Federal Aviation Administration

Memorandum

Date: January 30, 2006

To: Jim Ballough, AFS-1

From: Rebecca MacPherson, AGC-200

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Subject: Interpretation of "Flight Training Device" in 14 CFR Part 142

Introduction

In response to a memorandum dated October 26, 2005, from the Office of the Inspector General (OIG), the Office of the Chief Counsel has reviewed guidance materials issued by the Flight Standards Service (AFS) used to determine what constitutes an acceptable "Flight Training Device" (FTD) under Part 142, Title 14 of the Code of Federal Regulations (14 CFR). In addition to the guidance materials, this office has also reviewed the history of the underlying regulations and preamble materials. Further, this office considered the information included in the OIG memorandum. This office concludes that the AFS guidance materials are legally sound and consistent with both the letter and the spirit of Part 142. Further, this office finds that the application of the regulation by the senior FAA inspector discussed below is consistent with the AFS guidance regarding the approval of FTD.

The OIG memorandum reported an allegation that:

> The senior inspector, for personal reasons, does not want CRM to have approval for any course that is conducted in an aircraft without associated training in a simulator or FTD and the FTD would have to be an advanced (level 6) FTD or above.

The OIG memorandum also stated that, "[r]egulations regarding the use of an FTD are not clear" and requested that AFS provide a legal interpretation regarding the requirements for a FTD under part 142.

The Requirements for Flight Training Devices

The concise answer to the question posed by OIG is that only those FTD that must utilize flight data supplied by aircraft manufacturers for specific make, models, and series of aircraft meet the requirements of part 142. The only FTD that fit within this requirement are level 6 or above.

The requirement for flight simulators and flight training devices is contained in 14 CFR § 142.59 which states in relevant part:

> (a) An applicant for, or holder of, a training center certificate must show that each flight simulator and flight training device used for training, testing, and checking (except AQP) will be or is specifically qualified and approved by the Administrator for—
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> *(1) Each maneuver and procedure for the make, model, and series of aircraft, set of aircraft, or aircraft type simulated, as applicable; and [emphasis supplied]*
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> (2) Each curriculum or training course in which the flight simulator or flight training device is used, if that curriculum or course is used to satisfy any requirement of 14 CFR chapter I.
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> (b) The approval required by paragraph (a)(2) of this section must include—
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> (1) The set of aircraft, or type aircraft;
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> (2) If applicable, the particular variation within type, for which the training, testing, or checking is being conducted; and
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> (3) The particular maneuver, procedure, or crewmember function to be performed.

Section 142.59 describes a standard for flight simulators and FTD that requires that they replicate the form and function of the aircraft being simulated to the degree that they can be used in the training, testing, and checking of pilots.

Flight simulators are classified as Level A, Level B, Level C, or Level D. Level C and Level D simulators are state-of-the-art, high fidelity equipment while Level A and Level B were designed and built with less advanced technology. Flight training devices are classified into levels ranging from 1 to 7. Level 7 devices are the most advanced and level 1 are least advanced. (These values primarily reflect the sophistication of the FTD software and not the hardware.) In satisfying the requirement of part 142, a flight simulator in any of the four levels is sufficient. However the same is not true for flight training devices. Only level 6 and level 7 advanced flight training devices are considered acceptable.

Flight simulators of all levels and level 6 and level 7 FTD share the common trait that they all must use airplane manufacturer supplied flight data that is aircraft specific. By drawing a threshold at level 6 FTD, AFS has applied the regulation in a manner consistent with section 142.59(a) and with the fundamental purpose of part 142 as discussed below. (The evaluation and approval of simulators and advanced FTD is managed by the FAA's National Simulator Program. The National Simulator Program long predates part 142 and is comprised of experienced engineers and pilots. The agency relies on their technical judgment to ensure that devices used by air carriers and part 142 training centers are of sufficiently high fidelity to meet their intended purpose of supplanting aircraft in training programs).

Part 142 Training Centers

14 CFR Part 142 established a regulatory framework for allowing training that once had to be conducted in airplanes to be conducted on the ground using advanced flight training technology. Modern flight simulators and FTD are able to replicate aircraft performance, handling, and functionality to a very high degree of fidelity. There are clear advantages to conducting certain types of flight training in advanced simulators or FTD rather than using airplanes. The use of these devices results in less air traffic congestion, noise, and air pollution. Further they allow for certain emergency procedures training that cannot be safely conducted in actual flight.

Beginning in the early 1970s the FAA had begun allowing training in advanced simulators to supplant certain portions of training traditionally conducted in airplanes; simulator training was permitted through the exemption process and was only available to part 121 certificate holders initially to train their own crewmembers. That was later expanded to include part 135 certificate holders. In subsequent years, more exemptions were issued allowing part 121 and part 135 certificate holders to provide training services using advanced simulators to other certificate holders and also to allow aircraft manufacturers to provide such training (57 FR 35888, August 11, 1992). In summary, it became apparent to the FAA and to the aviation community that certain advanced flight training activities could occur independently of air carrier operations.

The FAA proposed part 142 based on a recommendation from a joint industry/FAA task force that discussed using "an operational concept that would require a training center to obtain a certificate plus a training specification (similar to an operating specification for part 121 and part 135 operators). It is believed that this would add flexibility to accommodate changing conditions without changing the certificate itself." (57 FR 35889) The preamble went on to state that the proposed system, "would allow training centers that do not hold a part 121 or part 135 operating certificate to use approved flight simulators and approved flight training devices for airman training, testing, and checking." (57 FR 35890). The baseline concept of a part 142 training center proposed by the FAA can be analogized to an air carrier training department that utilizes a training program reliant on advanced simulation.

This distinction drawn between the different levels of FTD by AFS is consistent with the intent and purpose of part 142 i.e. to promote flight training outside of airplanes using high-fidelity equipment that very faithfully replicates the airplane and the flight environment. By drawing a line to include only those kinds of equipment that utilize actual data from manufacturers, AFS assures that the training devices used by part 142-certificated training centers handle and respond just as the actual aircraft types being simulated.

Flight Training Conducted in Aircraft

The allegation also stated that the senior FAA inspector would not approve any course conducted in an aircraft without associated training in a simulator or FTD. This office believes that the senior inspector correctly applied the regulations. Pilot training courses conducted primarily using aircraft without an associated flight simulator or FTD component fall within the scope of 14 CFR Part 141, which regulates pilot schools.

While both part 141 pilot schools and part 142 training centers provide training, they are regulated differently as the former rely primarily on actual aircraft and the latter rely primarily on advanced simulators and flight training devices. Thus the pertinent safety oversight considerations and priorities of the FAA vary according to the nature of these operations. Part 141 contains certain safeguards including the hiring of specially qualified flight instructors to reflect the use of airplanes in training. These safeguards are not necessary for training that occurs primarily on the ground and thus are not included in part 142. The Director of AFS issued a memorandum dated June 3, 2004, to all Regional Flight Standards Division Managers. This office finds that the AFS memorandum correctly clarified what types of training may be provided by each type of certificate holder when it stated that "when approving these pilot training course under 14 CFR part 142, they will be based on advanced flight training devices and/or simulators." This is consistent with the structure of the regulation which separates the regulations for training activities primarily conducted in aircraft and training activities primarily conducted in advanced flight simulators and training devices.

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