



Federal Aviation Administration

Memorandum

FAA Order 1050.1, Guidance Memo #6¹

Date: January 10, 2013

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Michael Danahy, Acting Manager, Quality, Integration and Process Division, AQS-100

CC: Rebecca Cointin, Manager, Noise Division, AEE-100

From: Julie Marks, Manager, Environmental Policy and Operations Division, AEE-400

Subject: Clarification of FAA Order 1050.1 CATEX for Aerobatic Actions

PURPOSE

This memorandum is in response to Aviation Safety's (AVS) request for clarification from the Office of Environment and Energy (AEE) for the Categorical Exclusion (CATEX) pertaining to aerobatic actions in FAA Order 1050.1 *Environmental Impacts: Policies and Procedures* in order to harmonize the interpretation of terms and facilitate consistent application of this CATEX. The current version of the order is FAA Order 1050.1E, Change 1, and the CATEX pertaining to aerobatic actions is contained in paragraph 312b (*Categorical Exclusions for Regulatory Actions*). Paragraph 312b FAA Order 1050.1E, Change 1 reads as follows:

312b. Authorizations and waivers for infrequent or one-time actions, such as an airshow or aviation-related exposition, to include an aerobatic practice box or aerobatic contest box per FAA Order 8700.1, Chapter 48, and parachuting or skydiving events that may result in some temporary impacts that revert back to original conditions upon action completion. (ATO, AFS)²

There have been different interpretations of the term "infrequent" used in Categorical Exclusion (CATEX) 312b. In addition, the use of the terms "aerobatic practice box" and "aerobatic contest box," as opposed to "aerobatic practice area," may make it difficult to determine when the CATEX is applicable. Therefore, this memorandum seeks to (1) define the term "infrequent" in the context

¹ This document is guidance memo #6 for FAA Order 1050.1. It is the sixth in a series of memos to provide additional guidance on FAA's NEPA requirements, procedures, and practices.

² This CATEX references 8700.1, which no longer exists. The current reference is FAA Order 8900.1 Flight Standards Information Management System, Volume 3 General Technical Administration, Chapter 5 Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box, Section 1.

of the aerobic actions CATEX³ and (2) clarify the applicability of CATEX 312b to “aerobic practice areas” (APAs).

DEFINING “INFREQUENT”

Based on years of experience with aerobic operations, noise is the environmental impact with the most potential to result in a significant impact. Therefore, aerobic operations that can occur and not cause a significant noise impact have been determined by examining the noise results of the Volpe National Transportation System Center (Volpe) Report DOT-VNTSC-FAA-12-06 named “Analysis of Aerobic Aircraft Noise Using the FAA’s Integrated Noise Model”, hence referred to as the Volpe Report.

The Volpe Report grouped aerobic operations by aircraft category (e.g., low weight piston, high power radial (warbird), high power jets) and by routine type (i.e. Sportsman, Intermediate, Advanced, Unlimited). The Volpe Report examined the aircraft types and routines that are flown in the aerobic practice box or aerobic contest box, along with different numbers of operations flown. Based on the Volpe Report results, AEE has determined that the number of operations by aircraft category is the governing factor for noise impact and that the type of routines being flown do not result in a substantial difference in noise. We have also used the Volpe Report to determine the number of operations by aircraft category that can be flown in an aerobic practice box in a year without resulting in a Day-Night Average Sound Level (DNL) of 65 decibels (dB) and, therefore, would not result in a significant noise impact. Since a significant noise impact could only occur if a proposed action would cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB, an annual number of operations in an aerobic practice box that would not result in a DNL of 65 dB would not result in a significant noise impact absent extraordinary circumstances.⁴ Accordingly, we can support a CATEX that defines infrequent use in terms of numbers of annual operations by aircraft category.

For low weight pistons, mid weight pistons, high weight pistons and high weight radials, “infrequent” is defined as 18,000 or less annual operations. For aircraft that are categorized as mid power jets and high power radials (warbirds), “infrequent” is defined as 1,800 or less annual operations. Finally, for high power jets, “infrequent” is defined as 300 or less annual operations. Below is a table with these aircraft categories and the corresponding “infrequent” definition. The Attachment lists aircraft by name and engine type within each category that were used to determine these numbers.

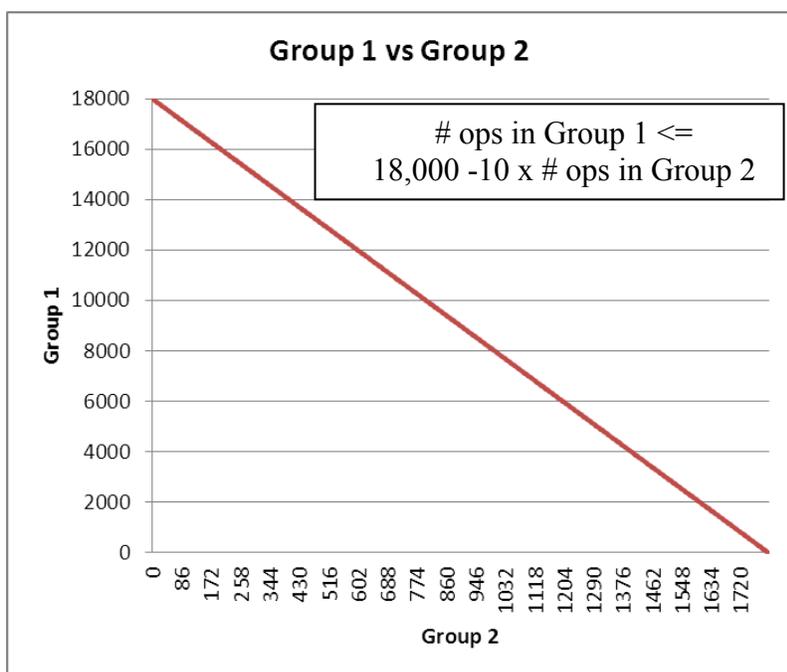
Aircraft Category	Aircraft Group (for mixed use definition)	“Infrequent” Definition
Low Weight Pistons	Group 1	18,000 or less annual operations
Mid Weight Pistons		
High Weight Pistons		

³ In this memorandum, the term “aerobic actions CATEX” refers to CATEX 312b in FAA Order 1050.1E, Change 1, and future versions of this CATEX contained in FAA Order 1050.1F and subsequent revisions, unless explicitly stated otherwise.

⁴ Special consideration needs to be given to certain noise sensitive areas where other noise is very low and a quiet setting is a generally recognized purpose and attribute (e.g., quiet areas in national parks), see FAA Order 1050.1E Change 1 Section 14.3

High Weight Radials		
Mid Power Jets	Group 2	1,800 or less annual operations
High Power Radials (Warbirds)		
High Power Jets	Group 3	300 or less annual operations

In addition, “infrequent” has been defined for situations when the aerobatic practice box or the aerobatic contest box will be used by more than one aircraft group, i.e., “mixed use”. For mixed use situations, the definition of “infrequent” is defined using a graphical method to account for a trade-off between the numbers of aircraft in each group that ensures noise would remain below the significant level. Below are three graphs showing the trade-offs between the three groups. Annual numbers of operations on and below the line depicted in the graphs support a CATEX. An exact number can be found by using the formula provided.

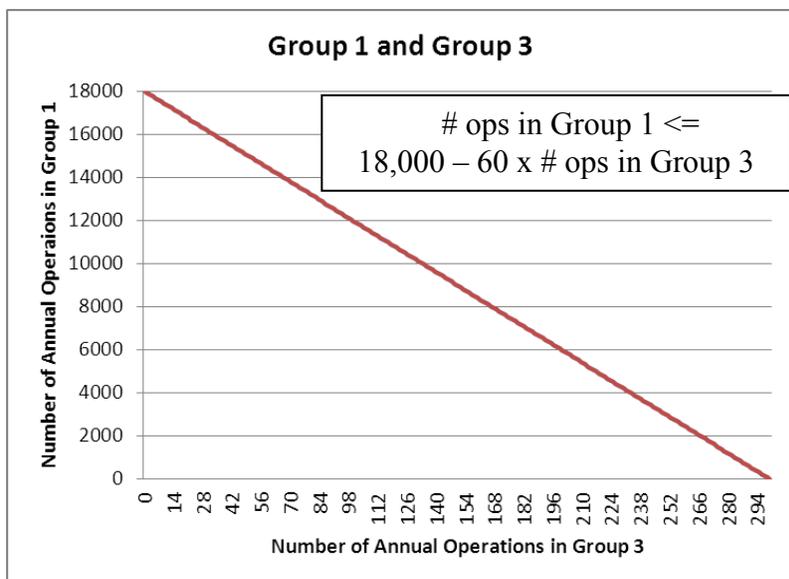


Example: Number of annual operations in Group 1 is 10,000, and number of annual operations in Group 2 is 770.

$$18,000 - 10 \times 770 = 18,000 - 7,700 = 10,300$$

The number of annual operations in Group 1 (10,000 ops) is less than 10,300.

The APA with this mixed use is eligible for the aerobatic actions CATEX.

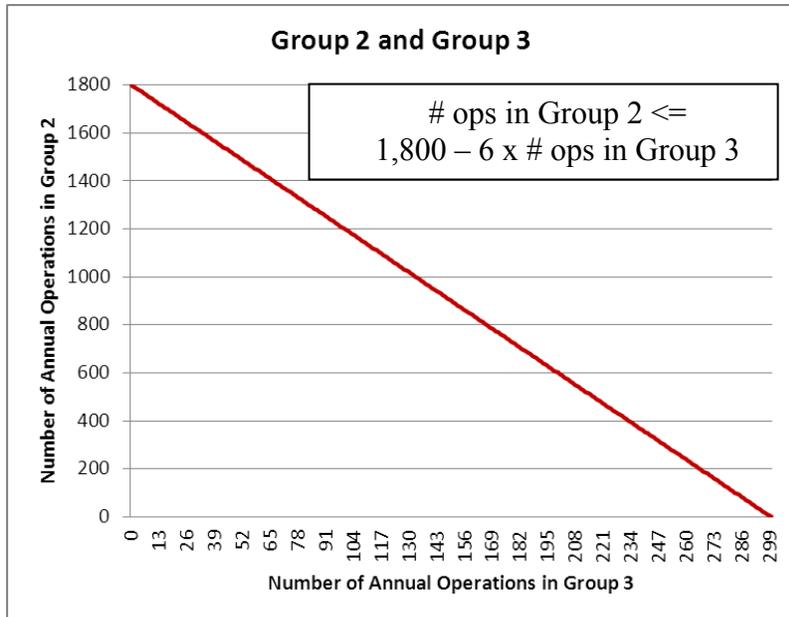


Example: Number of annual operations in Group 1 is 8,000, and number of annual operations in Group 3 is 170.

$$18,000 - 60 \times 170 = 18,000 - 10,200 = 7,800$$

The number of annual operations in Group 1 (8,000 ops) is not less than or equal to 7,800.

The APA with this mixed use is not eligible for the aerobatic actions CATEX.



Example: Number of annual operations in Group 2 is 800, and number of annual operations in Group 3 is 166.

$$1,800 - 6 \times 166 = 1,800 - 996 = 804$$

The number of annual operations in Group 2 (800 ops) is less than 804.

The APA with this mixed use is eligible for the aerobatic actions CATEX.

Should a unique situation occur in which mixed use is proposed that would involve all three groups of aircraft, please consult AEE regarding the calculation of operations that would be eligible for a aerobatic actions CATEX.

AEROBATIC PRACTICE AREA APPLICABILITY

While CATEX 312b has been applied to aerobatic practice boxes and aerobatic contest boxes, it has not been applied to aerobatic practice areas (APAs). This guidance is intended to clarify that CATEX 312b can be applied to Certificates of Waiver requests for an “aerobatic practice area,” when the request for a waiver is limited to one box.

FAA Order 8900.1 Flight Standards Information Management System, Volume 3 General Technical Administration, Chapter 5 Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box, Section 1⁵, paragraph 3-118(A)(3)(a) states that “An aerobatic practice area is established for the purpose of practicing aerobatic skills” but does not define the area. FAA Order 8900.1, Volume 3, Chapter 5, Section 1, paragraph 3-118(A)(3)(b) also states that an “aerobatic contest box is established for the sole purpose of conducting competitive aerobatic demonstrations in accordance with the rules, procedures and practices of the International Aerobatic Club (IAC).” In addition, FAA Order 8900.1, Volume 3, Chapter 6 states that an “aerobatic box” is “The airspace at an air show where participating aircraft are authorized to perform aerobatic maneuvers appropriate to their category.”

The federal action associated with an “aerobatic practice area” is the Certificate of Waiver, which is the same federal action as for an “aerobatic practice box” and the same action to which CATEX 312b is applied.

An “aerobatic practice area” containing a single box is essentially the same as an “aerobatic practice box” and should be treated the same for purposes of applying CATEX 312b. Examination of documentation associated with 115 Waiver requests from approximately 2009 to 2011 compiled by AVS found that 95.7% of the “aerobatic practice areas” analyzed contain single boxes.

CONCLUSION

Based upon a review of the data in the Volpe Report, consultation with AVS, and absent extraordinary circumstances, the aerobatic actions CATEX (paragraph 312b in FAA Order 1050.1E, Change 1) can be applied to Certificates of Waiver requests for an “aerobatic practice area” (in addition to aerobatic practice boxes and aerobatic contest boxes) when (1) the request for a waiver is limited to one box, and (2) the APA usage will not exceed the numbers of annual operations for the appropriate aircraft category or mix of categories allowed in this guidance memo.

We hope that this clarification will alleviate any misinterpretation of the CATEX in question, and provide consistent understanding across the AVS organization.

cc: AFS-408, AGC-600

/s/ Julie Marks on January 10, 2013

Manager, Environmental Policy and Operations Division, AEE-400

⁵ <http://fsims.faa.gov/PICResults.aspx?mode=EBookContents>

Attachment

Aircraft List

The mappings of aerobatic aircraft used for the definition of “infrequent” are presented below.

Low Weight Piston

Aircraft Name	Engine
Steen Skybolt	Lycoming HO-360-B1B piston, 180 hp (130 kW)
American Champion Citibria	Lycoming O-320-A2B, 150 hp (111.9 kW)
Pitts S-2	Textron Lycoming AEIO-540-D4A5 flat-six air cooled piston engine, 260 hp (194 kW)
RV-4	Lycoming O-320, O-360 or IO-360, 150-180hp (110-135 kW)
RV-6	Lycoming O-320 or Lycoming O-360 fixed pitch or constant speed, 150-180hp (112-134 kW)
Piper J-3	Continental A-65-8 air-cooled flat four, 65 hp (48 kW) at 2,350 rpm
Aviat Eagle	Lycoming AEIO-360-A1D, 200 hp (149 kW)
Great Lakes 2T	Lycoming engine
Lazer 230	piston engine
Stearman	radial engine

Mid Weight Piston

Aircraft Name	Engine
Zlin 242	Avia M 137A inverted 6 cylinder inline engine, 134 kW (180 hp)
American Champion 8KAB Decathlon	Lycoming AEIO-360-H1B CSU, 180 hp (134.2 kW)
RV-7	Lycoming O-320 or Lycoming O-360 Constant Speed or Fixed Pitch, 160 to 200 hp (119 to 149 kW)
RV-8	Lycoming O-320, Lycoming O-360 or Lycoming IO-360 fixed pitch or constant speed, 150-200hp (112-149 kW)
Cap 232	Lycoming AEIO-540-L1 B5D air-cooled flat-six, 224 kW (300 hp)
Edge 540	Modified Lycoming AEIO-540 Hartzell composite, 3 blade, 254 kW (340 hp)

Giles 202	Lycoming AEIO-360-A1E piston engine, 235 hp ()
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High Weight Piston

Aircraft Name	Engine
Grob G120	Lycoming AEIO-540-D4D5 6-cylinder, horizontally opposed engine, 194 kW (260 hp)
Extra 300	Lycoming AEIO-540-L1B5 MT-Propeller composite propeller (3- or 4-blade), 224 kW (300 hp)

High Weight Radial

Aircraft Name	Engine
Sukhoi 31	Vedeneyev M-14PF, 294 kW (400 hp)
Super solution	Pratt & Whitney R-1340 Radial, 535 hp (399 kW)
Yak 52	Vedeneyev M-14P 9-cylinder radial engine, 268 kW (360 hp)
Yak 55	Vedeneyev M14P 9-cylinder radial engine, 268.5 kW (360.1 hp)

Mid Power Jet

Aircraft Name	Engine
Aero Vodochody L39C	Ivchenko AI-25TL turbofan, 16.87 kN (3,792 lbf)
Dornie alpha jet	SNECMA Turbomeca Larzac 04-C5 turbofans, 13.24 kN (2,976 lbf) each
MiG 15 UTi	Klimov VK-1 turbojet, 26.5 kN (5,950 lbf)

High Power Radial (Warbird)

Aircraft Name	Engine
Hawker Sea Fury	Bristol Centaurus XVIIC 18-cylinder twin-row radial engine, 2,480 hp (1,850 kW)
North American T6	Pratt & Whitney R-1340-AN-1 Wasp radial engine, 600 hp (450 kW)
North American P51 Mustang	Packard V-1650-7 liquid-cooled supercharged V-12, 1,490 hp (1,111 kW) at 3,000 rpm; [76] 1,720 hp (1,282 kW) at WEP
Lockheed P-38	Allison V-1710-111/113 V-12 piston engine, 1,725 hp [N 7] (1,194 kW) each

Grumman 7F7	Pratt & Whitney R-2800-34W "Double Wasp" radial engines, 2,100 hp (1,566 kW) each
P-47	Pratt & Whitney R-2800-59 twin-row radial engine, 2,535 hp (1,890 kW)
Grumman F8F Bearcat	Pratt & Whitney R-2800-34W "Double Wasp" two-row radial engine, 2,100 hp (1,567 kW)
North American A36	Allison V-1710-87 liquid-cooled piston V12 engine, 1,325 hp (988 kW)
North American T28	Wright R-1820 single row radial 1425 hp

High Power Jet

Aircraft Name	Engine
F-15	Pratt & Whitney F100-100 or -220 afterburning turbofans
F-16	F110-GE-100 afterburning turbofan