AIAB
ASSOCIAÇÃO DAS INDÚSTRIAS AEROESPACIAIS DO BRASIL

Ref. AIAB-114/2020.
São José dos Campos, 21 de dezembro de 2020.

Mr. Gary Horan
Federal Aviation Administration
Aircraft Certification Service
Engine and Propeller Standards Branch
1200 District Avenue
Burlington, Massachusetts 01803
Phone: (781) 238–7164
E-mail: gary.horan@faa.gov

Dear Mr. Gary Horan,

AIAB appreciates the opportunity to offer the following comments for your consideration, regarding the Docket No. FAA-2020-0894; Notice No. 33-19-01-SC about Special Conditions: magniX USA, Inc., magni250 and magni500 Model Engines.

AIAB considers the publishing of this proposed special condition an important milestone in defining additional requirements for electrical propulsion system. Since the additional proposed safety standards in this special condition are the first to address electrical propulsion systems Part 33 certification, they may establish a basis for adequate airworthiness requirements to certify them for all future aircraft types. Considering this relevant aspect, AIAB kindly requests to consider the proposed comments for this special condition.

- **2. Engine Ratings and Operating Limits**

AIAB proposes that the requirement 33.7(d) should also be applicable, since electric motor can be affected by the accuracy of the engine control system and instrumentation. Proposed text is not clear if compliance to 33.7(d) is required.

- **10. Engine Control Systems**

(f) Engine control system failures. The engine control system must—

[…]

~~*(2) When in the full-up configuration, be single-fault tolerant, as determined by the Administrator, for electrical, electrically detectable, and electronic failures involving LOPC events;*~~

[…]

The AIAB proposes to delete this special condition requirement. The single-fault tolerance requirement may be too restrictive and its intent can be covered by the requirements (f)(1), (f)(3) and (f)(4). In some applications, such as aircraft with distributed propulsion system, LOTC/LOPC event in a single engine can be considered minor and it may not require electrical redundancy as requested by this requirement (f)(2).

- **10. Engine Control Systems**

(i) Aircraft-supplied data.

Any single failure leading to loss, interruption, or corruption of aircraft supplied data (other than power command signals from the aircraft), or aircraft-supplied data shared between engine systems within a single engine or between fully independent engine systems must—

(2) Be able to be detected and accommodated by the control system.

[…]

AIAB proposes to keep a more prescriptive requirement as originally defined in 14 CFR Part 33.28(h)(2). The accommodation strategy can be dependent on the intended application, since acceptable change thrust or power will depend on the effects in the aircraft. Effects of aircraft supplied data failures should be evaluated and documented in the engine installation instructions.

33.28(h)(2) Be detected and accommodated. The accommodation strategy must not result in an unacceptable change in thrust or power or an unacceptable change in engine operating and starting characteristics. The applicant must evaluate and document in the engine installation instructions the effects of these failures on engine power or thrust, engine operability, and starting characteristics throughout the flight envelope.

- **13. Critical and Life-Limited Parts**

Regarding this paragraph, AIAB proposes that the assumptions considered in the life-limited parts analysis should be documented in the engine installation manual, mainly if the engine is certified with no associated aircraft. Aircraft operation profile can differ a lot for each intended application, and assumptions for life-limited part analysis for one aircraft may not be valid for a different application.

Best Regards,

Julio Hideo Shidara
President of AIAB