



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: Aircraft Fuel Storage, Handling,
Training, and Dispensing on Airports

Date: 9/28/2012

AC No: 150/5230-4B

Initiated by: AAS-300 **Change:**

- 1. Purpose.** This advisory circular (AC) contains specifications and guidance for the storage, handling, and dispensing of aviation fuel on airports. Additionally, this AC provides standards and guidance for the training of personnel who conduct these activities.
- 2. Cancellation.** This AC cancels AC 150/5230-4A, Aircraft Fuel Storage, Handling, and Dispensing on Airports, dated June 18, 2004.
- 3. Application.** This AC provides an acceptable means of complying with Title 14 Code of Federal Regulations (CFR) part 139 (hereinafter referred to as Part 139) for all Part 139 airport operators. Although non-certificated airports are not required to develop fuel standards, the FAA recommends these airports use the guidance contained in this AC to develop such standards for the continued enhancement of aviation safety.
- 4. Addendum of Authorized Fuel Safety Training Courses.** The Federal Aviation Administration (FAA) regards instructional programs that provide line service and supervisory training, as required by 14 CFR §139.321 (e) (1) and (2), as critical to safety on airports.

To ensure this training is complete and effective, the FAA has determined that:

- a.** Third-party training providers who provide line service training and/or supervisory training of line service personnel must submit their training syllabus to the Administrator for review and a determination of its acceptability.
- b.** Airport and Tenant Fueling Agents who provide line service training for other than their own airport employees and/or supervisory training of line service personnel must submit their training syllabus to the Administrator for review and a determination of its acceptability.
- c.** Training syllabus (syllabi) should be submitted to:

Federal Aviation Administration
Manager, Airport Safety and Operations
Attn: Fuel Safety Training
800 Independence Ave SW
AAS-300, Room 618
Washington DC 20591

The FAA publishes a list of the companies offering courses of instruction in line service training as well as supervisory training that are acceptable to the Administrator. Because changes may occur more frequently than the schedule for updating the AC, the FAA will review this list on a quarterly basis and post an updated version online as an **Addendum** to this AC.

The airport operator is responsible for consulting the current listing of acceptable training courses. Likewise, the companies listed in this Addendum are responsible for notifying the FAA of any changes to their training syllabus and the availability of the course(s) offered or to contact information.

5. Effective Date. The effective date of this AC is September 28, 2012.

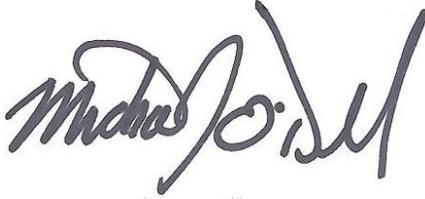
6. Comments or Suggestions. Send suggestions for improving this AC to:

Federal Aviation Administration
Manager, Airport Safety and Operations
Attn: Fuel Safety Training
800 Independence Ave SW
AAS-300, Room 618
Washington DC 20591

7. Principal Changes. This AC contains:

- a. New Chapter 1, Standards and Resources for Procedures on Fuel Storage, Handling, and Dispensing
- b. New Chapter 2, Fuel Safety Training
- c. New Chapter 3, Supervisors Training Course
- d. New Chapter 4, Testing, Certification and Recordkeeping
- e. New Chapter 5, Guidelines for Submitting Line Service and/or Supervisory Safety Course(s)
- f. New Addendum of Authorized Fuel Safety Training Courses
- g. New Appendix A, Definitions and Acronyms
- h. New Appendix B, Additional Resources
- i. Required wording differentiating the two levels of Fuel Safety Training

8. Copies of this AC. The FAA makes this AC and the current Addendum of training courses available online at http://www.faa.gov/regulations_policies/advisory_circulars/.

A handwritten signature in black ink, appearing to read "Michael J. O'Donnell". The signature is stylized and cursive, with the first name "Michael" and last name "O'Donnell" clearly legible.

Michael J. O'Donnell
Director, Office of Airport Safety and Standards

Table of Contents

Chapter 1. Standards and Resources for Procedures on Fuel Storage, Handling, and Dispensing.....5

Chapter 2. Fuel Safety Training6

Chapter 3. Supervisors Training Course.....11

Chapter 4. Testing, Certification, and Recordkeeping.....12

Chapter 5. Guidelines for Submitting Line Service and/or Supervisory Safety Course(s) ..14

Appendix A. Definitions and Acronyms16

Appendix B. Additional Resources.....18

Addendum Of Authorized Fuel Safety Training Courses.....19

Chapter 1. Standards and Resources for Procedures on Fuel Storage, Handling, and Dispensing

- 1. Introduction.** Many standards and resources exist throughout the fueling industry to provide guidance on the proper and safe method for handling aviation fuels.
- 2. Standards.** The FAA uses the standards contained in the most recent edition of National Fire Prevention Association (NFPA) 407, Standard for Aircraft Fuel Servicing. NFPA 407 provides a standard for the storage and delivery of aviation fuel in an airport environment..
- 3. Copies of Standards.** You can order NFPA 407 from:

National Fire Protection Association
1 Batterymarch Park
PO Box 9101
Quincy MA 02269-9101
1-800-344-3555
<http://www.nfpa.org>

NFPA 407 may also be viewed online from the NFPA website as a read-only document at:
<http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=407>.

Chapter 2. Fuel Safety Training

This chapter provides guidance on the development of **both** the supervisory fuel safety and the line service fuel safety training courses. Based on the minimum standards established in 14 CFR §139.321 (b) (1) – (7) and §139.321 (e), this chapter identifies the areas that must be addressed in these courses. **Because of the responsibilities inherent in training others in fire safety, this AC identifies in Chapter 3 further areas of competence that must be met for the Supervisory Training Course.**

1. Introduction.

a. 14 CFR §139.321 sets forth the requirements for fuel safety training at certificated airports. These requirements include two distinct types of training for employees of agents handling aviation fuel: supervisory training and line service fuel safety training. Training performed under the supervisory training program must be obtained by completing a FAA authorized Supervisory Fuel Safety training course. Line service fuel safety training for other employees may be provided by a supervisor who has completed the supervisory course or an authorized fuel safety training program. The material and program utilized by a certified supervisor to provide training to their company employees does not need to be reviewed or approved by the FAA. Training for employees may also be completed through the use of an approved line service fuel safety course. Using an approved line service fuel safety course does not relieve a fueling agent from the obligation to have at least one supervisor complete a supervisory fire safety course.

b. Incidents and accidents caused by the mishandling of fuels and other hazardous materials are vital concerns of both the FAA and airport operators. Additionally, the FAA and other local and federal agencies are concerned with activities related to conditions that lead to personnel injuries and damage to property as well as those attributable to insufficient attention to the impacts that fuel and lubricant products have on the environment when they are not used properly. For these reasons, airports certificated under Part 139 must ensure training is received in the areas listed in 14 CFR §139.321 (b) for personnel whose duties and responsibilities involve the handling and storing of hazardous substances and materials.

c. Part 139.321(e) (1) requires that “[at] least one supervisor with each fueling agent must have completed an aviation fuel training course in fire safety that is authorized by the Administrator. Such an individual must be trained prior to initial performance of duties, or enrolled in an authorized aviation fuel training course that will be completed within 90 days of initiating duties, and receive recurrent instruction at least every 24 consecutive calendar months.”

d. Part 139.321(e) (2) requires “[a]ll other employees who fuel aircraft, accept fuel shipments, or otherwise handle fuel must receive at least initial on-the-job training and recurrent instruction every 24 consecutive calendar months in fire safety from the supervisor trained in accordance with paragraph (e) (1) of this section.” Training for employees may also be completed through the use of an approved line service fuel safety course. The FAA lists supervisory and line service programs currently available nationally in the Addendum, which is updated quarterly. It can be found along with this AC on the FAA’s website.

e. 14 CFR §139.321 (b) places the responsibility of determining standards for fueling safety on the individual airport based on state, local, or municipality fueling regulations. The FAA does not intend this AC to replace airport procedures that are tailored to meet requirements imposed because of the use of special equipment or as a result of local regulations.

f. This AC provides guidelines in Chapter 5 for submitting a supervisory and/or a line service fueling safety program to the FAA for national acceptance.

2. Mandatory Elements for Supervisory and Line Service Fuel Safety Training Programs.

A fuel safety training program should include:

- a. An orientation that addresses:
 - (1) Purpose of the course
 - (2) Expected outcomes as identified in 14 CFR §139.321
 - (3) Familiarity with applicable FAA ACs, fire codes, and fire and fuel safety organizations and their publications
 - (4) Knowledge of fuel types
 - (5) Fueling of different types of aircraft
 - (6) Supervisory Requirement - An overview of techniques for effective training, including:
 - i. Methods of delivery; Classroom, On-the-Job and Online
 - ii. Understanding of different types of learning (i.e. visual, cognitive, hands-on)
 - iii. Motivational aspects of training
- b. Basic safety practices including:
 - (1) Protection against fire and explosions
 - (2) Safe handling and storage procedures for fuels and lubricants
 - (3) An understanding of the term “hazardous materials” and procedures for handling hazardous materials and other fuels and lubricants
 - (4) Use of Personal Protective Equipment (PPE) , including eye protection, ear protection, hand protection, and proper types of clothing and shoes/boots
 - (5) Prohibition on carriage of smoking materials (i.e., cigars, cigarettes, lighters, matches, and pipes)

(6) First aid for responding to contact with aviation fuels or lubricants, including ingestion, inhalation, and contact with eyes or bare skin

c. Bonding

- (1) Definitions as contained in NFPA 407
- (2) Physics of bonding (what/when/why)
- (3) How to ground versus how to bond:
 - i. Where and how to bond
 - ii. Types of bonding equipment
 - iii. Correct bonding procedures
- (4) Static electricity
- (5) Fuel flash points

d. Public protection

- (1) Protection from sources of ignition
- (2) Proper ramp fueling procedures, including aircraft with passengers on board
- (3) Coordination with flight crew prior to fueling aircraft
- (4) Situations requiring cessation of fueling procedures

e. Control of access to storage areas

- (1) Fences and gates/locks
- (2) Signs and other required placarding (e.g., “No smoking,” “Jet A,” “AVgas”)
- (3) Protection and security associated with fuel farms, including proper authorizations and procedures
- (4) Safety awareness (location and operation of fire extinguishers, location of emergency shutoffs, communications for assistance)

f. Fire safety in fuel farm and storage areas

- (1) Verification of product types
- (2) Fuel farm inspection procedures

- (3) Fueling operations at fuel storage facilities during low visibility and night operations
- (4) Fuel delivery operations, including the use of hoses, valves, and other equipment
- (5) Proper procedures for fuel equipment use/storage (nozzle covers, securing of equipment when not in use)
- (6) Leak and spill prevention
- (7) Product leaks and contamination
- (8) Emergency procedures and notifications
 - i. Local spill reporting procedures
 - ii. Spill control and containment (limited quantity)
 - iii. Spill (large quantity) and aircraft rescue and firefighting notification requirement
 - iv. Cleanup procedures
- (9) Fire classification and appropriate types of extinguishers
 - i. Fire classifications and extinguisher types used
 - ii. Inspections, safety, and personnel protection after a spill
 - iii. Hands-on training in use of a portable fire extinguisher (see section 4)
- (10) Effects of weather on fueling operations
- g. Fire safety in mobile fuelers, fueling pits, and fueling cabinets**
 - (1) Weight and balance, driving requirements, speed precautions, and driver qualifications
 - (2) Inspection of fueling vehicle and the sumping, exhaust, and muffler system
 - (3) Procedures and vehicle placement for fueling operations, controls, interlocks, brakes, and chocking
 - (4) Mobile fueler refueling procedures
 - (5) Parking requirements and separation distances
 - (6) Fueling pit safety/procedures/product leaks/clean-up

(7) Fueling cabinet safety procedures

h. Fire code requirement – supervisory personnel requirement (see section 3)

3. Local Fire Codes and Regulations. A local fire code or the National Fire Code may be the governing document at specific airport(s). This information must be included in the course(s). Supervisory personnel must be informed of their responsibility to determine the code that appropriately governs the airport at which they provide and conduct fueling activities. They must ensure code information is incorporated into their line service personnel training. It is their responsibility to receive a briefing on local fire codes from airport management, local Fire Marshall, or Authority Having Jurisdiction (AHJ). Additionally, they must be aware the local jurisdiction may have other safety requirements for fueling procedures at their airport.

a. Airport Operators holding a Part 139 certificate should be aware that it is their duty to provide a briefing to tenant fueling agents on the fire codes in effect at the airport that differ from NFPA 407.

4. Hand Held Fire Extinguishers. Each student must receive hands-on training in the proper use of hand held fire extinguishers. Companies listed in the Addendum must provide this training or highlight the requirement for the student to receive this training from their local fire department or other local qualified source.

a. Certificates of completion for courses that do not include hand held fire extinguisher training must include a statement indicating “excluding hands-on fire extinguisher training”.

b. If hands-on fire extinguisher training is not provided by a company listed in the Addendum, the student is required to complete this training via local fire departments or another qualified provider. A statement or a certificate of completion for hands-on fire extinguisher training must be dated and signed by an approving authority. The statement or certificate of completion must be maintained in the student’s training record as part of the certification that the supervisor has completed all of the required elements of a course in aviation fuel safety in a manner acceptable to the Administrator.

c. Hands-on fire extinguisher training, if not provided concurrently with the supervisory and/or line service training course in fire safety, must be completed within 60 days of completion of the supervisory training course in fire safety.

5. Airport Specific Courses. An individual airport may create and submit for approval a supervisory or line service course in fuel safety that is specific to a particular airport.

a. Such a course may exclude items from section 2 of this chapter that do not apply to that specific airport.

Chapter 3. Supervisors Training Course

The contents of Chapter 2 form the basis of the Supervisory Training Course. This chapter identifies the additional requirements that must be met in the Fire Safety for Supervisors Training Course. In addition, the depth of instruction in each section identified in Chapter 2 must be sufficient to ensure that supervisors understand the material and their responsibilities in training others in fire safety.

1. The FAA recommends that instructors teaching the Supervisor Fuel Training Course possess:
 - a. A thorough working knowledge of the contents of Chapter 2 and **requirements of 14 CFR §139.321(b)(1) through (b)(7) and §139.321(e) (1) and (2).**
 - b. A minimum of 2 years' experience in all aspects of fueling procedures.
2. Instructors teaching the Supervisor Fuel Training Course must be able to discuss training methodologies and motivation and understand how to test student comprehension and recognition.
3. Each supervisor must receive training in the proper use of hand held fire extinguishers. Companies listed in the Addendum must provide this training and identify the requirement for the student to receive this training from their local fire department.
 - a. Certificates of completion for courses that do not include hand held fire extinguisher training must include a statement indicating "excluding fire extinguisher training".
 - b. If hand held fire extinguisher training is not provided by a company listed on the Addendum, the supervisor is required to complete this training via local fire departments. A statement or a certificate of completion for fire extinguisher training provided by a local fire Department must be dated and signed by an approving authority. The statement or certificate of completion from the local fire authority must be maintained in the student's training record as part of the certification that the supervisor has completed all of the required elements of a course in aviation fuel safety in a manner acceptable to the Administrator.
4. The date of the fire extinguisher training, the date of completion of the fuel safety course, or whichever occurred most recently should be used as the date to verify completion of all required elements of aviation fuel safety training.

Chapter 4. Testing, Certification, and Recordkeeping

1. Exams. Exams or tests may be oral, written, practical, or a combination. All test questions must be researched and referenced with validation of correct answers shown in the master test and retained on file.

2. Record-keeping.

a. Responsibilities of Airport Fueling Agents.

(1) Fueling agents must maintain a copy of the certificate of completion for any supervisors completing a supervisory course in fueling safety for 24 consecutive calendar months.

(2) 14 CFR §139.321(e)(2) requires all employees to receive initial hands-on and recurrent training from a supervisor who has completed a Supervisory Training Program in Fire Safety. Records of that training must be maintained by the fueling agent for 24 consecutive calendar months.

(3) At locations where the training required under §139.321(e)(2) is provided through an approved Line Service Fire Safety Training Program, fueling agents must maintain a copy of the certificate of completion for 24 consecutive calendar months.

b. Responsibilities of Tenant Fueling Agents. Tenant fueling agents must record and retain the certificate/record of completion in the fuel safety supervisor's training record or the line person's training record, as appropriate, by the party certifying course completion for 12 consecutive calendar months. Line service personnel completing an online or offsite course must also have documentation of onsite training conducted by the tenant fueling agent's trained supervisor. Tenant fueling agents must also provide the airport operator/certificate holder a written confirmation once every 12 consecutive calendar months that the training required by 14 CFR §139.321(e) has been accomplished.

3. Certificates. Certificates must differentiate between supervisor training and line service training.

a. Supervisor certificates must have the following wording:

- (1) Name of company doing the training
- (2) Name of individual who completed the "**Fuel Safety Supervisor**" training
- (3) "**Has successfully completed all classroom and practical application for the requirements of 14 CFR §139.321(b)(1) through (b)(6) and §139.321(e) (1)**"
- (4) Date of completion

b. Line training certificates must have the following wording:

- (1) Name of company doing the training
- (2) Name of individual who completed “**Line Fuel Service**” training
- (3) “**Has successfully completed all classroom and practical application for the requirements of 14 CFR Part §139.321(b)(1) through (b)(7) and 139.321 (e) (2)**”
- (4) Date of completion

c. The FAA does not endorse any training programs; however, certificates issued as a result of completion of an approved training program in fire safety may include the following:

- (1) A statement indicating the associated training program is on the FAA’s Addendum of approved training facilities.

Chapter 5. Guidelines for Submitting Line Service and/or Supervisory Safety Course(s)

1. Supervisory Training Program and/or Line Training Program.

a. Purpose. This chapter establishes the standards for submitting a Fueling Safety Training Program for Supervisory Personnel and/or Fueling Safety Training Program for Line Service Personnel. It provides guidance for addressing the requirements of 14 CFR §139.321 (e) (1) and (2) and the additional requirements for supervisory personnel stipulated by §139.321 (b) (1) – (7).

b. Explanation. Fueling Safety Programs are also known as Fueling Supervisory Courses, Line Service Supervisory Training, and Fire Safety Training. These courses ensure that supervisory and line fueling personnel recognize the importance of aircraft fueling safety. Fueling supervisory courses are designed to emphasize the importance of instructing effectively in the principles necessary to ensure safety during fueling operations on airports.

c. Introduction. Fueling safety involves several areas: aircraft fueling, fuel transport, and fuel storage. Failure to follow safe operating procedures during any of these activities on and off the airport can result in accidents. Fueling procedures and practices have been designed to minimize the risks associated with flammable materials for the protection of fuelers themselves, other airport personnel, and the general public. Instruction in this subject is vital and a necessary part of airport safety.

(1) The FAA recommends the training addressed by these guidelines include at least 16 to 18 hours of class time. In addition to classroom training, students must receive appropriate demonstrations and hands-on training. Curriculum development personnel must ensure the minimum content identified in Chapters 2 and 3 of this AC are addressed. Safety must be paramount during training and enforced throughout the entire training course.

2. Supervisors Fuel Training Curriculum. This curriculum must address the contents of Chapter 2, including material marked “Supervisory Requirement”. An outline of the course, testing material, references, and a sample of the course completion certificate must be submitted to the FAA for review.

3. Line Service Fuel Safety Training Curriculum. The curriculum must address the contents of Chapter 2. An outline of the course, testing material, references, and a sample of the course completion certificate must be submitted to the FAA for review.

4. Review and Approval.

a. All courses should be submitted for initial approval and also whenever there any major rewrites or changes to the material being taught.

b. Send curriculum materials to:

Federal Aviation Administration
Manager, Airport Safety and Operations
Attn: Fuel Safety Training
800 Independence Ave SW
AAS-300, Room 618
Washington DC 20591

The FAA will add acceptable courses to the Addendum of Authorized Fuel Safety Training Courses on a quarterly basis.

Appendix A. Definitions and Acronyms

DEFINITIONS

Airport Fueling Agent - An airport operator/certificate holder that sells fuel products on the airport.

Airport Fueling System - An arrangement of aviation fuel storage tanks, pumps, piping, and associated equipment, such as filters, water separators, hydrants and station, or aircraft fuel servicing vehicles, installed at an airport and designed to service aircraft at fixed positions.

Authority Having Jurisdiction (AHJ) - An organization, office, or individual responsible for enforcing the requirements of a code or standard or for approving equipment, materials, an installation, or a procedure.

Dead Man Control - A device that requires a positive continuing action of a person to allow the flow of fuel.

Emergency Fuel Shutoff - A function performed to stop the flow of fuel in an emergency.

Fueling Agent - A person or company that sells fuel products on the airport. This is intended to exclude the self-fueling activities of an airline or corporation that conducts self-fueling.

Self-Fueling and Self-Service - Self-fueling means the fueling or servicing of an aircraft by the owner of the aircraft with his or her own employees and using his or her own equipment. Self-fueling cannot be contracted out to another party. Self-fueling implies using fuel obtained by the aircraft owner from the source of his/her preference. Self-fueling differs from using a self-service fueling pump made available by the airport, a Fixed Base Operator (FBO), or an aeronautical service provider. The use of a self-service fueling pump is a commercial activity and is not considered self-fueling as defined herein. Self-service includes activities such as adjusting, repairing, cleaning, and otherwise providing service to an aircraft, provided the service is performed by the aircraft owner or his/her employees with resources supplied by the aircraft owner. Title 14 CFR Part 43 of the Federal Aviation Regulations permits the holder of a pilot certificate to perform specific types of preventative maintenance on any aircraft owned or operated by the pilot.

NOTE: Fueling from a pull-up commercial fuel pump is not considered self-fueling under the Federal grant assurances since it involves fueling from a self-service pump made available by the airport or a commercial aeronautical service provider.

Tenant Fueling Agent - A person or company that sells fuel products on the airport, other than the certificate holder.

ACRONYMS

AC	Advisory Circular
AHJ	Authority Having Jurisdiction
CFR	Code of Federal Regulations
DOT	Department of Transportation
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
NFPA	National Fire Protection Association
PPE	Personal Protective Equipment

Appendix B. Additional Resources

1. **ATA Spec 103** – Spec. 103, *Standard for Jet Fuel Quality Control at Airports*, produced by Airlines for America, provides guidance for the safe storage and distribution of jet fuel at airports as currently practiced in the commercial aviation industry. Spec. 103 can be obtained from:

A4A Publications Department
1301 Pennsylvania Avenue, NW
Suite 1100
Washington, DC 20004
202-626-4062
<https://publications.airlines.org>

2. **NATA Refueling and Quality Control Procedures for Airport Service and Support Operations** – The National Air Transportation Association's (NATA's) refueling and quality control guidebook provides information and detailed procedures on the safe handling and delivery of aviation fuels. The guide is available from:

National Air Transportation Association
4226 King Street
Alexandria, VA 22302
800-808-6282
<http://www.nata.aero>

3. **ASTM Manual 5, Aviation Fuel Quality Control Procedures** – Manual 5 provides a complete explanation of several common procedures used by fuel handlers to assess and protect aviation fuel quality. Manual 5 can be obtained by contacting:

ASTM Customer Service
610-832-9585
610-832-9555 Fax
service@astm.org
<http://www.astm.org>

Addendum of Authorized Fuel Safety Training Courses

The current Addendum, updated quarterly, is available online with this AC at http://www.faa.gov/regulations_policies/advisory_circulars/.