VOLUME 3. AIR OPERATOR TECHNICAL ADMINISTRATION

CHAPTER 2. TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS

SECTION 5. FLIGHTCREW AIRCRAFT GROUND TRAINING CURRICULUM SEGMENTS

425. GENERAL. This section specifies the objectives of aircraft ground training. Structure and content of flightcrew aircraft ground training curriculum segments are discussed. Also, three distinct areas of aircraft ground training are identified. They are general operational subjects, aircraft systems, and systems integration training.

427. AIRCRAFT GROUND TRAINING OBJECTIVES. The primary objective of aircraft ground training is to provide flight crewmembers with the necessary knowledge for understanding the basic functions of aircraft systems, the use of the individual system components, the integration of aircraft systems, and operational procedures. An important requirement of an aircraft ground training curriculum segment is that, upon completion, a student will be sufficiently prepared to enter the flight training curriculum segment. Aircraft ground training, as used in this section, is training for a specific aircraft type. Aircraft ground training may be conducted using many methods, including classroom instruction, ground training devices, computer-based instruction, flight training devices, flight simulators, and static aircraft.

429. AIRCRAFT GROUND TRAINING CURRICULUM SEGMENTS. Pilots and flight engineers must successfully complete an aircraft ground training curriculum segment for the appropriate category of training (initial new-hire, initial equipment, transition, upgrade, recurrent, or requalification training). Each aircraft ground training curriculum segment consists of training modules containing pertinent subject matter appropriate to the category of training. Training modules may be designed to be used interchangeably in the various categories of training. For example, a hydraulic system training module could be used in initial new-hire, initial equipment, and transition training.

431. AIRCRAFT GROUND TRAINING MODULES.

A. An aircraft ground training curriculum segment must include as many training modules as necessary for appropriate training to occur. Each module outline must provide at least:

- A descriptive title of the training module, and
- A list of the related elements or events that will be presented during instruction on the module

B. The training module outline must contain sufficient elements or events to ensure that a student will receive training on the main features of individual systems, the operation of individual systems, and the integration of those systems with other aircraft systems. It is unnecessary to include detailed descriptions of each element within a training module outline. However, such detailed descriptions are appropriate and should be included in the operator's courseware. During the approval process, a Principal Operations Inspector (POI) should review courseware as necessary to ensure that the scope and depth of the training modules are adequate. The following example illustrates one of the many acceptable methods of presenting an aircraft ground training module outline:

7. HYDRAULIC SYSTEM (B737-300) → *Descriptive Title*

(a) A System
(b) B System
(c) Standby System
(d) System Layout
(e) Limitations
(f) Controls and Annunciators
(g) Introduction to Procedures

Elements Within a Training Module

C. The job aid at the end of this section is provided to assist inspectors when determining whether the scope and depth of the aircraft ground training modules are acceptable. The following example illustrates the interrelationship of curriculum segments and training module outlines:

II. PIC BAe-146 INITIAL EQUIPMENT GROUND TRAINING → Title of Curriculum Segment

A. Objective of Training: → Objective Statement

B. General Operational Subjects:

C. Aircraft Systems:

Subject Area Titles

1. Aircraft General, Equipment and Furnishings, Emergency Equipment
2. Fire and Overheat Protection, Warning Systems, Lighting
3. Powerplants, APU
4. Electrical System
5. Pneumatic System, Air Conditioning, and Pressurization
6. Ice and Rain Protection, Oxygen System
7. Hydraulic System
8. Landing Gear and Brake System
9. Flight Controls
10. Fuel System
11. Navigation System
12. Flight Instruments, Communication Equipment
13. Review
14. Written Exam

Training Modules Within a Curriculum Segment

7. HYDRAULIC SYSTEM TRAINING MODULE → Descriptive Title

(a) Yellow System
(b) Green System
(c) Standby System
(d) System Layout
(e) Limitations
(f) Controls and Annunciators
(g) Introduction to Procedures

Elements Within a Training Module

433. TRAINING HOURS. The number of training hours must be specified on all aircraft ground training curriculum segment outlines. It is difficult to provide guidance on acceptable training hours for aircraft ground training curriculum segments because of the various situations that can be encountered. POIs must thoroughly study the operator's proposals. Based on experience with the operator, past experiences with other operators, as well as their own training experiences, POIs must use reasonable judgment when determining whether the training can be adequately accomplished within the training hours specified in the curriculum segment. Certain training methods, such as computer-based instruction, allow students to progress through training at a rate that depends on each individual student's ability to assimilate the required knowledge or abilities. For these kinds of training methods, the specified training hours should be indicative of the time an average student will progress through training.

A. Table 3.2.5.1 provides direction and guidance for determining acceptable training hours for aircraft ground training curriculum segments. Generally, training hours listed in this table approximate training days or fractions of days. Periods for reasonable breaks during instruction are included in these training hours. The table provides two sets of training hours for the various categories of training and families of aircraft.

(1) The first set is considered to be the national norm and reasonable training support is presumed, such as proficient instructors, well-organized courseware, and modern training devices or aids. The national norm must not be construed as being always acceptable. When determining the adequacy of training hours, a POI should use the national norm as a point from which other factors shall be weighed. There may be many reasons why the training hours need to be greater than the national norm. The operator may need to specify more hours because of the complexity of the aircraft or types of operation. A POI may need to require more hours because of inadequate training support. Conversely, training hours less than the national norm may be fully acceptable due to the use of highly sophisticated and modern training methods, the use of less complex aircraft, or the use of a less complex type of operation.

(2) The second set of training hours, in parentheses, is an established threshold for training hours. Threshold training hours are established for particular categories of training and families of aircraft. Before granting initial approval to a curriculum segment with less than the established threshold training hours, a POI must ensure that the training to be given provides sufficient training and meet the objective of the curriculum segment. When granting initial approval of curriculum segments with training hours below the established threshold training hours, POIs must notify AFS-200, through the Flight Standards Regional Division, that such initial approval has been granted. The notification must be by letter and describe the reasons and actions resulting in the grant of initial approval. The letter must transmit a copy of the initially-approved aircraft ground training curriculum segment outline and any additional supporting information submitted by the operator. This AFS-200 notification is necessary for tracking and standardization purposes on a national basis.

(3) Training hour national norms have not been established for upgrade ground training curriculum segments. Upgrade ground training requirements vary widely depending on a flight crewmember's experience, previous duty position, and currency status in the aircraft for which training is being conducted. In cases when students have not served on the aircraft for a long time, upgrade ground training may need to be as extensive as initial equipment training. In other cases when students are currently qualified on the aircraft, either as flight engineers (FE) or second-in-commands (SIC), the upgrade ground training may only be that training necessary to qualify them in the new duty position. In such cases, an operator may be able to expand or conduct upgrade flight training and qualify students for the new duty positions without a separate upgrade ground training curriculum segment.

(a) The following illustration provides several factors to be considered when evaluating upgrade ground training curriculum segments:

UPGRADE GROUND TRAINING			
FLIGHT CREWMEMBER STATUS	GENERAL OPERTIONAL SUBJECTS	AIRCRAFT SYSTEMS	SYSTEMS INTEGRATION
SIC (current on aircraft) upgrade to PIC	Training modules or elements pertaining to PIC duty position	May not be needed	Training modules or elements pertaining to PIC duty position
SIC (NOT current on aircraft) upgrade to PIC	Training modules or elements pertaining to PIC duty position	Appropriate training modules depending on time NOT current	Appropriate training modules depending on time NOT current
F/E (current on aircraft) upgrade to SIC	Training modules pertaining to SIC duty position	May no be Needed	Training modules or elements pertaining to SIC duty position
F/E (NOT current on aircraft) upgrade to SIC	Training modules or elements pertaining to SIC duty position	Appropriate training modules depending on time NOT current	Appropriate training modules depending on time NOT current

(b) Training hour thresholds for upgrade ground training curriculum segments have been established. AFS-200 must be notified of any upgrade ground training curriculum segment that specifies fewer training hours than the threshold hours listed in table 3.2.5.1. This notification must be accomplished in accordance with the instructions outlined in the previous subparagraph.

TABLE 3.2.5.1
FLIGHTCREW AIRCRAFT GROUND TRAINING HOURS
NATIONAL NORMS
(THRESHOLDS)

		CATEGORY OF TRAINING				
	Family of Aircraft	Initial New-Hire	Initial Equipment	Transition	Upgrade	Recurrent
TRANSPORT & COMMUTER CAT	Part 121 Group I (Reciprocating)	64(48)	56(40)	56(40)	(16)	8(8)
	Part 121 Group I (Turboprop)	72(56)	64(48)	64(48)	(16)	16(8)
	Part 121 Group II (Turbojet)	80(64)	80(64)	80(64)	(24)	16(8)
	Part 135 Transport and Commuter Category	72(56)	64(48)	64(48)	(16)	16(8)
MULTI ENGINE	Part 135 IFR/VFR	32(16)	24(16)	24(16)	(8)	8(4)
	Part 135 VFR Only	24(16)	20(8)	20(8)	(4)	4(4)
SINGLE ENGINE	Part 135 IFR/VFR	20(8)	16(8)	16(8)	(4)	8(4)
	Part 135 VFR Only	12(8)	8(4)	8(4)	(4)	4(4)
CHOPPER	IFR/VFR	32(16)	24(16)	24(16)	(8)	8(4)
	VFR Only	24(16)	20(8)	20(8)	(4)	4(4)

B. Title 14 of the Code of Federal Regulations (14 CFR) part 121, §§ 121.419 and 121.427 specify 14 CFR-programmed hour requirements for initial new-hire, initial equipment, and recurrent aircraft ground training curriculum segments. The regulatory programmed hours for these categories of training are listed in table 3.2.5.2.

TABLE 3.2.5.2
PART 121 REGULATORY PROGRAMMED HOURS

14 CFR -Programmed Hours
By Category of Training

		Initial New-Hire	Initial Equipment	Recurrent
Part 121 Airplane Groups	Group I (Reciprocating)	64	64	16
	Group I (Turboprop)	80	80	20
	Group II (Turbojet)	120	120	25

(1) Under part 121, § 121.405(d), a POI is authorized to approve reductions to the 14 CFR-programmed hour requirements of these three categories of training. When approving reductions to the 14 CFR programmed hours, a POI must determine that the training aids, devices, and methods and procedures used by the operator will increase the quality and effectiveness of the training. The letter that transmits initial or final approval of these part 121 aircraft ground training curriculum segments must contain a statement giving the basis for the reduced 14 CFR-programmed hours (see paragraphs 331 and 339). AFS-200 must be notified (as described in paragraph A(2)) of any reduction below the 14 CFR-programmed hours if that reduction is also below the threshold training hours in table 3.2.5.1.

(2) There are no other categories of training in part 121 that specify 14 CFR-programmed hour requirements. Part 135 does not specify any 14 CFR-programmed hour requirements.

435. COURSE COMPLETION REQUIREMENTS. Completion of the curriculum segment must be documented by an instructor's or supervisor's certification that the student has successfully completed the course. This certification is usually based on the results of a written examination given at the end of the course. With some training methods, the certification may be based on student progress checks administered during the course.

437. CONTENT OF AIRCRAFT GROUND CURRICULUM SEGMENTS. An aircraft ground curriculum segment must show that training will be given in three distinct subject areas appropriate to the specific aircraft. These subject areas of training are "general operational subjects" (see paragraph 439), "aircraft systems" (see paragraph 441), and "systems integration" (see paragraph 443). An operator should develop separate training modules for each of these distinct areas of training. Usually, training in systems integration should occur during the latter part of the course. However, other methods of training module development and sequencing of training may be fully acceptable.

439. GENERAL OPERATIONAL SUBJECTS. The subject area of ground training, referred to as "general operational subjects," includes instruction on certain operational requirements that are specific to the aircraft in which the training is being conducted. The general operational subject area of an aircraft training curriculum segment may include instruction on many operational subjects but should include instruction in at least the following:

A. Dispatch, flight release, or flight-locating procedures applicable to the specific aircraft

B. Weight and balance procedures specific to the aircraft (including computation of company weight and balance forms)

C. Adverse weather practices, including procedures specific to the aircraft that must be followed when operating in the following conditions:

- Icing
- Turbulence
- Heavy precipitation
- Thunderstorms with associated windshear and microburst phenomena
- Low visibility
- Contaminated runways

D. Procedures for operating specific aircraft communications and navigation equipment in accordance with the following:

- Specific company communications requirements
- ATC clearance requirements
- Area departure and arrival requirements
- En route requirements
- Approach and landing requirements

E. Specific performance characteristics of the aircraft during all flight regimes, including:

- The use of charts, tables, tabulated data, and other related manual information
- Normal, abnormal, and emergency performance problems
- Meteorological and weight-limiting performance factors (such as temperature, pressure, contaminated runways, precipitation, and climb/runway limits)
- Inoperative equipment performance limiting factors (such as MEL/CDL, and inoperative anti-skid)
- Special operational conditions (such as unpaved runways, high altitude airports, and drift down requirements)

F. The following example illustrates one of many acceptable methods in which the "general operational subjects" area of an aircraft ground training curriculum segment could be outlined (including a typical training module):

B. GENERAL OPERATIONAL SUBJECTS — *Title of Subject Area*

1. Flight Control
2. Weight and Balance
3. Operations Specifications (Authorizations and Limitations)
4. Adverse Weather
5. Flight Planning
6. Aircraft Operations Manual
7. Company Operations Manual (Applicable Aircraft Sections)
8. Performance

Training Modules Within a Curriculum Segment Applicable to a Specific Aircraft in General Operational Subject Area

4. ADVERSE WEATHER

(a) Operations in ice, slush, and snow
(b) Operations in turbulence
(c) Operations in heavy precipitation
(d) Thunderstorm, windshear, and microburst procedures
(e) Low visibility operations

Elements Within a Training Module

441. AIRCRAFT SYSTEMS. The second subject area of an aircraft ground curriculum segment is the "aircraft systems" area. This area is particularly adaptive to the use of training modules because of the modular nature of each system and its related components. Instruction on each aircraft system must be given in sufficient detail to ensure the student clearly understands system components, limitations, relevant controls, actuators, annunciators, and procedures for various system configurations. An example of one of the many acceptable methods in which the aircraft systems subject area of an aircraft ground curriculum segment outline could be presented is illustrated in paragraph 431.C. It is not possible to list every conceivable aircraft system that should be included in the aircraft ground curriculum segment. However, the following descriptions of training modules (with typical elements) illustrate the depth and scope that should be provided for an operator's submission to be acceptable:

A. Aircraft General. Typical elements include an overview of the basic aircraft, such as dimensions, turning radius, panel layouts, cockpit and cabin configurations, and other major systems and components or appliances.

B. Powerplants. Typical elements include a basic engine description, engine thrust ratings, engine components such as accessory drives, ignition, oil, fuel control, hydraulic, and bleed air features.

C. Electrical. Typical elements should include elements identifying the sources of aircraft power including engine-driven generators, auxiliary power unit (APU) generator, and external power. Other elements include the electrical buses and related components such as circuit breakers, fuses, the aircraft battery, and other standby power systems, if applicable.

D. Hydraulic. Some typical elements are the hydraulic reservoirs, pumps, accumulators; the means of routing hydraulic fluid through filters, check valves, interconnects, and to associated actuators and hydraulically-operated components.

E. Fuel. Elements include the fuel tank system (location and quantities), engine-driven pumps, boost pumps, system valves, crossfeeds, quantity indicators, and provisions (if applicable) for fuel jettisoning.

F. Pneumatic. Typical elements include bleed-air sources (such as engines, APU, or external ground air), the means of routing, venting, and controlling bleed air via associated valves, ducts, chambers, and temperature and pressure limiting devices.

G. Air Conditioning and Pressurization. Typical elements include heaters, air conditioning packs, fans, and other environmental control devices. Pressurization system components include elements such as outflow and negative pressure relief valves with associated automatic, standby, and manual pressurization controls and annunciators.

H. Flight Controls. Elements in flight controls include primary (yaw, pitch, and roll devices) and secondary controls (leading/trailing edge devices, flaps, trim, and damping mechanisms). Elements that indicate the means of actuation (direct/indirect or fly-by-wire) should be included as well as applicable redundancy devices.

I. Landing Gear. Typical elements should include the landing gear extension and retraction mechanism including the operating sequence of struts, doors, and locking devices, and brake and antiskid systems, if applicable. Other elements are steering (nose or body steering gear), bogie arrangements, air/ground sensor relays, and visual downlock indicators.

J. Ice and Rain Protection. Elements should include rain removal systems and each anti-icing and/or deicing system that prevents or removes the formation of ice from airfoils, flight controls, engines, pitot-static probes, fluid outlets, cockpit windows, and aircraft structures. Other elements should include system components such as pneumatic/electrical valves, sensors, ducts, electrical elements, or pneumatic devices.

K. Equipment and Furnishings. Typical elements are the aircraft exits, galleys, water and waste systems, lavatories, cargo areas, crewmember and passenger seats, bulkheads, seating and/or cargo configurations, and non-emergency equipment and furnishings.

L. Navigation Equipment. Typical elements are flight navigation system components including flight directors, horizontal situation, radio magnetic indicators, navigation receivers (ADF, VOR, OMEGA, LORAN-C, RNAV, Marker Beacon, DME) used on the aircraft. Other elements include applicable inertial systems (INS, IRS), functional displays, fault indications, and comparator systems; aircraft transponders, radio altimeters, weather radar, and cathode ray tube or computer-generated displays of aircraft position and navigation information.

M. Auto Flight System. Typical elements include such items of equipment as the autopilot, autothrottles and their interface with aircraft flight director and navigation systems, including automatic approach tracking, autoland, and automatic fuel or performance management systems.

N. Flight Instruments. Typical elements should include an overview of the panel arrangement and the electrical and pitot-static sources and alternate sources for the flight instruments. Other elements include attitude, heading (directional gyro and magnetic), airspeed, vertical speed, altimeters, standby flight instruments, and other relevant instruments.

O. Communication Equipment. Elements include the VHF/HF radios, audio panels, inflight interphone and passenger address systems, the voice recorder, and air/ground passive communications systems (ACARS).

P. Warning Systems. Typical elements are aural, visual, and tactile warning systems, including the character and degree of urgency related to each signal. Other elements include warning and caution annunciator systems, including ground proximity and takeoff warning systems.

Q. Fire Protection. Elements should include all fire and overheat sensors, loops, modules, or other means of providing visual and/or aural indications of fire or overheat detection. Other elements include procedures for the use of fire handles, automatic extinguishing systems, agents, and the power sources necessary to provide protection for fire and overheat conditions in engines, APU, cargo bay/wheel well, the cockpit, cabin, and lavatories.

R. Oxygen. Typical elements are the aircraft oxygen system including the installed passenger, crew, and portable systems. Other elements include sources of oxygen (gaseous or solid), flow and distribution networks, automatic deployment systems, regulators, pressure levels, gauges, and servicing requirements.

S. Lighting. Typical elements are the cockpit, cabin, and external lighting systems, including power sources, switch positions, and spare light bulb locations.

T. Emergency Equipment. Typical elements are the type, location, and purpose of each item of emergency equipment such as fire and oxygen bottles, first aid kits, liferafts, life preservers, crash axes, and emergency exits and lights. Other elements include each item of egress equipment such as slides, sliderafts, escape straps or handles, hatches, ladders or movable stairs.

U. Auxiliary Power Unit (APU). Elements should include installation of the APU, APU capacity and operation including its electrical and bleed air capabilities and how it interfaces with the aircraft's electrical and pneumatic systems. Other elements include the APU components such as inlet doors, exhaust ducts, and fuel supply.

443. AIRCRAFT SYSTEMS INTEGRATION TRAINING.

A. The third subject area of a ground training curriculum segment is referred to as "Systems Integration Training." This area provides the student with training on how aircraft systems interrelate with respect to normal, abnormal, and emergency procedures. This training includes procedures as basic as those for powering the aircraft electrical and pneumatic systems with the APU or as complex as those for programing computerized navigation and autoflight systems. System integration training should include flightcrew interaction in the use of checklists, cockpit resource management, and other operational procedures. It is normally conducted using ground training devices portraying a specific cockpit layout, including the switch and indicator/annunciator logic. The flight training devices and flight simulators described in the flight training section (section 6) may be used for systems integration training. Additionally, computer-based instruction or other interactive systems may be used for this training. Integration training may be conducted in conjunction with aircraft systems training or as a later phase of the aircraft ground training curriculum segment.

B. Effective systems integration training serves as a logical bridge between conventional ground training instructional delivery methods and flight training. This training allows students to become familiar with the cockpit layout, checklists, operator procedures, and other areas that are best learned before they conduct actual flight maneuvers and procedures. A POI should consider this type of training, and the quality and capability of the involved training devices, as factors in the decision for reducing training hours.

C. The following examples are of aircraft systems integration training modules with typical elements:

(1) *Use of Checklist.* Typical elements include safety checks, cockpit preparation (switch position and checklist flows), checklist callouts and responses, and checklist sequence.

(2) *Flight Planning.* Elements should include performance limitations (meteorological, weight, and MEL/CDL items), required fuel loads, weather planning (lower than standard takeoff minimums or alternate requirements).

(3) *Display Systems.* Typical elements include the use of weather radar and other CRT displays (checklist, vertical navigation or longitudinal navigation displays).

(4) *Navigation Systems.* Elements include preflight and operation of applicable receivers, onboard navigation systems, and flight plan information input and retrieval.

(5) *Autoflight.* Typical elements include the autopilot, autothrust, and flight director systems, including the appropriate procedures, normal and abnormal indications, and annunciators.

(6) *Cockpit Familiarization.* Typical elements include activation of aircraft system controls and switches to include normal, abnormal, and emergency switches and control positions, and relevant annunciators, lights, or other caution and warning systems.

D. Aircraft systems integration training may be as simplistic as a student learning checklist procedures in a single-engine aircraft or as complex as programming aircraft computer systems for an international flight. Integration training is particularly effective when an aircraft is equipped with relatively sophisticated computerized navigation, flight director, performance, and autoflight systems. The key to effective training in this area is to use a training device that provides an accurate, real time, and interactive medium for the students during the practice of procedures. The functional requirements of the training device do not necessarily require motion or visual systems or specific aircraft flight data characteristics. However, the training device should accurately portray relevant keyboards, switches, CRTs and include air/ground and flightpath logic.

E. The following example illustrates one of the many acceptable methods in which the "aircraft systems integration" subject area of an aircraft ground training curriculum segment could be outlined (including a typical training module):

D. SYSTEMS INTEGRATION TRAINING — *Title of Subject Area*

1. Use of Checklist
2. Preflight / Inflight Planning
3. Use of Weather Radar / CRT's
4. Autoflight/Flight Directors
5. Vertical / Longitudinal Navigation

Training Modules Within a Curriculum Segment

4. AUTOFLIGHT/FLIGHT DIRECTOR

(a) Auto Pilot Preflight / Setup / Modes
(b) Autothrust Operation
(c) Autoland Operation
(d) Flight Director Preflight / Setup / Modes
(e) CAT II Procedures

Elements Within a Training Module

F. APU Announcement.

(1) Background.

(a) A National Transportation Safety Board (NTSB) study of emergency evacuations cited an evacuation that occurred during the boarding of a Boeing 727. In preparation for flight, the flight crew started the airplane's APU. An orange flame appeared that extended from the APU exhaust port forward along the right side of the airplane as the APU "torched."

(b) The flame was noticeable in the cabin and several passengers screamed "fire" and began to evacuate the airplane via the left overwing exit and the

jetway. The flight attendant in the rear of the airplane tried to stop the evacuation, but as the rush of passengers approached her, she decided that opening the tailcone exit was a more prudent action. Additionally, passengers also opened up the L2 door. When the flightcrew learned of the situation they issued an announcement over the public address system to remain seated. Control was finally reestablished in the cabin, but not before several passengers received injuries. The NTSB believes that the FAA should ensure that passengers are made aware of the possibility of APU torching just prior to use of the APU to preclude an unwarranted evacuation by passengers who only see "fire" outside the aircraft.

(2) *Policy.* FAA agrees with the intent of this recommendation and issued Flight Standards Handbook Bulletin for Air Transportation 96-03 on March 22, 1996 to address the issue of unwarranted evacuations. It requested POIs and their operators to re-emphasize emergency situation training modules and emergency evacuation procedures on unwarranted evacuations, including "Appropriate" actions on aircraft which are equipped with Auxiliary Power Units (APU) which have a tendency to "torch."

(a) The best way to address the issue of unwarranted evacuations is to take proactive steps to ensure that they do not occur. APU torching is a known possible outcome of starting the APU. Passenger information regarding the possibility of APU torching would eliminate the panic and confusion that results from passengers simply seeing "fire" outside the aircraft and attempting to evacuate.

(b) POIs should inform their assigned certificate holders who operate Boeing 727s to include in their APU procedures instructions stating that during normal operations when passengers are on board, the flight crew make a PA announcement about the possibility of APU torching immediately prior to starting the APU.

445. GROUND TRAINING DEVICES.

A. Ground training devices are commonly used by operators in the conduct of aircraft ground training. The level of sophistication of these devices may range from a simple paper pictorial display to a static aircraft. They may include slide/tape presentations, computer-based instruction systems, aircraft system panels, models, mockups, FTDs, flight simulators, and numerous other instructional delivery methods. POIs approve or accept each ground training device for use when granting initial or final approval of a ground training curriculum segment for the operator.

B. Ground training devices used for systems integration training must be individually evaluated by the POI. If these devices are also used for flight training (level 6 and 7 FTDs or level A through D flight simulators) they must be evaluated and found satisfactory for flight training by the National Simulator Program Manager (NSPM).

447. EVALUATION OF GROUND TRAINING CURRICULUM SEGMENT OUTLINES FOR INITIAL APPROVAL. When evaluating an aircraft ground training curriculum segment outline an inspector must determine whether it meets the following criteria:

A. The training hours specified in each curriculum segment outline must be examined. Inspectors should not attempt to measure the quality or sufficiency of training by the amount of training hours alone. Adequacy of quality and sufficiency of training can only be determined by direct observation of training and testing (or checking) in progress or by examination of surveillance and investigation reports. However, the specified training hours must be realistic in terms of the amount of time it will take to accomplish the training outlined in the curriculum segment. Any request and the appropriate justification for reductions to training hours must be submitted with the initial proposal.

B. The curriculum segment outline contains appropriate training modules for the specific aircraft. The training modules should have sufficient elements or events to ensure that the quality and depth of training given in a particular subject area will be provided.

449. AIRCRAFT GROUND TRAINING CURRICULUM SEGMENT JOB AID.

A. The aircraft ground training curriculum segment job aid (Figure 3.2.5.1) is provided to assist the inspector in evaluating curriculum segments. The job aid is provided for guidance only and must not be construed as a mandatory or regulatory requirement. The job aid focuses on the three subject areas of this segment: general operational subjects, aircraft systems, and systems integration training. It serves as an aid for evaluating individual training modules.

B. When using the job aid, an inspector should

make a side-by-side comparison of the operator's proposal to determine the following:

- Whether each subject is aircraft-specific in terms of description, company policy, and appropriate procedures
- Whether sufficient training module elements or events are listed to ensure the appropriate depth and scope of the material being presented

C. The job aid is organized with the training modules listed in the left column and evaluation criteria or remarks listed horizontally across the top. Inspectors may use the spaces within the matrix for items such as notes, comments, dates, or checkmarks. There are also blank columns and rows in the job aid in which inspectors may include additional training modules for systems unique to a particular aircraft and methods or procedures unique to a particular operation.

450. - 460. RESERVED

FIGURE 3.2.5.1
AIRCRAFT GROUND TRAINING MODULE JOB AID
SUBJECT AREA 1: GENERAL OPERATION SUBJECTS

	EVALUATION CRITERIA			
TRAINING SUBJECTS	Adequacy of Elements/Events	Adequacy of Courseware	Training Aids and Facilities	
Flight Control *				
Weight and Balance				
OpSpecs Authorizations/ Limitation				
Adverse Weather				
Flight Planning				
Aircraft Flight Manual				
Company Operations Manual				
Performance				

*** Flight dispatch (part 121 Domestic and Flag), flight release (part 121 supplemental), or flight-locating (part 135), as applicable.**

FIGURE 3.2.5.1
AIRCRAFT GROUND TRAINING MODULE JOB AID (Cont'd)
SUBJECT AREA 2: AIRCRAFT SYSTEMS

	EVALUATION CRITERIA			
TRAINING SUBJECTS	Adequacy of Elements/Events	Adequacy of Courseware	Training Aids and Facilities	
Aircraft General				
Equipment and Furnishings				
Emergency Equipment				
Powerplants				
Electrical				
Pneumatic				
Air Conditioning and Pressurization				
Ice and Rain Protection				
APU				
Hydraulics				
Landing Gear and Brakes				
Flight Controls				
Fuel				
Communications Equipment				
Flight Instruments				
Navigation Equipment				
Autoflight				
Warning Systems				
Fire and Overheat Protection				
Oxygen				
Performance				

FIGURE 3.2.5.1
AIRCRAFT GROUND TRAINING MODULE JOB AID (Cont'd)
SUBJECT AREA 3: AIRCRAFT SYSTEMS INTEGRATION

	EVALUATION CRITERIA			
TRAINING SUBJECTS	Adequacy of Elements/Events	Adequacy of Courseware	Training Aids and Facilities	
Use of Checklist				
Cockpit Familiarization				
Preflight Planning				
Inflight Planning				
Use of Weather Radar/CRTs				
Navigation Systems				
Communication Systems				
Autoflight/ Flight Director				

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