

# ORDER

8110.41A

## FAA FLIGHT TEST TRAINING RESPONSIBILITIES AND PROCEDURES



DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION



## **FOREWORD**

This Order prescribes the Federal Aviation Administration's (FAA's) Aircraft Certification Service (AIR) policy and procedures for flight test pilot/engineer responsibilities, procedures and training.

Marion C. Blakey  
Administrator

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## CHAPTER 1. FLIGHT TEST PILOT/ENGINEER RESPONSIBILITIES, PROCEDURES, AND TRAINING OVERVIEW

**1. Purpose.** This order establishes responsibilities, procedures and guidance pertaining to FAA flight testing. It also outlines certain training and type rating requirements. This information supersedes pilot training data contained in Order 8110.4B, Type Certification, and supplements the guidance in Order 8000.32, National Training Plan for Aerospace Engineers, Flight Test Pilots, and Program Support Specialists.

**2. Distribution.** This order is distributed to Washington Headquarters branch levels of the Aircraft Certification Service (AIR), to the branch level in the regional Aircraft Certification Directorates, all Aircraft Certification Offices (ACOs), the Brussels Aircraft Certification Division, the office of Training and Higher Education, and the FAA Academy.

**3. Who This Order Applies To.** All flight test pilots (FTPs), flight test engineers (FTEs), and their managers will adhere to the policies contained in this order. The requirements of this order should be followed during budget preparation to identify pilot training needs. The Flight Program Oversight Committee (FPOC) has responsibility for the oversight of the AIR Flight Program. Appendix I contains the charter of the FPOC.

**4. Background.** The Aircraft Certification Service work force includes a cadre of FTPs and FTEs (otherwise referred to as Crewmembers in this Order), who are assigned among the Service's directorate staffs and ACOs. Those flight test personnel comprise one of the most highly credentialed, experienced, and skilled flight test organizations in the aviation industry today. This group of flight test professionals is instrumental in achieving the successful accomplishment of AIR's strategic goals and in maintaining a position of preeminence in Safety Management. A flight test staff that represents the FAA well, contributes significantly to the overall effectiveness and credibility of the Service in the national and international aviation arenas. FAA flight test personnel provide the final validation in the certification process, and provide a credible flight operations and aircraft level perspective in the Continued Operational Safety (COS) process. In order to establish operating limitations, FAA FTPs and FTEs routinely fly technically advanced or unconventional aircraft well beyond the most adverse conditions the aircraft will encounter in operation. FTPs fly aircraft during marginally safe conditions and may encounter unexpected and potentially hazardous situations, which require exceptional piloting skill. The safety of FAA flight test personnel and the applicant flight crews who fly with them is paramount to the accomplishment of our safety management responsibilities. The keys to insuring flight test safety are: hiring and retaining the most qualified people, training them continuously, keeping them current and proficient in the practice of flight testing, and maintaining an effective safety program.

**5. General Responsibilities.** FAA flight test personnel perform essential roles in AIR's certification programs, COS efforts, and delegation oversight functions. FTPs and FTEs perform flight tests on new or modified aircraft, and evaluate the resultant engineering

data to determine compliance with applicable certification regulations. Those tests typically include assessments of aircraft performance, flight characteristics, systems integration, and human factors design considerations. In the COS arena, FAA flight test personnel evaluate service difficulty reports and manufacturer's service bulletins, provide the engineering flight test and flight operations perspective in the development of Airworthiness Directives, and develop responses to FAA and National Transportation Safety Board safety recommendations. FAA flight test personnel are also responsible for the oversight and guidance of Designated Engineering Representatives (DERs) and delegated organizations.

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## **CHAPTER 2. GENERAL FLIGHT TEST PERSONNEL QUALIFICATION, TRAINING, AND CURRENCY POLICY**

**200. Initial Training and Qualification of Flight Test Personnel.** Each newly hired FTP or FTE [an FAA employee for less than two (2) years] is initially qualified by successfully completing a formal flight test training program coupled with on-the-job training. This order should be cited as the authority for requesting this required initial training. The courses listed in this chapter of the order are considered Priority 1 training for all FTPs and FTEs.

**a.** FTPs and FTEs must successfully complete the formal Initial Flight Test Pilot/Flight Test Engineer Course #28083, within the first year following assignment to flight test duty. Failure to successfully complete the course could result in reassignment, demotion, or dismissal from assignment as a FTP or FTE in the FAA.

**b.** Each FTP and FTE should complete the Engineering Indoctrination Training Course (#21936 and 27936) within the first six months of service with the Aircraft Certification Service.

**c.** The Crew Resource Management Course, #12062, should be completed within the first year of employment.

**d.** Within the first 2 years of employment, each FTP or FTE should complete the following courses:

**(1)** Core Job Functions Course (#21017)

**(2)** Part 21 Course (#21016)

**(3)** Delegation Management Course (#21050)

**e.** Prior to participating in flight-testing, FAA employees must meet the following requirements:

**(1)** Medical Certificates. FAA Management has an over-riding obligation to ensure that our employees are physically capable of performing flight duties. Employee well-being and safety are our major concerns. The only method of insuring the medical fitness of employees to perform flight duties is by a flight physical. Flight physicals should be coordinated through the local Office of Aerospace Medicine

**(a)** All test pilots are required to maintain at least an FAA Class II medical certificate in order to perform their duties.

**(b)** All active flight test engineers are required to maintain at least an FAA Class III medical certificate in order to perform their duties.

(c) Other individuals whose proper performance of duty is necessary for safety during flight tests must have a current FAA Class III medical certificate to perform those duties.

**(2) Physiological Training.**

(a) FAA personnel participating in flight tests above 10,000 feet, where oxygen equipment is normally used, or on pressurized aircraft that operate at altitudes above 25,000 feet, must have completed an initial physiological training course (including altitude chamber) prior to being assigned to such flight tests.

(b) The physiological training course is routinely given at the Civil Aeromedical Institute (CAMI), although completion of a training course conducted by one of the military services or an approved civil facility is acceptable. Previous altitude chamber training as a flight crew member of the U.S. Armed Forces, is an acceptable means of meeting the initial training requirements of this order.

(3) Smoke Evacuation Training. It is recommended that all flight test personnel participate in a smoke evacuation drill conducted by the Accident Investigation School at Oklahoma City, OK, or equivalent, at least once early in their careers. This training provides a very real appreciation of the difficulty of performing emergency evacuation procedures.

**(4) Survival Training.** All flight test crews must complete survival training as specified in FAA Order 4040.9. Survival training received while a flight crew member of the U.S. Armed Forces, satisfies this requirement.

**201. Initial Flight Training.**

a. It is desirable to have career FTPs attend an initial qualification course (type rating/formally trained) in a new or different type of aircraft, as soon as possible after initial assignment. Additional initial qualification courses should be offered subsequently, based on the operational needs of the office and available training resources. However, this order will NOT be used as authority to obtain an Initial Type Rating in an aircraft in which the test pilot will probably not perform certification testing.

b. In order to participate in the AIR Flight Currency Program, each FTP must qualify in accordance with FAA Order 4040.9.

**202. Recurrent Training of Flight Test Personnel.**

a. FTPs and FTEs must complete the Recurrent Flight Test Pilot/Flight Test Engineer Course #28273, every three years.

b. Recurrent physiological training is required as specified in FAA Order 4040.9, when official duties require high altitude flight, currently every four years.

c. Recurrent survival training must be completed in accordance with FAA Order 4040.9.

d. The CRM Recurrent Course (12066) must be completed every three years.

**203. Recurrent Flight Training.** All FTPs will be scheduled to complete at least one recurrent training course annually in the class of aircraft appropriate to their expected workload, unless scheduled for initial qualification training in another type of aircraft the same year. That recurrent training must be obtained in a formal course. If a test pilot is involved with both fixed and rotary wing testing, recurrent training may be completed annually in each category. Recurrent training for normal category airplanes and normal category helicopters may be obtained at the local level following the guidelines of FAA Order 4040.9, FAA Aircraft Management Program.

**204. Currency.** The Aircraft Management Program (FAA Order 4040.9) must be used to ensure that all FTPs are proficient and have flown at least 100 hours per year. To ensure that FTPs meet the minimum flight hour requirements of Order 4040.9, the certification directorates should request aircraft rental resources. If such requests are not accepted at the regional level, the directorate manager must notify the Aircraft Certification Service Senior Flight Program Manager in writing. Additionally, FAA FTPs must maintain the instrument and night recent flight experience requirements of FAR 61.57.

**205. Cockpit Pass.** It is virtually impossible for anyone to remain abreast of the technology currently being installed in aircraft. Therefore, each flight test pilot (and flight test engineer) is encouraged to apply for a cockpit pass following the instructions contained in order 8000.38, "Aviation Safety Inspector Credential Program", (FAA Form 110A), as an Aviation Certification Specialist. All requests should be routed through the directorate manager and the Director, Aircraft Certification Service, for approval. Pilot and engineers are encouraged to use a cockpit pass on commercial flights to enhance their knowledge of new technology and to familiarize themselves with the operation of modern equipment used by flight crews in the National Airspace System. This program also provides an additional set of eyes and ears in the cockpit, which many captains appreciate. This type of pass can only be used in conjunction with a purchased ticket.

**206. Five-Year Flight Training Plan.** Each Flight Test Manager/ACO Manager will develop and maintain a Five-Year Flight Training Plan for each assigned FTP. The five-year training plan must ensure that newly assigned FTP will obtain the necessary type ratings appropriate to their regional responsibilities (Priority (1) training requirement). FTPs may be type rated or formally trained in:

- a. Single engine reciprocating airplane, both tricycle gear and tail wheel,
- b. Light reciprocating twin-engine airplane,
- c. Multi-engine turbo-propeller airplane,

- d. Business jets and/or regional jets,
- e. Narrow body transports,
- f. Wide body transports,
- g. Normal and transport helicopters (where applicable), and

h. Any other special aircraft types that may be appropriate for the type certificate (TC)/supplemental type certificate (STC) projects typically flown within the office's geographic area of responsibility (e.g., seaplanes, gyroplanes, gliders, LTA-balloons, LTA-airships).

**NOTE:** Items (1) through (8) are not mission critical; however, it is the goal of AIR to have as many career FTPs as possible trained and experienced in the above categories of aircraft. Previous training and ratings (military, airline, etc.) may be used to meet the above requirements.

**207. Waivers.** The purpose of a waiver letter is to formally recognize that the requirements of this order were not met for specific reasons beyond the control of the Aircraft Certification Service and its flight test managers. If the training requirements of this order cannot be met for any reason (e.g. budgetary), then a letter of waiver from the requirements must be issued to the individual FTP or FTE (including Flight Test Managers) by his/her supervisor with an explanation of why the requirements were not met. Waivers for other than budgetary reasons must be approved by a directorate manager. A copy of each waiver should be forwarded to the AIR Senior Flight Program Manager. The letter of waiver will be maintained locally with the individual's flight qualification records. The waiver letter will allow the individual to continue to perform flight testing under the conditions specified in the letter.

## CHAPTER 3. SPECIFIC PILOT QUALIFICATION POLICY

### **300. Aircraft Certification Office (ACO) Flight Test Pilots.**

**a.** Each ACO should have at least two FTPs who are type rated or formally trained in the aircraft types currently in production for which the ACO is geographically responsible. The term “formally trained” means a type rating course or a formal course of training on those aircraft that do not require a type rating or for which a type rating is not yet available. If it is impractical for a particular ACO to have two FTPs trained in a currently produced aircraft type for which they are responsible, then an FAA FTP from another office may be called upon to assist with required test flying.

**b.** For each aircraft intended primarily for operation under 14 CFR Parts 121 or 135 that are still in production in an ACO’s geographic area, a project FTP should be assigned, as a focal for certification and COS activities related to that aircraft. The project FTP must possess a type rating in that specific aircraft type or in one of equivalent size and complexity. Although specific type ratings are always desirable, and in some cases may be required by a specific airline, amassing the full range of transport type ratings for current fleets would be both unnecessary and uneconomical. A test pilot does not need a type rating in a Boeing 777 to do a Traffic Collision and Avoidance System (TCAS) installation flight test in that aircraft. However, the FTP should have experience in TCAS programs and a type rating in a heavy jet to ensure understanding of crew duties and procedures, piloting techniques, performance characteristics, and operational implications for a large jet transport. In any case, a FTP possessing the above qualifications is to conduct all tests that have an important role in the cockpit interface. Project pilots operating large aircraft intended primarily for operation under FAR Part 91 should be type rated in those aircraft or one of comparable size and complexity.

**301. Flight Test Managers.** Flight test managers who are rated FTPs and who actively participate in certification flight tests are expected to conform to the requirements of this order. They will also fly an adequate amount annually to stay abreast of the advancing technology and maintain their ability to help their FTPs and FTEs evaluate specific problems with the certification of an aircraft. They must also stay sufficiently current to not only evaluate the performance of their cadre of FTPs, but also to evaluate prospective FTP candidates. When selecting new FTPs, non-test pilot managers should rely on evaluations of senior FAA FTPs.

**302. Imported Transport Category Aircraft.** Nationally, at least two test pilots (depending upon the workload) should be type rated/formally trained in every foreign manufactured transport category aircraft type that are or will be used primarily in 14 CFR Part 121 or 135 operations, and in current production. Familiarity with the imported aircraft is essential for proper evaluation of the aircraft to ensure compliance with the regulations. Experience in the aircraft is essential to AIR in the accomplishment of its safety management responsibilities. FTPs should remain current in the aircraft after their initial qualification, as long as there are active projects on the aircraft. It is incumbent upon each Directorate to ensure that an adequate number of FTPs are trained in the

import aircraft for which the Directorate has type validation responsibility. Directorate staffs may coordinate with supporting ACOs top arrange for the necessary training.

**303. Production Surveillance.** Production surveillance flight-testing by FAA FTPs, may be conducted at the discretion of the ACO. Production flight testing by FAA FTPs is encouraged as a means of auditing the production flight testing performance of manufacturers and keeping FAA FTPs familiar with the manufacturer's product line.

**304. Qualification on Test Aircraft.** As a part of the flight test program for TC projects, the applicant is expected to provide the necessary first pilot checkout qualification flight time for the flight test pilot(s) responsible for the project. The assigned project test pilot(s) will contact a responsible official of the applicant's organization to arrange for an adequate and agreed upon checkout in the applicant's aircraft. The checkout must be completed before the FAA pilot(s) conduct any flight tests requiring action in an official flight test pilot capacity.

**305. Familiarization Flight Time on New Models.** Familiarization flying may be arranged for additional flight test pilots as a part of functional and reliability testing, production testing, or during extensive type testing, if it does not impose an additional burden on the applicant or interfere with the responsible directorate's conduct of the required certification tests. If additional test pilots, not assigned directly to the project, need qualification flight training (as a convenience to the government) in a manufacturer's prototype or in first production models, arrangements should be made to contract for this training. Such arrangements should be made through internal service channels of the pilot's training organization, and not directly with the manufacturer. Since it is unlikely that the FAA Academy can provide such training, the funds will come from the training budget.

**306. Airman Rating Qualification During Type Certificate (TC)/Supplemental Type Certificate (STC) Tests.** Each TC project involving a new design or any major STC project that significantly modifies the flight characteristics or procedures (such as change from reciprocating engine to turboprop) will include those airman competency tests and maneuvers specified in FAR Part 61. A civilian pilot is required to perform these tests and maneuvers to determine how the aircraft will perform in the operation(s) and atmospheric conditions for which it will be approved. The airman competency maneuvers and minimum crew evaluation will be developed in coordination with the assigned Aircraft Evaluation Group (AEG) specialist during the type certification program. This is to ensure satisfactory determinations of speeds, handling characteristics, procedures and systems operations for the airman competency maneuvers and the adequacy of the proposed minimum flight crew.

**307. Initial Type Rating.** If a test aircraft requires a new type rating, the project FTP should make every effort to obtain a type rating on that aircraft as soon as possible. The preferred method of obtaining a type rating on a new aircraft is by participating as an advisor to the Aircraft Evaluation Group (AEG) Flight Standardization Board (FSB). A test pilot's participation in the FSB benefits both the AEG and AIR. The benefit to the AEG is that the FSB is able to use the FTP's knowledge of the aircraft from the

certification aspect to make more accurate FSB findings. AIR benefits when one of its FTPs receives a type rating in a new aircraft type. This benefit to AIR is especially true for foreign aircraft validated by the FAA under a bilateral agreement where training opportunities for the test pilot are more difficult to obtain. An alternative to FTP participation in the FSB is for the FTP to make arrangements to obtain ground school acceptable by the AEG and undergo an oral and practical flight checkride in the new aircraft. A second alternative is for the FTP to schedule formal type rating training for that aircraft through the FAA Academy.

## CHAPTER 4. RESPONSIBILITY FOR QUALIFICATIONS

**400. Skills and Knowledge.** Every FAA FTP is expected to be skilled and knowledgeable in experimental aircraft testing techniques, as well as in aircraft operations under environmental conditions appropriate to the kind(s) of operation(s) for which the applicant is seeking approval. Special training (e.g. type rating, seaplane rating, or tailwheel qualification) should be requested, to qualify individuals in advance of actual need for a specific project. This training may be through normal training request channels, or may be obtained locally. The special training may be a formal course of instruction or a check-out in the applicant's aircraft. A FTP will not be assigned to conduct flight tests until the manager is assured that the FTP's experience, ability, skills, and proficiency are adequate to safely conduct the tests. When certification projects arise that require special training, the manager should cite this order when preparing the request for Priority 1 training. Funds normally used to maintain currency under Order 4040.9() (rental funds) may be used by FTPs to acquire training and proficiency in unique aircraft in preparation for assigned test programs.

**401. Determination of Qualification for Flight Testing.** Before a FTP is assigned to conduct a flight test, it should be determined by the first line supervisor/manager that:

**a.** The FTP's experience, training, skill, and proficiency are appropriate for the scope, level of difficulty, and criticality of the test.

**b.** The FTP has:

(1) Successfully completed the Initial Flight Test Pilot/Flight Test Engineers Course (# 28083), or,

(2) While waiting to complete the required formal course, has received the equivalent in on-the-job training in certification testing techniques and knowledge under the supervision of an experienced FAA FTP, or,

(3) Has otherwise demonstrated his/her aircraft testing competence and knowledge to an experienced FAA FTP and the results have been reviewed and approved by another FTP or flight test manager;

**c.** The FTP otherwise meets the requirements of this order.

## CHAPTER 5. FLIGHT TEST RESPONSIBILITIES AND PROCEDURES

**500. Flight Test Planning.** All flight testing and evaluations conducted by FAA personnel will be done under the authority of either a Type Inspection Authorization (TIA) or a Letter of Authorization (LOA) signed at the appropriate management level. Prior to issuing the above authorization, the approving authority must ensure that a risk assessment of the flight tests has been done following FAA Order 4040.26, Aircraft Certification Service Flight Safety Program. Each flight test must be performed under an approved test plan. In addition, the FAA Flight Test Briefing Guide described in Appendix 1 of Order 4040.26 must be used prior to each flight or sequence of flights as appropriate unless an applicant's company briefing guide is deemed to be more appropriate.

**501. Type Inspection Authorization (TIA).** The TIA is prepared by the ACO on FAA Form 8110-1 and is used to authorize official conformity, airworthiness inspections, and flight tests necessary to fulfill certain requirements for TC, STC, and approval of other design changes. In addition, the TIA may contain a section (Operational and Maintenance Requirements) that provides for certain other operational evaluations identified by the AEG. FAA Form 8110.1, TIA, is presented in Appendix 2 of this Order. This form may be supplemented as necessary by individual ACOs to fit their unique regional requirements (e.g., Risk Assessment).

**502. Letters Of Authorization (LOA).** An LOA must be used in lieu of a TIA in cases where other than dedicated certification flights are conducted by FAA crews. Examples of such flights are flight tests in support of field approvals, foreign type validations, proof of concept flights, avionics systems demonstrations, or early FAA participation in developmental flight tests. When an LOA is required, it must be signed by the appropriate level of authority commensurate with the level of risk and following Order 4040.26. A sample LOA is presented in Appendix 3. An LOA must also be used for training flights not covered by FAA Academy courses or FAA Order 4040.9, Form 4040-6.

**503. Concurrent Testing.** The FAA defines concurrent testing as those certification tests that are performed simultaneously with the applicant. Concurrent testing may be performed in certain unique cases when the cognizant FAA manager considers them appropriate and practical to ease the burden on the applicant. Examples of typical concurrent tests are tests that are considered low risk such as avionics installations; in addition, V<sub>mu</sub>, V<sub>mcg</sub>, V<sub>mca</sub>, maximum brake energy tests, and wet runway tests, that by their nature are impractical to repeat. For such tests, concurrent testing by the FAA may be performed provided that an appropriate level of risk management evaluation is completed per Order 4040.26.

**504. Flight Equipment.** Managers, FTPs, and FTEs should ensure that all necessary safety equipment is provided and that all crew members are familiar with the usage of this equipment. The required safety equipment for each test will be determined by the hazard analysis/risk assessment required by Order 4040.26. Each crew member should be

provided with all necessary protective clothing and equipment as detailed in Order 3900.19, Occupational Safety and Health, Chapter 8, 9, Section 107f.

The basic flight equipment includes:

Number	Item(s)
2	Nomex flight suits
1	Nomex flight jacket
1	Pair high top, steel toe flight boots
2	Pair Nomex gloves
2	Two piece Nomex (2)underwear and (2)socks
1	Flight Helmet and bag (Based on operational requirements)
1	Military type MBU Oxygen mask with amplifier (Based on operational requirements)
1	Kneeboard
1	Headset with boom mike
1	Flight Bag
--	Equipment required for unique environmental conditions
--	Sunglasses (prescription if required are fully reimbursable)

**505. Ballast Requirements.** FAA Order 8110.4B Para graph 5-11.b. (3). (c) states, *“Flight Loadings—The manufacturing inspector should determine the various loading conditions specified by the flight test specialist are carried out by the applicant. This includes a determination that the ballast used is accurately weighed, located, and safely secured.”*

**a.** All weight and Center Of Gravity (c.g.) requirements must be specified in the approved flight test plan for each test condition.

**b.** Approved engineering documentation must be provided to the manufacturing inspector to define the ballast, the location for the ballast to be installed, and the method used to secure it safely to the airframe structure.

**c.** All critical loadings should be checked after the aircraft has been loaded. Critical loadings will be defined as those that are added to achieve either the forward or aft c.g. limit, or to obtain the maximum weight condition. The crew should be onboard for the weighing, whenever possible. Stand-ins of comparable weight may be used if the crew is not available. Calibration data for the scales should be included in the instrument calibrations submitted in the Type Inspection Report.

**d.** The FAA FTP makes the final acceptance of the test aircraft for flight, as it relates to the operation of the aircraft and the integrity of the test.

**506. Spin Tests.** Spin tests conducted by FAA FTPs should be flown initially with a spin chute (or equivalent equipment) installed on the aircraft and approved by an FAA structural engineer. (See Appendix IV for additional guidance on requirements for spin recovery devices). After all spin modes have been evaluated and found satisfactory, the spin characteristics should be checked with the external spin chute removed, unless it is determined that the spin chute installation has no significant effect on spin characteristics.

**507. Official Flight Tests.** Official flight tests will not be started until a TIA or LOA has been issued. All official tests, including those conducted by a DER, will be conducted in concurrence with any restrictions and limitations issued to ensure safety and to determine compliance with the FAR. The TIA may be phased or issued in increments to ensure basic airworthiness and that flight test safety has been established before proceeding to the next phase. A LOA will be used in lieu of a TIA, in cases where a TIA would be inappropriate such as; foreign type validation flight testing, or tests in support of field approvals. In these cases, a letter will be prepared by the appropriate office authorizing participation by FAA flight test and manufacturing inspection personnel, specifying in detail, what is to be accomplished. . When company flight tests are performed early in a program (prior to TIA), before a FAA conformity inspection is conducted, the resulting data may still be valid if it can be established that the testing took place on an aircraft that was essentially identical to the article that is later conformed to the type design and that no significant changes were made between the time of the test and the subsequent conformity inspection.

**508. Non-certification / Developmental Flight Testing.** Occasionally, there is a need for early flight testing by FAA flight test personnel, either to familiarize themselves with a proposal or to evaluate its merits and potential certification issues. In such cases, FAA flight test personnel may be authorized to fly provided the following requirements are met:

**a.** Approval has been granted via a LOA signed by the appropriate management level described in Order 4040.26.

**b.** A flight test safety risk assessment has been performed following requirements detailed in FAA Order 4040.26 and so stated in the LOA.

**509. Pilot Relationships.** During FAA flight tests, the pilot-in-command is the applicant's pilot except in single piloted aircraft. The FAA FTP must ensure that the applicant's pilot understands that either pilot may terminate any test at his/her discretion. All tests that evaluate the performance, flight characteristics, systems, or pilot/cockpit interface must be conducted by an FAA (or DER) FTP occupying the pilot seat most appropriate for the evaluation being conducted. At the discretion of the FAA (or DER) FTP, other tests may be observed from any other cockpit position. The letter in Appendix 5 of this order may be used to justify the requirement for an FAA FTP to occupy a pilot position.

## CHAPTER 6. INTER-ACO COOPERATION

**600. Short Duration Projects.** For short duration projects, when a particular ACO does not have a qualified FTP in a particular type aircraft, the ACO's are encouraged to request help from an ACO that has a qualified FTP. A list of pilot qualifications is available in Flight Activity and Crew Tracking System (FACTS).

## CHAPTER 7. TRAINING REQUESTS

**700. Flight Test Training.** The AIR flight test community has global safety management responsibility. Therefore, training must receive service-wide prioritization, and the overall qualifications of the Service's flight test community must be considered when allocating training funds and assets. Available training must be flexible to meet the changing aircraft qualification requirements, based on anticipated certification projects and COS requirements. The AIR flight test community workload, certification schedules, and manufacturer's delivery schedules must be considered when prioritizing available training funds and assets. Prioritization of AIR's flight test training is the responsibility of the Flight Program Oversight Committee (FPOC), and will be completed prior to the Agency's annual call for training.

## CHAPTER 8. INFORMATION CURRENCY.

**800. Order Comments.** Any deficiencies found, clarification's needed, or improvements suggested regarding the content of this order should be forwarded to the Aircraft Certification Service, Administrative Branch, AIR-520, Attention: Directives Management Officer, for consideration. Your assistance is welcomed. Federal Aviation Administration Form 1320-19, Directives Feedback Information, is located in Appendix VI for your convenience. If an interpretation is urgently needed, you may contact the AIR Senior Flight Program Manager, ASW-100 or an FPOC member, but you should also use FAA Form 1320-19 as a follow-up to verbal conversation.

David A. Downey  
AIR Senior Flight Program Manager



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

# Memorandum

Subject: INFORMATION: Flight Program Oversight Committee  
Charter

Date: FEB 13 2004

From: Manager, Rotorcraft Directorate,  
Aircraft Certification Service, ASW-100

Reply to  
Attn. of:

To: All Aircraft Certification Directorate Managers  
All Aircraft Certification Division Managers  
All Aircraft Certification Offices  
All Manufacturing Inspection Office Managers  
All Manufacturing Inspection District Offices  
Flight Program Senior Executive, ASW-200

## TEAM SPONSORS: ACMT

**BACKGROUND:** FAA organizations with pilot participants are required by FAA Order 4040.9 to administer their own pilot proficiency and flight safety programs, or to be included under the cognizance of another recognized program. The decision by the Aircraft Certification Service (AIR) to form a flight program that is independent from the Flight Standards Service brings an attendant requirement to oversee that program.

**OBJECTIVE:** The Flight Program Oversight Committee (FPOC) is established as an advisory group to provide expert advice on the Service flight program to the AIR Director and Deputy Director, the AIR Senior Flight Program Manager, the DMTs, and the various cross-organizational Management Teams ("MTs") within AIR.

## MEMBERSHIP:

FPOC membership includes the following representatives: the flight test branch managers of the Atlanta ACO, Los Angeles ACO, Seattle ACO, and Wichita ACO; a manager or senior flight test pilot from the Rotorcraft Directorate, Small Airplane Directorate, Engine and Propeller Directorate, and the AIR Lead Flight Safety Officer. The AIR Senior Flight Program Manager will appoint the FPOC chairman from the membership to a three-year term.

## TEAM TASKS:

1. The FPOC will review the AIR plans, policies, procedures, conditions, instructions for recent flight experience, and the responsiveness to corrective recommendations. The FPOC will charter the Flight Safety Committee (FSC) required by Order 4040.9D, paragraph 503.b.(4) and will be led by the Lead Flight Safety Officer. The primary purpose of the FSC is to set safety goals and review safety-related recommendations.
2. Recommend appropriate changes to the AIR Operations Manual to FAA Order 4040.9, which delineates those aspects of the AIR flight program that are unique to AIR.
3. Provide prioritized FPOC recommendations to AIR-500 during annual call for flight training needs. Provide advice to local management regarding pilot proficiency training. Coordinate pilot proficiency training requirements from a national perspective.
4. Advise Technical Training Steering Committee (TTSC) regarding adequacy of flight training courses.
5. Oversee national test pilot hiring register and qualification requirements for FAA test pilots.
6. Provide coordinated FPOC input to the annual flight rental budget.
7. Provide national policy on pilot qualifications, pilot development, and shared pilot resources.
8. Coordinate with the Flight Test Technical Committee regarding expert oversight of the initial and recurrent FAA flight test pilot/flight test engineer courses.
9. FPOC members will be the focal points for Flight Program matters within their respective regions/Directorates.

#### PRODUCTS:

1. Flight Safety.
2. Oversight of AIR flight program.
3. Recommend revisions to various documents as necessary.

#### TIMING:

The FPOC is a standing committee within AIR. Products will be developed to meet flight safety and overall program needs.

**CONSTRAINTS:**

The present organizational structure of the Aircraft Certification Service requires that flight program issues be administered via the various Directorate/Division Management Teams and the cross-organizational Management Teams such as the ACOMT, DMT, and ACMT. As a result, the FPOC is an advisory group, albeit one with most of the AIR flight test resources in a direct reporting status. Unless otherwise directed, the FPOC will provide recommendations and products to all DMTs and other applicable MTs.

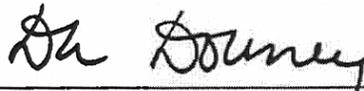
**PROCESS:**

The FPOC will hold one annual meeting, normally during the first or second quarter of the fiscal year. Telecons will be scheduled as needed.

**FUNDING:**

Travel and per diem expenses for FPOC members will be shown in the AIR Business Plan as Management Team Meeting for budgeting.

CHARTER APPROVED BY: \_\_\_\_\_



David A. Downey, ASW-100,  
AIR Senior Flight Program Manager

DATE: 2/13/04

**APPENDIX 1. Flight Program Oversight Committee Charter**

**APPENDIX 2. TYPE INSPECTION AUTHORIZATION (TIA)**

PROJECT NO. \_\_\_\_\_

TO: <input checked="" type="checkbox"/> FLIGHT _____ <small>(Routing Symbol)</small>		<input checked="" type="checkbox"/> MANUFACTURING _____ <small>(Routing Symbol)</small>						
NAME OF APPLICANT _____		ADDRESS(Number, Street, City, State, and ZIP Code) _____						
1. INSPECTION AUTHORIZED FOR								
<input type="checkbox"/> AIRPLANE	<input type="checkbox"/> OTHER (Specify) _____	<input type="checkbox"/> NEW MODEL (Give Model No.) _____						
<input type="checkbox"/> ENGINE		<input type="checkbox"/> ALTERED MODEL (Give name of original manufacturer) _____ ORIGINAL T.C. DATA SHEET NO. _____						
<input type="checkbox"/> PROPELLER								
<input type="checkbox"/> ROTORCRAFT								
2. CERTIFICATION BASIS _____								
3. CATEGORY - FOR AIRCRAFT ONLY (Check all applicable items)								
<input type="checkbox"/> NORMAL	<input type="checkbox"/> UTILITY	<input type="checkbox"/> ACROBATIC	<input type="checkbox"/> TRANSPORT					
		<input type="checkbox"/> RESTRICTED	<input type="checkbox"/> OTHER (Specify) _____					
4. DESCRIPTION OF ALTERATION _____								
5. DESIGN SPEEDS - (EAS) - _____		6. MAXIMUM MACH NO. (DESIGN) _____						
		7. DESIGN WEIGHTS - _____						
8. MAXIMUM OPERATING ALTITUDE (FEET) _____		9. MAXIMUM CABIN PRESSURE DIFFERENTIAL (p.s.i.) _____						
		10. CG LIMITS _____						
11. CARGO AND BAGAGE COMPARTMENTS - LOCATION AND _____		12. STRUCTURAL/ MANEUVERING LIMITS _____						
13. OPERATION LIMITATIONS								
ENGINE MAKE AND MODEL _____			ENGINE DATA SHEET NO _____					
ITEM	ON TAKEOFF (Specify) _____ <small>(Minutes)</small>	LOW RATIO SUPERCHARGER		HIGH RATIO SUPERCHARGER		MAXIMUM ALLOWABLE TEMPERATURE		DEG. F
		SEA LEVEL	ALT. HEIGHT (Specify) _____ <small>(Feet)</small>	ALT. (MIN) (Specify) _____ <small>(Feet)</small>	ALT. (MAX) (Specify) _____ <small>(Feet)</small>	CYLINDER HEAD (OR COOLANT OUTLET)	WASHER BAYONET	
IN. HG.						CYLINDER BASE		
RPM						OIL INLET		
HP						MINIMUM CARBURETOR HEAT RISE REQUIRED AT _____ % MC POWER		
14. PROPELLER								
MAKE AND MODEL _____						DATA SHEET NO. _____		DIAMETER _____
HUB MODEL NO. _____			BLADE MODEL NO. _____			LIMITATIONS - SEE PAGE _____		
15. ROTORCRAFT				MAXIMUM	MINIMUM	16. INSPECTION REPORT		
POWER ON ROTOR LIMITS - RPM _____						100-HOUR INSPECTION COMPLETED		YES
POWER OFF ROTOR LIMITS - RPM _____								NO
17. EQUIPMENT LIST				18. TYPE INSPECTION REPORT				
IS EQUIPMENT LIST CORRECT AS TO WEIGHT AND ARM OF EACH ITEM			<input checked="" type="checkbox"/> YES	COMPLETE APPLICABLE PORTIONS OF TYPE INSPECTION REPORT, PART 1				
			<input type="checkbox"/> NO	COMPLETE APPLICABLE PORTIONS OF TYPE INSPECTION REPORT, PART 2				
EQUIPMENT LIST ATTACHED		<input checked="" type="checkbox"/> YES	MFGR. REPORT NO. _____	<input checked="" type="checkbox"/>	SEE ATTACHED PAGES FOR INSTRUCTIONS			
		<input type="checkbox"/> NO		<input type="checkbox"/>	SEE ATTACHED PAGES FOR SPECIAL TEST (Define divisions of responsibilities)			
<b>ORIGINATED BY</b>			<b>CONCURRENCES</b>					
ROUTING SYMBOL		ROUTING SYMBOL	INITIALS	ROUTING SYMBOL	INITIALS	ROUTING SYMBOL	INITIALS	
ANE-171		ANE-170		ANE-172		ANE-172		
		ANE-171		ANE-172		MIDO-46		
<b>APPROVAL</b>								
DATE _____		TITLE _____			SIGNATURE _____			

### APPENDIX 3. SAMPLE LETTER OF AUTHORIZATION (LOA)

Subject: **ACTION:** Letter of Authorization (LOA)

Date:

From: Manager, XXX Aircraft Certification Office

Reply to  
Attn. of:

To:

You are authorized to conduct a demonstration flight on XXX aircraft on or about -----. The purpose for this flight is to evaluate the capability of the XXX flat panel display, mounted in the right cockpit pane, to interface in-flight with existing XXX avionics systems and to identify potential TSO certification issues.

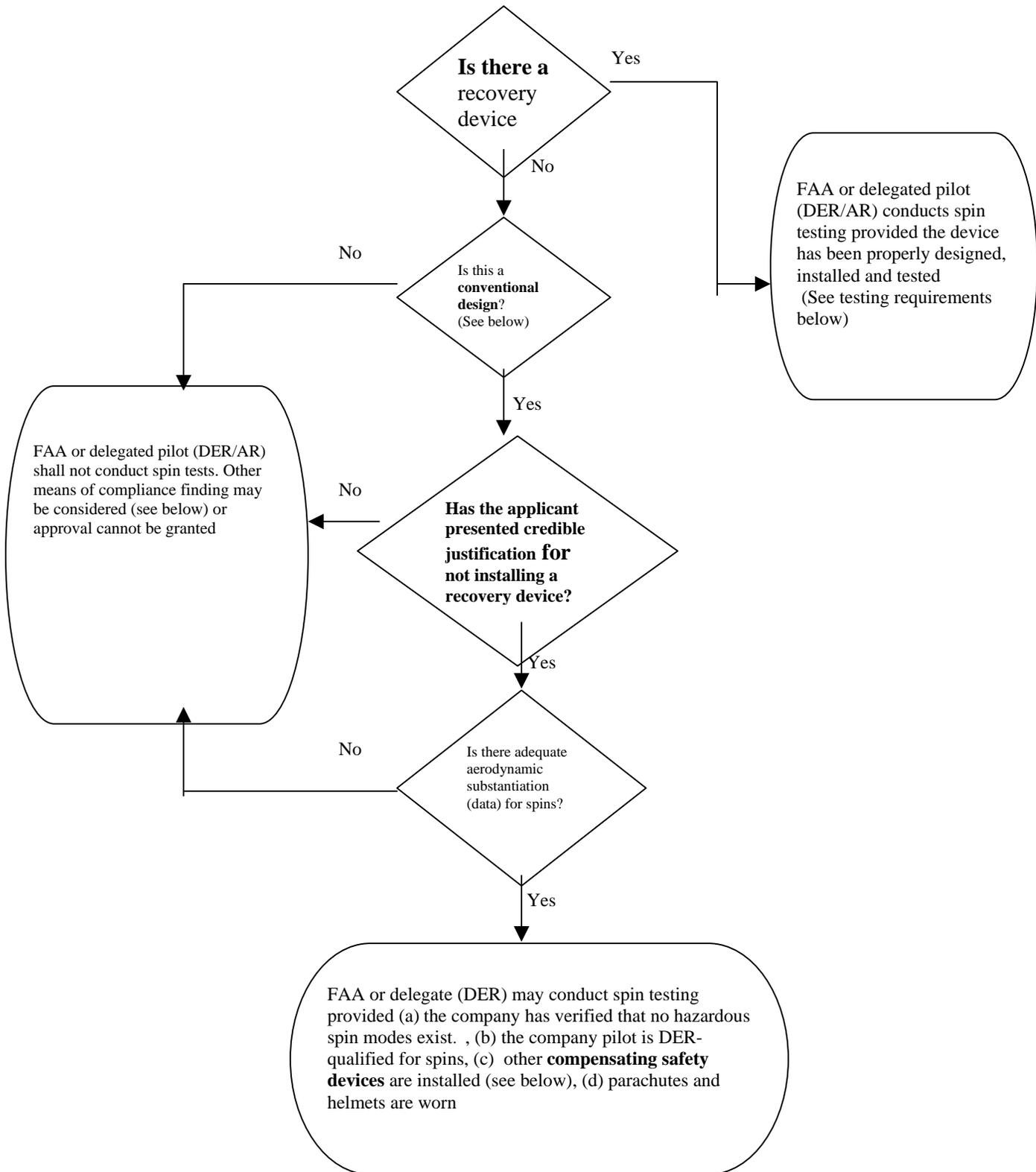
The evaluation will be conducted in accordance with XXX Flight Test Plan document number ----, Revision X, dated ----. The evaluation will include both a day and a night flight. The aircraft, -----, is owned and operated by XXX Aviation, Inc.,------. The aircraft is under an Experimental R&D Certificate of Airworthiness, Market Survey, issued by ANE MIDO-XX on April -----. The XXX flat panel display is installed under a limited field approval and is the only component installed that does not meet the type design. This will not be the first flight on this aircraft with this system installed. For the purpose of the evaluation, the company pilot, Pilot In Command (PIC), will be seated in the left seat and the FAA pilot in the right seat.

This flight is considered to be Low Risk. The provisions of Table 1, Index A of Order 4040.26A, attached, will be observed on this flight. This LOA meets the Risk Management requirements of FAA Order 4040.26A.

XXXXXXXX

Attachment  
4040.26A Table 1

### APPENDIX 4. SPIN TEST / RECOVERY DEVICE REQUIREMENT DECISION TREE



**Spin Recovery Device testing requirements.** The following requirements for spin recovery parachutes (Spin chutes) are necessary to in order to be acceptable for use during FAA flight testing:

1. The applicant must demonstrate that the spin chute can be deployed and released safely during flight.
2. During extensive program delays or for follow-on spin testing, the applicant may be required to repeat the in-flight deployment and release demonstration.
3. The design must follow the guidance provided in AC 23-8A, Chapter 2, Section 23.221, b(5), Spin Recovery Parachutes.

**Company Flight Test Program.** The following should be considered when planning a company spin program and FAA demonstration without a spin recovery device when it is determined that a spin chute or appropriate spin recovery device is not to be used as shown in the flowchart above.

1. The FAA pilot may chase the prototype airplane during company spin demonstrations, and
2. Video cameras (time coded) are installed in the test airplane cockpit to show control inputs and aircraft motions during applicant spin demonstrations, or
3. The test airplane is instrumented to show control inputs and aircraft motions during applicant spin demonstrations.

**Other compensating devices.** The following devices are recommended individually and/or in combination as mitigating factors when FAA is conducting spin testing without a spin recovery device installed:

1. Jettisonable cockpit door that has been properly designed and tested.
2. Alternative escape options such as a second cockpit door or other doors installed
3. Ropes or handles installed to assist in reaching alternative escape means.
4. Proposed non-cockpit doors must be easily opened or jettisonable
5. Quick-disconnect seat restraints.
6. Chase airplane.

**Conventional design.** For the purposes of this decision tree, a conventional design is defined as follows:

1. A conventional tail (no canards, forward wing design or T-tail). \*
2. Wing - Positive or neutral camber with no leading edge devices, significant sweep and/or winglets.
3. Engine - A tractor type propeller design with the thrust axis in line with the fuselage.
4. Positive static margin.
5. No new or novel aerodynamics, propulsion or control design.
6. Floats are acceptable.

\* See NASA Technical Paper 2644, February 1987, "Flight Investigation of the Effect of Tail Configuration on Stall, Spin, and recovery Characteristics of a Low-Wing General Aviation Airplane" for information on cruciform tails.

## **APPENDIX 5. FAA FLIGHT TEST PILOT SEAT POSITION SAMPLE LETTER**

Applicants requiring  
Federal Aviation Administration (FAA)  
Flight Tests

Dear Applicant:

Subject: FAA Flight Test Pilot Seat Position

During certification flight testing by FAA flight test pilots, it may be necessary for them to occupy either the left seat or the right seat of the aircraft being flight tested. The actual seat position will be determined by the system being evaluated. Systems involving either aircraft performance, handling qualities, avionics systems integration or pilot workload require evaluations where the FAA test pilot needs to manipulate the controls from the position in which FAA approval is being requested. Performance and handling qualities flight tests are normally flown from the left seat (right seat for most helicopters); avionics systems integration tests are normally flown from the left seat, if approval for high gain tasks such as approaches are sought. In cases where the left and right seat implementation is identical, evaluations may be conducted from the right seat. The assigned FAA flight test pilot makes the ultimate decision as to which seat is to be used on a case- by-case basis.

The authority for FAA flight test pilots to manipulate the controls of aircraft being flight tested for the purpose of certification comes from §21.33 of the Federal Aviation Regulations, 14 CFR §21.33. That section provides that “each applicant must allow the Administrator to make any inspection and any flight and ground test necessary to determine compliance with the applicable requirements of the Federal Aviation Regulations.”

During FAA certification flight tests, the FAA test pilot will not act as Pilot-in-Command (PIC). Takeoffs and landings by the FAA test pilot are only necessary if required by the test plan. Even if the aircraft to be evaluated is type certificated for more than one pilot flight crewmember, the FAA test pilot need not be fully current as second-in-command (SIC) in order to occupy a pilot flight crewmember position. Section 61.55 provides that for the purposes of “aircraft flight test or airborne equipment evaluation” a person may act as SIC of an aircraft requiring more than one pilot flight crewmember without having logged the necessary takeoffs and landings or performed the necessary engine out procedures to maintain currency as SIC.

FAA flight test pilots are highly qualified with extensive flight test experience in multiple types of aircraft. In addition, they maintain flight proficiency through certification flight testing and a rental aircraft program, which includes simulators; they also often obtain type ratings in aircraft they are expected to fly. There should be no question that before a test flight, an FAA test pilot has become familiar with all information concerning that aircraft’s powerplant, major components and systems, major appliances, performance and limitations, standard and emergency operating procedures, and the contents of the approved aircraft flight manual or approved flight manual material, placards, and markings.

Please contact this office should you or your insurance carrier need additional information about the FAA flight test pilot before the test flight.

Sincerely,

**APPENDIX 6. FAA FORM 1320-19, DIRECTIVES FEEDBACK INFORMATION**

U.S. Department  
of Transportation

**Federal Aviation  
Administration**

**Directive Feedback Information**

Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: Order 8100.9, DAS, DOA, and SFAR 36 Authorization Procedures

To: Directive Management Officer, AIR-520

*(Please check all appropriate line items)*

An error (procedural or typographical) has been noted in paragraph \_\_\_\_\_ on page \_\_\_\_\_ .

Recommend paragraph \_\_\_\_\_ on page \_\_\_\_\_ be changed as follows:  
*(attach separate sheet if necessary)*

In a future change to this directive, please include coverage on the following subject  
*(briefly describe what you want added):*

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

FTS Telephone Number: \_\_\_\_\_ Routing Symbol: \_\_\_\_\_

