
APPROVAL OF A FLIGHT SIMULATION TRAINING DEVICE

1.0 PURPOSE

1.1 This Advisory Circular (AC) describes the application and process for obtaining an approval for use of a Flight Simulation Training Device to conduct aviation training under the Civil Aviation (Personnel Licensing). This AC provides basic information applicable to the certification process.

1.2 Applicants will be briefed in as much detail as necessary regarding the preparation of the relevant manuals and other documents during meetings with the Authority personnel. The information in this AC and the material referenced therein will assist the applicant in completing the process with minimal delays and complications.

2.0 REFERENCES

2.1 The Civil Aviation Act

2.2 The Civil Aviation (Approved Training Organisations) Regulations.

2.3 The Civil Aviation (Personnel Licensing) Regulations.

3.0 BACKGROUND

3.1 This process is designed to ensure that a prospective holder of an Approved Training Organisation Certificate understands the requirements for the approval of a FSTD and is capable of meeting them. When satisfactorily completed, the certification process would ensure that the applicant is able to comply with the applicable requirements of Civil Aviation (Approved Training Organization) Regulations and the civil aviation (personnel Licensing) Regulations and the international standards applicable to the operation of a Flight Simulation Training Device.

3.2 The certification comprises of 5 phases. A phase separates the process into related sequential activities supporting a specific function. Each phase is described in sufficient detail to provide a general understanding of the entire certification process. The five (5) phases are:

3.2.1 Pre-application;

3.2.2 Formal Application;

3.2.3 Document Evaluation;

3.2.4 Demonstration and Inspection; and

3.2.5 Certification.

4.0 QUALIFICATION AND APPROVAL GUIDE (QAG).

4.1 The QAG is a detailed description of the simulated aircraft systems, design criteria, and functionality for a basic instrument flight trainer or a flight procedures trainer. The required design criteria for a basic instrument flight trainer are described in Appendix A, The additional design criteria for a flight procedures trainer are described in Appendix B. The QAG must include and verify all the required elements of design and functionality identified in these appendices to facilitate the Authority's acceptance.

NOTE: The QAG is a document that is developed by the Manufacture and approved by the state that issues the letter of Authorization/approval and/or Qualification Certificate.

4.2 The QAG document must include a cover page with the company name, address, and contact phone number with the training device picture, model name, and number. The following page should include the table of contents. The following is an example of the appropriate QAG contents:

1. **Trainer Description.** Include a detailed description of what aircraft are represented and the model details. This is where quality pictures of the trainer should be located. This will permit easy identification of the approved trainer configuration(s).
2. **Components List.** List any hardware or software components that make the device function (flight deck panels, avionics components, computer processors, projectors, screens, LCD screens, operating systems software, etc.).
3. **Design Criteria.** Word-for-word listing identifying the applicable qualifying items (a basic instrument flight trainer are described in Appendix A. The additional design criteria for an flight procedures trainer are described in Appendix B)
4. **Aircraft Configurations.** Provide a picture of the instrument panel for each configuration. The performance table for all aircraft available should be provided in this section.
5. **Visual System(s).** Provide pictures and descriptions of the visual systems available for the trainer.
6. **FSTD Checklist (Procedures and Tasks Test Checklist).** Identify the functions and tasks that can be accomplished in this trainer.

4.3 Please include footers for each page to reflect when the page was last revised, or if it is the original version of the document. This document should be formatted as one document and book-like in nature, with numbered pages. Each content section should start at the top of a new page.

4.4 Revised QAG Requirement.

4.4.1 An operator who modifies a FSTD in any manner must receive an approval from the manufacturer and/or state that issues the letter of Authorization/approval and/or Qualification Certificate.

4.4.2 The applicant must also submit a new application letter summarizing the changes that are reflected in the revised QAG and a revised LOA submitted to the manufacturer. This ensures that

the standards of the approval are maintained, including model identification, design, system integrity, aerodynamic modelling, and other essential characteristics of the hardware/software components.

5.0 FSTD GUIDE

5.1 A FSTD Guide is a document/manual developed by the user guided by the manufacturers approved QAG. This document/manual is customized by the user to only show the equipment/device with which user approval is sought

Example: A FSTD may be capable to be configured into three different types of aircraft however user approval sought is for only one type.

5.2 A FSTD Guide shall include:

- a) a detailed list and description of all the hardware and software components that makes up the training device presented for approval. This list must include any optional equipment or features. The description of the hardware and software components must include the manufacturer, model, and version number of each component, or any other information necessary to correctly identify each component or feature.

- b) a word-for-word listing of each title, number, and letter item listed in Appendix A for a basic flight instrument trainer, and additionally the items listed in Appendix B for a flight procedures trainer approval, and state the following information for each item.
 - i. The operation or role of the item as appropriate to the aircraft being represented.
 - ii. The value for each requirement that either meets or exceeds the minimum specified for that item or criteria.
 - iii. If the aircraft represented does not have the referenced item by design, report it as follows: “Carburetor Heat-N/A, Cowl Flaps-N/A,” or “Retractable Landing Gear-N/A.”
 - iv. A performance chart for the aircraft configurations (M/M) represented must be included in the FSTD Guide, appropriate to the airplane or helicopter configuration. Performance should be specified for sea level and 6,000 ft. mean sea level (MSL) at gross weight. The FSTD Guide must contain color photographs of the assembled unit in any of the configurations available. The photographs must clearly show the overall component arrangement, features, ergonomics, and operational role of each hardware control or display item listed for the aircraft being represented.
 - v. The requirements specified for the FSTD Guide are necessary so the Authority can determine the acceptability of a device as a flight simulation training device by conducting a comprehensive in-office evaluation and review of the FSTD Guide. The flight simulation training device must appropriately represent the aircraft cockpit instrument panel design, flight controls, radio and navigation equipment, panels, switches, systems, and other controls and be readily identifiable in the QAG.

Note: The FSTD Guide shall be developed by the user/training organization with reference to the manufacturers QAG (The QAG shall be used as a master guide).

6.0 APPROVAL OF A BASIC INSTRUMENT FLIGHT TRAINER (BIFT)

6.1 It is a device that:

- a) Meets or exceeds the criteria outlined in Appendix A, basic instrument flight trainer Requirements.
- b) Provides an adequate training platform and design for both procedural and operational performance tasks specific to the ground and flight training requirements for Private Pilot Licence with instrument rating as per the civil aviation (Personnel Licensing) regulations.

7.0 APPROVAL OF FLIGHT PROCEDURES TRAINER

7.1 A flight procedures trainer is a device that:

- a) Meets or exceeds the criteria outlined in Appendix A;
- b) Meets or exceeds the criteria outlined in Appendix B, flight procedures trainer Requirements.

7.2 It Provides an adequate training platform for both procedural and operational performance tasks specific to the ground and flight training requirements for Commercial Pilots Licence, Instrument Rating and Airline Transport Pilots Licence as per the Civil Aviation (Personnel Licensing) Regulations as amended.

7.3 Each FPT that is intended for training, testing or checking in an Approved Training Organization and for which credit is being sought should be approved for use by the Authority.

7.4 FPT that are to be used for training are to be ‘qualified’ and ‘approved’; Device Qualification is a measure of the devices capabilities against a set of technical specifications; whereas user approval relates to the extent which a device maybe used in lieu of the aircraft for licensing and/or operational training, testing or checking. This also takes into account where appropriate, the aircraft to device differences and the operating and training ability of the ATO. The user approval effectively links the use of a qualified device to a particular course of training by giving credits against flight time or more specifically allowing a given device to be used in lieu of the aircraft, to satisfy various licensing and operational requirements.

7.5 The Authority does not qualify FPTs but will issue FPT user approvals based of Qualification Certificates and any other qualification documents given by the state that issues the letter of Authorization/approval and/or Qualification Certificate as well as the manufacturer.

7.6 Manufacturer Responsibilities. Manufacturers of FSTDs are responsible for assuring acceptable design and providing all the required documentation for each model they produce when authorized for pilot training and experience requirements. This would include any new or revised LOAs and QAGs that apply to the approved FSTD. The manufacturer should provide the current LOA, the state approved QAG to the person or persons that purchase and use their FSTD for pilot training and experience.

7.7 Instructor Requirements: The Authority requires that an instructor who intends to use an FSTD for training pilot candidates obtain documented advanced training from the manufacturer (or person proficient with its use) on all aspects of the training device operation. This indoctrination should include a complete review of the available databases, aircraft configurations, systems review (avionics and aircraft systems and performance), weather

simulations, systems failure capabilities, instructor station use, and support available from the manufacturer. This would be similar to someone becoming familiar and proficient in a new aircraft as described for transition or differences training

8.0 PHASE I: PREAPPLICATION PHASE

8.1 Applicant shall present a letter of intent to the Authority. A Pre application meeting shall be held where the applicant shall be taken through the following:

- a) Approval process
- b) Relevant Regulations and further information in regards to the FSTD
- c) Documents to be presented

8.2 In addition to meeting the Civil Aviation (Approved Training Organization) Regulation; the ATO shall implement the following:

- a) a routine maintenance programme to ensure that the training devices continue to function properly and, when applicable, continue to accurately replicate any component, system or equipment for which training, checking or testing credits are being sought; and
- b) A record-keeping process for each training device to be established and maintained, which accurately records the device's use and lists any discrepancies with respect to its functionality or intended performance characteristics that may impact training.
- c) The relevant ATO manuals shall identify the device and reflect the number of hour's credit for each device and each course; these will be reviewed and agreed by the Authority and any changes need to be notified to the authority for review and approval prior to implementation.
- d) Quality Safety system within the ATO shall encompass the FSTD as appropriate.

9.0 PHASE II: FORMAL APPLICATION PHASE

9.1 The ATO shall present the formal application package which shall contain at least:

- a) Current copy of Qualification certificate
- b) Qualification and approval guide and all documents related to the Qualification
- c) Statement of compliance
- d) FSTD Guide(developed by user)
- e) Training and Procedures Manual or Amendments
- f) Quality Manual or Amendments
- g) A copy of letter of authorization/approval from the manufacturer or state that issues the letter of Authorization/approval and/or Qualification Certificate
- h) Performance information for the aircraft configurations being represented

10.0 PHASE III: DOCUMENT EVALUATION PHASE

10.1 In this phase the Authority shall evaluate the documents presented in the application package and further proceed to approve or accept the manuals/amendments using the relevant checklists. The Authority shall accept the FSTD Guide as well as the Quality Manual and approve the Training and procedures manual.

10.2 The Authority shall visit the applicant's premises where the FSTD is kept and conduct an

inspection to ensure all regulations and procedures/items outlined in this manual are met. In case any finding is raised the applicant is given time to address them before moving to the final stage.

10.3 The inspection/demonstration shall include but not limited to:

- a. Start-up process
- b. How the pre-flight checklist is completed
- c. How the snags are documented and resolved
- d. Maintenance program of the FSTD
- e. Record Keeping
- f. Infrastructure

11.0 PHASE V: CERTIFICATION PHASE

11.1 The approval is either granted or denied. The Approval/Denial will be in the form of a letter. A letter of approval shall be granted based on the Qualification Documents presented. Approval shall be granted for students to train and log time as below:

- a) BIFT approvals will be as follows:
 - Up to 5hrs towards a PPL qualification as per the Civil Aviation (Personnel Licensing) Regulations
- b) FPT approvals will be as follows:
 - Up to 10 hrs towards a CPL qualification as per the Civil Aviation (Personnel Licensing) Regulations
 - Up to 20 hrs towards an Instrument Rating qualification as per the Civil Aviation (Personnel Licensing) Regulations

Note: Both BIFT and FPT approvals are valid for one year.

12.0 RENEWAL OF A FSTD RENEWAL

12.1 The continued validity of an FSTD is dependent upon an operator maintaining the requirements under the procedures outlined above under the supervision of the Authority.

12.2 The application for the renewal of an FSTD must be submitted to the Authority at least 60 days, or as otherwise agreed, before the end of the existing period of validity. This application for renewal of FSTD should contain the following:

- a. A letter of request for renewal of the FSTD.
- b. Where applicable, proof of payment of the FSTD renewal fee.

12.3 The request for renewal shall include any desired changes to the basic information that was submitted prior to the original approval process and during the ongoing operations. Such renewal does not involve a complete recertification procedure and thus will not be a prolonged process, because of the continuing surveillance exercised by the Authority.

12.4 The Authority shall conduct at least an annual inspection to ensure compliance of the FSTD in respect to regulations and ATO's Approved Documents.

Note 1: Upon Renewal/Initial approval the FSTD shall only be valid as long as the Letter of Authorization from the manufacturer/state of approval is valid.

Note 2. The Letter of Approval shall only be valid for the particular training organization however if the ATO intends to train students from another approved training organization an agreement must be signed outlining the following:

- i. The student shall meet all the prerequisite requirements of the new ATO*
- ii. The student will be trained as per the approved training manual and FSTD guide*
- iii. The credit time provided to the student shall not exceed the requirements as stipulated on the letter of approval.*

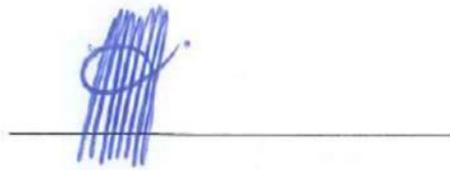
13.0 EXPLANATION OF APPENDICES IN THE AC

13.1 The following Appendices accompany this document:

Appendix A sets out the requirements of a basic instrument flight trainer;

Appendix B sets out the requirements of a flight procedures trainer;

Appendix C is a list of definitions of some key terms used in ATO certification



Civil Aviation Authority

APPENDIX A. BASIC INSTRUMENT FLIGHT TRAINER (BIFT) REQUIREMENTS

1.1 Purpose. This appendix describes how the Authority will evaluate a BIFT for approval and authorized use. A BIFT incorporating specific design criteria will be evaluated for approval as a BIFT on the basis of meeting or exceeding the criteria outlined in this appendix.

1.2 Authorized Use. The Authority will specify the allowable credit in the BIFT letter of approval for private pilot, instrument rating, and instrument recency of experience.

Note: Flight crew training organizations must obtain a specific authorization for the use of the BIFT as part of that ATO's approved training manual. This approval must come from the Authority.

1.3 BIFT Design Criteria. The Qualification and Approval Guide (QAG) is the initial means for determining whether a BIFT is acceptable for use in flight crew training organizations. The QAG will be used to determine if a BIFT meets or exceeds minimum Authority design criteria outlined in this appendix.

1.3.1 A BIFT found acceptable for use will typically be used to train procedural tasks and may also be used to meet instrument experience requirements when specifically authorized. Each QAG submitted to the Authority for evaluation must state the make and model (M/M) of aircraft being represented and is the basis for the following requirements:

1.4 General Control Requirements. The following items are required for all FSTD approvals.

1.4.1 The aircraft physical flight and associated control systems must be recognizable as to their function and how they are to be manipulated solely from their appearance. These physical flight control systems cannot use interfaces such as a keyboard, mouse, or gaming joystick to control the aircraft in simulated flight.

1.4.2 Virtual controls are those controls used to set up certain aspects of the simulation (such as selecting the aircraft configuration, location, weather conditions, etc.) and otherwise program, effect, or pause the training device. These controls are often part of the instructor station or independent computer interface.

1.4.3 Except for the initial setup, a keyboard or mouse may not be used to set or position any feature of the FSTD flight controls for the maneuvers or training tasks to be accomplished. See the control requirements listed below as applicable to the aircraft model represented. The pilot must be able to operate the controls in the same manner as it would be in the actual aircraft. This includes the landing gear, wing flaps, cowl flaps, carburetor heat, mixture, propeller, and throttle controls appropriate to the aircraft model represented.

1.4.4 The physical arrangement, appearance, and operation of controls, instruments, and switches required by this appendix should closely model the aircraft represented. Manufacturers are expected to recreate the appearance, arrangement, operation, and function of realistically placed physical switches and other required controls representative of an aircraft instrument panel that includes at least the following:

- Master/battery;
- Magnetos for each engine (as applicable);
- Alternators or generators for each engine;

- Auxiliary power unit (APU) (if applicable); • Fuel boost pumps/prime boost pumps for each engine;
- Avionics master;
- Pitot heat; and
- Rotating beacon/strobe, navigation, taxi, and landing lights

1.5 Additional Controls and Functional Requirements. Physical flight and aircraft system controls must be provided as follows:

1.5.1 for Airplane:

1. A self-centering displacement yoke or control stick that allows continuous adjustment of pitch and bank.
2. Self-centering rudder pedals that allow continuous adjustment of yaw and corresponding reaction in heading and roll.
3. Throttle or power control(s) that allows continuous movement from idle to full-power settings and corresponding changes in pitch and yaw, as applicable.
4. Mixture/condition, propeller, and throttle/power control(s) as applicable to the M/M of aircraft represented.
5. Controls for the following items, as applicable to the category and class of aircraft represented:
 - Wing flaps,
 - Pitch trim,
 - Communication and navigation radios,
 - Clock or timer,
 - Gear handle (if applicable),
 - Transponder,
 - Altimeter,
 - Carburetor heat (if applicable), and
 - Cowl flaps (if applicable).

1.5.2 For Helicopter:

2. A cyclic control stick that tilts the main rotor disk by changing the pitch angle of the rotor blades in their cycle of rotation.
3. A collective pitch control that changes the pitch angle of all main rotor blades simultaneously.
4. Throttle/power control that allows continuous movement from idle to full power settings and which controls engine (rotor) revolutions per minute (rpm).
5. Antitorque pedals used to control the pitch of the tail rotor that allows continuous adjustment of the helicopter heading.
6. Mixture/condition control applicable to the helicopter model represented. Controls for the following items, as applicable to the helicopter represented:
 - Communication and navigation radios,
 - Clock or timer,
 - Transponder,
 - Altimeter, and
 - Carburetor heat (if applicable).

1.6 Control Input Functionality and Response Criteria.

1. Time from control input to recognizable system response must be without delay (i.e., not appear to lag in any way). The manufacturer must verify this performance criteria in the QAG submitted for approval
2. The control inputs must be tested by the computer and software program at each startup and displayed as a confirmation message of normal operation or a warning message that the transport delay time or any design parameter is out of tolerance. It should not be possible to continue the training session unless the problem is resolved and all components are functioning properly.

1.7 Display Requirements.

1.7.1 The following instruments and indicators must be replicated and properly located as appropriate to the aircraft represented:

1. Flight instruments in a standard configuration representing the traditional “round” dial flight instruments. An electronic primary flight display (PFD) with reversionary and backup flight instruments is also acceptable.
2. A sensitive altimeter with incremental markings each 20 feet or less, operable throughout the normal operating range of the M/M of aircraft represented.
3. A magnetic direction indicator.
4. A heading indicator with incremental markings each 5 degrees or less, displayed on a 360 degree circle. Arc segments of less than 360 degrees may be selectively displayed if desired or required, as applicable to the M/M of aircraft represented.
5. An airspeed indicator with incremental markings as shown for the M/M aircraft represented; airspeed markings of less than 20 knots need not be displayed.
6. A vertical speed indicator (VSI) with incremental markings each 100 feet per minute (fpm) for both climb and descent, for the first 1,000 fpm of climb and descent, and at each 500 fpm climb and descent for the remainder of a minimum $\pm 2,000$ fpm total display, or as applicable to the M/M of aircraft being represented.
7. A gyroscopic rate-of-turn indicator or equivalent with appropriate markings for a rate of 3 degrees per second turn for left and right turns. If a turn and bank indicator is used, the 3 degrees per second rate index must be inside of the maximum deflection of the indicator.
8. A slip and skid indicator with coordination information displayed in the conventional inclinometer format where a coordinated flight condition is indicated with the ball in the center position. A split image triangle indication as appropriate for PFD configurations may be used.

9. An attitude indicator with incremental markings each 5 degrees of pitch or less, from 20 degree pitch up to 40 degree pitch down or as applicable to M/M of aircraft represented. Bank angles must be identified at “wings level” and at 10, 20, 30, and 60 degrees of bank (with an optional additional identification at 45 degrees) in left and right banks.

10. Engine instruments as applicable to the M/M of aircraft being represented, providing markings for the normal ranges including the minimum and maximum limits.

11. A suction gauge or instrument pressure gauge with a display applicable to the aircraft represented.

12. A flap setting indicator that displays the current flap setting. Setting indications should be typical of that found in an actual aircraft.

13. A pitch trim indicator with a display that shows zero trim and appropriate indices of airplane nose down and airplane nose up trim, as would be found in an aircraft.

14. Communication radio(s) with a full range of selectable frequencies displaying the radio frequency in use.

15. Navigation radio(s) with a full range of selectable frequencies displaying the frequency in use and capable of replicating both precision and nonprecision instruments, including approach procedures (each with an aural identification feature), and a marker beacon receiver. For example, an instrument landing system (ILS), non-directional radio beacon (NDB), Global Positioning System (GPS), Localizer (LOC) or very high frequency omni-directional range (VOR). Graduated markings as indicated below must be present on each course deviation indicator (CDI) as applicable. The marking should include:

- One-half dot or less for course/glideslope (GS) deviation (i.e., VOR, LOC, or ILS), and
- Five degrees or less for bearing deviation for automatic direction finder (ADF) and radio magnetic indicator (RMI), as applicable.

16. A clock with incremental markings for each minute and second, or a timer with a display of minutes and seconds.

17. A transponder that displays the current transponder code.

18. A fuel quantity indicator(s) that displays the fuel remaining, either in analogue or digital format, appropriate for M/M of aircraft represented.

Note: The minimum instrument and equipment requirements specified under the civil aviation (Instrument and Equipment) Regulation for day visual flight rules (VFR) and instrument flight rules (IFR) must be functional during the training session. This does not prohibit simulating failures for training purposes.

1.7.2 All instrument displays listed above must be visible during all flight operations. Allowances can be made for multifunction electronic displays that may not display all instruments simultaneously. All of the displays must provide an image of the instrument that is clear and:

1. Does not appear to be out of focus or illegible.
2. Does not appear to “jump” or “step” during operation.
3. Does not appear with distracting jagged lines or edges.
4. Does not appear to lag relative to the action and use of the flight controls.

1.7.3 Control inputs should be reflected by the flight instruments in real time and without a perceived delay in action. Display updates must show all changes (within the total range of the replicated instrument) that are equal to or greater than the values stated below:

- Airspeed indicator: change of 5 knots.
- Attitude indicator: change of 2 degrees in pitch and bank.
- Altimeter: change of 10 feet.
- Turn and bank: change of ¼ standard rate turn.
- Heading indicator: change of 2 degrees.
- VSI: change of 100 fpm.
- Tachometer: change of 25 rpm or 2 percent of turbine speed.
- VOR/ILS: change of 1 degree for VOR or ¼ of 1 degree for ILS.
- ADF: change of 2 degrees.
- GPS: change as appropriate for the model of GPS-based navigator represented.
- Clock or timer: change of 1 second.

1.7.4 Displays must reflect the dynamic behavior of an actual aircraft (e.g., a VSI reading of 500 fpm must reflect a corresponding movement in altitude, and an increase in power must reflect an increase in the rpm indication or power indicator.)

1.8 Flight Dynamics Requirements.

1.8.1 Flight dynamics of the BIFT should be comparable to the way the represented training aircraft performs and handles. However, there is no requirement for a BIFT to have control loading to exactly replicate any particular aircraft.

1.8.2 Aircraft performance parameters (such as maximum speed, cruise speed, stall speed, maximum climb rate, and hovering/sideward/forward/rearward flight) should be comparable to the aircraft being represented. A performance table will need to be included in the QAG for each aircraft configuration for sea level and 5,000 feet using standard atmosphere and gross weight conditions. An alternate performance altitude for 6,000 feet can be used if the manufacturer of that aircraft has a performance chart reflecting that altitude; otherwise the FSTD manufacturer will need to interpolate the performance for the chart. Performance at altitude for turboprop or turbojet configurations should reflect 18,000 ft

1.8.3 Aircraft vertical lift component must change as a function of bank comparable to the way the aircraft being represented performs and handles.

1.8.4 Changes in flap setting, slat setting, gear position, collective control, or cyclic control must be accompanied by changes in flight dynamics comparable to the way the M/M of aircraft represented performs and handles.

1.8.5 The presence and intensity of wind and turbulence must be reflected in the handling and performance qualities of the simulated aircraft and should be comparable to the way the aircraft represented performs and handles.

1.9 Instructor Management Requirements.

1.9.1 The instructor must be able to pause the system at any time during the training simulation for the purpose of administering instruction or procedural recommendations.

1.9.2 If a training session begins with the “aircraft in the air” and ready for the performance of a particular procedural task, the instructor must be able to manipulate the following system parameters independently of the simulation:

- Aircraft geographic location,
- Aircraft heading,
- Aircraft airspeed,
- Aircraft altitude, and
- Wind direction, speed, and turbulence.

1.9.3 The system must be capable of recording both a horizontal and vertical track of aircraft movement during the entire training session for later playback and review.

1.9.4 The instructor must be able to disable any of the instruments prior to or during a training session and be able to simulate failure of any of the instruments without stopping or freezing the simulation to affect the failure. This includes simulated engine failures and the following aircraft systems failures: alternator or generator, vacuum or pressure pump, pitot static, electronic flight displays, or landing gear or flaps, as appropriate

1.9.5 The FSTD must have at least a navigational area database that is local (25 nautical miles (NM)) to the training facility to allow reinforcement of procedures learned during actual flight in that area.

APPENDIX B. FLIGHT PROCEDURES TRAINER (FPT) REQUIREMENTS

1.0 Purpose. This appendix describes how the AUTHORITY will evaluate an FPT for approval and authorized use. A BIFT incorporating the additional specific advanced design simulation criteria will be evaluated for approval as an FPT on the basis of meeting or exceeding the additional criteria outlined in this appendix.

2.0 Authorized Use. Except for specific aircraft type training and testing, an FPT may be approved and authorized for use in accomplishing certain required tasks, maneuvers, or procedures as applicable under the civil aviation(personnel licensing) regulations. The authority will specify the allowable credit in the FPT Letter of Approval for Private Pilots Licence, Commercial pilots Licence, Airline Transport Pilots Licence, and Instrument Rating.

Note: A flight crew training organization must obtain approval for the use of the FSTD as part of that ATO's approved Training manual.

3.0 FPT Design Criteria. Devices presented for approval as an FPT must first meet or exceed the requirements for BIFT approval criteria contained in Appendix A, Basic Aviation Training Device (BIFT) Requirements. An FPT must display sufficient aircraft cockpit design, ergonomic features, and performance characteristics beyond that of the BIFT approval criteria to qualify for the authorized uses appropriate for the FPT simulation devices. Since it is highly desirable for the pilot to be mentally immersed in a realistic aircraft cockpit when using an FPT, design features must significantly exceed those of a BIFT cockpit layout.

3.1 An FPT must include the following additional features and components:

1. A realistic shrouded (enclosed) or unshrouded (open) cockpit design and instrument panel arrangement representing a specific model aircraft cockpit.
2. Cockpit knobs, system controls, switches, and/or switch panels in realistic sizes and design appropriate to each intended functions, in the proper position and distance from the pilot's seated position, and representative of the category and class of aircraft being represented.
3. Primary flight and navigation instruments appropriately sized and properly arranged that exhibit neither stepping nor excessive transport delay.
 - Digital avionics panel.
 - GPS navigator with moving map display.
4. Two-axis autopilot, and, as appropriate, a flight director (FD). This is only required when an autopilot is original standard equipment from the aircraft manufacturer.
5. Pitch trim (manual or electric pitch trim) permitting indicator movement either electrically or analog in an acceptable trim ratio (airplane only).

6. An independent visual system, panel, or screen that provides realistic cues in both day and night VFR and IFR meteorological conditions to enhance a pilot's visual orientation in the vicinity of an airport including:
 - Adjustable visibility parameters; and
 - Adjustable ceiling parameters.
7. A fixed pilot seat appropriate to the aircraft configuration, including an adjustable height and an adjustable forward and aft seat position.
8. Rudder pedals secured to the cockpit floor structure, or that can be physically secured to the floor beneath the device in proper relation to cockpit orientation.
9. Push-to-talk switch on the control yoke.
10. A separate instructor station to permit effective interaction without interrupting the flight in overseeing the pilot's horizontal and vertical flight profiles in real time and space. This must include the ability to:
 - Oversee tracks along published airways, holding entries and patterns, and LOC and GS alignment/deviation (or other approaches with a horizontal and vertical track).
 - Function as air traffic control (ATC) in providing vectors, etc., change in weather conditions, ceilings, visibilities, wind speed and direction, light/moderate/severe turbulence, and icing conditions.
 - Invoke failures in navigation and instruments, radio receivers, landing gear and flaps, engine power (partial and total), and other aircraft systems (pitot, electric, static, etc.) by using either a keyboard or mouse.

3.2 The following features and components are not required for the AUTHORITY's approval of an FPT, but are encouraged:

- Multi-panel or wrap-around visual system providing a 120 degrees or more of horizontal vision
- Automated ATC communications, scenario-based training (SBT), or line-oriented type training in which the instructor can evaluate pilot performance without having to act as ATC.
- Simulated loss of performance and aerodynamic changes from ice accretion.
- Realistic aircraft engine sound appropriate to the aircraft configuration, power settings, and speed.
- A magnetic compass with incremental markings each 5 degrees, that displays the proper lead or lag during turns, and displays incremental markings typical of that shown in the aircraft.

Note: The authority will allow touch screen functionality to be used in an FSTD for those functions or tasks executed in an aircraft that are simple push-button actions (or similar) to replicate similar actions on the instrument panel or flight deck, to control aircraft systems or avionics. However, for actions that require a twisting or turning action of a physical knob, and/or require a gripping or pulling action of a physical lever or handle to actuate a system in the aircraft, the trainer must have a similar physical knob/lever/handle representation in the FP.

APPENDIX C

DEFINITIONS

Accountable Manager. The individual who has corporate authority for ensuring that all training commitments can be financed and carried out to the standard required by the civil aviation authority, and any additional requirements defined by the approved training organization (ATO).

Approved training. Training conducted under special curricula and supervision approved by a Contracting State.

Approved training organization (ATO). An organization approved by and operating under the supervision of a Contracting State in accordance with the requirements of Annex 1 to perform approved training.

Checking. See definition of testing.

Compliance. The state of meeting those requirements mandated through regulation.

Conditions. Anything that may qualify a specific environment in which performance will be demonstrated.

Evaluator. A generic term used in the context of an approved training organization (ATO) to describe a person who is qualified, authorized and assigned to carry out specific assessment, checking, testing and/or auditing duties to determine that all required standards of performance have been satisfactorily achieved.

Finding. A finding is a conclusion by the operator's or by the civil aviation authorities audit personnel that demonstrates either non-compliance with a regulation or non-conformity with a specific standard.

Flight Simulation Training Device means any one of the following three types of apparatus in which flight conditions are simulated on the ground—

a flight simulator, which provides an accurate representation of the cockpit of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members and the performance and flight characteristics of that type of aircraft are realistically simulated;

A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the cockpit environment of an aircraft in flight in instrument flight conditions

a flight procedures trainer, which provides a realistic cockpit environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class controls in an open flight deck area or an enclosed aircraft cockpit. It includes the hardware and software necessary to represent a category and class of aircraft (or set of aircraft) operations in ground and flight conditions having the appropriate range of capabilities and systems installed in the device as described within this AC for the specific basic or advanced qualification level.

Foreign ATO. An approved training organization (ATO) located outside the territory of the State.

Head of training. The individual responsible for the organization's activities, policies, practices and procedures while ensuring the continued maintenance of the training organization's approval status.

Licensing Authority. The Authority designated by a Contracting State as responsible for the licensing of personnel.

Performance criteria. Statements used to assess whether the required levels of performance have been achieved for a competency. A performance criterion consists of an observable behavior, condition(s) and a competency standard.

Policy. A document containing the organization's position or stance regarding a specific issue.

Process. A set of interrelated or interactive activities which transform inputs into outputs.

Quality. The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

Qualification and Approval Guide (QAG). The QAG is a detailed description of the simulated aircraft systems, design criteria, and functionality for a flight procedures trainer.

Testing. The comparison of the knowledge about a task or the skill to perform a task against an established set of criteria to determine that the knowledge or skill observed meets or exceeds, or does not meet, those criteria.