specification that is acceptable to the FAA (see paragraph 5.d. of AC 20-24B). For a fuel or oil specification to be acceptable to the FAA, it must be written in sufficient detail to provide, at minimum, the physical properties and limits by which uniform quality and composition can be maintained. The FAA has determined that this can be accomplished by performance specifications that rely on specialized test methods to ensure quality and composition.

b. In the past, approval of lubricating oils for use on turbine engines involved a three-step process. First, the oil manufacturer would work with the U.S. Navy (USN) to obtain qualification of the oil to the military oil specification (MIL-STD-23699). Once the oil was approved and the specific brand was added to the USN Qualified Products List (QPL), the oil

manufacturer would solicit turbine engine manufacturers to perform specialized laboratory and rig testing to determine if the oil was suitable for their engines. If the oil were found to be acceptable, the engine manufacturer would proceed with a certification program to obtain approval from the FAA. This certification program would typically consist of extensive engine testing performed in accordance with AC 20-24B. This process resulted in potentially duplicative bench and rig testing performed at each engine manufacturer that resulted in excessive development costs and unnecessary delays in service entry of the oil.

c. AS5780 combines all of the analysis and testing required in the first two steps (MIL-STD 23699 qualification and engine OEM bench/rig testing) into one standardized qualification procedure. Once qualified to AS5780, the engine manufacturer can proceed directly to the FAA certification process.

### **3. Policy**

#### **a. FAA Certification of AS5780 Qualified Oil**

1. The applicant should follow the procedure specified in AC 20-24B, paragraph 5, to gain approval to operate a specific turbine engine model with a specific lubricating oil. The following guidance is applicable to this procedure when used for AS5780 qualified oil:

2. Preliminary Data (paragraph 5.a. of AC 20-24B). This is primarily a materials compatibility requirement. Extensive rig and bench testing is performed for qualification to AS5780 and the applicant may utilize data obtained during that process for compliance with this requirement. If the AS5780 process did not evaluate all oil-wetted materials on the engine model applied for, then additional materials compatibility testing may be required for FAA approval.

3. Test (paragraph 5.b. of AC 20-24B). The applicant will need to perform the engine testing specified in the AC for AS5780 qualified oils. The AS5780 qualification process does not include engine testing to the extent required by the FAA.

4. Final Data (paragraph 5.c. of AC 20-24B). The applicant will need to provide the final report as specified in the AC for AS5780 qualified oils.

5. Identification (paragraph 5.d. of AC 20-24B). The expectation is that the lubricating oil formulation and performance will be controlled and identified by the specific oil brand name. This is a more specific means of identification than simply referencing SAE AS5780, and therefore, would be acceptable to the FAA for compliance with regulation 14 CFR 33.7 (b) (3). However, specifying AS5780 is also considered an acceptable method for identification if the engine manufacturer has substantiated that any oil with properties that fall within the range of criteria in the specification will be acceptable for use on the subject engine.

#### **b. FAA Oversight of Major/Minor Changes to AS5780 Qualified Oils**

1. Lubricating oil manufacturers occasionally find it necessary to make changes to qualified oils that may affect the performance of the oil. The manufacturer may change the oil

formulation, the basestock composition, the additive composition, or a manufacturing plant location. The AS5780 specification requires that these changes be evaluated and approved by consensus-based industry group of engine manufacturer experts called the Qualified Products Group (QPG). Changes that have the potential to adversely impact the engine oil system will result in a brand reidentification which will require review by the regulatory authorities (see paragraph 3.b.3. below).

2. If the change does not result in a brand name reidentification, then it is not considered a change to the FAA approved operating limitations. This is because the FAA operating limitations relative to lubricating oil are typically defined in terms of the brand name, and the brand name is unchanged. In this case, the oversight of change process is effectively delegated to the industry oversight organization (the QPG).

3. If the change does result in a brand name reidentification, then the evaluation of the change by the QPG should be conducted in parallel with the engine manufacturer's FAA design change control process. The QPG report and associated evidence can be used as substantiating data for the FAA approval.

#### **4. Effect of Policy**

a. The general policy stated in this document does not constitute a new regulation or create what the courts refer to as a "binding norm". The office that implements policy should follow this policy when applicable to the specific project. Whenever an applicant's proposed method of compliance is outside this established policy, it must be coordinated with the policy issuing office (for example, through the issue paper process or equivalent).

b. Applicants should expect the certificating officials will consider this information when making findings of compliance relevant to new certificate actions. Also, as with all advisory material, this policy statement identifies one means, but not the only means, of compliance.

#### **5. Conclusion**

The Engine and Propeller Directorate (EPD) has determined that all proposed turbine engine lubricating oil type certification projects will be significant as defined in Order 8110.4C, section 2-4 c. The ACO is expected to notify the EPD Standards Office of such projects promptly and forward certification project notifications and associated certification plans as soon as practical after project application. Signature authority for certificate issuance on these projects will be delegated to the ACO in most cases in which this policy is being applied.



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