Federal Aviation Administration

Memorandum

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To: See Distribution List

From: James D. Seipel, Acting Manager, Design, Manufacturing, & Airworthiness Division, AIR-100

Prepared by: Jon Mowery, Operational Oversight Policy Branch, AIR-140

Subject: Guidance to Aircraft Certification Offices (ACOs) and Organizational Designation Authorizations (ODAs) on Authorizing Designated Engineering Representaitves (DERs) Delegation of Title 14 of the Code of Federal Regulations, 14 CFR Part 34, Fuel Venting and Exhaust Emissions

Memo No.: AIR100-14-140-GM13

This memo is intended to assist Aircraft Certification Offices (ACOs) and Organizational Designation Authorizations (ODAs) in determining if a DER Applicant or Unit Member is qualified to approve findings of compliance to 14 CFR part 34, Fuel Venting and Exhaust Emissions. Previously, DERs were typically limited to recommending approval to findings of compliance to these emissions regulations. DERs that have previously been appointed to conduct engine emissions certification work, and who maintain their qualifications, shall retain their authorization to approve findings of compliance according to their letter of appointment.

This memo also describes how to document the delegation of authority, if given. This memo is not retroactive.

Applicant Qualifications

An applicant should have a thorough knowledge of the applicable regulations associated with aircraft exhaust emissions and/or fuel venting which include:

1. 14 CFR part 34, Fuel Venting and Exhaust Emissions, 40 CFR part 87, Control of Air Pollution from Aircraft and Aircraft Engines, and the relationship between the FAA and the U.S. Environmental Protection Agency (EPA), as specified under Title II of the Clean Air Act, Sections 231 through 234, in establishing and implementing aircraft engine emissions standards; and

2. International Civil Aviation Organization (ICAO) Annex 16: Environmental Protection, Volume II – Aircraft Engine Emissions, due to its incorporation by reference to the Code of Federal Regulations related to emissions, including associated guidance material such as AC-34 and the ICAO Environmental Technical Manual.

The applicant's knowledge of the emissions area should also include:

1. Understanding the intent of the regulations, and what is being controlled;

2. The regulation's background, preambles, and implementation policy(s); and

3. The ability to correctly apply regulatory requirements to any given certification scenario.

Technical considerations for the applicant should include:

1. Participation in an engine emissions certification test, serving in a technical capacity;

2. Knowledge of probe/rake design, and the setup of the exhaust emissions sampling system per the requirements, including methods for optimizing the sampling results to provide representative samples;

3. Knowledge of the latest versions of the Society of Automotive Engineers (SAE) Standards SAE ARP1533, ARP1256, ARP1179, the appendices of ICAO Annex16, Volume II, the ICAO Environmental Technical Manual, and any equivalent procedures according to AC-34-1B (or latest revision);

4. Knowledge of procedures for calibration, operation, data acquisition, and troubleshooting of emission measurement equipment;

5. Knowledge of procedures for data processing and adjustments from the measured data to reference conditions for the validation of emissions data;

6. Knowledge of the design and operation of the combustor and engine gas parametric relationships, including the effects of significant parameters (e.g. P3, T3, and AFR) on HC, CO, NOx and smoke levels, and their potential trade-offs; and

7. Knowledge of emission test cells and lab data acquisition, files thereof, and the manner in which they are collected, merged, archived, retrieved, and edited for the generation of characteristic emission levels for the purposes of emissions certification.

The above can be demonstrated by the extent of work experience in areas such as the following:

1. Defining and developing emission test procedures;

2. Participation in the engineering design, development, and validation of exhaust sampling probes;

3. Participation in combustor design, and involvement in emissions testing;

4. Participation with test-cell operators in pre-test and post-test calibration of test cells;

5. Experience in troubleshooting test-cell equipment during witnessing of emissions tests;

6. Ability to explain, in engineering terms, the effects and tradeoffs of engine gas path hardware design changes on gaseous and smoke emission levels;

7. Detecting engine anomalies and malfunctions which may affect emission results by observing engine parametric data during emissions tests or by reviewing test data after completion of emission tests;

8. Ability to identify and explain the purpose of various computer files used in emission test data sampling and data collection, and how they are acquired, stored, retrieved, modified, validated, verified, and archived during all pre-and post-test and certification stages;

9. Ability to work with emission test certification data systems in using SAE ARP1533 procedures, including the ability to verify and validate computer program(s) and analysis tool(s);

10. Defining engine and test set-up conformity inspection requirements and preparing conformity requests, and the disposition of unsatisfactory results;

11. Participation in SAE working group meetings and/or ICAO CAEP WG3 meetings which may enhance the extent of experience in any given area(s) of expertise; and

12. Working with the FAA certification offices in prior emissions certification approvals.

If an ODA wishes to have the ability to make findings to these regulations, they should alter their procedures manual to include the above criteria in their appointment process for Unit Members.

Documentation of the Delegation

Once the ACO has determined that a DER should be delegated approval for 14 CFR part 34, it should be documented as follows:

1. A DER delegated under Chart E, DER Engines, should have authority identified in block A8. A DER under Chart B, DER Powerplant Installations, should have authority identified in block A14.

2. In addition, the following should be put into the limitations section of their delegation: *Findings of compliance to [list specific regulations being delegated, e.g., §34.XX] may be fully delegated to this DER.*

ODAs should document the delegation of a Unit Member in accordance to their procedures manual.

As per this memorandum, the ability for ACOs and ODAs to authorize DERs to approve compliance data in this area is available immediately.

If the ACO or the Organization Management Teams and Team Leads (OMT) have any questions or need additional clarification regarding an applicant's qualifications, they are encouraged to contact John Fisher, Aircraft Certification Service Engine & Propeller Directorate, ANE 110, at (781) 238-7149 or at john.fisher@faa.gov.

If there are any questions or additional clarification is needed regarding how the authority should be documented, please contact Jon Mowery, AIR 140, at jon.mowery@faa.gov , or at (562) 627-5207.

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