

14 CFR Part 63, Appendix C

**Appendix C to Part 63—Flight Engineer Training Course Requirements**

(a) *Training course outline* —(1) *Format*. The ground course outline and the flight course outline are independent. Each must be contained in a looseleaf binder to include a table of contents. If an applicant desires approval of both a ground school course and a flight school course, they must be combined in one looseleaf binder that includes a separate table of contents for each course. Separate course outlines are required for each type of airplane.

(2) *Ground course outline*. (i) It is not mandatory that the subject headings be arranged exactly as listed in this paragraph. Any arrangement of subjects is satisfactory if all the subject material listed here is included and at least the minimum programmed hours are assigned to each subject. Each general subject must be broken down into detail showing the items to be covered.

(ii) If any course operator desires to include additional subjects in the ground course curriculum, such as international law, flight hygiene, or others that are not required, the hours allotted these additional subjects may not be included in the minimum programmed classroom hours.

(iii) The following subjects and classroom hours are the minimum programmed coverage for the initial approval of a ground training course for flight engineers. Subsequent to initial approval of a ground training course an applicant may apply to the Administrator for a reduction in the programmed hours. Approval of a reduction in the approved programmed hours is based on improved training effectiveness due to improvements in methods, training aids, quality of instruction, or any combination thereof.

| <b>Subject</b>  | <b>Classroom hours</b> |
|---|------------------------|
| Federal Aviation Regulations  | 10                     |
| To include the regulations of this chapter that apply to flight engineers |                        |
| Theory of Flight and Aerodynamics   | 10                     |
| Airplane Familiarization  | 90                     |
| To include as appropriate:  |                        |
| Specifications.   |                        |
| Construction features.  |                        |
| Flight controls.  |                        |
| Hydraulic systems.  |                        |
| Pneumatic systems.  |                        |
| Electrical systems.   |                        |
| Anti-icing and de-icing systems.  |                        |

|   |    |
|---|----|
| Pressurization and air-conditioning systems.                        |    |
| Vacuum systems.   |    |
| Pilot static systems.   |    |
| Instrument systems.   |    |
| Fuel and oil systems.   |    |
| Emergency equipment.  |    |
| Engine Familiarization  | 45 |
| To include as appropriate:  |    |
| Specifications.   |    |
| Construction features.  |    |
| Lubrication.  |    |
| Ignition.   |    |
| Carburetor and induction, supercharging and fuel control systems    |    |
| Accessories.  |    |
| Propellers.   |    |
| Instrumentation.  |    |
| Emergency equipment.  |    |
| Normal Operations (Ground and Flight)                               | 50 |
| To include as appropriate:  |    |
| Servicing methods and procedures.                                   |    |
| Operation of all the airplane systems.                              |    |
| Operation of all the engine systems.                                |    |
| Loading and center of gravity computations.                         |    |
| Cruise control (normal, long range, maximum endurance)              |    |
| Power and fuel computation.   |    |
| Meteorology as applicable to engine operation                       |    |
| Emergency Operations  | 80 |
| To include as appropriate:  |    |
| Landing gear, brakes, flaps, speed brakes, and leading edge devices |    |

|                                      |     |
|--------------------------------------|-----|
| Pressurization and air-conditioning. |     |
| Portable fire extinguishers.         |     |
| Fuselage fire and smoke control.     |     |
| Loss of electrical power.            |     |
| Engine fire control.                 |     |
| Engine shut-down and restart.        |     |
| Oxygen.                              |     |
| Total (exclusive of final tests)     | 235 |

The above subjects, except Theory of Flight and Aerodynamics, and Regulations must apply to the same type of airplane in which the student flight engineer is to receive flight training.

(3) Flight Course Outline. (i) The flight training curriculum must include at least 10 hours of flight instruction in an airplane specified in §63.37(a). The flight time required for the practical test may not be credited as part of the required flight instruction.

(ii) All of the flight training must be given in the same type airplane.

(iii) As appropriate to the airplane type, the following subjects must be taught in the flight training course:

Subject

normal duties, procedures and operations

To include as appropriate:

Airplane preflight.

Engine starting, power checks, pretakeoff, postlanding and shut-down procedures.

Power control.

Temperature control.

Engine operation analysis.

Operation of all systems.

Fuel management.

Logbook entries.

Pressurization and air conditioning.

recognition and correction of in-flight malfunctions

To include:

Analysis of abnormal engine operation.

Analysis of abnormal operation of all systems.

Corrective action.

emergency operations in flight

To include as appropriate:

Engine fire control.

Fuselage fire control.

Smoke control.

Loss of power or pressure in each system.

Engine overspeed.

Fuel dumping.

Landing gear, spoilers, speed brakes, and flap extension and retraction.

Engine shut-down and restart.

Use of oxygen.

(iv) If the Administrator finds a simulator or flight engineer training device to accurately reproduce the design, function, and control characteristics, as pertaining to the duties and responsibilities of a flight engineer on the type of airplane to be flown, the flight training time may be reduced by a ratio of 1 hour of flight time to 2 hours of airplane simulator time, or 3 hours of flight engineer training device time, as the case may be, subject to the following limitations:

( a ) Except as provided in subdivision ( b ) of this paragraph, the required flight instruction time in an airplane may not be less than 5 hours.

( b ) As to a flight engineer student holding at least a commercial pilot certificate with an instrument rating, airplane simulator or a combination of airplane simulator and flight engineer training device time may be submitted for up to all 10 hours of the required flight instruction time in an airplane. However, not more than 15 hours of flight engineer training device time may be substituted for flight instruction time.

(v) To obtain credit for flight training time, airplane simulator time, or flight engineer training device time, the student must occupy the flight engineer station and operate the controls.

(b) *Classroom equipment.* Classroom equipment should consist of systems and procedural training devices, satisfactory to the Administrator, that duplicate the operation of the systems of the airplane in which the student is to receive his flight training.

(c) *Contracts or agreements.* (1) An approved flight engineer course operator may contract with other persons to obtain suitable airplanes, airplane simulators, or other training devices or equipment.

(2) An operator who is approved to conduct both the flight engineer ground course and the flight engineer flight course may contract with others to conduct one course or the other in its entirety but may not contract with others to conduct both courses for the same airplane type.

(3) An operator who has approval to conduct a flight engineer ground course or flight course for a type of airplane, but not both courses, may not contract with another person to conduct that course in whole or in part.

(4) An operator who contracts with another to conduct a flight engineer course may not authorize or permit the course to be conducted in whole or in part by a third person.

(5) In all cases, the course operator who is approved to operate the course is responsible for the nature and quality of the instruction given.

(6) A copy of each contract authorized under this paragraph must be attached to each of the 3 copies of the course outline submitted for approval.

(d) *Instructors.* (1) Only certificated flight engineers may give the flight instruction required by this appendix in an airplane, simulator, or flight engineer training device.

(2) There must be a sufficient number of qualified instructors available to prevent an excess ratio of students to instructors.

(e) *Revisions.* (1) Requests for revisions of the course outlines, facilities or equipment must follow the procedures for original approval of the course. Revisions must be submitted in such form that an entire page or pages of the approved outline can be removed and replaced by the revisions.

(2) The list of instructors may be revised at any time without request for approval, if the requirements of paragraph (d) of this appendix are maintained.

(f) *Ground school credits.* (1) Credit may be granted a student in the ground school course by the course operator for comparable previous training or experience that the student can show by written evidence; however, the course operator must still meet the quality of instruction as described in paragraph (h) of this appendix.

(2) Before credit for previous training or experience may be given, the student must pass a test given by the course operator on the subject for which the credit is to be given. The course operator shall incorporate results of the test, the basis for credit allowance, and the hours credited as part of the student's records.

(g) *Records and reports.* (1) The course operator must maintain, for at least two years after a student graduates, fails, or drops from a course, a record of the student's training, including a chronological log of the subject course, attendance examinations, and grades.

(2) Except as provided in paragraph (3) of this section, the course operator must submit to the Administrator, not later than January 31 of each year, a report for the previous calendar year's training, to include:

(i) Name, enrollment and graduation date of each student;

(ii) Ground school hours and grades of each student;

(iii) Flight, airplane simulator, flight engineer training device hours, and grades of each student; and

(iv) Names of students failed or dropped, together with their school grades and reasons for dropping.

(3) Upon request, the Administrator may waive the reporting requirements of paragraph (2) of this section for an approved flight engineer course that is part of an approved training course under subpart N of part 121 of this chapter.

(h) *Quality of instruction.* (1) Approval of a ground course is discontinued whenever less than 80 percent of the students pass the FAA written test on the first attempt.

(2) Approval of a flight course is discontinued whenever less than 80 percent of the students pass the FAA practical test on the first attempt.

(3) Notwithstanding paragraphs (1) and (2) of this section, approval of a ground or flight course may be continued when the Administrator finds—

(i) That the failure rate was based on less than a representative number of students; or

(ii) That the course operator has taken satisfactory means to improve the effectiveness of the training.

(i) *Time limitation.* Each student must apply for the written test and the flight test within 90 days after completing the ground school course.

(j) *Statement of course completion.* (1) The course operator shall give to each student who successfully completes an approved flight engineer ground school training course, and passes the FAA written test, a statement of successful completion of the course that indicates the date of training, the type of airplane on which the ground course training was based, and the number of hours received in the ground school course.

(2) The course operator shall give each student who successfully completes an approved flight engineer flight course, and passed the FAA practical test, a statement of successful completion of the flight course that indicates the dates of the training, the type of airplane used in the flight course, and the number of hours received in the flight course.

(3) A course operator who is approved to conduct both the ground course and the flight course may include both courses in a single statement of course completion if the provisions of paragraphs (1) and (2) of this section are included.

(4) The requirements of this paragraph do not apply to an air carrier or commercial operator with an approved training course under part 121 of this chapter providing the student receives a flight engineer certificate upon completion of that course.

(k) *Inspections.* Each course operator shall allow the Administrator at any time or place, to make any inspection necessary to ensure that the quality and effectiveness of the instruction are maintained at the required standards.

(l) *Change of ownership, name, or location.* (1) Approval of a flight engineer ground course or flight course is discontinued if the ownership of the course changes. The new owner must obtain a new approval by following the procedure prescribed for original approval.

(2) Approval of a flight engineer ground course or flight course does not terminate upon a change in the name of the course that is reported to the Administrator within 30 days. The Administrator issues a new letter of approval, using the new name, upon receipt of notice within that time.

(3) Approval of a flight engineer ground course or flight course does not terminate upon a change in location of the course that is reported to the Administrator within 30 days. The Administrator issues a new letter of approval, showing the new location, upon receipt of notice within that time, if he finds the new facilities to be adequate.

(m) *Cancellation of approval.* (1) Failure to meet or maintain any of the requirements of this appendix for the approval of a flight engineer ground course or flight course is reason for cancellation of the approval.

(2) If a course operator desires to voluntarily terminate the course, he should notify the Administrator in writing and return the last letter of approval.

(n) *Duration.* Except for a course operated as part of an approved training course under subpart N of part 121 of this chapter, the approval to operate a flight engineer ground course or flight course terminates 24 months after the last day of the month of issue.

(o) *Renewal.* (1) Renewal of approval to operate a flight engineer ground course or flight course is conditioned upon the course operator's meeting the requirements of this appendix.

(2) Application for renewal may be made to the Administrator at any time after 60 days before the termination date.

(p) *Course operator approvals.* An applicant for approval of a flight engineer ground course, or flight course, or both, must meet all of the requirements of this appendix concerning application, approval, and continuing approval of that course or courses.

(q) *Practical test eligibility.* An applicant for a flight engineer certificate and class rating under the provisions of §63.37(b)(6) is not eligible to take the practical test unless he has successfully completed an approved flight engineer ground school course in the same type of airplane for which he has completed an approved flight engineer flight course.