Federal Aviation Administration

Memorandum

Date: June 16, 2016

To: Manager, Atlanta ACO, ACE-115A

From: Manager, Small Airplane Directorate, ACE-100

Prepared by: Raymond Johnston, Project Support Office, ACE-112

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Piper Aircraft, Inc. PA-46-600TP, 14 CFR Part 23 Amendment 23-62, FAA Project # AT13893AT-A

ELOS Memo#: AT13893AT-A-G-9

Regulatory Ref: 14 CFR 23.45, 23.51, 23.63, 23.73, 23.77, 23.161, 23.181, 23.221, 23.251, 23.253, 23.831, 23.1527, 23.1545, and 23.1583

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This memorandum informs the certificate management aircraft certification office of an evaluation made by the Accountable Directorate on the establishment of an equivalent level of safety finding for the Piper Aircraft Corporation model PA-46-600TP.

Background:

Airplane Description:

The PA-46-600TP is an aluminum, low wing, normal category, single turboprop, pressurized airplane. The airplane is powered by a 600 shaft horsepower Pratt & Whitney PT6A-42A turboprop engine with a Hartzell 4 blade constant speed, reversible propeller. It has a maximum take-off weight of 6,000 lbs. with a maximum seating capacity of up to six, including a two-crew flight deck.

Airplane Certification Basis:

The PA-46-600TP is derivative model that will be type certified in the normal category of part 23 and added to FAA Type Certificate (TC) A25SO. The type certification basis includes part 23, amendment 23-62, for the areas of significant change per 14 CFR 21.101. The certification basis for this model includes 14 CFR part 36, as amended by amendment 36-1 through amendment 36-28, and 14 CFR part 34, as amended through amendment 34-4. The certification basis also includes other equivalent level of safety findings for regulations outside the scope of this finding.

The Need for an Equivalent Level of Safety Finding:

Amendment 23-62 (76 FR 75736, December 2, 2011) amended the applicable regulations for part 23 turbofan- and turbojet-powered airplanes to reflect the current needs of industry, accommodate future trends, address emerging technologies, and provide for future airplane operations.

Recently, while working several new certification projects that incorporated amendment 23-62, some unintentional errors were discovered by the FAA. The Small Airplane Directorate reviewed amendment 23-62, identified the errors, and drafted a corrected version of regulations. The Small Airplane Directorate is drafting a technical amendment to correct amendment 23-62. In the meantime, to avoid project delays for applicants certifying new airplanes under amendment 23-62, the FAA created Issue Paper G-9 to show an ELOS to the intent of amendment 23-62.

Applicable regulations:

§§ 23.45, 23.51, 23.63, 23.73, 23.77, 23.161, 23.181, 23.221, 23.251; 23.253, 23.831, 23.1527, 23.1545, and 23.1583.

Regulations requiring an ELOS finding:

§§ 23.45, 23.51, 23.63, 23.73, 23.77, 23.161, 23.181, 23.221, 23.251; 23.253, 23.831, 23.1527, 23.1545, and 23.1583.

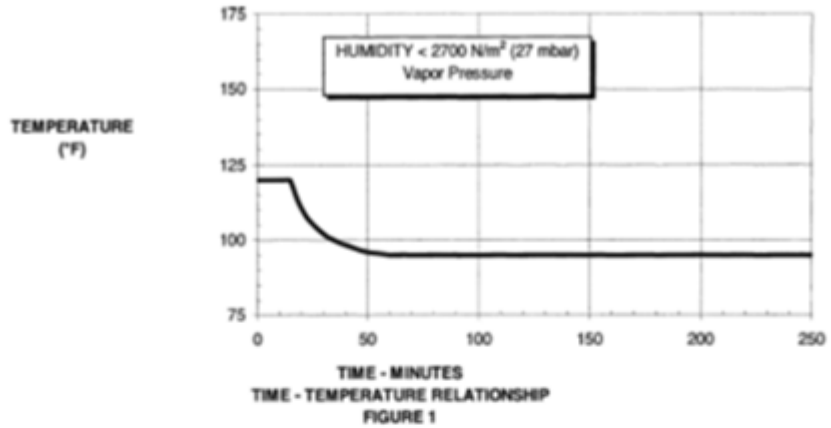
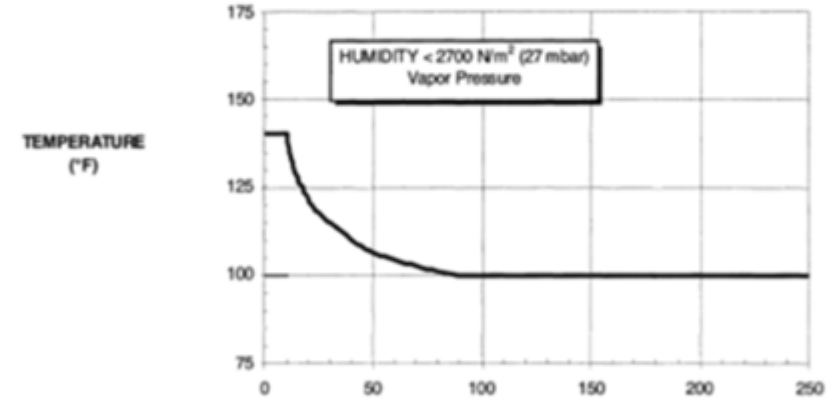
Description of compensating design features or alternative Methods of Compliance (MoC) which allow the granting of the ELOS (including changes, limitations, or equipment needed for equivalency)

The FAA has determined that an ELOS finding is the appropriate means for showing that the PA-46-600TP meets the intent of amendment 23-62. The following table documents the ELOS to amendment 23-62 for the PA-46-600TP.

CFR 14 Reference	**Equivalent Interpretations**
§ 23.45, General (Performance)	
§ 23.45(h)(4) change:	"§ 23.67(c)(4)" to "§ 23.67(d)(4)"
§ 23.51, Takeoff speeds	
§ 23.51(c)(4) change:	"§ 23.67(c)(1) and (c)(2)" to "§ 23.67(d)(1) and (d)(2)"
§ 23.63, Climb: General	
§ 23.63(c), including (c)(1) and (c)(2), change to read:	(c) For each of the following normal, utility, and acrobatic category airplanes: (1) reciprocating engine-powered airplanes of more than 6,000 pounds maximum weight, (2) single engine turbines, and (3) multiengine turbine airplanes of 6,000 pounds or less maximum weight, compliance must be shown at weights as a function of airport altitude and ambient temperature within the operational limits established for takeoff and landing, respectively, with: (1) For reciprocating engine-power airplanes of more than 6,000 pounds maximum weight: (i) Sections 23.65(b) and 23.67(b)(1) and (2), where appropriate, for takeoff and (ii) Section 23.67(b)(2), where appropriate, and § 23.77(b), for

CFR 14 Reference	Equivalent Interpretations
	landing, (2) For single-engine turbines: (i) Section 23.65(b), for takeoff, and (ii) Section 23.77(b) for landing. (3) For multiengine turbine airplanes of 6,000 pounds or less maximum weight: (i) For takeoff, § 23.65(b) and (A) If a turbopropeller-power airplane, § 23.67(b)(1), and (2), where appropriate. (B) If a jet airplane, § 23.67(c)(1), and (2), where appropriate. (ii) For landing, § 23.77(b) and (A) If a turbopropeller-powered airplane, § 23.67(b)(2), where appropriate. (B) If a jet airplane, § 23.67(c)(2), where appropriate.
§ 23.63(d)(1) change to read:	(d) * * * (1) If a normal, utility, or acrobatic category, turbopropeller-powered airplane: (i) Section 23.67(b)(1), and (2), where appropriate, for takeoff, and (ii) Section 23.67(b)(2), where appropriate, and § 23.77(c), for landing.
§ 23.63(d)(2) change to read:	(d) * * * (2) If a jet or commuter category airplane: (i) Section 23.67(d)(1), (2), and (3), where appropriate, for takeoff, and (ii) Section 23.67(d)(3), and (4), where appropriate, and § 23.77(c) for landing.
§ 23.73, Reference landing approach speed	
§ 23.73(b) change to read:	"Each of the following normal, utility, and acrobatic category airplanes: (1) reciprocating engine-powered airplane of more than 6,000 pounds maximum weight, (2) turbine powered airplane of 6,00 pounds or less maximum weight, and (3) single engine turbine powered airplane of more than 6,000 pounds maximum weight,"
§ 23.73(c) change:	"jets of more than" to "multiengine turbine powered airplanes over"
§ 23.77, Balked landing	
§ 23.77(b) change to read:	"Each of the following normal, utility, and acrobatic category airplanes: (1) reciprocating engine-powered airplane of more than 6,000 pounds maximum weight, (2) turbine powered airplane of 6,000 pounds or less maximum weight, and (3) single engine turbine powered airplane of more than 6,000

CFR 14 Reference	**Equivalent Interpretations**
	pounds maximum weight,
§ 23.161, Trim	
§ 23.161(d) change:	"§ 23.67(a), (b)(2), or (c)(3)," to "§ 23.67(a), (b)(2), (c)(2), or (d)(3),"
§ 23.181, Dynamic stability	
§ 23.181(c) change:	"(b)(2)" to "the fixed position testing of (b)"
§ 23.221, Spinning	
§ 23.221(a)(2)(ii) change:	"§ 23.201(e)" to "§ 23.201(f)"
§ 23.221(b) change:	"§ 23.807(b)(7)" to "§ 23.807(b)(6)"
§ 23.221(c) change:	"§ 23.807(b)(6) to "§ 23.807(b)(5)"
§ 23.251, Vibration and buffeting	
§ 23.251(a) change:	"turbojets" to "jets"
§ 23.253, High speed characteristics	
§ 23.253(b)(2) change:	"turbojets" to "jets"
§ 23.831, Ventilation	
§ 23.831(d) add to the end of the paragraph:	"The cabin cooling system must be designed to meet the following conditions during flight above 15,000 feet mean sea level (MSL): (1) After any probable failure, the cabin temperature-time history may not exceed the values shown in Figure 1 of this paragraph. (2) After any improbable failure, the cabin temperature-time history may not exceed the values shown in Figure 2 of this paragraph."

CFR 14 Reference	Equivalent Interpretations
	 TIME - TEMPERATURE RELATIONSHIP FIGURE 1  TIME - TEMPERATURE RELATIONSHIP FIGURE 2
§ 23.1527, Maximum operating altitude	
§ 23.1527(b) change:	"§ 23.775(e)" to "§ 23.775(d)"
§ 23.1545, Airspeed indicator	
§ 23.1545(d) change:	"(b)(4)" to "(b)(3)"
§ 23.1583, Operating limitations	
§ 23.1583(c)(3) change to read:	"For each of the following normal, utility, and acrobatic category airplanes: (1) reciprocating engine-powered airplanes of more than 6,000 pounds maximum weight, (2) single-engine turbines, and (3) multiengine turbines of

CFR 14 Reference	Equivalent Interpretations
	6,000 pounds or less maximum weight . . .”
§ 23.1583(c)(3)(i) change:	“§ 23.63(c)(1)” to “§ 23.63(c)(1)(i), (c)(2)(i), or (c)(3)(i), as appropriate”
§ 23.1583(c)(3)(ii) change:	“§ 23.63(c)(2)” to “§ 23.63(c)(1)(ii), (c)(2)(ii), or (c)(3)(ii), as appropriate”
§ 23.1583(c)(4) change:	“jets” to “turbines”
§ 23.1583(c)(4)(i) change:	“§ 23.63(d)(1)” to “§ 23.63(d)(1)(i), or (d)(2)(i), as appropriate”
§ 23.1583(c)(5) change:	“jets” to “turbines”
§ 23.1583(c)(5)(i) change:	“§ 23.63(d)(1)” to “§ 23.63(d)(1)(ii) or (d)(2)(ii), as appropriate”

Explanation of how design features or alternative Methods of Compliance (MoC) provide an equivalent level of safety intended by the regulation:

The FAA has determined that an ELOS finding is the appropriate means for showing that the PA-46-600TP meets the intent of amendment 23-62. The previous table documents the ELOS to amendment 23-62 for the PA-46-600TP.

FAA approval and documentation of the ELOS finding:

The FAA has approved the aforementioned ELOS finding in project issue paper G-9. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Accountable Directorate has assigned a unique ELOS memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS memorandum number must be listed in the Type Certificate Data Sheet under the Certification Basis section (TCs & ATCs). An example of an appropriate statement is provided below.

Equivalent Level of Safety findings has been made for the following regulation(s):

23.45 General (Performance)
23.51 Takeoff speeds
23.63 Climb: General
23.73 Reference landing approach speed
23.77 Balked landing
23.161 Trim
23.181 Dynamic Stability
23.221 Spinning
23.251 Vibration and buffeting
23.253 High speed characteristics

23.831 Ventilation
23.1527 Maximum Operating Altitude
23.1545 Airspeed indicator
23.1583 Operating limitations

//SIGNED// June 16, 2016

Mel Johnson, Acting Manager, Small Airplane Directorate, Aircraft Certification Service — Date

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