

**FAA Validation of EASA State of Design Turbine Aircraft Engines
 FAA Significant Standards Difference Summary List
 Per FAA-EASA Technical Validation Procedures (TIP) Revision 6**

**14 CFR Part 33 Amendment 34 compared to CS-E Amendment 6
 Dated December 9, 2020**

SSD	Subject	14 CFR Section	Remarks
1	Instructions for Continued Airworthiness (ICA)	33.4, A33.1(b), A33.3, A33.3(b), A33.4(a)(2), A33.3(c)	1) 33.4 requires ICA instructions to be complete at type certification unless a program exists to ensure their completion prior to delivery of the first aircraft with the engine installed, or upon issuance of a standard certificate of airworthiness for the aircraft with the engine installed, whichever occurs later. 2) A33.1(b) requires that each engine ICA must include ICAs for all engine parts. 3) A33.3 requires ICAs to be in the English language. 4) A33.3(b) requires an Engine Overhaul Manual or Section in the ICAs. 5) A33.4(a)(2) requires an ICA Airworthiness Limitations FAA approval statement to support FAA regulatory authority. 6) A33.3(c) Requires engine condition monitoring for ETOPS eligibility.
2	Durability (Propeller Blade Pitch Control Systems)	33.19(b)	1) 33.19(b) requires each component of the propeller blade pitch control system which is a part of the engine type design to meet the requirements of Sec. 35.21, 35.23, 35.42 and 35.43.
3	Turbine, compressor, fan, and turbosupercharger rotor overspeed.	33.27(d), (f), (f)(6)	1) 33.27(d) requires growth assessment at 105% speed for (b)(3). 2) 33.27(f) is applicable to the fan forward shaft only. 3) 33.27(f)(6) does not allow exclusion of the entire shaft for overspeed loss of load.
4	Induction System Icing	33.68(a), (b), (c), (e)	1) 33.68 (a), (b), (c) Applicable to all engines irrespective of aircraft installation. 2) 33.68 (c) Requires engine test at specific conditions (33.68 Table 1). 3) 33.68 (c) Requires testing at high power condition in addition to descent.
5	Ignition Systems	33.69	1) 33.69 Requires at least 2 igniters.
6	Hydraulic Systems	33.72	1) Applicable only to non-fuel driven hydraulic systems. For fuel driven hydraulic systems EASA requirements have shown to provide a level of safety equivalent to 33.72.
7	Fuel Burning Thrust Augmentor	33.79	1) Design and construction requirements for engines certified with fuel burning thrust augmentor.
8	Vibration Test	33.83(a)	1) 33.83(a) requires a vibration survey to be conducted on an engine test; i.e. validated analysis is not provided in §33.83.
9	Endurance Test	33.87(a)(8), 33.7(c)(14), (15), and (16), 33.87(a)(3)	1) 33.87(a)(8) requires testing of the declared transient rotor shaft overspeed, transient gas overtemperature, and transient engine overtorque. See detail write up for EASA equivalency using special conditions for transients of up to 30 second and transients longer than 30 seconds and up to 2 minutes. 2) 33.87(a)(3) requires that during testing except as provided in paragraph (a)(5), the gas temperature must be at least 100 percent of the value associated with the particular engine operation being tested.
10	Overtemperature Test	33.88	1) 33.88(a) requires running a test at turbine inlet temperature above the maximum permissible value, in combination with the maximum permissible shaft speeds except for 30-second OEI and 2-minute OEI ratings. 2) 33.88(b) prescribes the overtemperature test conditions for engines with 30-second OEI and 2-minute OEI rating.
11	Initial Maintenance Inspection	33.90	1) Requires a test for new type certificates to establish when the initial maintenance inspection is required. Alternately, per 33.90(b) an engine test may be conducted in accordance with § 33.201 (c) through (f).

12	Engine-propeller systems tests	33.95	1) 33.95(a) requires 25 cycles of feathering operation. 2) 33.95(b) requires 25 cycles from maximum continuous power of negative torque and thrust system operation. 3) 33.95(c) requires 25 cycles of the automatic decoupler operation from maximum continuous power if repeated decoupler use is intended in service.
13	Engine tests in auxiliary power unit (APU) mode.]	33.96	1) Endurance test requirements for turboprop engines designed with a propeller brake.
14	Design & Test Requirements for Early ETOPS Eligibility	33.201	These differences are based on 14 CFR Part 33 Amendment 34 compared to CS-E Amendment 4 and AMC 20-6, revision 2 effective October 23, 2010. 1) 33.201(c) requires a test for engines to be granted ETOPS eligibility without the service experience specified in part 25, appendix K, K25.2.1 of more than 250,000 engine-hours. 2) 33.201(d) and (e)(1) require engine calibration prior and at the conclusion of the test in 33.201(c) for the purpose to demonstrate that any change in power or thrust characteristics is within approved limits. 3) Reference detail write up: a) Other differences compensated by compliance with CS-E 1040 and AMC 20-6. b) Guidance on how to run the test. c) Guidance on when to repeat the test for new models and design changes.

Notes:

- 1) In accordance with Title 14 Code of Federal regulations (14 CFR) 21.29 and the Technical Implementation Procedures for Airworthiness and Environmental Certification between the Federal Aviation Administration of the United States of America and the European Aviation Safety Agency of the European Union, Revision 6, Amendment 2, dated April 2, 2019, (TIP Rev 6.2), the FAA here prescribes additional requirements relative to CS-E to provide a level of safety equivalent to that provided by 14 CFR part 33.
- 2) Reference detail SSD write ups for additional information including guidance material.

Approved by:

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