

## CHAPTER 3 EVALUATE CATEGORY I/II/III/IIIA LANDING MINIMUM MAINTENANCE/INSPECTION PROGRAMS

### Section 1 Background

#### 1. PTRS ACTIVITY CODES

A. *Maintenance*: 3435

B. *Avionics*: 5435

**3. OBJECTIVE.** This chapter provides guidance for evaluating and accepting applications for lower approach and landing minimums in respect to the appropriate support program.

#### 5. GENERAL

##### A. *Responsibilities*

(1) The Airworthiness Aviation Safety Inspector's (ASI's) primary responsibility is to provide technical support to the Operations ASI and the applicant. The responsibility for monitoring all applicants during the evaluation period should be coordinated between the Avionics and Operations ASIs, to include:

- Approvals
- In-flight evaluation observations
- Surveillance

(2) It is the applicant's responsibility to obtain and submit all documents that establish the eligibility of its aircraft, such as:

- The required maintenance/inspection program necessary for continued eligibility
- The applicant's Minimum Equipment List (MEL), with the limitations for Category I operations, if applicable

- An acceptable means for maintaining the reliability of the flight guidance control and associated systems

B. *Qualifications for Low Approach Landing Minimums.* Low approach and landing minimums are issued to qualified operators operating under FAR Parts 91, 121, 125, 129, or 135. While the operating rules for each of these authorizations may vary significantly, the approval guidelines do not. Approval for low or minimum approaches in all categories will require regulatory compliance in the following three major areas:

- Airborne equipment and systems
- Flight crew and maintenance personnel qualifications
- Lowered minimum procedures, including a maintenance/inspection program

C. *Deviations.* Commitments to deviations should not be made without coordination between the Airworthiness and Operations ASIs. All requests for deviations must be forwarded to AFS-210 and AFS-350 by the Operations ASI. The applicant should be advised not to proceed in operating under its lower minimum proposal until the deviation request is resolved.

**7. CATEGORY I OPERATIONS.** The Avionics ASI's responsibilities for Category I authorizations are primarily limited to the evaluation of the flight director and/or auto-pilot systems. The Principal Operations Inspector is responsible for determining the overall suitability of an operator's Category I capabilities.

#### **9. CATEGORY II EQUIPMENT APPROVAL UNDER FAR PARTS 91 AND/OR 135 (9 OR LESS)**

A. *Lower Approach Minimum Approval.* An application for lower approach minimum authority should specify the basis for the aircraft approval to conduct lower minimum approaches. This authority may be based on:

- (1) Type certification and the Airplane/Rotorcraft Flight Manual
- (2) Supplemental type certification
- (3) Operational evaluation
- (4) Any acceptable combination of the above

B. *Requirements for Category II Approval*

(1) Requirements for Category II approval for general aviation operators have been established in FAR §§ 91.189, 91.205, 91.191, and Appendix A. These sections specify:

- Required instruments and items of equipment
- Methods of approval
- Evaluation program conduct
- Calibration standards
- Maintenance/inspection programs

(2) Advisory Circular 91-16, Category II Operations-General Aviation Airplanes, as amended, is available to assist operators in developing and obtaining approval of Category II equipment installations and maintenance/inspection programs.

C. *Operational Evaluation Programs.* Engineering coordination should be requested when necessary, particularly for those aircraft in which the functions and limitations of the automated systems are significant factors for safe operation.

D. *Flight Director Systems.* ASIs should be aware that single flight director systems with dual displays in

which the second display repeats only the ILS information on the pilot's display will not meet the requirements for two ILS receiving systems.

E. *Optional Avionics Equipment.* Optional avionics equipment installed by the operator will either be approved in the field or referred to FAA Engineering for evaluation. The engineering evaluation can assist in determining if flight testing is required, what limitations may apply, and whether or not the installation may require a Supplemental Type Certificate. If a Supplemental Type Certificate is required, avionics personnel will assist in the accomplishment of a compliance and conformity inspection, as necessary, when requested by the engineering and manufacturing office. Optional equipment that may be installed and require approval includes the following:

- Flight director systems
- Automatic throttle control systems
- Autopilot and approach coupler systems
- Speed control command systems
- System fault detection and warning systems
- Radio altimeters

F. *Alterations.* Proposals to alter installed avionics equipment required for a particular category of operation should be carefully reviewed and handled in accordance with established procedures. Each proposal should be evaluated for its affect on system performance, compatibility with the original standard, and compliance with Category II criteria.

(1) When manufacturer-proposed alterations to existing avionics equipment appear to be major, verify the approval status before sanctioning incorporation of the change by the operator. If FAA approval of the alteration is not clearly indicated in the manufacturer's instructions, the operator should obtain such approval before performing the alteration.

(2) An ASI should exercise a cautious approach to field approval of alterations. Pressure from any source should not discourage the ASI from verifying that the alteration is

being made in accordance with approved technical data and that the technical evaluation is clearly within the scope of the ASI's training, experience, and approval authority.

(3) Alterations originating in an operator's engineering department should also be examined carefully and, when necessary, referred to the appropriate FAA Engineering and Manufacturing Office.

## **11. CATEGORY II EQUIPMENT APPROVAL UNDER FAR PART 121/135 (10 OR MORE)**

A. *Large Aircraft Criteria.* Operators using large aircraft required to be operated under FAR Part 121 should meet all of the requirements that are outlined in Advisory Circular 120-28C, Criteria for Approval of Category III Landing Weather Minima, as amended, or 120-29, Criteria for Approving Category I and Category II Landing Minima for FAR 121 Operators, as amended.

B. *Turbojet Criteria.* All operators using turbojet aircraft must comply with the aircraft systems evaluation criteria that applies to FAR Part 121 operators. Applicants certificated under FAR Part 135 using turbojet aircraft should also use the aircraft equipment evaluation standards outlined in Advisory Circular 120-28C or 120-29.

C. *Systems Evaluation Approval.* Systems evaluation approval should be accomplished in accordance with Advisory Circulars 91-16, 120-28C, or 120-29, as applicable.

D. The aircraft requirements for Category IIIa authorization include requirements for the total aircraft performance and associated systems. The acceptance of an aircraft for this category must be completely based on performance and approved FAA data.

(1) Upon receiving an operator's request for Category IIIa authorization, the assigned Avionics ASI should immediately contact the type certificating region. This action is to determine whether the aircraft has been approved for such operation and what equipment and systems have been approved. If the aircraft has not been Category IIIa certified, the ASI should request assistance

from the appropriate Aircraft Certification Office so that an application for a Supplemental Type Certificate can be properly consolidated.

(2) Advisory Circular 120-28C, as amended, outlines the requirements for the maintenance program. The nature of this type of operation will necessitate a detailed evaluation supported by well-defined maintenance, training, and reliability programs. All maintenance and reliability supporting documents become part of the accepted program.

(3) The initial program should also include appropriate programs identified in the Maintenance Review Board document. The frequency of maintenance actions may be revised when sufficient experience has been gained to justify a change and when there is no conflict with the certification requirements.

(4) The reliability of systems and/or components set forth as substantiation for the Category IIIa certification becomes the performance criteria for the program.

(a) Controlled monitoring of the Category IIIa system reliability will require that the operator, after initial evaluation, incorporate the pertinent systems and components into the approved reliability program. If the Category IIIa system reliability exceeds the approved program, the operator should be allowed a reasonable time period in which to improve the reliability.

(b) The type certificating Regional Engineering Office should be advised when the monthly removal rate is exceeded and informed of the probable cause. The reliability reporting is a necessity, particularly when operational approval was predicated upon probability analysis.

(5) The maintenance manual should identify all special techniques, maintenance/inspection frequencies, and test equipment requirements to support the program. It should also specify the method of controlling the operational status of the aircraft. Those technicians qualified to release an aircraft for Category IIIa must be identified.

(6) An approved training and recurrent training program must be provided. The listing of such personnel must be current. Only those persons trained and qualified should be

permitted to perform Category IIIa maintenance/inspections.

(7) The operational demand for Category IIIa airborne systems with exposure to numerous hidden functions requires that the aircraft be either periodically exercised or functionally checked. This is to ensure that all systems are operational and that no dormant failure has occurred. The initial program should provide either a periodic Category IIIa approach or periodic system functional check.

(8) Until sufficient experience and data is available (excluding the six month demonstration), it is recommended the aircraft status period not exceed 35 days. Failure to exercise the system by simulated Category IIIa approach or functionally checking the system within 35 days should automatically place the aircraft in a non-Category IIIa status. The aircraft must maintain this status until the required functional check is made.

### 13. PROGRAM DEVELOPMENT

A. *Initial Development.* At the time of formal application, the ASI should begin to monitor development activity. Participation in all meetings with an applicant will usually require coordination with the Operations ASI. It is important for the operator to include all key personnel in any meetings.

B. *The Operator's Lower Minimums Program.* The operator's lower minimums program must be developed and the procedures used during the evaluation period. Operations specifications Part D must reflect all special Category II maintenance requirements that were developed to support repetitive evaluation of Category II systems and equipment.

### 15. CATEGORY II MAINTENANCE MANUAL REQUIREMENTS.

A. The maintenance manual should identify all special techniques, maintenance/inspection frequencies, and test equipment requirements that support the program. Those technicians qualified to release an aircraft with lower minimums should be listed or identified.

B. The operator's procedures must include a method for manual distribution to ensure availability to the appropriate maintenance facility.

C. Operators should be encouraged to show the method of approval of required equipment as listed in the maintenance portion of the manual.

### 17. MAINTENANCE/INSPECTION PROGRAMS.

The proposed maintenance/inspection programs must be tailored to the applicant's operations and maintenance organization. All maintenance and reliability supporting documents become part of the accepted program.

A. *Requirements For Maintenance/Inspection Programs.* Advisory Circulars 120-28C and 120-29, as amended, outline the requirements for the maintenance/inspection programs. Maintenance/inspection programs must provide for the proper maintenance and inspection of equipment and aircraft systems.

B. *Control and Accountability.* Emphasis must be placed on control and accountability of all areas associated with lower landing minimums approvals. These areas primarily encompass the following:

- Initial and recurrent training on flight guidance control systems
- The use of test equipment
- The differences in aircraft systems between aircraft in an operator's fleet
- Special procedures for airworthiness release and control of the aircraft approach status
- Initial and recurrent training in all areas of the lower minimums program
- Training for new personnel and equipment types

C. *Operational Status of the Aircraft.* The method for controlling the operational status of the aircraft lower minimum required equipment must ensure that flight, dispatch, and maintenance personnel are kept aware of the current status.

D. *Purchase of Avionics Equipment "Package" Installations.* General aviation maintenance/inspection programs may be developed by some manufacturers and repair stations in conjunction with their Category II avionics equipment installation "package". The contents of such programs should be thoroughly evaluated for compliance and maintainability with Category II regulations.

E. *Requalification Procedures.* The program must include procedures for requalification of an aircraft for lower minimums following maintenance on any required system. This must include tests after replacements, resetting in rack, and interchange of components.

F. *Approval.* The ASI will indicate approval of the maintenance program portion of the operator's Category II manual by signing and dating each page of the program.

## 19. MAINTENANCE TRAINING PROGRAMS.

Avionics ASIs, during the course of normal surveillance, should evaluate the maintenance facilities performing Category II equipment maintenance to ensure that the training provided meets the requirements of lower minimum standards.

## 21. EXISTING MAINTENANCE/INSPECTION PROGRAMS

A. Programs can be developed to be compatible with the existing maintenance/inspection program, as long as there is a clear distinction between normal and lower minimum requirements.

B. When an operator's proposal is based on an existing maintenance/inspection program, the ASI must ensure that all procedures will provide for the lower minimums program requirements. Caution should be exercised when an applicant has used a program approved for use by another operator for developing its own.

C. The following areas of the proposal and or existing programs should be closely reviewed:

- The existing reliability program
- The training program

- The initial evaluation checks for existing aircraft and for new aircraft
- The existing parts pool, borrowed parts procedure, and control of spare parts

D. *Existing Reliability Programs.* An operator's existing reliability program may be accepted when shown to be adequate for its lower minimum operations.

## 23. TEST EQUIPMENT AND STANDARDS

### A. *Performance Standards, Tolerances, and Calibration Procedures*

(1) Performance standards, tolerances, and calibration procedures applicable to ILS equipment have been adequately covered by:

- Technical Standard Orders (TSO)
- Radio Technical Commission of Aeronautics (RTCA) documents
- Manufacturers' instruction manuals

(2) These standards or their equivalent are generally considered acceptable for inclusion in maintenance/inspection programs for equipment operated to landing minimums of 220-1/2 (Category I). Such standards may not be adequate for Category II. Those which will not provide category system performance should be revised to provide the required level of performance.

B. *Category II Tolerances.* In many cases, the tolerances for Category II airborne equipment are more rigid than those for Category I. Therefore, the equipment used to inspect, test, and bench check Category II equipment may require more frequent test and calibration.

C. *Established Standards and Tolerances.* Standards and tolerance established in the maintenance/inspection program for testing and calibrating airborne equipment and systems that are required for Category II operations should not be relaxed following program approval without adequate substantiation that system performance will not be degraded.

D. *Self-Test Features.* Self-test features may be used for periodic inspections if:

(1) They have been evaluated and found to adequately test the system

(2) Instructions for their use and interpretation of self-test indications are included in the maintenance/inspection program portion of the Category II manual. Inclusion in the approved maintenance/inspection program will indicate FAA approval.

## 25. MAINTENANCE PERIOD EXTENSIONS - GENERAL AVIATION

### A. *Applications For Extensions*

(1) Applications for extensions of maintenance periods for general aviation operators may be considered at the completion of one maintenance cycle of at least 12 calendar months. Application should be made by letter to the Flight Standards District Office (FSDO) having jurisdiction of the area in which the operator is located.

(2) The following factors are considered in granting an extension:

- Records of Category II approaches due to malfunctioning equipment
- Number of Category II approaches (actual and simulated)
- Maintenance records of Category II equipment failures
- Service history of known trends toward malfunctioning

- Unit mean time between failures
- Records of functional flight checks

B. *Check, Test, and Inspection Extensions.* Extensions to the check, test, and inspection periods may be granted if factors indicate that the performance and reliability of the Category II instruments and equipment will not be adversely affected. General aviation extension periods, in most cases, would be one calendar month for tests, inspections, and functional flight checks, and four calendar months for bench checks. The operator's program should include procedures for obtaining the extensions.

C. *Increased Extension Periods.* The extension periods suggested in paragraph B may be increased at the discretion of the Avionics ASI.

**27. FUNCTIONAL FLIGHT CHECKS.** Some operators have submitted programs that provide for functional flight checks. This procedure must not be approved unless all airworthiness requirements have been satisfied before dispatch. In no instance can a functional flight check be substituted for the certification by maintenance of complete systems or equipment operation.

## 29. REPORTS AND RECORDS - GENERAL AVIATION

A. *Responsibilities of Record Keeping.* The persons responsible for these reports should be provided training in appropriate parts of the proposed lower landing minimums program.

B. *Category III or any Autoland Category.* Operators authorized for Category III, or any Autoland category, should be encouraged to provide reports of airborne equipment malfunctions during actual approaches. The reports may be provided on a yearly basis or at any time the malfunctions significantly affect the Autoland capability.

## Section 2 Procedures

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS

#### A. *Prerequisites*

- Knowledge of the regulatory requirements of FAR Parts 91, 121, 125, 129, and 135, as applicable

- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

B. *Coordination.* This task requires close coordination with the Operations Aviation Safety Inspector (ASI), the applicant, and FAA Engineering if necessary.

### 3. REFERENCES, FORMS, AND JOB AIDS

#### A. *References*

- FAR Parts 23, 25, and 61
- Advisory Circulars 91-16, Category II Operations-General Aviation Airplanes, as amended
- Advisory Circular 120-28C, Criteria for Approval of Category II Landing Weather Minima, as amended
- Advisory Circular 120-29, Criteria for Approving Category I and Category II Landing Minima for FAR 121 Operators, as amended

B. *Forms.* None.

C. *Job Aids.* None.

### 5. PROCEDURES

#### A. *Review the Maintenance/Inspection Program.*

Review the applicant's maintenance/inspection program to ensure that it contains control and accountability of the following:

- (1) All maintenance accomplished on lower minimum required systems and equipment
- (2) All alterations to systems and equipment
- (3) Approach status of each aircraft at all times

(4) Evaluations of self test, Built-In Test Equipment (BITE), or Automated Test Equipment (ATE) to ensure suitability

(5) Spare equipment

(6) Maintenance calibration, use of test equipment, records/reporting requirements

(7) Repetitive and chronic discrepancies to ensure the affected aircraft remains out of lower minimums approach status until positive corrective actions is made

(8) All aircraft in the fleet that have not been evaluated for lower minimums approaches

B. *Review the Existing Maintenance/Inspection Programs.* Ensure that the existing maintenance/inspection program has procedures for the following:

(1) Identifying chronic discrepancies and corrective action follow-up

(2) Keeping aircraft with chronic and/or repetitive discrepancies out of a lower minimum status until positive corrective action is taken

(3) Training maintenance personnel assigned to reliability analysis

(4) Initial evaluation checks for existing aircraft and for new aircraft to the fleet before inclusion in the operator's lower minimum operations

(5) Identification of all components used in the lower minimum systems in the existing parts pool, parts borrowing procedure, and control of spare parts

(6) Ensuring that calibration standards for all test equipment used for maintaining lower minimum systems and equipment are met

(7) Ensuring that each flight crew and persons with operational dispatch authority are aware of any equipment malfunction that may restrict lower minimum operations

C. *Review the Functional Flight Checks.* If a functional flight check has been submitted, ensure that the following information is included:

(1) Maintenance clearance and/or concurrence before an aircraft is returned to a lower minimum status, even if the functional flight check was found to be satisfactory

(2) Request for a flight check by maintenance in the aircraft log

(3) Maintenance entry acknowledging the results and the action taken

D. *Evaluate the Supporting Data.* Unless the applicant provides supporting approval data, the Avionics ASI should coordinate with the Operations ASI and the aircraft Type Certificate Holding Region to determine the acceptability of each aircraft for the authorizations requested.

E. *Review the Minimum Equipment List (MEL).* Appropriate sections of the MEL must be revised to identify Category II required systems and special procedures, if applicable.

F. *Review the Personnel Training Requirements.* Ensure there are procedures for the following:

(1) Ensuring personnel contracted to perform Category II related maintenance are qualified and the program requirements are made available to these persons

(2) Training and/or recurrent training for the air taxi maintenance personnel. Personnel not qualified to perform maintenance on Category II systems and equipment, including flight crew and dispatch, should be trained in the airworthiness release requirements of the lower minimums program.

## 7. TASK OUTCOMES

### A. *File PTRS Transmittal Form*

B. The Principal Operations Inspector has the primary responsibility to grant the operator approval for lower minimums. It is the Avionics ASI's responsibility to evaluate and approve the avionics requirements and associated support programs. Successful completion of this task will therefore consist of coordination with the Operations ASI for sending all original Category II and IIIa documentation to AFS-400.

## 9. FUTURE ACTIVITIES. None.