**CHANGE**

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8300.10 CHG 12

12/14/99

SUBJ: AIRWORTHINESS INSPECTOR'S HANDBOOK

**1. PURPOSE.** This change transmits new and revised portions of the handbook.

**2. EXPLANATION OF CHANGES.** This is the first change to the 8300.10 handbook to use the Adobe FrameMaker program. Implementation of the FrameMaker program will eventually include the entire handbook. During this transition period, changes to the handbook will include some formatting differences. Volume 2, chapters 1, 5, 6, 22, 89, 202; and volume 4, chapter 10, that were previously coordinated, have been withdrawn and will be issued in a future change. This change will continue to use change bars to designate new or revised material. Significant areas of new direction, guidance, and policy included in this change are as follows:

Incorporating handbook bulletins, editorial updates, and the continuation of changing FAR to 14 CFR references in the following:

a. Two new chapters have been added, volume 1, chapter 10, Inspector Ethics and Conduct; and volume 2, chapter 71, Evaluate Part 121/135.411(a)(2) Air Carrier's Maintenance Recordkeeping System.

b. New and additional policy information incorporated into volume 2, chapter 23, Certificate Foreign Applicants Located Outside the United States for Mechanic Certificates/Rating; chapter 27, Renew Inspection Authorization; chapter 78, Process Part 121/135 Operator's Aircraft/Engine Utilization Report; and volume 3, chapter 18, Conduct a Reexamination Test of a Mechanic or an Inspection Authorization Under Title 49 of the United States Code.

c. Incorporating handbook bulletins into volume 2, chapter 82, Evaluate/Inspect Part 121 Extended-Range Operations with Two-Engine Aircraft; and chapters 23, and 27.

d. Editorial changes only to volume 2, chapters 24, 26, 68, 80, 83, 92, 161, 162, 188, 211, 227, 241; volume 3, chapters 25, 41, 91, 98, 115, 128, 131; and volume 4, chapter 7. PTRS codes updated in volume 2, chapter 61.

e. Appendix 1, Acronyms and Abbreviations is new and is replacing the Comprehensive Index which can be found at the end of the handbook after the appendices.

**3. DISPOSITION OF TRANSMITTAL.** This transmittal is to be RETAINED AND FILED IN THE BACK OF THIS HANDBOOK until it is superseded by a new basic order.

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/s/
L. Nicholas Lacey
Director, Flight Standards
Service

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# CHAPTER 10. INSPECTOR ETHICS AND CONDUCT

**1. PURPOSE.** This chapter contains direction and guidance for airworthiness aviation safety inspectors (ASI) pertaining to principles of ethics and conduct as they affect the performance of duties. ASI's will be referred to as employees in portions of this chapter. Although some basic outlines are listed in this document, all circumstances an ASI may encounter, could not possibly be covered. Because ASI's are always in the public eye, they are expected to exercise good judgment and professional behavior at all times while on and off duty.

**3. GENERAL.**

*A. Unique Responsibilities of ASI's.* ASI's are exposed to a number of circumstances that are critical to their positions and which are not pertinent to other Federal Aviation Administration (FAA) job functions. The ASI has the critical position of frequently interpreting and evaluating the quality of training programs, operations and maintenance manuals, pilot and mechanic performance, and overall safety activities. It is imperative that all ASI's be sensitive to the responsibilities and demands of their positions and be objective and impartial while performing their duties. ASI's must also be sensitive to actual as well as perceived appearances of any conflict that could disrupt the effectiveness or credibility of the Flight Standards mission.

*B. Department of Transportation (DOT) Requirements.* ASI's are required to comply fully with the letter and spirit of the standards of conduct as set forth by this chapter; with those set forth in United States Office of Government Ethics publication, Standards of Ethical Conduct for Employees of the Executive Branch; FAA Order 3750.7, Ethical Conduct and Financial Disclosure, and in the Federal Aviation Personnel Manual (FAPM) Letter 2635, Conduct and Discipline. The agency's policy on employee conduct is designed to encourage employees to maintain a level of professionalism that will promote the efficiency of the FAA and conform to accepted principles of conduct.

**5. REFERENCES.**

- FAA Order 1400.8, Equal Opportunity in FAA Employment
- FAA Order 1600.2D, Safeguarding Controls and Procedures for Classified National Security Information and Sensitive Unclassified Information
- FAA Order 1600.6, Physical Security Management Program
- FAA Order 1600.24D, Listening-In to or Recording Conversations on Telephone or Telecommunications Systems
- FAA Order 3750.7, Ethical Conduct and Financial Disclosure
- FAA Order 3900.19A, Occupational Safety and Health
- FAPM Letter 2635, Conduct and Discipline
- Title 29 Code of the Federal Regulations (CFR) Part 1604
- Title 49 CFR Part 99, Employee Responsibilities and Conduct
- Title 18 U.S.C., Section 208

**7. ON-THE-JOB ETHICS AND CONDUCT.**

*A.* The conduct of an ASI has a direct bearing on the proper and effective accomplishment of official job functions and responsibilities. ASI's are required to approach their duties in a professional manner and to maintain that attitude throughout their activities. Through their conduct, ASI's working in direct contact with operators, and with the public, bear great responsibility in the determination of public perception of the FAA. Inspectors must guard against allowing personal emotions, or conflicts with industry personnel to influence their behavior or actions in providing assistance to operators, or in filing enforcement actions. Whereas an inspector need not tolerate harassment, they must not respond in kind.

*B. Rules of Conduct.* All employees must observe the following rules of conduct:

*(1)* Report for work on time and in a condition that will permit performance of assigned duties, i.e., in appropriate clothing, with appropriate tools or equip-

ment, and in a mentally alert and physically fit condition.

*(2)* Render full and industrious service in the performance of their duties. If such duties are not sufficient to fully occupy employees at any given time, they should notify their supervisor so that additional work may be assigned.

*(3)* Maintain a clean and neat personal appearance to the maximum practicable extent during working hours.

*(4)* Respond promptly to directions and instructions received from their supervisor.

*(5)* Exercise courtesy and tact in dealing with fellow workers, supervisors, and the public.

*(6)* Employees must obtain approval of all absences from duty (including leave without pay). An absence, which is not approved, will be charged as absence without leave. In addition, disciplinary action may be taken if the circumstances warrant.

*(7)* Conserve and protect FAA funds, property, equipment, and materials (ASI's may not use or permit others to use FAA equipment, property, or personnel for other than official business).

*(8)* When duties concern the expenditure of public funds, have knowledge of and observe all applicable legal requirements and restrictions. In addition employees are expected to be prudent and exercise sound judgment in the expenditure of such funds. Summaries of the penalty provisions of some of the more important laws relating to the misuse of Federal funds are contained in appendix B, DOT Regulations, 49 CFR Part 99.

*(9)* Safeguard classified information as provided in FAA Order 1600.2D and unclassified information that should not be given general circulation ASI's shall not disclose or discuss any classified information or "official use only" information unless specifically authorized to do so or except as required on a "need-to-know" basis in the proper discharge of official duties. Classified information shall not be disclosed to anyone who does not have the appropriate security clearance. In addition, employees shall not:

*(a)* Divulge any official information obtained through or in connection with their Government employment to any unauthorized person.

*(b)* Release any official information in advance of the time prescribed for its authorized issuance.

*(c)* Use, or permit others to use, any official information for private purposes, which is not available to the general public.

*(d)* Remove official documents or records from the files for personal reasons. The willful and unlawful falsification, concealment, mutilation, or unauthorized removal of official documents or records is prohibited by law.

*(10)* Observe the various laws, rules, regulations, and other authoritative instructions. This includes all rules, signs, and instructions relating to personal safety. (See FAA Order 3900.19A, Occupational Safety and Health.) In addition to avoiding accidents, employees must report potential accidents and fire hazards to the proper officials and cooperate fully with the safety officer to ensure that the safety of persons or property is not endangered. Willful nonobservance of the governing safety regulations, such as the acts described below, constitutes grounds for disciplinary actions:

*(a)* Failure to report an accident involving injury to persons or damage to property or equipment;

*(b)* Failure to use protective clothing or equipment (e.g., failure to use a safety device when one is provided);

*(c)* Endangering the safety of, or causing injury to, personnel or damaging property or equipment through negligence; and

*(d)* Failure to wear an available safety/seat belt while using a motor vehicle for official Government business.

*(11)* Uphold with integrity the public trust involved in the position to which assigned.

*(12)* Report known or suspected violations of law, regulations, or policy through appropriate channels.

*(13)* Do not engage in private activities for personal gain or any other unauthorized purpose while on government property.

*(14)* Give any supervisor or official conducting an official investigation or inquiry all information and testimony about all matters inquired of, arising under

the law, rules, and regulations administered by the FAA.

*(15)* As an employer, the FAA is concerned with the private decision of any employee to use illicit drugs or abuse alcohol or other substances in a way that could affect the employee's work performance. As an employer with responsibility for aviation safety, the FAA is especially concerned when this private decision can effect the safety of the flying public. Employees directly involved in aviation safety, who use illicit drugs or abuse alcohol or other substances, place their jobs in jeopardy. Anyone known to do so will not be permitted to perform any duties related to aviation safety until the FAA is satisfied that any such person is no longer a risk to public safety. When there is creditable evidence that any employee is involved in the growing, processing, manufacturing, selling, disposition, transportation, or importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances, that employee shall be separated from the Federal service. Use, possession, purchase, or being under the influence of drugs on duty by employees whose duties could affect the safety of people or property will also result in separation.

*(16)* Do not make irresponsible, false, or defamatory statements that attack, without foundation, the integrity of other individuals or organizations (ASI's are accountable for the statements they make and the views they express).

*(17)* Telephone eavesdropping is prohibited.

*(a)* Advance notice must be given whenever any other person is placed on the line for any purpose whatsoever. An advance verbal warning must be given when an automatic recording device or a speaker telephone is used. The use of recording devices, portable or otherwise, on telephones shall be limited to areas involving air safety. This includes accident investigations, near-collision reporting, Command Communications Network, and the Washington Tactical Switch (see FAA Order 1600.24D).

*(b)* FAA employees, in the conduct of their official duties, may not use secret recording or monitoring equipment of any kind or aid in or ignore the improper use of such equipment.

*(c)* The prohibitions do not preclude the use of normal or standard types of recording equipment used openly in areas.

*C. Policy Against Sexual Harassment.*

*(1)* The FAA is committed to providing a workplace that is free of sexual harassment. All employees have a right to work in an environment where they are treated with dignity and respect. Acts of sexual harassment will be treated as misconduct in violation of the agency's policy against sexual harassment and when appropriate as unlawful sex discrimination in violation of 29 CFR Part 1604.

*(2)* Sexual Harassment as Misconduct in Violation of the Agency's Policy. Acts of sexual harassment are prohibited conduct and a single incident will result in disciplinary action. All employees have a responsibility to behave in a proper manner and to take appropriate action to eliminate sexual harassment in the workplace. Actions that are in violation of the FAA's policy against sexual harassment include, but are not limited to, the following:

*(a)* Unwelcome sexual teasing, jokes, remarks, or questions;

*(b)* Unwelcome sexual looks (e.g., leering, ogling, or staring at a person's body) or gestures;

*(c)* Unwelcome letters, telephone calls, or materials of a sexual nature;

*(d)* Unwelcome touching of a sexual nature;

*(e)* Promise of benefit in exchange for sexual favors; and

*(f)* Threat or act of reprisal for refusal to provide sexual favors. Actions will be determined to be "unwelcome" when the employee does not solicit the action and the employee regards the conduct as undesirable or offensive. Employees who experience sexually harassing behavior from others should report it to their immediate supervisor or the next level of supervision if a complaint involves the immediate supervisor. When there is creditable evidence that misconduct of this nature occurred, disciplinary action will be taken in accordance with the table in appendix 1 of FAPM Letter 2635.

*(3)* Sexual Harassment as Sex Discrimination in Violation of 29 CFR Part 1604. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute

unlawful harassment in violation of 29 CFR Part 1604 when:

*(a)* Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment;

*(b)* Submission to or rejection of such conduct by an individual is used as the basis for employment decisions; or

*(c)* Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment. An individual who believes he or she has been a victim of sex discrimination in connection with employment practices may file a discrimination complaint in accordance with FAA Order 1400.8, Equal Opportunity in FAA Employment, Chapter 8. In determining whether alleged conduct constitutes sexual harassment in violation of 29 CFR Part 1604, the situation (not a single incident) will be viewed as a whole to determine if it had the effect of discriminating against an individual or class of individuals on the basis of sex. This stringent standard differs significantly from the agency's policy where a single incident of sexually harassing conduct will result in disciplinary action.

**9. OFF-THE-JOB ETHICS AND CONDUCT.**

*A. General.* The FAA expects ASI's to conduct themselves off duty in a manner that will not adversely reflect on the agency's ability to discharge its mission. ASI's must conduct themselves while off duty in a manner that will not cause the public to question their reliability and trustworthiness in carrying out their responsibilities as employees of the FAA. Off duty criminal activity is regarded as misconduct and can result in disciplinary action.

*B. Political Activity.* It is the right of all employees to vote as they choose and to express their opinions on all political subjects and candidates. However, public expression of opinion in such a way as to constitute taking an active part in partisan campaigns is prohibited. Any political activity that is prohibited in the case of an employee acting independently is also prohibited in the case of an employee acting in cooperation with others or through an agent. Any employee violating the political activity restrictions will be subject to disciplinary action. Some of the prohibited political activities are as follows:

*(1)* Soliciting, receiving, disbursing, or otherwise handling contributions made for political purposes. This does not preclude employees from making voluntary contributions to a political party or organization for its general expenditures;

*(2)* Furnishing names and addresses of other employees for the purpose of political solicitation;

*(3)* Using official authority or influence for the purpose of interfering with an election or affecting the result thereof; and

*(4)* Discriminating in favor of, or against, another employee or prospective employee because of political contributions or opinions.

*C. Subversive Activity.* No employee shall become a member of any organization that the employee knows advocates the overthrow of the constitutional form of the government of the U.S., or that seeks by force or violence to deny other persons their rights under the U.S. Constitution.

*D. Striking.* No employee shall engage in, or encourage any other Federal employees to engage in a strike, work stoppage, or work slowdown, in a labor-management dispute involving the Federal Government.

*E. Meeting Financial Obligations.* All employees are expected to meet their private financial obligations in a proper and timely manner. Failure without sufficient excuse or reason to honor valid debts, including claims based on court judgments and tax delinquencies, or to make and adhere to reasonable arrangements for settlement, will constitute grounds for disciplinary action.

*F. Inaugural Flight and Ceremonial Events.* The Departmental standards of conduct regulations in 49 CFR Part 99 prohibit employees from accepting gifts, favors, gratuities, or any other thing of monetary value, including free transportation, from any person or company that is subject to FAA regulations, that has or is seeking to have contractual relations with the FAA, or that has interests which might be affected by the performance or non-performance of the duties of the particular employees. Acceptance of invitations by our personnel from airlines, aircraft manufacturers, or other aviation-related businesses for inaugural flights or for free transportation in connection with roll-outs and similar ceremonial events is specifically prohibited. Invitations of this nature may only be accepted if the employee is to perform official FAA duties in connection with the event. In such an instance, all related travel and transportation expenses will be

borne by the agency. Any invitation of this kind should immediately be forwarded to the appropriate approving official along with a written recommendation from the employee receiving the invitation and his or her supervisor.

**11. OUTSIDE EMPLOYMENT AND FINANCIAL INTERESTS.**

*A.* Information on outside employment and financial interests is contained in 49 CFR Part 99. Employees must comply fully with the letter and spirit of the guidance and information relating to outside employment and financial interests.

*B.* Each employee is responsible for reading and conducting him/herself in a manner consistent with the appropriate regulations. Each employee must review their financial and outside employment activities to ensure that they have no direct or indirect involvement that conflicts with the duties and responsibilities of their FAA position.

**13. TEACHING, LECTURING, WRITING, AND OTHER OUTSIDE, PART-TIME EMPLOYMENT ACTIVITIES.**

*A.* Consistent with the regulations, employees may engage in outside employment which is compatible with their Government duties and which does not impair their physical or mental capacity to perform those duties. Employees may teach, write, or lecture, provided they do not use "inside" information (i.e., information which has not yet been made available to the public). Employees may accept compensation provided they advise the General Counsel, in writing, of the amount and source within 5 days after the event.

*B.* The FAA has taken the position that additional limitations must apply to its employees who wish to engage in aviation-related, part-time work. Since the agency is solely responsible for control of airspace and the promotion and enforcement of aviation safety in the United States, the "appearance" problem raised by the participation of its employees in outside employment in the aviation arena is considerable. The agency does permit employees to work in aviation-related activities, on a part-time basis, if these activities are not subject to the jurisdiction of the employee's employing office or facility. Any aviation-related business activity which may be subject to inspection, licensing, certification, or other official contact by the FAA office where the employee works is off-limits to the employee as a source of part-time employment. This prohibition is effective even though the employee personally has no official responsibility over the business in question as part of his or her FAA duties.

**15. FINANCIAL INTERESTS.** Title 49 CFR Part 99 prohibits employees from having any financial interests which conflict, or appear to conflict, with their official duties or responsibilities. On the basis of the "appearance" standard, FAA employees are prohibited from owning stocks or other interests in airlines or aircraft manufacturing companies. This policy applies to all employees, regardless of their particular official duty assignments. Consideration of whether or not an employee's duties involve the aviation-related company, in which he or she may own stock, is not relevant to the application of this prohibition. The regulations specifically exempt from the prohibition any holding in a widely held mutual fund, or regulated investment company, which does not specialize in the aviation or airline industry.

**17. DISQUALIFICATIONS ARISING OUT OF FINANCIAL INTERESTS.** Title 18 U.S.C., section 208 provides for criminal penalties for employees who participate personally and substantially, as Government officials, in any particular matter in which they, their spouse, or their minor children have a financial interest. This means that employees may not become involved, as a part of their official Government duties, in any decision making process involving companies in which they hold stock. This statute also classifies negotiations or arrangements for future employment by an employee as financial interests. The statute requires that the employee avoid any official participation in matters affecting the company with which he or she is negotiating while the individual is still working for the Government.

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# CHAPTER 23. CERTIFICATE FOREIGN APPLICANTS LOCATED OUTSIDE THE UNITED STATES FOR MECHANIC CERTIFICATES/RATINGS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3501/3508

*B. Avionics:* 5501/5508

**3. OBJECTIVE.** This chapter provides guidance and describes procedures for certificating foreign and foreign-based applicants for mechanic certificates and ratings.

**5. GENERAL.**

*A.* This chapter prescribes procedures for evaluating foreign applicants located outside the United States for Airframe and/or Powerplant Mechanic/Added Rating(s).

*(1)* Those procedures that are unique to foreign applicants located outside the U.S. are discussed in this chapter. Certification policy is established by the current edition of the following orders:

- FAA Order 8000.16, U.S. Certification or Designation of Foreign National Airmen, Airman Schools, Examiners, and Repair Station Facilities Outside the U.S.
- FAA Order 8610.4, Aviation Mechanic Examiner Handbook

*(2)* This chapter does not apply to foreign applicants in the U.S. Any applicant who is in the U.S. and meets the English language and experience requirements is entitled to take the examinations for a mechanic certificate. Advisory Circular (AC) 65-11, Airframe and Powerplant Mechanics Certification Information, current edition, provides further guidance regarding foreign applicants within the U.S.

*B.* When foreign nationals are physically located outside the U.S. at the time of the examination, determine that the mechanic certificate is needed for the continued airworthiness (maintenance) of U.S.-registered civil aircraft and that the applicant is neither a U.S. citizen or a resident alien.

*(1)* Ensure that a positive identification has been established (review passport prior to issuance). FAA Order 8610.4 advises on review to ensure authenticity.

*(2)* Require applicant to provide a signed and detailed statement (original document) from their employer substantiating specific type of maintenance performed and duration of each.

*(3)* Applicants must provide a letter obtained from the foreign airworthiness authority of the country in which the experience was gained or from an advisor of the International Civil Aviation Organization (ICAO) that will validate their experience. Experience information submitted must be verified or rejected. All documents must be signed, dated originals, and traceable to the initiator.

*C. Payment of Fees.* Title 14 of the Code of Federal Regulations (14 CFR) part 187 prescribes fees for certification services performed outside the U.S. on behalf of foreign nationals other than resident aliens of the U.S. Payment for technical and clerical services is required before the certification action can begin. Fees are to be paid by U.S. currency, money order, or check payable to the FAA.

*D.* Any mechanic certificate or rating will remain effective unless it is surrendered, suspended, or revoked. Applicants who do not meet the English requirements of 14 CFR part 65, § 65.71(a)(2), shall have their certificates endorsed "Valid only outside the U.S."

# CHAPTER 24. CERTIFICATE REPAIRMAN/ADDED PRIVILEGES

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3510

*B. Avionics:* 5510

**3. OBJECTIVE.** This chapter provides guidance and describes procedures for certificating applications for repairman certificates and added privileges.

**5. GENERAL.**

*A.* Applicants for repairman certification are employed by repair stations or air carriers. Issuance of a repairman certificate is based on practical experience of at least 18 months or formal training appropriate for the position and to the satisfaction of the Administrator. Applicants must be at least 18 years of age and read, write, speak, and understand English.

*(1)* According to Title 14 of the Code of Federal Regulations (14 CFR) part 145, § 145.41(b), an applicant must be at or above the level of shop foreman or department head, or must be able to supervise the work performed by employees of the repair station.

*(2)* An applicant employed by an air carrier or repair station may be assigned to a position requiring at least one of the following:

- Responsibility for the work of a shop or department that performs maintenance
- Authorization to sign the airworthiness release or log entry according to the air carrier's manual
- Performance of inspections required by the air carrier's manual

*(3)* A repairman employed by an air carrier or repair station which also holds a repair station certificate may apply for one certificate if the duties are the same in both operations. AFS-760 will issue one certificate with the same privileges listing each operation in the limitations section. If a repairman is employed at either the operator or the repair station and subsequently wishes to be added to the other, certification will be handled as an added privilege.

*(4)* A repairman employed and certificated by more than one repair station or by more than one operator, where the employers are distinctly different business entities, will need a separate airman certificate for each repair station or operator.

*(5)* A repairman employed by a repair station using stations at different locations may serve in any station in that system in accordance with 14 CFR part 145, §145.51.

*B.* For each certificate/rating requested, an applicant should submit the following:

*(1)* One copy of Federal Aviation Administration (FAA) Form 8610-2, Airman Certificate and/or Rating Application, with items I through IV completed. Applicants should check the box for Repairman Certificate and indicate the privileges sought.

*(2)* A letter of recommendation from the applicant's employer clearly stating that the applicant meets the requirements of 14 CFR part 65, § 65.101. The letter should describe the specialized jobs the applicant will perform or supervise as a repairman.

*C.* Ratings for an applicant employed by an air carrier or repair station should coincide with ratings issued at the repair station limited to the specific job for which the person is employed to perform or supervise.

*(1)* In no instance should a repairman certificate be issued with an airframe and/or powerplant rating to circumvent the process of obtaining a mechanic certificate. If a repairman certificate has been issued with airframe and/or powerplant ratings, request that the airman surrender the certificate. Issue a repairman certificate with the appropriate privileges and limitations.

*(2)* Repairman certificates should be reserved for applicants having special skills, such as:

- Argon-heliarc welding
- Cylinder plating
- Nondestructive testing
- Propeller overhaul
- Electrical system analysis and repair. This type of certificate should be reserved for specific systems only, such as flight guidance databus and power distribution
- Radio and/or instrument repair. For these repairman certificates, the applicable privileges may be entered as “radio and instrument” or “radio” or “instrument.”

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 43, 65 and 145

*B. Coordination.* This task may require coordination between maintenance and avionics aviation safety inspectors (ASI).

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

*A. References:*

- Advisory Circular (AC) 65-24, Certification of a Repairman (General), current edition

*B. Forms:*

- FAA Form 8610-2, Airman Certificate and/or Rating Application
- FAA Form 8060-4, Temporary Airman Certificate

*C. Job Aids:*

- Figure 24-1, Temporary Airman Certificate
- Figure 24-2, Temporary Airman Certificate for an Air Carrier or a Repair Station

### 5. PROCEDURES.

*A. Verify Eligibility.* Ensure that the applicant is at least 18 years of age and reads, writes, speaks, and understands English.

*B. Review the Application and Letter of Recommendation.*

*(1) Application.* Ensure that the applicant checks the box for Repairman Certificate and indicates the privilege(s) sought on the front of FAA Form 8610-2, Airman Certificate and/or Rating Application. Determine if the applicant meets the requirements of part 65.

**NOTE: AFS-760 no longer requires that the "Applicant Certification," A or B, on the reverse side of Form 8610-2, be filled out for a Repairman Certificate.**

*(2)* Verify the letter of recommendation contains the following elements:

- A certification that the applicant meets the requirements of the privileges(s)/limitation(s) sought
- A statement recommending the applicant for the privileges(s)/limitation(s) sought

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B. Issue Certificate.* When it has been determined whether the applicant meets all the requirements for certification, sign the applicant as approved and complete FAA Form 8060-4, Temporary Airman Certificate, in duplicate.

*(1)* Check the Airman Information portion of the National Vitals Information Subsystems (NVIS) to determine whether the applicant already possesses a certificate. An applicant seeking added privileges to a specific certificate must surrender the applicable Airman Certificate, FAA Form 8610-2, held at the time of application approval.

*(2)* Give the applicant a copy of FAA Form 8060-4. Both the applicant and the ASI must sign this form.

*(3)* Complete the ASI's report portion on the reverse side of FAA Form 8610-2.

*(4)* Send the original FAA Form 8610-2, the letter of recommendation, Airman Certificate (for an added privilege, as applicable), and the original FAA Form 8060-4 to the Airmen Certification Branch, AFS-760.

*C. Deny Certificate.* If the application is disapproved, return it to the applicant with a letter explaining the denial.

### 9. FUTURE ACTIVITIES.

*A.* Review repair station and air carrier records to determine if the scope of the applicant's employment is consistent with the job described in the letter of recommendation.

*B.* Send Airman Certificates surrendered in accordance with § 65.15(c) to the Airmen Certification Branch, AFS-760, with a brief statement relating to the circumstances.

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**FIGURE 24-1.**

**TEMPORARY AIRMAN CERTIFICATE**

To issue FAA Form 8060-4, Temporary Airman Certificate, for an application to work at a repair station, fill out the form as indicated below:

*A.* In Item III, type the social security number, or if an exclusive number is requested, type the word "Pending."

*B.* In Item IX, type the word "Repairman."

*C.* In Item XII, type the following: Certificate privileges of 14 CFR part 65, § 65.103 valid for (applicable privileges) while employed by (name of repair station, city, state.)

*D.* In Item XIII, type the repair station certificate number.

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**FIGURE 24-2.**

**TEMPORARY AIRMAN CERTIFICATE FOR AN AIR CARRIER OR A REPAIR STATION**

To issue FAA Form 8060-4, Temporary Airman Certificate, for an applicant to work for an air carrier or a repair station, fill out the form as indicated below:

A. In Item III, type the social security number. If an exclusive number is requested, type the word "Pending," and AFS-760 will assign a number.

B. In Item IX, type the word "Repairman."

C. In Item XII, type the following: Certificate privileges of 14 CFR part 65, § 65.103 valid for (applicable privileges) while employed by (air carrier and/or repair station name, city, and state.)

# CHAPTER 26. EVALUATE INSPECTION AUTHORIZATION

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3512

*B. Avionics:* 5512

**3. OBJECTIVE.** This chapter provides guidance for issuing an inspection authorization (IA).

**5. GENERAL.** Advisory Circular (AC) 65-19, Inspection Authorization Study Guide, current edition, serves as a reference and study guide for persons interested in obtaining an IA.

*A.* There is no limit on the number of IA's that may be issued by a given field office. No qualified applicant should be refused the opportunity to take the test.

*B.* Aviation safety inspectors (ASI), should urge the holders of an IA to obtain and subscribe to changes for AC's and other pertinent publications. ASI should offer guidance for obtaining the required data, as requested. However, the responsibility for obtaining this material rests with the holder of the IA.

**7. ELIGIBILITY.** The ASI shall establish the applicant eligibility before allowing the applicant to test. None of the requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 65, § 65.91 can be waived by the ASI.

*A.* The applicant must hold a current mechanic's certificate, with airframe and powerplant ratings, that has been in effect for at least three years. The applicant must have been actively engaged in maintaining certificated aircraft for at least the two-year period before applying.

*B.* There must be a fixed base of operation at which the applicant can be located in person or by telephone. This base need not be the place where the applicant will exercise the inspection authority.

*C.* The applicant must have available the equipment, facilities, and inspection data necessary to conduct proper inspection of airframes, powerplants, propellers, or any related part or appliance. This data must be current.

*D.* The applicant must pass the IA knowledge test, testing the ability to inspect according to safety standards for approval constituting return to service an aircraft, related part, or appliance after major repairs, major alterations, annual, and progressive inspections performed under 14 CFR part 43. There is no practical test required for an IA.

**NOTE: The ASI should see "Section 2, Procedures" of this chapter for instructions to determine applicant eligibility.**

**9. KNOWLEDGE TEST.** The knowledge test establishes the applicant's ability to read, understand, interpret, and apply the regulations, policies, and procedures set forth in Federal Aviation Administration (FAA) publications. The ASI should discuss the test procedures with the applicant, ensuring the applicant understands the test procedures.

*A.* The following documents will be required at the test site:

*(1)* An ID with current photo, signature, and applicant's residential address.

*(2)* A completed FAA Form 8610-1, Mechanic's Application For Inspection Authorization, with signature of approving inspector.

*B.* There is a three-hour time limit that is controlled by the computer.

*C.* The test has 50 questions and one section.

*D.* The minimum passing score is 70, and if the test is failed, there will be a **90-day waiting period before retesting is allowed.** An attempt to retest prior to the waiting period is contrary to part 65, and could result in revocation of any airman certificates held.

*E.* When the applicant enters the actual testing area, he/she is only permitted to take scratch paper furnished by the test administrator and an authorized calculator, approved for use in accordance with FAA Order 8080.6, Conduct of Airman Knowledge Testing Via the Computer Medium, and AC 60-11, Aids Authorized for Use by Airman Written Test Applicants. All reference material will be provided by the test center, the applicant need not take IA reference materials to the test.

*F.* The applicant will be instructed by the test administrator on the operation of the computer for the test, and will be given an opportunity to do a practice test prior to taking the actual test.

*G.* The applicant is responsible for making arrangements with the Computer Test Center for his/her knowledge test as outlined in AC 65-19.

**11. DURATION OF AN IA.** An IA expires March 31, of each year and ceases to be effective whenever either of the following occur:

- The authorization is surrendered, suspended, or revoked. When this occurs, the inspector shall request the holder to return the authorization, FAA Form 8310-5.
- A holder fails to meet the renewal requirements of §§ 65.91(c)(1) through (4).

**13. PRIVILEGES OF AN IA.**

*A.* When exercising the privileges of an IA, the holder may:

- Inspect and approve for return to service major repairs and major alterations, if the work was done according to technical data approved by the Administrator
- Perform an annual inspection
- Perform or supervise a progressive inspection

*B.* An IA holder shall not approve, for return to service, major repairs, major alterations, or inspection on an aircraft maintained in accordance with a continuous airworthiness program under 14 CFR part 121.

*C.* When operating away from the district office having geographic responsibility, the IA holder should notify the district office in the area where the work will be performed, before exercising the authorization. The IA holder should submit FAA Form 337 to the local office where the work was performed.

*D.* An IA holder who changes the fixed base of operation may not exercise the privilege of the authorization before notifying the district office or international field office for the area where the new base is located. This notification must be in writing.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 39, 43, and 65.

*B. Coordination.* None

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

*A. References:*

- AC 60-11, Aids Authorized for Use by Airman Written Test Applicants
- AC 65-19, Inspection Authorization Study Guide, current edition
- FAA Order 8080.6A, Conduct of Airman Knowledge Tests Via The Computer Medium
- FAA Order 8300.10, vol. 2, ch. 26, Evaluate Inspection Authorization

*B. Forms:*

- FAA Form 8310-5, Inspection Authorization
- FAA Form 8610-1, Mechanic's Application for Inspection Authorization

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Establishing Eligibility.* The applicant's eligibility should be determined prior to taking the IA knowledge test. The ASI conducting the eligibility interview should:

*(1)* Instruct the applicant to complete and sign two FAA Form 8610-1, Mechanic's Application for Inspection Authorization.

*(2)* Require the applicant to provide positive proof of identification. The identification presented must include a current photograph of the applicant, the applicant's signature, and the applicant's actual residential address if different from the mailing address in block 3, FAA Form 8610-1. Acceptable forms of identification include, but are not limited to, driver's licenses, government identification cards, passport, alien residency cards, and military identification cards.

*B. Review for Completeness.* When the applicant completes the FAA Form 8610-1, the ASI determines that the applicant meets the requirements stated on the form, including the prior 2-year work requirement. The ASI may wish to contact the employing agency. The ASI should proceed with the following:

*(1)* Conduct a search of the Enforcement Information Subsystems (EIS) to determine if any suspension or revocations are in effect against the mechanic's certificate.

*(2)* Review the applicant's publications and technical data as listed in AC 65-19, appendix 2, current edition. Determine that it is complete and up to date and how this material will be kept current.

*C. Establishing Qualifications.*

*(1)* Interview the applicant to the extent necessary to determine that he/she is qualified per the requirements for the authorization as specified in section 65.91 (c)(1) through (4). The ASI may wish to visit the applicant's facility if necessary to verify that the applicant meets these requirements prior to granting permission to test.

*(2)* Once qualification has been established, the inspector should note this in item 14 of FAA Form 8610-1 by checking the endorsement box and writing the date under the work ENDORSEMENT. The approving inspector will then sign his/her name in the signature block of item 14 and print the name under the signature. Complete item 14 by adding the office identification in the appropriate block of that section. In item 12 (Remarks) enter the statement "Endorsement expires in 30 days."

*D. Instructions for Testing.*

*(1)* The applicant should be instructed what must be presented at the test site. This includes the required ID, a completed FAA Form 8610-1 signed by the interviewing FAA ASI, and an authorized calculator. Inform the applicant where the test may be taken. The IA test is available at only one location in most FSDO districts. If the applicant fails the test he/she may retest after 90 days by presenting the failed test report at the test site. The applicant need not return to the FSDO for additional authorization to test. When the applicant returns with a passing test report, the ASI issuing the IA may wish to review the applicant's qualification again if a substantial amount of time has elapsed in the testing process (6 months or more). Testing may be allowed at a test site in another district office's area of jurisdiction. You may call AFS-630, Operations Standards Support Branch, at the Mike Monroney Aeronautical Center in Oklahoma City, OK, (405) 954-6677 for the locations of test sites.

*(2)* The ASI should open a file in the mechanic's name accessible to other FSDO office personnel as needed. One of the two FAA Form 8610-1 will be held here until the applicant returns with a passing test results.

*(3)* When the applicant returns with a test report the ASI should review it, noting the number of the test takes and date. If the applicant has taken the test more than once

the ASI should determine the reason. It may be that the applicant has used the option of retaking a **passed** test after 30 days in hopes of obtaining a better score or has fraudulently retaken a **failed** test in less than the 90-day waiting period. If the ASI cannot determine this to his/her satisfaction locally, contact AFS-630, Operations Standards Support Branch, (405) 954-6677, for a complete review of the applicant's testing activity.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Issue the IA.* When an applicant successfully completes the test, issue an IA, FAA Form 8310-5, as follows:

*(1)* Type all information on the face of FAA Form 8310-5.

*(2)* Enter the mechanic's full name in the space provided.

*(3)* Make certain that the mechanic's certificate number entered on this form is the same as that appearing on the applicant's mechanic certificate, Aeronautical Center Form 8060-1. Have the applicant sign FAA Form 8310-5 in ink. Forward the Form 8610-1 to the Airmen Certification Branch, AFS-760. Retain a copy for the district office files. Enter information into the Vital Information System (VIS).

**NOTE: The FAA Form 8610-1 the applicant takes to the test site is retained and destroyed by the test site. This is done to preclude the applicant from fraudulently reusing the form to retake test in less than 90 days if the test is failed.**

**9. FUTURE ACTIVITIES.** Inform the IA holder of the requirement to report any change of base of operation. Conduct annual IA renewal and routine surveillance.

# CHAPTER 27. RENEW INSPECTION AUTHORIZATION

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* (Pending)

*B. Avionics:* (Pending)

**3. OBJECTIVE.** This chapter provides guidance for the renewal of Inspection Authorizations (IA).

**5. GENERAL.**

*A.* When the base of operation changes for an IA holder, the Flight Standards District Office (FSDO) for the area of the new base must be notified in writing before the holder can again exercise the privileges of the authorization.

*B.* The IA expires annually on March 31. An Inspection Authorization holder must continue to meet the requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 65, § 65.93 in order to retain the authorization.

**7. RENEWAL OF INSPECTION AUTHORIZATION.**

*A.* Application for renewal may be required to comply with following:

*(1)* Complete FAA form 8610-1, Mechanic's Application for Inspection Authorization, in duplicate; and

*(2)* Show evidence of meeting the requirements of § 65.93(a).

*B.* Meeting the requirements of § 65.93(a) does not mean that the applicant has to meet all five (5) of the listed requirements. To be eligible for renewal of an inspection authorization for a one-year period, the applicant must show evidence of having performed four annual inspections during the 365-day period prior to renewal date to be able to qualify for renewal. The same logic applies for major repairs and alterations. However, the number of annual inspections, major repairs and alterations performed cannot be mixed simply because the 14 CFR section does not provide for such combinations. The following chart demonstrates this system:

| | | | |
|---|---|---|---|
| 1st 90 | 2nd 90 | 3rd 90 | 4th 90 |
| 1 Ann | 1 Ann | 1 Ann | 1 Ann or |
| 2 MA | 2 MR | 2MA | 2MR |
| 0 | 4 Ann | 0 | 0 |
| 0 | 0 | 8MR/MA | 0 |

Mixing annual inspections, major repairs, and alterations is not permissible:

**NOTE: An inspection program required under 14 CFR part 91, § 91.409(e) is not acceptable as IA activity. Partial inspections such as phases or events on more than one aircraft are not acceptable as activity. A progressive inspection is a complete inspection on one identified aircraft.**

*(1)* Successful completion of an eight hour refresher course, acceptable to the Administrator, during the 12-month period preceding the renewal application.

*(a)* The refresher course must contain subjects directly related to aircraft maintenance, inspection repairs, and alterations. In addition, some non-technical subjects, such as human factors or professionalism as they relate to aviation maintenance personnel, may be acceptable. Training must not be used to promote a new or existing product.

*(b)* The instructional requirements of § 65.93(a)(4), may be met by accumulating at least 8 hours of maintenance training. Each course or seminar must be at least one hour long and completed in the 12-month period between April 1 and March 31 prior to inspection authorization renewal.

*(c)* In order to provide standardization and preclude IA refresher training from being evaluated each time it is given, training must be accepted through one of the Regional Safety Program Managers (RSPM) Airworthiness (A/W). The RSPM A/W will be responsible for the review and acceptance or rejection of all IA refresher training. If an RSPM A/W is not available in a particular region, the IA renewal package will be forwarded to the General Aviation and Commercial Branch, AFS-340, for approval. AFS-340 will review IA refresher training given by professional organizations (PAMA, AOPA, NATA, etc.). Training must be on the list of accepted training provided by the RSPM A/W. Training that appears on the list of acceptable training is good in any location and has been accepted for up to a 2-year period. Each training organization that intends to provide training must notify the local FSDO or International Field Office (IFO) in writing 30 days prior to the actual training session. Inspectors are encouraged to attend any training in their district. For surveillance purposes, the training organization will provide any A/W inspector with free access to the meeting and all student materials pertinent to the course or seminar. Should an inspector find that the course does not meet the requirements for IA renewal, they

should contact the regional RSPM within 5 days. It is not the responsibility of Flight Standards Airworthiness Inspectors attending in official capacity to endorse or provide a certificate of training to the course attendees. Inspectors may/are encouraged to participate in training sessions, they may not, however, act as the primary source of training. A local or regional SPM, A/W may act as the primary source of training, provided the training has been developed and approved. Technical training provided by an aircraft, engine, propeller, or component manufacturer, is considered acceptable training without further showing. If the manufacturer contracts out his training the contractor must obtain approval.

*(d)* Each person who intends to use 8 hours of instruction to meet 14 CFR § 65.93(a)(4) must provide proof of attendance for instruction received at the time of renewal. Acceptable proof of attendance consists of a certificate of training or similar document showing the name of the course, name of attendee, course identification number assigned by the RSPM A/W, expiration date, description of the course content, time in hours, the date, location, and course instructor's name and affiliation. The proof of attendance should be reviewed by inspectors at renewal time to ensure that both the training organization and the IA have met the appropriate requirements. The training organization must keep a list of all attendees for a period of two (2) years. This list must be provided by the training organization to FSDO inspectors upon request.

*(2)* Passing of an oral test given by an Aviation Safety Inspector (ASI) to ensure that the applicant's knowledge of regulations and standards is current.

**NOTE: An IA issued less than 90 days before the expiration date need not comply with § 65.93(a)(1) through (5) for that quarter.**

*C.* If the applicant applies for renewal at an office other than the jurisdictional office, the receiving office should withhold renewal until the applicants activities can be verified.

*D.* When the applicant is employed by a repair station, credit for renewal activity can be claimed only for those aircraft that the authorization holder personally inspected. Evidence supporting the activity should be presented in addition to the signed application.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 39, 43, and 65

*B. Coordination.* This task may require coordination with other FSDOs.

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

*A. References:*

- FAA Order 8300.10, Vol, Ch. 26

*B. Forms:*

- FAA Form 8310-5, Inspection Authorization
- FAA Form 8610-1, Mechanic's Application for Inspection Authorization

*C. Jobs Aids.* None.

### 5. PROCEDURES.

*A. Ensure Applicant Meets Eligibility Requirements.*

*B. Renew Inspection Authorization.*

*(1)* Enter the new expiration date and sign the reverse side of FAA Form 8310-5.

*(2)* Complete Item 14, "record of action" portion of FAA Form 8610-1 and forward the original of the form to AVN-460 in Oklahoma City while retaining the duplicate copy.

*(3)* Issue a new IA, FAA Form 8310-5, if the holder's form is soiled or worn, or the reverse side is completely filled out.

*C. Process Failure to Renew IA.* Update data in the Vital Information System at the FSDO level, which will delete the Inspection Authorization from the data bank.

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B. Process Change of Location.* Upon receipt of written notification, contact the previous supervising office and request the appropriate Inspection Authorization file. Visit the Inspection Authorization holder at the new base as soon as possible.

*C. Process Surrendered Authorization.* When the holder of an IA voluntarily surrenders it, accomplish the following:

- Destroy the IA, FAA Form 8310-5
- Attempt to obtain a statement in writing indicating that the surrender is voluntary
- Submit mailing list information as required

**9. FUTURE ACTIVITIES.** Routine Surveillance.

# [CHAPTERS 40 THROUGH 59 RESERVED]

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# CHAPTER 61. EVALUATE PART 121/135.411(a)(2) OPERATOR

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance (14 CFR):*

- Part 121: 3202
- Part 135 (10 or more): 3207

*B. Avionics (14 CFR):*

- Part 121: 5202
- Part 135 (10 or more): 5207

*C. Cabin Safety:*

- Part 121: pending
- Part 135 (10 or more): pending

**3. OBJECTIVE.** This chapter describes the process used to evaluate an applicant for a part 121 or 135 (10 or more) certificate.

**5. GENERAL.** The certification process provides for interaction between the applicant and the Federal Aviation Administration (FAA), from initial inquiry to certificate issuance or denial. The process consists of the following five phases:

- Preapplication Phase
- Formal Application Phase
- Document Compliance Phase
- Demonstration and Inspection Phase
- Certification Phase

**7. PREAPPLICATION PHASE.**

*A. Initial Inquiry.* An initial request for information regarding certification may be verbal or in writing.

*B. Preapplication Statement of Intent (PASI).*

*(1)* The submission of a PASI shows intent and prompts the district office to allocate resources. A PASI should be submitted only after the applicant has reviewed the appropriate regulations and advisory material.

*(2)* The PASI is used by the district office manager to evaluate the complexity of the proposed operation.

*C. The Certification Team.* The district office manager will select a certification team consisting of at least two airworthiness aviation safety inspectors (ASI) (maintenance and avionics) and one ASI (operations). Additional ASI's, including Cabin Safety Specialists may be used.

*(1)* The district office manager will designate one team member as a Certification Project Manager (CPM). The CPM is the primary spokesperson for the FAA throughout the certification process. The person selected as CPM should have previous experience in certificating an air carrier under part 121 or 135.

*(a)* The CPM is the primary contact with the applicant. The CPM schedules and conducts meetings and coordinates any correspondence with the applicant.

*(b)* The CPM must be sure each certification task is completed in an acceptable and timely manner, and ensure that all certification matters are thoroughly coordinated with each team member.

*(c)* The CPM should schedule periodic meetings with the certification team, unit supervisors, and/or the district office manager to ensure that everyone is fully informed of the current status of the certification. The CPM must notify the unit supervisors and/or the district office manager of any information that may significantly affect or delay certification or that may attract media or political interest.

*(2)* Each team member will respond to requests for assistance made by the CPM and keep the CPM apprised of the status of the certification. Anything that may delay certification must be brought to the attention of the CPM immediately.

**NOTE: Although guidance should be provided to the applicant, it is important that each document, procedure, demonstration, or inspection reflects the applicant's knowledge, skills, and abilities. Therefore, refrain from providing explicit instructions on how a task should be accomplished.**

*D. Preapplication Meeting.* At the preapplication meeting, the following should occur:

*(1)* The applicant should be briefed in as much detail as necessary to ensure that the certification process is understood.

*(2)* The Schedule of Events should be used to facilitate any discussions to help ensure that all elements of the certification process are described.

*(3)* The applicant should be encouraged to ask questions about any area of the process that is not clearly understood.

*E. Formal Application.* At the preapplication meeting, the form, content, and documents required for formal application are discussed. The formal application must be submitted to the assigned district office. The applicant is encouraged to submit the application as far in advance as possible of the intended starting date. The formal application must be in letter format and must contain the following:

*(1)* The full and official name of the applicant.

*(2)* A statement that the document is a formal application for either an air carrier or an operating certificate.

*(3)* The applicant's mailing address and the physical address of the applicant's intended primary operating location.

*(4)* For an air carrier applicant, the full name and address of the agent (designated person who has signature authority) for service as required by Title 49 of the United States Code (49 U.S.C.), § 46103.

*(5)* The names of key management personnel, such as the General Manager (where applicable), Director of Safety, Director of Operations, Director of Maintenance, Chief Pilot, and Chief Inspector, as applicable.

*(6)* A note is added to the formal application letter if a request for deviation from management personnel requirements is anticipated. The request and justification for the deviation; however, must be made under separate cover.

*(7)* The signatures of the following, as applicable:

- The owner, when applying as an individual
- Each partner, when applying as a partnership
- An authorized officer, when applying as an organization, such as a company or corporation

*F. Formal Application Attachments.* The formal application must be accompanied by the following:

*(1) Schedule of Events.* The Schedule of Events lists documents, activities, and acquisitions required for certification. Each item is accompanied by the applicant's best estimate of the date that the item will be submitted, acquired, and/or ready for inspection.

*(a)* The number and types of events and activities that occur during certification vary according to the operation proposed. The Schedule of Events must list each document to be submitted, the activity to be performed, and the item to be inspected. The schedule must provide the FAA a reasonable amount of time for the review and acceptance or approval of each item or event.

*(b)* The Schedule of Events is intended to encourage an applicant to submit material well in advance of the date operations are proposed to begin. If, however, the application is submitted with only the minimum lead time required by the regulation, complete documents (such as maintenance manuals) may be required at the time of formal application.

*(c)* If the applicant plans to petition for exemption, processing time must be considered. Title 14 CFR part 11, § 11.25 requires that a petition be submitted to AGC-204, at least 120 days before it is needed.

**NOTE: Final certification could be delayed if the applicant fails to accomplish an item or event in a satisfactory manner or in accordance with the Schedule of Events. In addition, delays may be caused by the need to correct deficiencies in documents, such as manuals or maintenance/inspection programs.**

*(2) Company Manual.* The company manual contains information about the applicant's organization, general policies, duties, responsibilities, operational control policy, and procedures. This attachment may be comprised of one or more manuals or sections of manuals.

*(a)* When the formal application is submitted, the manual must show compliance with the applicable paragraphs of parts 121 and 135.

*(b)* Team members must ensure that all required material is shown on the Schedule of Events and that adequate time is allowed for review.

*(c)* The applicant should be encouraged to provide a table of contents.

*(3) Initial Company Training Curriculums.*

*(a)* At the time of formal application, some training program elements may not be fully developed. The projected date of submission for training course curriculums must be in the Schedule of Events. A draft of the initial company training curriculum, as complete as possible, must be attached to the formal application.

*(b)* The initial company training curriculum must include at least the following segments:

- Basic indoctrination training
- Emergency training
- Initial aircraft ground training

- Initial aircraft flight training

*(c)* Curriculums for training maintenance personnel may be included as part of the operator's manual.

*(4) Management Resumes.* This attachment includes resumes showing the qualifications, certificates, ratings, and experience of persons selected for the following, or equivalent, positions:

- General Manager (where applicable)
- Director of Safety
- Director of Operations
- Director of Maintenance
- Chief Pilot
- Chief Inspector (where applicable)

*(a)* If it appears that a proposed management candidate does not meet the appropriate experience requirements, inform the applicant that a deviation is required to employ that person. If a deviation is requested, the applicant must show equivalent aeronautical experience.

*(b)* An applicant may request a deviation to use fewer or different personnel. The applicant must prove the ability to perform operations safely under the deviation. The applicant must also show that the proposed personnel can effectively perform the functions associated with the positions in accordance with the regulations and the procedures outlined in the proposed manual.

*(c)* Requests for deviation must be by letter. These requests must be submitted to the district office as soon as possible. Justification for deviations must take into account the size and scope of the operation and the qualifications of the intended personnel. If fewer or different positions are approved, that approval will be made part of the operations specifications.

*(d)* Normally, full-time employees are expected for part 135 operations. However, depending on the size, scope, and complexity of the operation, part-time management personnel may be accepted.

*(5) Documents of Purchase, Contracts, and/or Letters of Intent.*

*(a)* These documents and/or letters show the applicant is committed to making arrangements for aircraft, supporting facilities, and services necessary for the proposed operation. Proof of formal purchase, lease, or contractual arrangement are acceptable. If formal arrangements have not been completed, letters showing preliminary agreements will suffice until formal contracts are available. However, formal agreements must be finalized in sufficient time for FAA evaluation before certification.

*(b)* If the applicant does not plan to make purchases or develop services until after submitting the formal application, a statement of intent is acceptable. However, such arrangements must be completed sufficiently in advance of certification for FAA evaluation.

*(c)* The following types of equipment, facilities, and services are to be addressed in these documents, contracts, or letters:

- Aircraft
- Station facilities and services
- Weather and NOTAM-gathering facilities and services (SAWRS stations)
- Communications facilities and services
- Maintenance facilities and services
- Aeronautical charts and related publications
- Airport analysis and obstruction data
- Contract training or facilities

*(6) Initial Compliance Statement.* The compliance statement ensures that all applicable regulatory aspects are appropriately addressed during the certification process. The compliance statement lists each part 121 or 135 regulation pertinent to the proposed operation. The applicant must describe proposed compliance methods alongside each applicable regulation. A brief narrative or a specific reference to a manual or other document is required. Where necessary, the applicant should indicate that the information will be provided in the final compliance statement.

## 9. FORMAL APPLICATION PHASE.

*A. Initial Review Of Formal Application.* The initial review of the formal application takes place before the formal application meeting is scheduled. This review verifies that required documents have been submitted. The review also ensures that the material submitted represents a feasible proposal and is of sufficient quality to continue the certification process.

*B. Reviewing the Schedule of Events.* The Schedule of Events set dates for accomplishing or submitting the listed items. When reviewing the Schedule of Events, the CPM/team must consider carefully the feasibility of the proposed schedule with respect to the logic of sequence, timeliness of events, completeness of events, and ASI availability.

*(1) Logic of Sequence.* The team must ensure that the proposed Schedule of Events has the proper sequence.

*(2) Timeliness of Events.* The Schedule of Events must be reasonable, realistic, and provide sufficient time for the certification team to review various documents, manuals, and proposals.

*(3) Completeness of Events.* The team must ensure that the Schedule of Events is complete. Each required manual, document, event, and activity must be listed,

including the submission date for the final compliance statement.

*(4) Availability of Personnel.* The availability of personnel may affect the Schedule of Events. The CPM must determine that qualified ASI's will be available to assist the team in conducting the extensive manual review. The CPM must also determine the need for and availability of resources other than Flight Standards.

*C. Initial Determination of Acceptability.* The initial decision to accept or reject the formal application is based primarily on the initial review of the formal application and attachments. Results from informal meetings, reviews, and observations of the applicant's capabilities should supplement the decision-making process.

**NOTE: The absence of required information in the application letter and/or the absence of one or more of the required attachments requires automatic rejection of the formal application. If the application is rejected before the meeting, it must be returned with a letter of explanation.**

*(1)* The application should be rejected if:

- It appears the applicant has not made a conscientious attempt to comply with the requirements of a formal application.
- Deficiencies and/or omissions are of such a serious nature that they could not be resolved during a meeting.

*(2)* The formal application should be of sufficient quality to ensure that any discrepancy or omission can be resolved during the formal application meeting. During the meeting, all discrepancies or omissions in submitted materials must be resolved.

*D. Final Determination of Acceptability.* After the formal application meeting, the CPM and the certification team make a final determination of acceptability. Generally, if the formal application meeting is concluded without significant disagreements, it should be considered successful and result in an acceptable formal application. However, the team may decide there are sufficient reasons to reject the formal application. These reasons should clearly indicate that to proceed with the certification project would not be productive. Such reasons might include inadequate agreements on appropriate courses of action or evidence that the applicant does not understand the regulatory requirements and/or the certification process.

**11. DOCUMENT COMPLIANCE PHASE.**

*A. Document Review.* In the document compliance phase, the applicant's manuals and other documents are reviewed and accepted, approved, or rejected. This phase is accomplished in the district office by the certification team. Each document is reviewed in depth to ensure compliance with applicable regulations and conformity to safe operating practices.

*(1)* The Schedule of Events determines the priority of items to be reviewed.

*(2)* The plan for review should ensure that each required manual or document is reviewed according to procedures and criteria outlined in other chapters of this handbook. The initial compliance statement directs the ASI to the location in the applicant's manuals where a compliance procedure is described.

**13. DEMONSTRATION AND INSPECTION PHASE.**

*A. Description.* In this phase, the certification team determines the effectiveness of the applicant's proposed procedures and programs, and ensures that facilities and equipment are satisfactory. Emphasis is on compliance with regulations and safe operating practices.

*B. Responsibilities.* The CPM must ensure that each aspect of the applicant's required demonstrations is observed and approved or disapproved.

**15. CERTIFICATION PHASE.** An applicant is entitled to a certificate when:

*(1)* The certification process is completed.

*(2)* Each significant unsatisfactory item has been corrected.

*(3)* The applicant has met all regulatory requirements.

*(4)* It has been determined that the applicant is capable of complying with the regulations.

*(5)* The applicant's ability to conduct operations in a safe manner has been demonstrated.

**NOTE: Before issuing the certificate, noncritical items needing further resolution should be discussed with the applicant and corrective action noted in writing.**

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 121 or 135, as applicable
- Successful completion of the Airworthiness Inspectors Indoctrination Course or equivalent

*B. Coordination.* This task requires coordination between ASI's (airworthiness and operations) and the region.

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

*A. References:*

- Parts 43, 45, 47, 65, and 91
- Advisory Circular (AC) 120-49, Certification of FAR Part 121/135 Operators, current edition
- FAA Order 8300.10, Airworthiness Inspector's Handbook, applicable chapters

*B. Forms:*

- FAA Form 8400-6, Preapplication Statement of Intent (PASI)
- FAA Form 8400-8, Operating Specifications
- FAA Form 8430-18, Air Carrier Certificate
- FAA Form 8430-21, Operating Certificate

*C. Job Aids.* None.

### 5. PREAPPLICATION PHASE PROCEDURES.

*A. Provide the Applicant With AC 120-49.* Advise the applicant to review AC 120-49, current edition, before filling out the PASI. Avoid lengthy or detailed discussions of the certification process until the applicant has read the AC.

*B. Determine Applicant Eligibility.*

*(1)* Determine if the applicant is qualified to apply for certification.

*(2)* Ensure that the applicant has proof of U.S. citizenship as defined under the Title 49 of the United States Code (49 U.S.C.).

*C. Discuss the Preapplication Package.* Provide the applicant with FAA Form 8400-6, with instructions to complete it and submit it to the district office.

*(1)* Advise the applicant that a completed PASI signals an intent by the applicant to continue the certification process.

*(2)* Recommend that the PASI be submitted only after the applicant has reviewed the appropriate regulations and advisory material.

*(3)* Advise the applicant that after receiving and processing the PASI, the FAA will arrange a preapplication meeting at which the certification process will be discussed in detail.

*D. Review PASI.* Within five working days of receipt of a signed PASI, determine if the information is complete, accurate, and acceptable. Ensure that the proposed operation is consistent with the regulations.

*(1)* If the PASI is unacceptable, accomplish the following:

- Note the reasons in section 2 of the PASI
- Notify the applicant in writing of the discrepancies detailed in section 2

**NOTE: A new PASI is required to resume the certification process.**

*(2)* If the PASI is acceptable, accomplish the following:

- Complete section 2 of the PASI
- Check the “Action” box of the PASI
- Contact AFS-620 for a precertification number
- Forward the PASI to the regional office

*E. Establish Certification Team.* When the district office has received a precertification number, the manager will select the certification team. Additional ASI's, including Cabin Safety Specialists, qualified on the types of aircraft to be used, may be used. One team member will be designated as the CPM.

*F. Schedule Preapplication Meeting.* Contact the applicant to arrange a preapplication meeting. Advise the applicant that key management personnel, as listed on the PASI, should attend the meeting and be prepared for a discussion of the applicant's proposed operation.

*G. Conduct Preapplication Meeting.*

*(1)* Review the PASI and verify all of the submitted information. Any changes made during the meeting should be reflected on the PASI by the applicant.

**NOTE: If the changes significantly affect the anticipated scope and/or type of operation, forward a copy of the revised PASI to the regional office. If the**

**changes indicate the need to reassign certification responsibilities, immediately notify the regional office.**

*(2)* Ensure that the applicant understands which regulations apply to the proposed operation. Advise the applicant to become familiar with the regulations and applicable advisory circulars.

*(3)* Ensure that the applicant and all key personnel understand the certification process.

*(4)* Advise the applicant of the responsibility to obtain appropriate Department of Transportation (DOT) economic authority. Ensure that the applicant understands that the FAA requires proof of DOT economic authority in order to issue a certificate.

*(5)* Verify that the applicant intends to continue the certification process. Encourage the applicant to submit required items in draft form before the formal package is submitted. Notify the CPM immediately of any problems or changes in the proposed operation.

*(6)* Inform the applicant of any reasons for concern. If necessary, advise the applicant to request another preapplication meeting after a more complete preparation. It is appropriate for the CPM to recommend to the applicant one or more of the following actions:

- A more thorough review of the applicable regulations
- Changes in proposed key management personnel
- Obtaining the services of a professional aviation consultant
- Ceasing certification efforts

*(7)* If at any time during the preapplication phase the applicant formally terminates certification efforts, or the CPM determines that the applicant will not proceed with certification, the CPM must:

*(a)* Return the PASI to the applicant, stating that the preapplication process is terminated and that a new PASI is required to resume the certification process.

*(b)* Notify the regional office that the project is terminated.

*(c)* Notify AFS-620 that the certification process is terminated and the precertification number is no longer needed.

## 7. FORMAL APPLICATION PHASE PROCEDURES.

*A. Receive the Formal Application.* The formal application may be received by mail or delivered in person. Within five working days of receipt of a formal application, the team must review it and determine its acceptability.

*B. Review the Formal Application.* Determine that each required item has been submitted. If any required item is missing, the entire package must be returned to the applicant within five working days of receipt with a letter stating the reasons for rejection. The minimum required items, as described in section 1 of this chapter, include the following:

*(1)* The formal letter requesting certification.

*(2)* The required formal application attachments, to include the following:

*(a) Schedule of Events.* Ensure that the Schedule of Events lists all items, activities, programs, aircraft, and facility acquisitions required for certification and the applicant's estimates of the date the item will be acquired or ready for inspection. Carefully consider the feasibility of the proposed schedule with respect to logic of sequence, timeliness of events, completeness of events, and ASI availability.

*(b) Company Manual.* Review the company manual(s) to be able to determine if the required information has been submitted. Evaluate the content and scope of the manual. Determine if the applicant is proceeding in an appropriate manner and is in compliance with the regulations. A more comprehensive evaluation will be conducted in the Document Compliance Phase.

*(c) Initial Company Training Curriculum.* Review the company training curriculum attachments and determine if each required segment has been submitted for each applicable crew member or dispatcher position. Determine if each curriculum meets regulatory requirements.

*(d) Management Qualifications.* A resume for each required management position is required. Each resume must contain information necessary to determine compliance. Ensure that there are no obvious omissions or significant discrepancies.

*(e) Documents of Purchase, Contracts, Leases, and Letters of Intent.* Review for obvious omissions or significant discrepancies.

*(f) Initial Compliance Statement.* Determine if the initial compliance statement meets requirement for form and content. Determine if the applicant is proceeding in an appropriate manner.

*C. Schedule Formal Application Meeting.* Contact the applicant and schedule the formal application meeting. Inform the applicant that key management personnel must attend. Before the meeting, identify discrepancies, omissions, or open questions that must be resolved.

*D. Conduct the Formal Application Meeting.* Each member of the certification team, the applicant, and all key management personnel must be present.

*(1)* Discuss the Formal Application Letter. Resolve any open questions and obtain missing information. Discuss the following:

*(a) Schedule of Events.* Provide clear and reasonable explanations as to why a scheduled item is not feasible. If deficiencies pertaining to the Schedule of Events cannot be resolved, terminate the meeting. Inform the applicant that the formal application is rejected and that it will be returned by letter with an explanation of the reasons for its rejection.

*(b) Initial Compliance Statement.* Provide recommendations for the correction of any deficiencies. Advise the applicant that the final compliance statement must reflect these corrections and that similar omissions or deficiencies must not recur when the final compliance statement is submitted.

*(c) Remaining Attachments.* Discuss any omissions and deficiencies found in the attachments. Provide clear explanations of why an item is considered deficient. Mutual agreements regarding corrective action must be reached during the meeting. If mutual agreements cannot be reached:

- Terminate the meeting
- Inform the applicant that the formal application is rejected and will be returned by letter with an explanation of the reasons for its rejection

*(d) Dates Shown on the Schedule of Events.* If necessary, adjust these dates.

*(2)* Encourage the applicant to present any questions concerning the certification process.

*(3)* Encourage the applicant to obtain and review the appropriate inspector handbooks. Provide the applicant with the address of the Government Printing Office (GPO) and encourage subscription to these handbooks in order to receive revisions.

*(4)* Ensure that the applicant clearly understands the following:

*(a)* Notification of acceptance or rejection of the formal application will be provided in writing within a few days after the meeting.

*(b)* Notification of acceptance of the formal application package does not constitute acceptance or approval of the separate attachments. Each attachment must be reviewed further. The applicant will be expected to take required corrective action.

*(c)* If the applicant is unable to meet the Schedule of Events, the FAA will need equivalent amounts of time, as agreed upon during the meeting, to complete necessary reviews and inspections. As a result, certification could be delayed. Additionally, unanticipated demands on FAA personnel, such as accident investigations, could delay the certification process.

*E. Accept or Reject the Formal Application Package.*

*(1)* If the formal application meeting is successful, prepare and forward a letter to the applicant no later than five working days after the meeting.

*(2)* If the formal application meeting is unsuccessful, prepare and forward a letter to the applicant stating reasons for rejection. Specific examples which clearly substantiate each reason must be cited. Return the formal application and supporting documents to the applicant within five working days. Retain all of the documentation pertaining to the reasons for rejection.

*(3)* If it appears that the applicant does not intend to proceed with the certification, notify the regional office.

*(4)* If the applicant does not intend to proceed with the certification, notify AFS-620 to release the precertification number.

**9. DOCUMENT COMPLIANCE PHASE PROCEDURES.**

*A. Review Submissions.* Review each document submitted by the applicant. Examples of typical submissions during the Document Compliance Phase are listed below:

- Management personnel resumes
- General operation manual
- General maintenance manual
- Weight and balance procedures
- Training program manuals
- Approved aircraft flight manual
- Minimum equipment list
- Deviation requests
- Flight attendant manual
- Dispatch/flight following/flight locating procedures
- Maintenance reliability program
- Continuous analysis and surveillance system
- Proving test plan
- Emergency evacuation demonstration plan
- Final compliance statement
- Any other appropriate documentation

*B. Document Deficiencies.*

*(1)* If deficiencies are found in any document, return it to the applicant with a letter of explanation.

*(2)* Meet with the applicant if:

*(a)* The applicant does not meet the Schedule of Events, review the deficiencies in detail, or agree to a new,

modified schedule and re-enter the Document Compliance Phase at the appropriate point.

*(b)* Submissions are not of sufficient quality to warrant further review. If appropriate, advise the applicant that it is not practical to continue the certification process.

**NOTE: Team members should remember that it is the applicant's responsibility to develop manuals and procedures which ensure safe operating practices and compliance with the rules. The team can offer suggestions on how to improve the product but should avoid "writing" the document.**

**11. DEMONSTRATION AND INSPECTION PHASE PROCEDURES.**

*A. Observe Demonstrations And Conduct Inspections.* The following events may occur in this phase, as applicable:

- Airman/Flight Attendant training (classroom, simulator, and aircraft training)
- Airman/Flight Attendant testing and certification (airmen, crew members, and dispatchers, as applicable)
- Station facilities inspection (equipment, procedures, and personnel)
- Recordkeeping procedures inspection (documentation of training, flight and duty times, flight papers, etc.)
- Flight operations (dispatch, flight following, or flight locating capabilities)
- Approved maintenance program procedures inspection
- Maintenance activities (facilities, personnel, technical information, spare parts, etc.)
- Aircraft inspection (conformity inspection, aircraft maintenance records, etc.)
- Minimum Equipment List (MEL) and Configuration Deviation List inspection (compliance with Airplane Owner's Manual/Airplane Flight Manual maintenance procedures, etc.)
- Weight and balance control inspection (procedures, accuracy, and document control)
- Emergency evacuation demonstration (aborted takeoff and/or ditching demonstrations)
- Aircraft proving test (ability of applicant to operate independently, safely, and in compliance with the applicable regulations)
- Any other event appropriate for the type of operation to be conducted

*B. Document Deficiencies.* If deficiencies are observed during the conduct of activities and events (training, emergency evacuation, etc.), or certain items are found deficient (MEL, records, etc.), recommend appropriate corrective action.

**13. CERTIFICATION PHASE PROCEDURES.** When the applicant has met all requirements, prepare the appropriate certificate. Use FAA Form 8430-18 for an Air Carrier Certificate and use FAA Form 8430-21 for an Operating Certificate. Include the following information on the appropriate form:

*A. Certificate Holder's Name.* Enter the certificate holder's full and official name directly below the words "This certifies that. . . ." Other names, such as "doing business as," will not be shown on a certificate.

*B. Certificate Holder's Address.* Enter the physical location of the certificate holder's principal base of operations directly below the name. Do not use a post office box.

*C. Certification Statement of Authority.* For the Air Carrier Certificate, do not modify the pre-printed certification statement of authority.

*D. Certificate Number.* Obtain the final certificate number from AFS-620.

*E. Effective Date.* Enter the date of issuance in the space provided. If a new certificate number is issued, the date on the new certificate will be that of original issuance. If an operator's name or certification statement of authority changes, a new certificate number must be issued. The new issuance date of the certificate will be entered in the space provided.

*F. District Office Designator.* Enter the four-character, alphanumeric designator of the certificate holding district office (CHDO) in the "issued at" space on the form (for example, EA18).

*G. Signature.* Air Carrier certificates issued to air operators complying with part 121 or 135 commuter rules must be signed by the regional Flight Standards Division manager or assigned designee. All other air operator certificates must be signed by the CHDO manager.

*H. Signature, Title, and Region/Office.* Enter the full title of the person signing the certificate in the space provided. If the Flight Standards Division manager signs the certificate, enter the full name of the region in the "Region/Office" space. If the district office manager signs the certificate, enter the full name of the region, the Flight Standards District Office (FSDO) acronym, and the number in the "Region/Office" space.

**15. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Completion of this task will result in one of the*

*following for a successful certification:*

*(1) Issuance of Operations Specifications.* Operations specifications must be signed by the applicant and the appropriate principal inspectors, (see vol. 2, ch. 84, FAR Part 121/135 Operations Specifications). Give the original certificate and operations specifications to the new certificate holder.

*(2) Preparation of the Certification Report.* After an operator is certificated, a certification report must be assembled. This report establishes the district office file. The report is signed by the CPM and includes the name and title of each team member who assisted in the certification project.

*(3) Distribution of the Certification Report.* Distribute the report as follows:

*(a)* For a part 135 Commuter Air Carrier or a part 121 Air Carrier, forward two copies of the report to the regional office for review. The regional office will forward one copy of the report to AFS-1.

*(b)* For all other part 121 or 135 operators, forward one copy of the report to the regional office for review.

*(4) For an unsuccessful certification:*

*(a)* A letter to the applicant indicating the certificate is denied.

*(b)* A letter to the applicant confirming termination of the certification process by the applicant.

**17. FUTURE ACTIVITIES.**

*A. Transition.* The district office manager must ensure that there is an orderly transition from the certification process to certificate management.

*B. Post-Certification Surveillance.* Assigned ASI's should observe the operator carefully during the first 90 days of operation. Additional inspections may be necessary to determine operating practices are performed at an adequate level of safety.

*(1)* Particular attention should be directed to areas that may not have been demonstrated or observed during certification, such as cargo and passenger loading.

*(2)* The ASI may detect a need for changes in the methods, techniques, operation, inspection, and/or maintenance during this early period of operation.

# CHAPTER 68. EVALUATE PART 135 (NINE OR LESS) OPERATORS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3204/3206

*B. Avionics:* 5204/5206

*C. Cabin Safety:* Pending

**3. OBJECTIVE.** This chapter provides guidance for evaluation of aircraft, facilities, maintenance programs, and records for certification of a Title 14 of the Code of Federal Regulations (14 CFR) part 135, § 135.411(a)(1) operator.

**5. GENERAL.** The certification process provides for interaction between the applicant and the Federal Aviation Administration (FAA) from initial inquiry to certificate issuance or denial. The process consists of the following five phases:

- Preapplication Phase
- Formal Application Phase
- Document Compliance Phase
- Demonstration and Inspection Phase
- Certification Phase

*A. Inspection/Maintenance Programs.* Applicants for certification under part 135, nine or less passenger seats, must comply with the requirements of § 135.411(a)(1). This regulation gives them the option of inspecting or maintaining their aircraft under one of the following programs:

*(1)* A 100-hour/annual inspection as designed by the manufacturer or in accordance with 14 CFR part 91, § 91.409 and appendix D of 14 CFR part 43.

*(2)* An Approved Aircraft Inspection Program, (AAIP), in accordance with § 135.419. Although large and multi-engine turbine powered airplanes must meet the requirements of § 91.409(e) and (f), these applicants may also choose to operate under an approved aircraft inspection program.

*B. Cargo Operations, 14 CFR Part 135 (Nine or Less).* The requirements of § 91.409(b) only apply to aircraft carrying revenue passengers. The 100 hour inspection does not apply to cargo-carrying part 135 operations, as long as the operator has an approved inspection schedule.

*C.* An applicant for operations of aircraft under part 135 (nine or less) must comply with the additional maintenance requirements of § 135.421 for engines, propellers, rotors, and emergency equipment. An applicant may use either the manufacturer's recommended maintenance requirements or a program approved by the Administrator.

*D. Carry-on Oxygen Equipment for Medical Purposes.* The oxygen equipment must meet the requirements of § 135.91 and must be under an approved maintenance program if owned by the applicant.

**7. PREAPPLICATION PHASE.**

*A. Initial Inquiry.* An initial inquiry or request for information regarding certification as a part 135 (nine or less) operator may be verbal or in writing.

*B. Preapplication Statement of Intent (PASI).* A PASI should be submitted only after the applicant has reviewed the appropriate regulations and advisory material. The submission of a completed PASI shows intent and prompts the district office to allocate resources.

*C. Certification Team.* The district office will select a certification team, consisting of at least one maintenance aviation safety inspector (ASI), one avionics ASI, and one operations ASI. Additional ASI's, including cabin safety specialists may also be used. One of these will be designated as a certification project manager (CPM). The certification project manager will be the primary contact and FAA spokesperson for the certification project.

*D. Preapplication Meeting.* This meeting is an opportunity to discuss with the applicant the next step in the process. Before discussing procedures for continuing the certification process, the team should ensure the applicant understands the regulations and advisory materials. The applicant should be encouraged to ask questions and to clarify anything not fully understood.

**9. FORMAL APPLICATION PHASE.**

*A.* During the formal application phase, the team conducts a cursory review of the application and attachments to determine that all documents have been submitted and are complete. In-depth reviews are conducted during the document compliance phase.

*B. Review Results.* Based on the results of the cursory review of the application and any meetings with the applicant, the CPM must accept or reject the application for processing and advise the applicant. In the case of rejection, the CPM must return the application and attachments with

an explanation as to why the application was found unacceptable.

**11. DOCUMENT COMPLIANCE PHASE.** During this phase, the formal application and other documents supplied by the applicant will be reviewed. The application will be accompanied by the following documents:

- General operating manual (if applicable)
- Initial compliance statement
- Proving flight plan (if applicable)
- Any other document appropriate for the particular type of operation to be conducted

**13. DEMONSTRATION AND INSPECTION PHASE.** In this phase, the certification team determines the effectiveness of the applicant's proposed procedures and programs. The team ensures that the facilities, equipment, and aircraft are satisfactory and emphasizes compliance with regulations and safe operating practices. Throughout this phase, the CPM must ensure that each aspect of the required demonstration is observed and either is accepted or denied.

**15. CERTIFICATION PHASE.** An applicant is entitled to a certificate when:

- The certification process is completed
- Each significant unsatisfactory item has been corrected
- The applicant has met all regulatory requirements
- It has been determined the applicant is capable of complying with 14 CFR
- The applicant's ability to conduct operations in a safe manner has been demonstrated

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14CFR part 135
- Successful completion of the Airworthiness Inspectors Indoctrination Course or equivalent
- Previous experience with part 135 (nine or less) certification and surveillance

*B. Coordination.* This task requires coordination between maintenance, avionics, and operations ASI's.

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

*A. References:*

- 14 CFR parts 43, 65, and 91
- AC 20-42, Hand Fire Extinguishers for Use in Aircraft, current edition
- AC 39-7, Airworthiness Directives (AD) for General Aviation Aircraft, current edition
- AC 43-9, Maintenance Records, current edition
- AC 120-27, Weight and Balance Programs, current edition
- AC 120-49, Certification of Air Carriers, current edition
- AC 135-10, Approved Aircraft Inspection Program, current edition

*B. Forms:*

- FAA Form 8400-6, Preapplication Statement of Intent (PASI)
- FAA Form 8400-8, Operations Specifications
- FAA Form 8430-18, Air Carrier Certificate
- FAA Form 8430-21, Operating Certificate

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Advise The Applicant of the Process for Certification of an Air Carrier (Nine or Less) and of 14 CFR Requirements.* Provide the following:

- A Preapplication Statement of Intent (PASI)
- AC 120-49, Certification of Air Carriers

*B. Review the PASI For Content, Completeness, and Acceptability.*

*(1)* If the PASI is unacceptable, inform the applicant of the discrepancies in writing. A new PASI will be required to continue the certification process.

*(2)* If the PASI is acceptable, check the action box and forward a copy to the regional office.

*(3)* The district office assigned to the project should contact AFS-620 to acquire a precertification number.

*C. Schedule a Precertification Meeting with the Applicant.* Ensure that key personnel from the applicant's organization and all certification team members will be in attendance.

*D. Conduct the Precertification Meeting.*

*(1)* Ensure that the applicant understands the applicable regulations. Advise the applicant to become familiar with 14 CFR and pertinent AC's.

*(2)* Ensure that the applicant and key personnel understand the certification process.

*(3)* Advise the applicant that the FAA will not issue a certificate until proof of Department of Transportation (DOT) economic authority or the DOT 298 exemption is provided.

**NOTE: If at any time during the preapplication phase the applicant formally terminates certification efforts, return the PASI to the applicant and notify the regional office and AFS-620.**

*E. Receive the Formal Application and Accompanying Documentation.* These may include the following:

- A manual (as required)
- An initial compliance statement
- Operations specifications
- Schedule for proving flights (as required)
- Training curriculum
- Minimum Equipment List (MEL) (as required)
- Any other documents required by the certification team

*F. Schedule and Conduct the Formal Application Meeting.*

*(1)* The certification team will review the application form, the initial compliance statement, the schedule for proving flights with the applicant, and key personnel from the organization.

*(2)* Resolve any open questions and obtain missing information.

*(3)* If the applicant cannot meet the regulatory requirements, reject and return the formal application and accompanying documents to the applicant. A letter must

accompany this package, listing the reasons for the rejection.

*G. Review Documents Submitted by the Applicant.* Ensure that each document complies with the regulations. If deficiencies are found in any of the documents, send the applicant a letter outlining the deficient areas.

**NOTE: The team members should remember that it is the responsibility of the applicant to develop manuals and procedures. The team can offer suggestions on how to improve the product but should avoid writing the document.**

*H. Observe Demonstrations and Conduct Inspections.*

*(1)* Ensure that the following are acceptable:

- Station facilities (equipment, procedures, and personnel), if applicable
- Recordkeeping procedures (documentation of training, flight and duty times, flight papers, etc.), as required
- Flight control (dispatch, flight following, or flight locating capabilities)
- Inspection and maintenance program procedures
- Maintenance activities (facilities, personnel, technical information, spare parts, etc.), as required
- Weight and balance control (procedures, accuracy, and document control)
- Aircraft (conformity, maintenance records, etc.)
- Minimum Equipment List
- Aircraft proving tests (ability of applicant to operate independently, safely, and in compliance with the applicable 14 CFR), if required
- Any other event appropriate for the type of operation to be conducted

(2) Inform the applicant of any deficiencies noted. Advise the applicant that corrective action will be required to continue the certification process.

*I. Prepare the Certificate.* When the applicant has met all certification requirements, fill out the certificate with the following information:

- Certificate holder's name
- Certificate holder's address (a post office box is not acceptable)
- Certificate number (obtained from AFS-620)
- Effective date
- District office designator
- Signature and title of district office manager

*J. Issue Operations Specifications, as Appropriate.* Operations specifications must be signed by the applicant or authorized member of the organization and the appropriate principal inspector. Give the original certificate and the operations specifications to the certificate holder.

## 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B.* Completion of this task results in one of the following:

- Issuance of a certificate and operations specifications (see vol. 2, ch. 84, FAR Part 121/135, Operations Specifications)
- A letter to the applicant indicating denial of the certificate
- A letter to the applicant confirming termination of the certification process by the applicant

*C. Establish the Certificate Holding District Office (CHDO) File For the Certificate Holder.* Include the following information in the file:

- The Preapplication Statement of Intent (PASI)
- The completed application form
- Final compliance statement
- Proving test evaluation report (if required)
- A copy of operations specifications
- A copy of the certificate
- A report by each team member, summarizing evaluations and observations from each phase of the certification process.

## 9. FUTURE ACTIVITIES.

*A. Transition.* The district office manager must ensure an orderly transition from the certification process to certificate management.

*B. Post Certification Surveillance.* Assigned inspectors should observe the operator carefully during the first 90 days of operation. Additional inspections may be necessary to determine that operating practices are performed as required.

*(1)* Particular attention should be directed to areas that may not have been demonstrated or observed during certification, such as cargo and passenger loading.

*(2)* The inspector may detect a need for changes in the methods, techniques, operations, inspections, and/or maintenance during this early period of operation.

# CHAPTER 71. EVALUATE PART 121/135.411(a)(2) AIR CARRIER'S MAINTENANCE RECORDKEEPING SYSTEM

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3351/3302/3303

*B. Avionics:* 5351/5302/5303

**3. OBJECTIVE.** This chapter provides information for use during evaluations of maintenance recordkeeping systems, both on an initial approval basis as well as on a continuing compliance basis. Pertinent sections of Title 14 of the Code of Federal Regulations (14 CFR) outline the requirement for an air carrier's system for the preparation, storage, and retention of certain required aircraft maintenance records. The primary objective of these systems is the generation, storage, retention, and retrieval of accurate and complete air carrier aircraft maintenance records. These records exist, primarily, to show that the Certificate of Airworthiness of a particular aircraft is valid, therefore, airworthy and capable of safe flight.

**5. GENERAL.** The Standard Certificate of Airworthiness issued to a U.S.-registered aircraft is valid only as long as the maintenance, preventive maintenance, and alterations are performed according to the requirements of the pertinent regulations. In view of this significant requirement, aircraft maintenance records become especially important, since incomplete or inaccurate required aircraft maintenance records have the effect of rendering a Standard Certificate of Airworthiness invalid. Aircraft maintenance actions, in almost all cases, become intangible or abstract after the fact. Therefore, in order that an aircraft operator can make a maintenance action tangible, a record of that maintenance action must be made. In addition, the current airworthiness status of an aircraft is also supported by making a record of certain summary information. Moreover, these maintenance records are important to the FAA as the FAA uses its continuing review of aircraft maintenance records as a direct means of determining the accomplishment of maintenance, preventive maintenance, and alterations, thereby fulfilling, in part, its public mandate of ensuring the airworthiness and safety of aircraft. Furthermore, because the review of maintenance records is the only direct means of determining the accomplishment of the required maintenance, preventive maintenance and alterations, and, recognizing the extreme importance of making, and keeping accurate aircraft maintenance records, the U.S. Congress has established the act of intentionally failing to make and keep, as well as the act of intentionally falsifying, mutilating, or altering air carrier aircraft records as a criminal act, subject to the imposition of substantial fines. In addition, persons intentionally falsifying or concealing, or inducing reliance on a false statement of material fact in an air carrier record, are subject to substantial fines, or imprisonment, or both. In view of the considerable importance of aircraft maintenance records, as emphasized by the severe statutory criminal penalties for aircraft recordkeeping and reporting infractions, as well as the statutory requirement for an air carrier to operate with the highest possible degree of safety in the public interest, the FAA expects air carrier records to be accurately produced, as well as complete and correct. When it is appropriate, FAA personnel should use the policy and procedures for handling criminal violations relating to air carrier records and reports that are contained in FAA Order 2150.3A, Compliance and Enforcement Program, Chapter 6, Criminal Investigations.

**7. REQUIRED AIR CARRIER AIRCRAFT MAINTENANCE RECORDS.** Over the years, air carrier aircraft maintenance record making and retention requirements have evolved from the minimal records of repairs and alterations required in the pre-WWII era, to the current requirements for a list of summary information and airworthiness release records. Currently, each air carrier is required to keep, using the system specified in 14 CFR part 121, 135, §§ 121.369 and 135.427, certain maintenance records for the time periods specified in §§ 121.380(c) and 135.439(b).

*A. Summary Information.* Air carriers are required to make and keep a list of certain summary status records as well as records related to the issuance of an airworthiness release and to transfer that information with the aircraft when it is sold. These specific records are listed and explained as follows:

*(1)* The "total time-in-service of the airframe, each installed engine, and each installed propeller." "Time-in-service" is defined in 14 CFR part 1, §1.1. Total time-in-service is a record that contains that time-in-service accrued

since new, or since rebuild, expressed in hours and landings or cycles.

*(2)* The "current status of each life-limited part" of each airframe, engine, propeller, and appliance means a record that contains, at least, the following information:

*(a)* Time-in-service since new expressed in the appropriate parameter (hours, cycles, calendar time, etc.).

*(b)* The time-in-service remaining to the specified life limit expressed in the appropriate parameter (hours, cycles, calendar time, etc.).

*(c)* The specified life limit expressed in the appropriate parameter (hours, cycles, calendar time, etc.).

*(d)* A record of any action that alters the part's life limit or changes the parameter of the life limit.

*(3)* The listing of the time "since last overhaul" means a record that contains at least the following information:

*(a)* A listing of the item required to be overhauled, and its associated scheduled overhaul interval.

*(b)* The time-in-service since the last overhaul.

*(c)* The time-in-service remaining to the next scheduled overhaul.

*(d)* The time-in-service when the next scheduled overhaul is due.

**NOTE: The listing of "time since overhaul" refers to summary current status information and must not be confused with an overhaul record, which is a description of the work performed and the identification of the person who performed and/or issued the approval for return to service.**

*(4)* The "current inspection status of the aircraft" means a record that contains, at least, the following information:

*(a)* A listing, identifying each of the scheduled inspection packages or groups and their associated intervals, that are required by the maintenance program under which the aircraft is maintained.

*(b)* The time-in-service accrued since the last accomplishment of each of the scheduled inspection packages or groups required by the maintenance program under which the aircraft is maintained.

*(c)* The time-in-service remaining to the next accomplishment of each of the scheduled inspection packages or groups required by the maintenance program under which the aircraft is maintained.

*(d)* The time-in-service when the next accomplishment of each of the scheduled inspection packages or groups required by the maintenance program under which the aircraft is maintained, is due.

*(5)* The "current status of an airworthiness directive" means a record that contains, at least, the following information:

*(a)* Identification of the particular airframe, engine, propeller, appliance, or component to which the AD is applicable.

*(b)* The airworthiness directive number (and/or regulatory amendment number).

*(c)* The date, and the time-in-service expressed in the appropriate measuring parameter (hours, cycles, calendar time, etc.), when the required action was accomplished.

*(d)* If the requirement is recurring, the time-in-service when the next action is due expressed in the appropriate measuring parameter (hours, cycles, calendar time, etc.).

*(e)* The "Method of Compliance" means, with regard to an airworthiness directive, a concise description of the action taken to comply with the requirements of the airworthiness directive. If the airworthiness directive or its referenced manufacturer's service bulletin permits the use of more than one method of compliance, the record must include a reference to the specific method of compliance used. If the operator uses an alternate method of compliance to comply with an airworthiness directive, the method of compliance means a description of this alternate method of compliance and a copy of the FAA approval.

**NOTE: The listing of "current status of an airworthiness directive" or "method of compliance" refers to summary current status information and must not be confused with an AD record of accomplishment, which is a description of the work performed and the identification of the person who performed and/or issued the approval for return to service.**

*(6)* A listing of "the current major alterations of each airframe, engine, propeller, and appliance" means a record that contains, at least, the following information:

*(a)* A listing identifying each major alteration as well as the associated item to which the major alteration has been installed.

*(b)* A description, or reference to the FAA-approved technical data used to make the major alteration.

**NOTE: For part 135 air carriers, this listing includes all current major repairs, as well as a requirement for a listing of major repairs and alterations to each rotor.**

**NOTE: The listing of "all of the current major alterations" refers to summary current status information and must not be confused with a major alteration record, which is a detailed description of the work performed, a description of the FAA-**

**approved technical data used to make the alteration, and the identification of the person who performed and/or issued the approval for return to service. This listing also must not be confused with the major alteration report which must be submitted in accordance with 14 CFR §121.707.**

*(7)* "All the records necessary to show that all requirements for the issuance of an airworthiness release have been met." While the regulatory requirement for these records does not provide a detailed list of records required to be retained, this requirement is generally accepted to mean:

*(a)* Detailed records of all scheduled maintenance that has not been superseded by work of equivalent scope and detail.

*(b)* For those items required to be overhauled, detailed records of the accomplishment of the last overhaul.

**NOTE: An overhaul record is not required to contain a record of AD accomplishment. The regulations require records of AD current status and accomplishment to be made and preserved as a separate and distinct record.**

*(c)* Detailed records of all unscheduled maintenance that has not been superseded by work of equivalent scope and detail.

*(d)* Adequate copies of the maintenance log required under 14 CFR §§ 121.563, 121.701, and 135.65. Adequate copies are generally accepted to mean copies covering the last sixty days of operation. All of these items (1-7) are required, by regulation, to be kept and transferred with the aircraft when it is sold.

*B. Air Carrier Airworthiness Release.* The relevant air carrier regulations require that each time maintenance, preventive maintenance, or alterations are performed on an air carrier aircraft, an airworthiness release or log entry must be completed before the aircraft may be operated. In addition to the requirement to make an airworthiness release, part 121 air carriers are also required to give a copy of the airworthiness release to the pilot-in-command, and to keep a record of the airworthiness release for at least two months. However, an additional requirement contains a mandate that requires all of those records necessary to show that all of the requirements for the issuance of an airworthiness release have been met, must be retained until the work is superseded by work of equivalent scope and detail, or for at least one year after the work is performed. Notwithstanding the one year retention requirement, detailed records of accomplishment of the last overhaul for those items required to be overhauled by the air carrier's maintenance time limitations are required to be kept until the work is superseded by work of equivalent scope and detail.

**9. OTHER REQUIRED RECORDS AND REPORTS.** Other reports and records required to be kept by air carriers are outlined in part 121, subpart V, as well as §§ 135.415, and 135.417. These reports are also used by the FAA in its continuous review of air carrier maintenance operations as a direct means of determining the adequacy of the content of the maintenance portion of the air carrier manual, the effectiveness of the air carrier maintenance program, as well as the continuing analysis and surveillance systems.

*A. Maintenance Log.* An aircraft maintenance log is required by §§ 121.563, 121.701, and 135.65. These sections require any person who takes action in response to a reported or observed failure or malfunction to make a record of that action in the maintenance log of the aircraft. In addition, §§ 121.563 and 135.65 require the pilot-in-command to ensure that all mechanical irregularities occurring during flight time are entered in the maintenance log at the end of that particular flight time.

*B. Mechanical Reliability Reports.* Mechanical reliability reports are required to be made by 14 CFR §§ 121.703 and 135.415. While these reports should be used by the air carrier to identify deficiencies within its air carrier maintenance program, these reports are also the primary means of gathering information for the FAA's Service Difficulty Reporting System.

*C. Mechanical Interruption Reports.* Mechanical Interruption Reports are required to be made by §§ 121.705 and 135.417. Essentially, these reports accent the significant issue of the inability of the aircraft to arrive at its scheduled destination due to mechanical difficulties. Moreover, these reports are one of the FAA's most effective means of determining the effectiveness of the continuous airworthiness maintenance program.

*D. Alteration and Repair Reports.* Title 14 CFR §121.707 outlines the regulatory requirement for air carrier Alteration and Repair Reports. A part 121 air carrier is required to prepare a report of each major alteration and each major repair made on its aircraft. Each report is required to be prepared promptly on completion of the repair or alteration. In addition, while the report of a major alteration is required to be submitted to the FAA principal maintenance inspector (PMI) assigned to the part 121 air carrier, the report of a major repair is not required to be submitted. However, the major repair report is required to be made available for inspection by the PMI. In addition, it should be noted that 14 CFR §43.9(b) permits an air carrier to use other than FAA Form 337 for reporting a major alteration or repair accomplished by it. The Major Alteration Report required by §121.707 should be submitted to the FAA in a timely manner and should contain, at least, the identification of the altered aircraft by registration number and serial number as well as the identification of the alteration and its technical data approval basis.

**NOTE: These Alteration and Repair Reports should not be confused with the current status listing of major alterations required under part 121 as well as the current status listing of major repairs and alterations required under part 135.**

**NOTE: A reporting requirement similar to §121.707 is not included in part 135.**

**11. HISTORICAL AIRCRAFT MAINTENANCE RECORDS.** Extensive and thorough research has been unable to discover a specific regulatory, or statutory requirement for the preparation, storage, and retention of historical or source records that may be used to authenticate or support required air carrier aircraft maintenance records, and in particular, air carrier current status records. However, under the federal statutes, the FAA is charged with the Public Trust involving the assurance of the safety of flight as well as the airworthiness of civil and commercial aircraft. Aircraft maintenance records and summary current status information are used by the FAA as the primary and most direct means of determining the airworthiness and safety of aircraft. As described in paragraph 5, the level of importance of air carrier maintenance records is emphasized by the statutory designation of the act of willful falsification or alteration of these records as a criminal offense. The importance of accurate air carrier aircraft maintenance records cannot be overstated. In view of the severe penalties involved with falsification or alteration of required aircraft records, the FAA expects these current status information records to be complete as well as accurate. Of course, in order that the FAA may adequately discharge its safety and airworthiness oversight duties under the federal statutes, it must have a high level of confidence in air carrier aircraft maintenance records. Moreover, the FAA's level of confidence in current status records produced by an air carrier's maintenance recordkeeping system and monitored by that air carrier's continuous analysis and surveillance system is clearly higher than it would be for those records produced by no system or by a system that is not monitored by the FAA. Therefore, unless there is evidence to the contrary, an aircraft maintenance record produced by an air carrier's maintenance recordkeeping system should be acceptable by itself, i.e., without historical or source records. It must also be noted that there is no regulatory or statutory basis that can be used to require or force an operator of an aircraft to produce or maintain records that are not required to be made by any regulations or by any statute. For its aircraft maintenance recordkeeping system, the air carrier must develop and use detailed documentation and source requirements and procedures for administrative handling of aircraft components and parts. These requirements and procedures must be clearly identified in the air carrier's manual. These source and documentation requirements may include, but are not limited to, documentation of AD compliance, life-limited parts current status information, description of maintenance performed, and appropriate certification of new and repaired parts. Once these requirements are satisfied and the essential information is entered into the air carrier's recordkeeping system, the documentation and source information required to be retained as necessary to support the continuing analysis and surveillance system or that which may be required to integrate the part into the air carrier's continuous airworthiness maintenance program, or that which is required to support future maintenance on the affected parts, such as detailed shop records or FAA-approved technical data. Of course, those specific air carrier maintenance records required to be retained for a specific period of time by the regulations are also required to be retained. However, a prudent air carrier may wish to archive certain source documentation records which were used to introduce parts into the air carrier's system. These may be records such as the manufacturer's invoice for new parts, export certificates of airworthiness, documentation of a major repair, or other similar information that may be considered to be useful in the future.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

- Knowledge of, and working experience with, the air carrier maintenance recordkeeping requirements of 14 CFR part 121 and part 135, and recordkeeping systems
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

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

*A. References:*

- 14 CFR part 43,
- 14 CFR part 121, subpart G, L, and V
- 14 CFR part 135, subpart B, and J
- FAA Order 2150.3A, Compliance and Enforcement Program
- 49 U.S.C., section 46310, Reporting and Recordkeeping Violations
- 18 U.S.C., section 1001, Statements or Entries Generally
- 18 U.S.C., section 3571, Sentence of Fine

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Overview.* During initial certification of an air carrier, the air carrier is required to establish an aircraft maintenance recordkeeping system, and to develop a section in its manual that provides a description of the system as well as detailed instructions for the use of that recordkeeping system. The PMI should ensure that the air carrier's manual contains a description or overview of the recordkeeping system. In addition, the air carrier's initial compliance statement should clearly identify the detailed procedures contained in the air carrier manual to be used for the generation, storage, retention, and retrieval of aircraft maintenance records. The air carrier manual maintenance recordkeeping procedures should be written in such a manner that a consistent format is followed. Clear, concise, and accurate procedures and information should be described. Any ambiguities are considered unacceptable. After certification, the PMI or his designee shall conduct surveillance of an air carrier's aircraft maintenance recordkeeping system on a routine basis to ensure that accurate records are being produced and maintained as well as being able to be retrieved in accordance with the system. The PMI shall also ensure that the aircraft maintenance records continue to contain the information necessary to show compliance with the regulations.

*B. System Evaluation.* Accomplish an evaluation of the aircraft maintenance reporting and recordkeeping system described in the air carrier's manual. In addition to the general requirements described above, this required system must include the procedures, information and instructions necessary to allow the personnel concerned to perform their duties and responsibilities with a high degree of safety. The general regulatory requirements for an air carrier maintenance recordkeeping system are that the system must be suitable, that the system must provide for the preservation and retrieval of information in a manner acceptable to the administrator, and that, with regard to maintenance work performed, the system includes procedures that ensure that maintenance records includes, at least:

*(1)* A description (or reference to data acceptable to the Administrator) of the work performed;

*(2)* The name of the person performing the work if the work is performed by a person outside the organization of the air carrier.

*(3)* The name or other positive identification of the individual approving the work. However, the PMI should also ensure that the system addresses both types of aircraft maintenance records, i.e., records to show that all requirements for the issuance of an airworthiness release have been met, as well as the record of current status summary information. The current status summary information should contain, at least, that information described in section 1, paragraph 7 of this chapter.

*C. Procedures Review.* Accomplish a review of the maintenance recordkeeping procedures contained in the air carrier's manual. During the review, the reviewing inspector should keep in mind that although each air carrier's system is required to meet the same requirements, the recordkeeping system and procedures developed and used by each individual air carrier to meet those requirements may be quite different from one another, yet still comply with the regulations. The reviewing inspector must also keep in mind that the recordkeeping procedures must address the generation, storage, retention, and retrieval of records of all maintenance and alterations, whether the maintenance or alteration was accomplished by authorized air carrier personnel or by authorized persons outside of the air carrier's organization. The procedures must clearly identify the particular person(s), by job title or description, who are responsible for carrying out each particular function of the program. In addition, the air carrier's maintenance recordkeeping procedures must not be contrary to the regulations, nor should the manual contain procedures which allow activity that results in de facto exemptions to selected

regulatory sections of the CFRs. An air carrier maintenance recordkeeping system is required to include, at least, methods and detailed procedures for the generation, storage, retention, and retrieval of:

*(1)* Records of scheduled maintenance;

*(2)* Records of unscheduled maintenance;

*(3)* Records of shop maintenance;

*(4)* Records of engine and/or propeller shop maintenance;

*(5)* Records of the airworthiness release described in 14 CFR §§ 121.709 and 135.443;

*(6)* All records necessary to show that all requirements for the issuance of the airworthiness release described in §§ 121.709 and 135.443, have been met;

*(7)* The mechanical reliability reports;

*(8)* The mechanical interruption reports;

*(9)* The major alteration report;

*(10)* The major repair report; and

*(11)* The current status summary information describing:

*(a)* The total time-in-service of the airframe, each engine, and each propeller, and for part 135 air carriers, each rotor;

*(b)* The current status of each life-limited part of each airframe, engine, propeller, and appliance, and for part 135 air carriers, each rotor;

*(c)* The time since overhaul of each item required to be overhauled;

*(d)* The current inspection status of the aircraft;

*(e)* The current status of each applicable airworthiness directive;

*(f)* A list of all of the major alterations; and

*(g)* For part 135 air carriers, a list of all of the major repairs.

*D. Analyze the Findings.* Evaluate all findings to determine the corrective action that is required and initiate action to achieve those corrective actions.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Successful Completion of this Task will Result in the Following:*

- A letter to the applicant outlining the results of evaluation
- Continuation of the certification process

*C. Document the Task.* File all supporting paperwork in the air carrier's office file.

**9. FUTURE ACTIVITIES.** Schedule follow-up inspections as required and/or in compliance with National Work Program Guidelines.

# CHAPTER 78. PROCESS PART 121/135 OPERATOR'S AIRCRAFT/ENGINE UTILIZATION REPORT

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3321

*B. Avionics:* 5321

**3. OBJECTIVE.** This chapter describes guidance for processing an operator's monthly engine utilization report as required by policy from the Aircraft Maintenance Division, AFS-300.

**5. GENERAL.**

*A.* The monthly engine utilization report provides data by the Safety Performance Analysis System (SPAS). This utilization data base is one of several databases that are utilized by SPAS to produce indicators that will be useful to the Aircraft Maintenance Division and the field inspectors in the performance of their duties as aviation safety inspectors (ASI).

*(1)* The responsibility for completing and submitting the report rests with the assigned ASI. There are no regulatory requirements for the operator to submit this information to the FAA in the form of aircraft/engine utilization reports but regulations in 14 CFR parts 121/135, §§ 121.705 and 135.417 do require mechanical reliability reports.

*(2)* AFS-620 must receive this report by the 15th of each month. To ensure processing requirements are met, the data should be received from the operator by the 7th of each month.

*B.* AFS-620 reviews the reports received from district offices to ensure the data is properly prepared for entry into the utilization system database. All computer-prepared reports will be reviewed by AFS-620 to ensure they are complete and accurate.

*C. Usage Report Improvements.* Correspondence concerning the improvement of the usage report system and significant problems found in using this system should be addressed to AFS-620.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of regulatory requirements of 14 CFR parts 121 and 135
- Successful completion of the Airworthiness Inspectors Indoctrination Course, or previous equivalent

*B. Coordination.* This task requires coordination between the ASI and the operator to ensure timely submission of data.

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

*A. References.* None.

*B. Forms:*

- Aeronautical Center Form, AC 8320-1, Air Carrier Aircraft Engine Utilization Report

*C. Job Aids:*

- Figure 78-1, Daily Utilization Calculations

### 5. PROCEDURES.

*A. Prepare the Report.* Each month the assigned ASI shall obtain from the air carrier(s) the information to complete the monthly engine usage report. The report is to be typewritten and submitted on AC Form 8320-1. The following information must be completed:

*(1)* Operator Designation: Enter the operator's four-character maintenance designator in this block.

*(2)* Month/Year

*(3)* Operator's Name

*(4)* Operator's Certificate Number

*(5)* Name and Phone Number of ASI Submitting Report

*(6)* Regional/District Office

*(7)* Aircraft Manufacturer: The one-to-two letter abbreviation for the manufacturer (code contained on back of AC Form 8320-1).

*(8)* Aircraft Model: The complete model/series designator listed on the aircraft data plate or type certificate data sheet (TCDS).

*(9)* Number of Aircraft: The total quantity of each model of aircraft which was in service any time during this report month.

*(10)* Engine Manufacturer: A one-to-four letter abbreviation for the engine manufacturer, Ref. FAA Order 8010.2 (code contained on back of AC Form 8320-1).

*(11)* Engine Model: See TCDS for model designation.

*(12)* Number of Engine Shutdowns: The number of engine shutdowns for cause, not to include training, demonstrations, or flight check purposes.

*(13)* Number of Engine Removals: Engines removed prematurely due to mechanical malfunctions, not to include engines removed for company convenience.

*(14)* Time Between Overhauls (TBO)

*(15)* Hot Section Inspection Time (HSI)

**NOTE: If times are controlled by the maintenance program, enter type of program, i.e., Condition Monitoring (CM), Logical Information Based on Reliability (LIBRA), etc.**

*(16)* Aircraft Total Hours: Fleet flight hours for each model to the nearest whole hour.

*(17)* Average Hours Per Day: To calculate daily usage, divide total aircraft fleet hours by the number that results from multiplying the total number of aircraft by the total number of days in the month. See figure 78-1.

*(18)* Engine Total Hours: Number of engines per aircraft times Aircraft Total Hours.

*(19)* Remarks: ASI's remarks and comments, e.g., type of engine program and revisions, TBO/Hot Section Inspection Time revisions, deletion and addition of aircraft to operations specifications, including date and N-number, etc.

*B. Submit the Report.* Submit the original report to the Federal Aviation Administration (FAA), Aviation Standards National Field Office, Operational Systems Branch, AFS-620, P.O. Box 25082, Oklahoma City, OK 73125.

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B. Document the Task.* File a copy in the certificate-holding district office (CHDO) file.

**9. FUTURE ACTIVITIES.** Normal surveillance.

**FIGURE 78-1**
**DAILY UTILIZATION CALCULATIONS**

To calculate daily usage, divide total aircraft fleet hours by the number that results from multiplying the total number of aircraft by the total number of days in the month.

| NO. AC | DAYS IN MONTH | AC TOTAL HOURS | DAILY USAGE |
|---|---|---|---|
| 10 | 31 | 1615 | 5.2 |

10 X 31 = 310 AC days

1615/310 = 5.2 Daily Usage

# CHAPTER 80. EVALUATE SHORT-TERM ESCALATION PROCEDURES

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:*

- With Reliability Program: 3332
- Without Reliability Program: 3316

*B. Avionics:*

- With Reliability Program: 5332
- Without Reliability Program: 5316

**3. OBJECTIVE.** This chapter provides guidance for approving short-term escalation procedures based on operations specifications.

**5. GENERAL.** Time limitations are maintenance intervals established by the provisions of an approved reliability program or by an operator-established maintenance monitoring program. They are based on continuing analysis and surveillance of a fleet's operating performance. Since operators try to avoid delays due to units being operated to the point of failure, the time limitations used are a conservative average. An operator therefore may need to adjust these intervals for an individual component, engine or aircraft.

*A. Use of a Short-Term Escalation.*

*(1)* Under controlled conditions, an operator may use a short-term escalation for an individual component, engine or aircraft without affecting safety. These procedures require close monitoring to ensure that they do not conceal unsound maintenance practices, maintenance program deficiencies, or poor management decisions.

*(2)* Each short-term escalation for aircraft, systems, or units not subject to a reliability program, plus all extended escalations, require prior approval by the assigned principal inspector.

*(3)* Operators on a reliability program do not require prior approval before using an escalation. The operator must, however, inform the certificate-holding district office (CHDO) of an escalation as soon as possible after the escalation is put into effect.

*(4)* A short-term escalation should only be used after carefully analyzing the history of the aircraft and its components. A review of the proposed escalation should include:

- Previous inspections results
- Supplemental/additional inspections that may be needed to ensure continued airworthiness during the escalation
- Items not covered by the escalation. The escalation must not cause these items to exceed their maintenance intervals

*(5)* Maximum short-term escalation intervals may be a percentage of an existing interval for a particular inspection, or may be designated in hours of service, in cycles, or in other increments. Except under certain conditions, maximum time for an escalation is 500 hours time-in-service or its equivalent. It must not be used repetitively to, in effect, constitute a fleet time extension.

*B. Extension of Short-term Escalations.* The 500-hour maximum time limit for an escalation is usually sufficient for an operator to position and/or repair the affected item. Occasionally, an operator cannot effectively accomplish the task within this time limit. After an in-depth review of this situation, an individual item may be extended beyond the 500-hour limit. In order to do this, an operator must submit justification to the principal airworthiness inspector before approval. This extension remains in effect for a prescribed time limit unless the component or inspection is accomplished before the time limit.

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## SECTION 2. PROCEDURES

**1. PREREQUISITES AND COORDINATION REQUIREMENTS.**

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 121 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 coordination between the principal airworthiness inspector and the operator.

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

*A. References.* None.

*B. Forms:*

- FAA Form 8400-8, Operations Specifications

*C. Job Aids:*

- Automated operations specifications checklists and worksheets

**5. PROCEDURES.** Review the applicant's short-term escalation procedures. Ensure that the procedures accomplish the following:

*A.* List the operator's management personnel with escalation approval authority. These personnel must have at least the equivalent authority for approving:

- An operations specifications time increase
- A maintenance interval adjustment controlled by a reliability program

*B.* Define the maximum limitations for a short-term escalation.

*C.* Contain criteria that defines the type of data acceptable for justifying a short-term escalation.

*D.* Correspond with the overall maintenance program. The procedures must ensure that an escalation will not create an unsafe condition.

*E.* Restrict the occurrence of repetitive short-term escalations that indicate a need for a change in the maintenance program.

*F.* Provide a method for recording all escalations, with provisions for submitting/reporting each request/use of an escalation to the CHDO.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task will result in one of the following:

*(1)* A letter to the operator indicating disapproval of the short-term escalation authorization.

*(2)* An amendment to the operator's operation specifications, if applicable, approving short-term escalation authorization.

*C. Document Task.* File all supporting paperwork in the operator's office file.

**9. FUTURE ACTIVITIES.** Close monitoring of the operation may be required to ensure the following:

- Authorization is not being abused
- Manual procedures are being followed

# CHAPTER 82. EVALUATE/INSPECT PART 121 EXTENDED-RANGE OPERATIONS WITH TWO-ENGINE AIRCRAFT

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3319

*B. Avionics:* 5319

**3. OBJECTIVE.** This chapter provides guidance for an inspector to perform an evaluation and surveillance of Title 14 of the Code of Federal Regulations (14 CFR) part 121 operator requesting a deviation for extended-range operations with two-engine airplanes, as per Advisory Circular (AC) 120-42, Extended Range Operations with Two-Engine Airplanes (ETOPS).

**5. GENERAL.**

*A. Definition.* Extended-Range Operation With Two-Engine Airplanes (ETOPS) are operations conducted over a route containing a point further than one hour flying time at the normal one-engine inoperative cruise speed (in still air) from an adequate airport.

*B.* An ETOPS authorization requires a deviation to the operating rule of 14 CFR part 121, § 121.161. To meet the requirements of this deviation, the operator must be able to:

*(1)* Substantiate that the type design reliability and performance of the proposed airplane/engine combination have been evaluated in accordance with AC 120-42 and found suitable for extended range operations.

*(2)* Submit a package that includes the following programs:

*(a) Verification program.* This program is designed to verify corrective actions. It must have procedures that would preclude an airplane from being dispatched for extended range operation after propulsion system shutdown, primary system failure or significant adverse trends on a previous flight, unless appropriate corrective action has been taken.

*(b) Verification flights.* ETOPS operators should have verification flight procedures described in their supplemental maintenance program for events involving propulsion system shutdown, engine or major engine module change, primary system failure, and for certain adverse trends or prescribed events. In the case of engine change or a major engine module change, the requirement of a verification flight is in addition to the normal test cell and ground run procedures. It is permissible to designate the period of time from airport departure to entry into the ETOPS environment as maintenance verification flight, in combination with a regularly scheduled ETOPS revenue flight, provided the verification phase is documented as satisfactorily completed upon reaching the ETOPS entry point. It is important to note when this type of ETOPS verification flight is conducted:

- There are written procedures to ensure the flightcrew is fully briefed prior to dispatch concerning the event and/or the maintenance performed.
- Appropriate maintenance personnel should convey to the flightcrew the specific observations and/or actions required of them during the verification portion of the flight as well as the method to be used to properly record the satisfactory completion of that verification flight.
- All flightcrew observations and/or actions must be completed upon entering the ETOPS portion of the flight.

*(c) Engine condition monitoring.* This program should provide a system for data collection and analysis that ensures timely analysis and correction of engine problems. This program should be designed to prevent in-flight shutdowns of powerplant systems.

*(d) Reliability program.* This is in addition to the regular reliability program and should be designed primarily to identify and prevent problems. The program should incorporate reporting criteria for use by the carrier and the Federal Aviation Administration (FAA) as a measure of extended range reliability.

*(e) Auxiliary power unit (APU).* The following criteria shall be included in the operator's APU in-flight start validation program, as part of their overall ETOPS maintenance program for each specific airframe/engine combination. APU in-flight starts should be made on flights of four hours or more, subject to the following conditions:

- In-flight APU starts need not be performed on ETOPS flights (the APU must be in the ETOPS configuration in accordance with the applicable configuration and maintenance procedures (CMP) document, in order for credit to be allowed.

- If in-flight APU starts are performed on an ETOPS flight, the start should be attempted on the return leg to the United States.
- The start attempt should be initiated before top of descent, or at such time that will ensure a two-hour cold soak at altitude.
- If the APU fails to start on the first attempt, subsequent start attempts may be made within the limits of the airframe and APU manufacturer design specifications.
- A continuation of the initial in-flight start validation program may be required, if less than 95 percent of in-flight start reliability is achieved in coordination with the Principle Maintenance Inspector (PMI).

*(f) Initial validation period.* All occurrences of an ETOPS configured APU in-flight unsuccessful start attempt (which exceed the airframe and APU manufacturer design specifications), shall be reported to certificate-holding district office (CHDO). All APU in-flight start failures, occurring during actual ETOPS operations, should be reported within 72 hours in accordance with AC 120-42A, appendix 4. The report should include corrective actions taken as well as the status of corrective action programs, fleet upgrades, etc.

*(g) APU data collection for ETOPS:*

- A specific airframe/engine combination must demonstrate substantial service experience during within essential airframe and propulsion systems achieve an acceptable level of reliability.
- ETOPS consideration also include requirements that the high level of reliability of essential airframe and propulsion equipment will be ensured by the operator's maintenance program.
- The provisions of AC 120-42A, stipulates that an APU in-flight start/run reliability be substantiated in order to ensure adequate reliability for ETOPS. ETOPS operators shall use an initial APU in-flight start/run program to substantiate their ability to maintain inherent APU in-flight start reliability levels for each airframe and engine combination.

*(h) Engine/APU oil consumption monitoring program.* This program must monitor oil consumption on a flight by flight basis, with verification of the oil system integrity made prior to each extended range leg.

*(i) Extended range parts control.* This program should ensure that the precise parts required by type design criteria are utilized to maintain the integrity of the systems that are unique to extended range operations. This program must consider verification of parts placed on aircraft through parts borrowing and pooling agreements.

*(j) Maintenance training program.* The training program should focus on extended range awareness for all personnel involved in the extended range program. It may be included in the normal maintenance training but should emphasize the special nature of two-engine extended range maintenance requirements.

*(k) Continuing analysis and surveillance program.* The air carrier's normal continuing analysis and surveillance program should be supplemented to require regular surveillance of the extended range program. The program's analysis should be used by the carrier as a means to ensure the integrity and adjust their ETOPS programs.

*C. Points of Contact.* For questions regarding an ETOPS authorization, contact:

- AFS-210, Air Carrier Training Branch
- AFS-330, Airworthiness - Air Carrier Maintenance Branch
- Aircraft Evaluation Group (AEG)
- Aircraft/Engine Certification Directorate

*D. Surveillance.* Due to the critical nature of the extended range maintenance program and its relationship to safety, special emphasis should be placed on surveillance of the approved extended range maintenance program. Surveillance consists of the following:

- Trend analysis
- Problem identification and resolution
- Implementation of corrective action

*(1)* The inspector must ensure that approved extended range maintenance programs are followed as outlined in the maintenance manual sections referenced in the operations specifications.

*(2)* The operator must submit proposed changes to the approved extended range maintenance program to the CHDO for review 60 days before implementation. Supporting documentation must accompany the proposal. Upon review, the inspector may allow proposed changes that enhance the program. The inspector must not allow approved program elements to be deleted or degraded.

*(3)* This surveillance must emphasize events and include trends.

*(a)* The inspector must report events or problems to the Aircraft Evaluation Group, ANM-270 or ANE-250, within 72 hours. The following are examples of events to be reported:

- In-flight shut downs
- Diversions or turnbacks
- Uncommanded power changes or surges
- Inability to control the engine or obtain desired power
- Problems in systems critical to the safety of extended range operations
- Any other event the inspector considers detrimental to extended range operations

*(b)* These reports must contain the following information:

- Type of aircraft
- N-number of the aircraft
- Engine type and serial number
- Total time and cycles, including last inspection or shop visit
- Total time since overhaul or inspection of the unit or system affected
- Phase of flight. Include climb, cruise, and descent. Coordinate with operations inspectors to acquire information such as speed, altitude, ambient temperatures, and atmospheric conditions during the event.
- Location and length of diversion or turnback
- Corrective actions taken
- Any other information pertinent to the event

*(c)* Each month, the inspector must acquire and provide to the Aircraft Evaluation Group the following information:

- Summary of in-flight shut down rates
- Delays and cancellations
- Ground events (aborted takeoff, power shortfall or loss, and engine removals)

*(d)* Special events may require the gathering and dissemination of the following information to the requesting FAA authorities:

- Engine condition monitoring and oil condition monitoring program summaries
- Component removal failure summaries
- Pilot reports
- Any other information, as requested

*(4) Trends.* Surveillance should also be directed toward identification and correction of adverse trends. Examples of adverse trends include the following:

- Repeat pilot write-ups
- Degradation of engine condition
- High fluid consumption rates
- Reoccurrence of deficient areas as identified by the carrier's continuing analysis and surveillance program
- Abuse of the minimum equipment list (MEL)

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of part 121
- Successful completion of the Air Carrier Maintenance and Electronic Indoctrination Course

*B. Coordination.* This task requires coordination between maintenance and avionics inspectors, region, AFS-200, and AFS-300.

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

*A. References:*

- AC 120-42, Extended Range Operations with Two-Engine Airplanes (ETOPS)
- Operator's manuals
- FAA Order 8300.10, Airworthiness Inspector's Handbook

*B. Forms:*

- FAA Form 8400-8, Operations Specifications

*C. Job Aids:*

- Automated operations specifications checklists and worksheets

### 5. PROCEDURES.

*A. Verify Compliance of Aircraft With Type Data Document.* Accomplish through coordination with the Aircraft Evaluation Group.

*B. Review the Operator's Manual.* The inspector must ensure that the following programs have been included in the operator's manual:

*(1)* Verification program, to include:

- List of primary systems, by Air Transportation Association chapter
- Conditions that require verification flights
- Procedures for initiating verification actions
- Procedures that monitor and evaluate corrective actions
- Procedures that identify and reverse the adverse trends
- Procedures that verify the implementation of corrective action

*(2)* Engine condition monitoring program, to include:

- Scope of program, e.g., data collection and analysis
- Notification procedures for deterioration
- Deterioration monitoring limits for internal engine parts

*(3)* Reliability program, to include:

- Reporting criteria
- Procedures to ensure reporting of significant individual events (engine shutdowns, flight diversions, etc.)

*(4)* Engine/APU oil consumption monitoring program, to include:

- Established limits of consumption
- Procedures for use and verification prior to the start of each extended range leg

*(5)* Extended range parts control, to include:

- Methods of verification of proper parts
- Control procedures during parts pooling and borrowing

*(6)* Maintenance training program, to ensure:

- Personnel are aware that an ETOPS authorization is in place
- Personnel, including contract personnel, are adequately trained on the special programs required by an ETOPS authorization

*(7)* Continuing analysis and surveillance program, to include:

- Frequency of audits
- Reports generated by audits
- Ease of use

*(8)* At the successful completion of the operator’s APU program validation, each operator is to establish a monitoring program acceptable to the local FAA CHDO to ensure that the APU will continue at a level of performance and reliability established by the manufacturer or FAA. Operators with existing approved programs may continue on their current program. This monitoring program should include periodic sampling of APU in-flight starting. This sampling interval may be adjusted according to system performance. PMI’s shall periodically review APU in-flight-

start program to ensure system reliability and recommend adjustments where necessary.

*C. Analyze Results.*

*(1)* If problems are found, return material to operator.

*(2)* If submitted material is found to be acceptable, forward the material to AFS-300 for concurrence of approval.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Successful completion of this task will result in the following:*

- An Extended-Range Operation With Two-Engine Airplanes Authorization
- Operations specifications paragraphs D086 and D086-1

**9. FUTURE ACTIVITIES.** Normal surveillance.

# CHAPTER 83. EVALUATE PART 135 (NINE OR LESS) APPROVED AIRCRAFT INSPECTION PROGRAM

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3343/3344

*B. Avionics:* 5343/5344

**3. OBJECTIVE.** This chapter describes how to evaluate and approve Title 14 of the Code of Federal Regulations (14 CFR) part 135 (nine or less) operator's Approved Aircraft Inspection Program (AAIP). It ensures that programs, systems, and intended methods of compliance are thoroughly reviewed, evaluated, and tested.

**5. GENERAL.**

*A.* Inspectors should become thoroughly familiar with the operator/applicant's operation. Special attention should be given to:

- Areas of operation
- Type of equipment (size and complexity)
- Operating history
- Maintenance/inspection organization, as applicable

*B.* The AAIP is used in lieu of the aircraft inspection requirements of 14 CFR part 91. However, it does not supersede other requirements of part 91 such as the altimeter system tests and equipment check, etc. An AAIP can be expanded to include additional maintenance requirements specified by 14 CFR part 135, § 135.421, repetitive Airworthiness Directives (AD) compliance, and life-limited controls, but the inspection program cannot override or alter AD or life-limited requirements.

*C.* An AAIP is authorized for use on operations specifications. Therefore, it cannot be transferred.

*D.* An AAIP is approved using a fixed inspection interval. There is NO regulatory basis that allows an AAIP to be approved with a plus (+) or minus (-) allowance for late accomplishment of inspections.

*E.* Large and turbine-powered multiengine aircraft inspection programs or progressive inspections per 14 CFR part 91, § 91.411 are more specific than the 100-hour/annual, but lack the ease and control provided by the AAIP. Programs for large and turbine-powered multiengine airplanes of nine or less passenger seats in operations under part 135 should be approved as AAIP's, because of the complexity of the aircraft. An AAIP is not considered better than a manufacturer's program; however, an AAIP provides the Federal Aviation Administration (FAA) inspector with more control of the program's content. It requires the operator to substantiate its program and revision to the approving inspector. Manufacturer's programs do not require this. This is not to say that a manufacturer's program cannot be used, but it must be identified as an AAIP approved for a particular operator as the operator's program, not the manufacturer's.

**7. CHANGES TO APPROVED TIME INTERVALS.**

*A. Operator-Initiated Changes.*

*(1)* The operator may request approval to amend inspection or overhaul intervals.

*(a)* The operator must justify the request using the following:

- Past operating experience
- Environmental conditions
- Inspection program provisions
- At least two overhaul tear-down reports
- Any other data necessary to substantiate changes

*(b)* Operator-initiated time changes require revisions to both the AAIP and operations specifications (see vol. 2, ch. 84, FAR Part 121/135 Operator's Specifications).

*(2)* Amendments or extensions are not allowed for life-limited items and/or those designated by AD's unless authorized in FAA-approved revisions.

*B. Manufacturer Escalations.*

*(1)* If a manufacturer extends the recommended inspection or overhaul interval, the operator may request approval to use the extension by submitting a revision to the AAIP. The request must be accompanied by the manufacturer's recommendation.

*(2)* Inspectors should not automatically approve a time escalation recommended by the manufacturer. The individual operator's aircraft use and experience must be considered. The inspectors should ensure that the escalation will not compromise safety.

**9. POLICIES AND PROCEDURES MANUAL.** The AAIP must be included in the operator's policies and procedures manual. The operator should request a manual revision (in accordance with manual revision procedures) at the same time the AAIP/revision is submitted for approval. This allows the FAA to approve the AAIP/revision and accept the manual concurrently, while advancing implementation of the program.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of part 135
- Previous experience with complex maintenance/ inspection programs

*B. Coordination.* This task is performed by both principal maintenance inspectors (PMI) and principal avionics inspectors (PAI). It may require coordination with principal operations inspectors (POI) and/or regional specialists.

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

*A. References:*

- 14 CFR parts 39, 43, 45, 47, 65, and 125
- Title 49 of the Code of Federal Regulations (49 CFR) Part 173
- AC 135-3, Air Taxi Operators and Commercial Operators, current edition
- AC 135-10, Approved Aircraft Inspection Program, current edition

*B. Forms:*

- FAA Form 8400-8, Operations Specifications

*C. Job Aids:*

- Automated operations specification checklists and worksheets

### 5. PROCEDURES.

*A. Schedule and Conduct Preliminary Meeting, As Needed.*

*(1)* Advise applicant of regulatory requirements and policies.

*(2)* Remind the operator that the AAIP/revision must be included in the policies and procedures manual.

*B. Plan and Coordinate Task.*

*(1)* Determine whether the aircraft meets eligibility requirements.

*(2)* Review operator file to identify any information concerning the AAIP/revision. Determine its effect on the operator's other programs or procedures.

*(3)* If this task is performed as part of an original certification, review the Schedule of Events to ensure that the evaluation can be accomplished according to the schedule.

*C. Evaluate the Proposed Program/Revision.*

*(1)* Evaluate instructions, procedures, and standards for conducting inspections.

*(a)* The program must include:

- Airframe
- Aircraft engines
- Propellers
- Appliances
- Survival and emergency equipment
- Component parts for the above items

*(b)* When establishing an inspection program for an aircraft, to comply with § 91.409(f)(5) or § 135.419, the program should include installed avionics and instrument systems (appliances). These systems are not always installed by the aircraft manufacturer and may not be included in their recommended inspection program to develop your inspections, instructions, and procedures for all installed systems incorporated into the program.

*(c)* Inspection standards, procedures, methods, instructions, or other technical data may be included in the program by reference, eliminating the expense and trouble of reprinting them. Such references may be either the airframe manufacturer's or the appliance manufacturer's service data. However, when both airframe manufacturer and the appliance manufacturer provide inspection data, that of the airframe manufacturer should be used.

*(d)* The avionics and instrument systems inspection should include a visual and functional check. Therefore, these definitions should be included in the program:

- *Visual Check.* Using acceptable methods, techniques, and practices to determine physical condition and safety item
- *Operational Check.* This is an operational test to determine whether a system or component is functioning properly in all aspects, conforming with minimum acceptable manufacture design specifications
- *Functional Check.* This test may require the use of appropriate test equipment

*(e)* The avionics and instrument systems inspections should be incorporated into the basic airframe program. The visual inspection of the avionics and

instrument systems should be accomplished at intervals corresponding to the airframe inspection interval, (i.e., inspect avionics and instrument equipment, wiring, connectors, bonding straps, circuit breakers, switches, etc.), forward of the instrument panel at the same interval with controls and structural inspections in that area.

*(f)* Functional checks of the avionics and instrument systems, using appropriate ramp test equipment, should be performed at intervals which should be a function of the aircraft operating environment, (i.e., one (1) year of manufacture design specification). The term "avionics" means aviation electronics and includes the following systems:

- Communications
- Navigation
- Electrical
- Instrument
- Lights
- Auto-Pilot/Flight Director System

*(g)* All required tests and checks recommended by the aircraft or equipment manufacturer must be addressed.

*(h)* Persons responsible for performing the work must be identified.

*(i)* The instructions, procedures, and standards must be clear and easily understood. They must identify the scope of each task and provide a detailed outline of each step that must be accomplished to perform the inspection and ensure that established standards are met.

*(2)* Evaluate the procedures for controlling life-limited parts. The program must contain provisions to ensure that records are current. Life limits must be expressed in one of the following measures:

- Length of time-in-service
- Number of cycles
- Number of landings
- Calendar time
- A combination of the above measures

*(3)* Evaluate procedures for scheduling inspections.

*(a)* The program must list inspection intervals and describe personnel responsibilities for scheduling and performing inspections.

*(b)* Procedures must ensure that inspections are performed by properly certificated, qualified, trained, current, and authorized personnel. The program must identify, by title, the person responsible for ensuring that inspection personnel meet FAA requirements.

*(4)* Ensure that engine overhaul periods correspond to the recommended overhaul intervals in the engine manufacturer's manuals and/or service bulletins.

*(5)* Evaluate procedures for reporting and correcting mechanical irregularities. The program must include detailed instructions, procedures, and the necessary forms and documents for the recording and repair of mechanical irregularities. These instructions, procedures, and forms may appear elsewhere in the company manual, but their location must be referenced in the AAIP.

*(6)* Ensure that the AAIP includes instructions on its use.

*D. Analyze Findings.* Determine if program changes are required. Before meeting with the operator/applicant, discuss initial findings with appropriate FAA personnel to determine the content of the briefing. Depending on the findings, it may be necessary to coordinate with the certification team, principal inspectors, regional specialists, or other FAA personnel.

*E. Debrief Operator/Applicant.* Discuss results of the evaluation, including any deficiencies noted during inspection.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task will result in one of the following:

*(1)* If the AAIP/revision is not acceptable, advise the operator/applicant by letter that the program/revision is rejected. Give the reasons for the rejection. Return the program proposal and documentation to the operator/applicant.

*(a)* If this review is performed as a part of a certification, inform the applicant in the letter that the certificate will not be issued until the deficiencies are corrected. If necessary, advise the applicant to revise the Schedule of Events.

*(b)* The letter must also accomplish the following:

- Confirm all agreements made during the debriefing
- Identify the date the AAIP/revision was submitted
- Show the revision number and date, as applicable
- Identify and describe all deficiencies by chapter, section, page, etc.
- Reference each deficiency to the appropriate regulation

- Request a revised Schedule of Events, if necessary
- If a revision, remind operator not to implement the revision

*(2)* If the program or revision meets all regulatory requirements, accomplish the following:

*(a)* Ensure that the AAIP or revision has been fully coordinated between maintenance and avionics.

*(b)* For a new or totally revised program, indicate, "Approved and authorized for use on operations specifications dated _____," on the first page identifying the program. The approving PMI and PAI shall sign and date the document. The date of the document approval must be the same as the date the AAIP's operations specifications are approved.

*(c)* Initial and date each page of the AAIP or revision, unless another control is used.

*(d)* In the case of a revision to an approved program, issue amended operations specifications (see vol. 2, ch. 84). The reverse side of the amendment must identify and justify the changes to the program.

*(e)* Send the operator a letter accepting the AAIP. The letter must accomplish the following:

- Request that the operator acknowledge receipt of the operations specifications by signing and dating the original and copy, and forward the copy to the district office
- Confirm all information given during the debriefing
- Indicate the date that the AAIP/revision was submitted
- Show the revision number and date, if applicable
- If a revision, indicate the number of approved pages
- Advise the operator that the revision may be implemented
- If a manual revision was submitted and is acceptable, advise the operator of acceptance
- If a manual revision was not submitted, remind the operator to revise the manual to incorporate the program/revision. Advise the operator to submit the manual change for acceptance.
- Enclose the stamped, dated, and initialed original AAIP
- Enclose the original and one copy of the approved operations specifications
- Enclose the accepted manual revision, if appropriate

*(f)* Send two copies of the new or amended operations specifications to the regional Airworthiness Branch.

**9. FUTURE ACTIVITIES.**

*A. Schedule of Events.* In the case of original certification, review the Schedule of Events to determine if a revised Schedule of Events is necessary.

*B. Procedures and Policies Manual.* Ensure that the Procedures and Policies Manual includes the AAIP/revision.

# CHAPTER 92. EVALUATE PART 135/135.411(a)(1) OPERATOR'S MAINTENANCE RECORDS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3634

*B. Avionics:* 5634

**3. OBJECTIVE.** This chapter provides guidance to ensure that the operator/applicant creates, preserves, and retrieves the maintenance records required by the regulations.

**5. GENERAL.**

*A. Definitions.*

*(1) Life-Limited Part:* An aircraft part whose service life is limited to a specific number of operating hours, operating cycles, or a specified calendar period. The part must be removed from service at its specified time or cycles-in-service.

*(2) Approved Data:* Drawings, methods, techniques, and materials used to accomplish major repairs or alterations that are approved by the Federal Aviation Administration (FAA) Administrator, (airworthiness inspectors, FAA engineering, manufacturing, or a Designated Engineering Representatives (DER)).

*B.* To comply with the maintenance recording requirements of the regulations, the operator/applicant's maintenance manual must identify and contain procedures that ensures that all applicable documents used by the operator/applicant are completed.

*C.* Title 14 of the Code of Federal Regulations (14 CFR) part 91, § 91.417 has maintenance recordkeeping requirements for the following:

*(1) Airworthiness Directives (AD).* 14 CFR, part 91 requires the current status of applicable AD's, including the date and method of compliance, recurring AD actions, and the time and date when the next action is required.

*(2) Total Time-in-Service.* Part 91 has requirements to maintain total time-in-service records for airframe, engines, propellers, and rotors.

*D. The Manual should Contain Procedures for the Recordkeeping System.* The procedures should address the following requirements of the regulations:

*(1) Total Time-in-Service.* This record may consist of aircraft maintenance record pages, separate cards or pages, a computer list, or other methods as described in the operator/applicant's manual. (Ref. § 91.417(a)(2)(i).)

*(2) Status of Life-Limited Parts.* Life-limited parts, (e.g., components of the airframe, engine, propellers, rotors, and appliances), are identified to be removed from service when a specific time limit or number of cycles has been reached. (Ref. § 91.417(a)(2)(ii).)

*(a)* The current status of the part is a record indicating the operating time limits, total number of hours or accumulated cycles, and the number of hours or cycles remaining before the required retirement time of the component is reached. This record also must include any modification of the part in accordance with AD's, service bulletins, or product improvements by the manufacturer or operator/applicant.

*(b)* The following are not considered a current status record:

- Work orders
- Maintenance installation records
- Purchase requests
- Sales receipts
- Manufacturers documentation of original certification
- Other historical data

*(c)* Whenever the current status of life-limited parts records cannot be established, the airworthiness of that product cannot be determined and it must be removed from service.

*(3) Overhaul List.* The operator/applicant is required to develop manual procedures complying with, § 91.417(a)(2)(iii) for recording the time since the last overhaul of all items installed on the aircraft required to be overhauled on a specified time basis. The items requiring overhaul are listed either in operations specifications or in a document referenced in the operations specifications.

*(a)* The overhaul list includes the actual time-or cycles-in-service since the last overhaul of all items installed on the aircraft.

*(b)* The overhaul list refers to the time since the last overhaul of an item and must not be confused with an

overhaul record, which requires a description of the work and identification of the person who performed and/or approved the work.

*(4)* A record must be made whenever an item of aircraft equipment is overhauled. This overhaul record must describe the work performed. The operator/applicant must have this record or be able to make it available to the Administrator.

*(5) Current Aircraft Inspection Status.* The operator/applicant is required by, § 91.417(a)(2)(iv) to retain a record identifying the current inspection status of each aircraft.

*(a)* The record must show the time-in-service since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

*(b)* Inspection work packages or routine and nonroutine items generated while performing any part of the inspection program must be retained for one year after the work is performed or until the work is repeated or superseded by other work.

*(6) Current AD Status.* The operator/applicant is required by § 91.417(a)(2)(v) to keep a record showing the current status of applicable AD's, including the method of compliance. This record must include the following:

- List of AD's applicable to the aircraft
- The date and time-in-service or cycles, as applicable
- Method of compliance
- The time-in-service or cycles and/or date when the next action is required (if it is a recurring AD)

*(a)* An acceptable method of compliance may be one of the following:

- Reference to a particular portion of the AD
- Reference to manufacturer's service bulletin, if the bulletin is referenced in the AD
- Reference to any other document generated by the operator/applicant that shows compliance with the AD, such as an Engineering Order or Engineering Authorization.

*(b)* When an Engineering Order/Engineering Authorization is used, the details must be retained by the operator/applicant. If the Engineering Order Engineering Authorization also contains the accomplishment instructions and sign-off, it must be retained indefinitely.

*(c)* An operator/applicant may apply for alternate methods of compliance for accomplishing AD's. Alternate methods of compliance must be approved by the appropriate FAA Engineering Directorate and apply only to the operator/applicant making the application. If an aircraft is transferred to another owner, the alternate method of compliance continues to apply to that aircraft.

*(d)* The operator/applicant's manual must have procedures to comply with new and emergency AD's to ensure that the action is completed within the given time limits. This must include procedures for notifying the responsible individuals to implement the required action during other than routine duty hours.

*(e)* The document that contains the current status of AD's and method of compliance may be different from the record of AD accomplishment.

- The document is a permanent, ongoing historical record of all AD accomplishments and must be retained with the aircraft indefinitely
- The record of accomplishments of an AD must be retained until the work is superseded or repeated, or for one year after the work is performed

*(f)* Serious problems have surfaced during national and routine inspections when the applicable AD current status and method of compliance was not complete. When current status and method of AD compliance cannot be determined from the document, the operator/applicant must verify this compliance.

*(7) Major Alteration.* All major alterations must be accomplished by using FAA-approved data. Previous inspections have identified lack of approved data to support major alterations. Section 91.417(a)(2)(vi) requires operator/applicants to retain records of each major alteration to the following:

- Airframe
- Engine
- Propeller
- Rotor
- Appliance

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 135
- Working experience with operator recordkeeping systems
- Successful completion of the Airworthiness Inspectors Indoctrination Course or equivalent

*B. Coordination.* This task may require local, regional, and/or headquarters coordination.

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

*A. References:*

- 14 CFR parts 43 and 91
- Operator maintenance records

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review Office Files.* Review the historical data of the operator's recordkeeping system. This includes the Program Tracking and Reporting Subsystem (PTRS) history of past inspections, Enforcement Information System (EIS), and other office files.

*B. Review the Operator's Maintenance Records.* Analyze the operator/applicant's recordkeeping system. Determine if the regulations' recordkeeping requirements are met. The recordkeeping should provide an acceptable method for creating, preserving, and retrieving required records. All records must contain the following:

- Description of the work performed (or reference to data acceptable to the Administrator)
- The date of completion of the work performed
- The signature and certificate number of the person approving the aircraft for return to service

*(1) Airworthiness Records.* Ensure that the records are retained for one year after the work is performed or until repeated or superseded by other work.

*(2) Total Time-In-Service.*

*(a)* Determine the method of recording total time-in-service of the airframe, engine, propeller, and rotor. This record must show the current time-in-service appropriate parameter.

*(b)* Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

*(3) Status of Life-Limited Parts.*

*(a)* Ensure that the operator is tracking the current status of life-limited parts for each airframe, engine, propeller, rotor, and appliance.

*(b)* Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

*(4) Time Since Last Overhaul of all Items Required to be Overhauled.* This document must accompany the aircraft when transferred.

*(5) Overhaul Records.* Ensure that the manual describes how the operator documents the last complete overhaul of each engine, propeller, and rotor. These records must be retained until the work is superseded by work of equivalent scope and detail or for one year. The overhaul record may include:

- Disassembly data
- Dimensional check data
- Replacement parts list
- Repair data
- Reassembly/test data
- Reference to data including overhaul specifications

*(6) Current Aircraft Inspection Status.*

*(a)* Determine how the operator records the time-in-service since the last inspection.

*(b)* Determine if procedures ensure that this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

*(7) Airworthiness Directive (AD) Compliance.* Determine how the operator complies with recordkeeping requirements of the AD's, including emergency AD's. Ensure that there is a record containing the following items:

*(a)* Current Status.

- A list of all AD's applicable to the aircraft
- Date and time of compliance
- Time and/or date of next required action (if recurring AD)

*(b) Method of Compliance.* This includes either a record of the work performed or reference to the applicable section of the AD.

*(c)* Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

*(8) Major Alteration Records.* Determine how the operator maintains the records of major alterations to each airframe, engine, propeller, rotor, and appliance.

*C. Inspect the Operator Record System.*

*(1)* Identify the documents/forms that are used for ensuring that the following are accomplished:

- Total time-in-service
- Status of life-limited parts
- Time since last overhaul document
- Overhaul records
- Current aircraft inspection status
- Current status of applicable AD's
- Major alteration records

*(2) Inspect the Records.* During the inspection, document and photocopy any confusing areas, obvious omissions or apparent discrepancies.

*(a)* Compare the records with the actual accomplishment of the maintenance.

*(b)* Obtain and review the maintenance logs to determine the scheduled inspections and nonroutine maintenance.

*(c)* Review maintenance records to ensure that:

- Flight discrepancies were entered at the end of each flight
- Corrective action was related to the discrepancy
- Corrective action and sign-off are entered into the maintenance record
- Repetitive discrepancies are handled properly
- Deferred maintenance as authorized by the minimum equipment list (MEL) is deferred according to the operator's MEL and instructions

*(3)* Select or obtain work packages for scheduled inspections and ensure that scheduled inspections are properly signed off.

*(a)* Ensure that nonroutine items generated were properly signed off.

*(b)* Determine if repairs were categorized correctly (major or minor) and if approved data was used for major repairs.

*(4)* Compare the actual record of accomplishment with the total time/cycles-in-service record for the airframe, engine, propeller and rotor.

*(5)* Select and obtain a total time/cycles-in-service record for a sample number of aircraft to ensure that cumulative flight times/cycles are added to the record.

*(6)* Make a spot check of the cumulative total time/cycle-in-service against the flight logs to ensure that daily entries correspond to the flight log.

*(7)* If the operator maintains a hand-written maintenance record for engines, compare the record entries to the aircraft flight log entries for accuracy and to detect transposition of flight time/cycles-in-service, numbers, etc.

*(8)* Compare the manual procedures for life-limited parts with the actual recording of the current status of life-limited parts.

*(9)* Select a random sample of records and ensure that:

*(a)* All life-limited parts described on type certificate data sheets (TCDS) or a manual referenced in the TCDS are noted.

*(b)* Current status of each part is provided, to include:

- Total operating hours (including calendar time)/cycles accumulated
- Life limit (total service life)
- Remaining time/cycles
- Modifications

*(c)* Ensure that:

- Time/cycles limits on the operator list are the same as those on the TCDS
- Life limits have not been exceeded

*(d)* Select a sample of life-limited items that have been installed within the last 12 months and review records to ensure that life-limited time was carried forward from the previous service record.

*(e)* If overhauled, ensure that the time since overhaul record is available.

*(f)* Ensure that the life limit of an item has not been changed as a result of the overhaul.

*(10)* Compare the overhaul list with the actual record.

*(11)* Identify items in the operator maintenance program that have overhaul requirements, if applicable.

*(12)* Ensure that all items identified are on the current list.

*(13)* Ensure that the overhaul list contains the time/cycles since last overhaul.

*(14)* Ensure that the items on the list have not exceeded their specified overhaul time/cycle limits.

*(15)* Select a random sample of items from the overhaul list to:

*(a)* Ensure that the records contain a description of the overhaul, and that the item was overhauled according to the overhaul specifications by a qualified and authorized person.

*(b)* Ensure the component was approved for return to service by an authorized person.

*(16)* Review the removal/installation records of overhauled components to determine if the overhaul was accomplished within the authorized time limits.

*(a)* Compare the current aircraft inspection status with the record available.

*(b)* Determine whether daily flight hours/cycles are recorded to obtain the current inspection status.

*(c)* Take a random sample of aircraft inspection records and review the last two “C” checks (or equivalent) to ensure that scheduled inspections times/cycles were not exceeded (overflown).

*(17)* Compare the compliance with AD's with the current status of AD document.

*(a)* Contact the operator responsible for AD records and request a random sample of aircraft AD compliance record.

*(b)* Ensure that the document contains all applicable AD's for the sampled aircraft.

*(c)* Ensure that the AD requirements were accomplished within the effective times of the AD, with special emphasis on recurring AD's.

*(d)* Ensure that the AD document contains current status and method of compliance. The current status must include these three items:

- A list of all AD's applicable to the aircraft
- Date and time of compliance
- Time and/or date of next required action (if recurring AD)

*(e)* Ensure that the list is being retained indefinitely.

*(f)* Identify those AD's with alternate methods of compliance, and ensure that the operator has obtained prior approval for that alternate method.

*(g)* Select from the current AD compliance document a number of AD's accomplished within the last 12 months and ensure that the appropriate accomplishment records are available. Review the accomplishment record to ensure the following:

- The method of compliance is as specified in the AD
- The date of compliance is identical to the date on the current status list
- The mechanic is certificated to accomplish the work
- The accomplishment was properly signed off

*(18)* Compare the major alteration and repair records with the actual records.

*(a)* Major Alterations:

- Request a list of all major alterations for a random sample of aircraft
- Ensure that the list contains the date of accomplishment and a brief description of the alteration
- Select a random sample of major alterations accomplished within the last 12 months and ensure that the respective maintenance records show that alterations were accomplished according to approved data

*(b)* Major Repairs:

- Request several records of major repairs, if available
- Ensure that the records contain the date of accomplishment and a brief description of the repair and that the respective maintenance records show that repairs were accomplished according to approved data
- When major repairs or alterations are identified and are not recorded, request the actual maintenance accomplishment record from the operator/applicant

*D. Analyze the Inspection Results.*

*(1)* Determine the effectiveness of the maintenance recordkeeping system. Ineffective recordkeeping systems may be the result of:

- Inadequate/nonexistent procedures
- Not following manual procedures
- Ineffective organization
- Lack of qualified personnel
- Poor scheduling of AD compliance, overhaul requirements, inspections, etc.
- Improper training

*(2)* Compile Deficiencies.

*(a)* Compile all findings that are contrary to the regulations.

*(b)* Compile all findings that are in noncompliance, but are producing satisfactory results.

*(3)* After compiling all findings and before the operator debriefing, consult with the appropriate FAA supervisory personnel to determine which (if any) findings require enforcement actions.

*(4)* If no findings are made, no further action is required.

*E. Meet with the Operator.*

*(1)* Discuss the following items:

*(a)* All discrepancies discovered during the inspection.

*(b)* Possible corrective action.

*(c)* Possible enforcement actions.

*(2)* Inform the operator that official written notification of findings may follow.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task may result in the following:

- Formal letter to operator confirming results of inspection.
- Enforcement action according to FAA Order 2150.3, if applicable

*C. Document Task.* File record of inspection in operator's file in district office according to office procedures.

**9. FUTURE ACTIVITIES.** Normal surveillance.

# CHAPTER 161. INTRODUCTION TO PART 145 REPAIR STATIONS

## SECTION 1. BACKGROUND

**1. PURPOSE.** This chapter defines Title 14 of the Code of Federal Regulations (14 CFR) part 145 Repair Stations and their capabilities. It also defines and describes air agency certificates and operations specifications.

**3. GENERAL.** Definitions:

*A. Domestic Repair Station:* A facility, located in the U.S., that performs maintenance and/or alterations on airframes, powerplants, propellers, and/or appliances.

*B. Foreign Repair Station:* A certificated facility, located outside of the U.S., that performs maintenance and/or alterations on airframes, powerplants, propellers, and/or appliances for U.S.-registered aircraft.

*C. Satellite Repair Station:* An additional certificated facility or location of a domestic parent facility.

*D. Manufacturer's Maintenance Facility (MMF):* A manufacturer of aircraft, aircraft engines, propellers, appliances, and/or parts certificated as a repair station with limited ratings.

*E. Air Agency Certificate:* Federal Aviation Administration (FAA) Form 8000-4, Air Agency Certificate, is the authority granted by the FAA for a repair station to conduct business. The certificate states the following information:

*(1)* Repair station number

*(2)* What the repair station's ratings are to include:

- Class ratings
- Limited ratings
- Limited specialized service ratings

*(3)* The location and name of the repair station

*(4)* The expiration date, as applicable

*F. Operations Specifications:* Operations specifications are issued by the FAA to indicate the limitations to the ratings as specified on the air agency certificate.

*G. Class Ratings:* Ratings issued if the repair station can prove the capability to maintain a representative number of products under this rating. A class rating should not be issued and then restricted to a specific product. For such a case, a limited rating should be issued.

*H. Limited Ratings:* Ratings issued to repair stations for the performance of maintenance on particular makes and models of airframes, powerplants, propellers, radios, instruments, accessories, and/or parts.

*I. Limited Specialized Service Ratings:* Ratings issued for a special maintenance function when the function is performed in accordance with a specification or data acceptable to the Administrator. The operations specifications must include the specifications or data used by the repair station to perform that service in accordance with 14 CFR part 145, § 145.33(C).

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## SECTION 2. PROCEDURES

**1. COORDINATION.** Issuing or amending operations specifications may affect other specialties. Operations specifications should be reviewed by airworthiness maintenance and avionics inspectors to determine if their areas are affected. This coordination may reveal the need for further communication with the operator or other FAA personnel.

**3. PREPARATION.** Air agency certificates and operations specifications are legal documents. Language should clearly specify the authorizations, ratings, and/or limitations being approved. When filling out these forms, there should not be any erasures, strikeovers, or typographical errors.

*A. Air Agency Certificates.* The certificate will include the following information:

*(1) Domestic Repair Stations.*

*(a)* After "Number," insert the certificate number assigned to the facility. This will be in accordance with the current air agency numbering system.

*(b)* Under "This certificate is issued to," insert the official name of applicant's business. This must be the same as shown on the application form.

*(c)* Under "whose business address is," insert the address/location of the applicant's business. This must be the same as shown on the application form.

*(d)* After "to operate an approved," insert the words "repair station."

*(e)* Under "with the following ratings:" insert the ratings issued. The ratings must be listed by the general category, such as airframe, powerplant, radio, etc.

- If a repair station is issued a limited rating, then it must be listed as such on the certificate, e.g., limited radio.
- When ratings are added or amended, the date of each issuance will be shown in parenthesis following the added or amended rating.

*(f)* After "shall continue in effect," insert the word "indefinitely."

*(g)* Under "Date issued:" insert the issuance date of the certificate. This will be the date of original certification.

*(h)* Under "By direction of the Administrator," insert the signature of the office manager and office identifier.

*(2) Foreign Repair Stations.*

*(a)* After "Number," insert the certificate number assigned to the facility. This will be in accordance with the current air agency numbering system.

*(b)* Under "This certificate is issued to" insert the official name of applicant's business. This must be the same as shown on the application form.

*(c)* Under "whose business address is," insert the address/location of the applicant's business. This must be the same as shown on the application form.

*(d)* After "to operate an approved," insert the words "repair station."

*(e)* Under "with the following ratings:" insert the ratings issued. The ratings must be listed in the broad sense, such as airframe, powerplant, radio, etc.

- If a repair station is issued a limited rating, then it must be listed as such on the certificate, e.g., limited radio.
- When ratings are added or amended, the date of each issuance will be shown in parenthesis following the added or amended rating.

*(f)* Where the certificate states "shall continue in effect," insert the date of expiration (see vol. 2, ch. 162, section 1.)

*(g)* Under "Date issued:" insert the issuance date of the certificate. This will be the date of original certification.

*(h)* Under "By direction of the Administrator," insert the signature of the office manager.

*(i)* At the very bottom of the page, the last line referring to "any alteration of the certificate" will be stricken in its entirety.

*B. Operations Specifications.*

*(1)* Following "The rating(s) set forth on Air Agency Certificate Number," insert the air agency certificate number from the respective certificate.

*(2)* Following "is/are limited to the following, "insert, as applicable:

- Class ratings
- Limited ratings, to include makes, models, or parts
- Limited rating for specialized services, to include the specification used
- Air carrier's geographic authorization, (foreign certificate holders only)

*(3)* Following "Delegated authorities," insert "none."

*(4)* Under "Date issued or revised," insert the date the inspection was satisfactorily completed.

*(5)* Under "For the Administrator," insert the signature block of the assigned inspector.

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## SECTION 3. EVALUATING A PART 145 FOREIGN REPAIR STATION UNDER CONTRACT TO A U.S. CARRIER AT A LOCATION OTHER THAN THE REPAIR STATION FACILITY

### 1. GENERAL.

*A.* U.S. air carriers have encountered a need for maintenance at stations where the frequency and scope of that maintenance does not warrant staffing and equipping the station for its accomplishment. This situation may be further complicated by prohibition against U.S. mechanics working in foreign countries by the government of those countries.

*B.* In an effort to provide those services while reducing the administrative effort of the FAA and industry, procedures were developed to certificate these activities for specific contracted air carriers. This certificate may be issued to a foreign air carrier, manufacturer, or other maintenance organization in accordance with part 145, subpart C.

*C.* If similar work is already being done at a remote location, on-like equipment, and meets the conditions for contractual work as described in this chapter, the existing operations specifications can be issued/amended without further demonstration of ability or submittal of an application.

# CHAPTER 162. CERTIFICATE PART 145 DOMESTIC REPAIR STATION/ SATELLITE STATION

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3230

*B. Avionics:* 5230

**3. OBJECTIVE.** This chapter provides guidance for evaluating an applicant for certification of a Title 14 Code of Federal Regulations (14 CFR) part 145 domestic or satellite repair station.

**5. THE CERTIFICATION PROCESS.** This process provides for interaction between the applicant and the Federal Aviation Administration (FAA) from initial inquiry to certificate issuance or denial. It ensures that programs, systems, and intended methods of compliance are thoroughly reviewed, evaluated, and tested. The certification process consists of five phases:

- Preapplication Phase
- Formal Application Phase
- Document Compliance Phase
- Demonstration and Inspection Phase
- Certification Phase

*A. Preapplication Phase.*

*(1) Preapplication Statement of Intent (PASI), FAA Form 8400-6.*

*(a)* The PASI will be used by the manager, Flight Standards Division or designee to evaluate the complexity of the proposed operation. This allows the establishment of the certification team to be based on the complexity of the certification. A certification project manager (CPM) will be designated as the principal spokesperson for the FAA during certification.

*(b)* An applicant should conduct a thorough review of the appropriate regulations and advisory material to provide guidance for personnel, facility, equipment, and documentation requirements. As a result of this review, the applicant must address, in the PASI, how these requirements will be met.

**NOTE: Submittal of the PASI by the applicant shows an intent to initiate the certification process.**

*(2) Preapplication Meeting.* The preapplication meeting should be held in the district office. This will allow the applicant to become familiar with the assigned FAA personnel.

*(3) Application for Repair Station Certificate and/or Rating, FAA Form 8310-3.* During the preapplication meeting the applicant should be instructed on how to complete the application.

*(4) Formal Application Attachments.* During the preapplication meeting requirements for the application attachments should be discussed. This discussion should include the following:

*(a) Inspection procedures manual.* The applicant should be encouraged to use Advisory Circular (AC) 145-3, Guide for Developing and Evaluating Repair Station Inspection Procedures Manuals, current edition, for guidance in developing the manual. The manual should allow the user to understand its content without further explanation and must not contradict any regulatory requirements.

**NOTE: It is the applicant's responsibility to develop manuals and procedures that ensure safe operating practices and compliance with the rules. The team can offer suggestions for improvement but must not "write" the material.**

*(b) Letter of compliance.* The letter of compliance will ensure that all applicable regulatory requirements are addressed during the certification process. This is done by listing each applicable 14 CFR section, in sequence according to 14 CFR. After each listed regulation, there must be a brief narrative or specific reference to a manual/ document that describes how the applicant will comply with that regulation. The letter of compliance must be reviewed to ensure that the applicant has a clear understanding of the regulation and that the proposed method of compliance meets the intent of the regulation.

**NOTE: If the Inspection Procedures (IP) manual references sections of the applicant's existing company Quality Control Manual there must be a corresponding cross reference list. This list must reference the 14 CFR sections to corresponding manual pages and can be used in place of a letter of compliance.**

*B. Formal Application Phase.* To begin the Formal Application Phase, the team will receive the application and attachments. As a rule, the team will meet with the applicant after receiving the formal application package. All questions about the proposed operation, the formal application, and attachments should be resolved at this time. The meeting should consist of the certification team members

and all key management personnel from the applicant's organization.

**NOTE: Legal name and address of owner should be determined at this point.**

*C. Document Compliance Phase.* In this phase, the application is thoroughly reviewed for approval or disapproval, and the manual and related attachments are reviewed for acceptance or rejection. This review ensures both conformity to the applicable regulations and safe operating practices. This phase is done in the district office by the certification team.

*D. Demonstration and Inspection Phase.* In this phase the certification team ensures that the applicant's proposed procedures are effective and that facilities and equipment meet regulatory requirements. The CPM must decide if demonstrations will be required.

*E. Certification Phase.* Once the applicant meets the regulatory requirements of part 145, the certification team will issue the repair station certificate and operations specifications with the appropriate ratings.

**7. SPECIALIZED SERVICE RATINGS.** An applicant may request a Specialized Service Rating, (e.g., emergency equipment, welding, altimeter/pilot static testing, etc.) The repair station's operations specifications must contain the military or civilian specification used in performing the specialized service. This specification may be either a civil or military one that is currently used by industry or developed by the applicant, and approved by the Administrator.

**9. WORK PERFORMED AWAY FROM THE STATION/ SATELLITE STATIONS.**

*A. Work Performed Away from the Station.*

*(1)* A station may perform work at a place other than its fixed location by moving facilities, material, equipment and technical personnel to perform specific maintenance functions such as the following:

- Testing of altimeter systems
- Nondestructive Inspection (NDI)
- Responding to special circumstances, such as an aircraft on the ground (AOG) at an isolated airport requiring repairs to allow it to be flown safely to the operator's main base or to a repair station

**NOTE: Continuous operation at a permanent facility other than the station's fixed location must not occur.**

*(2)* Procedures for performing and inspecting this work must be included in the repair station manual. The certificate holder must perform the work in the same manner as when performed at the parent facility, to include using:

- All necessary personnel
- All required technical data
- All required materials
- All required equipment

**NOTE: The address shown on the repair station's certificate is considered the station's fixed location. Any other fixed location must be certificated as a satellite station.**

*B. Satellite Facilities.*

*(1)* A domestic repair station may request certification of satellite facilities only within the United States or its possessions. If certification is sought outside this area, that facility is considered a foreign repair station and must be certificated as such, per vol. 2, ch. 163, Certificate FAR Part 145 Foreign Repair Station.

*(2)* A parent facility requests a satellite certificate to ensure control over the inspection procedures at these facilities and locations. Though the parent facility is establishing and ensuring this control, each satellite must satisfy all requirements of part 145 for each rating sought.

*(3)* The precertification number of a satellite facility coincides with the parent repair station number. Advise AFS-620 that a satellite repair station number is required.

*(4)* A repair station may interchange personnel anywhere in its system, as long as:

- Personnel are identified on the station roster
- The repairman's certificate shows the parent station certificate number

*(5)* Each satellite repair station is to be considered a stand-alone operation requiring normal certification procedures, with the regionally assigned district office having jurisdiction over that facility.

*(a)* The district office having jurisdiction over the parent facility will certificate the satellite only if the physical location falls within its geographic control.

*(b)* Any district office that has certificated a satellite in another district's geographic area of responsibility will coordinate and initiate a transfer of the responsibility for that operation to the appropriate office at the earliest opportunity.

*(6)* Any differences of opinion and/or position relating to the inspection procedures of satellite repair stations and the parent repair station must be resolved by negotiation between the responsible district offices.

**11. CHANGE IN OWNERSHIP.** Section 145.15(b) specifically requires a new application when the holder of a Repair Station Certificate sells or transfers its assets. The inspector should recommend a new certificate number due to the Freedom of Information Act (FOIA). However, should the new owner stipulate in writing that they clearly understand the potential of release of information under FOIA when retaining the old certificate number, then that number can be retained.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR part 145
- Successful completion of the Airworthiness Inspectors Indoctrination Course or equivalent
- Previous experience with certification or surveillance of part 145 Repair Stations

*B. Coordination.* This task requires coordination among the aviation safety inspectors (ASI) (airworthiness). Regional coordination may be required.

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

*A. References:*

- 14 CFR parts 43, 45, 65, 121, 125, and 135
- Advisory Circular (AC) 145-3, Guide for Developing and Evaluating Repair Station Inspection Procedures Manuals, current edition
- Special Federal Aviation Regulations (SFAR) 36
- FAA Order 8300.10, Airworthiness Inspector's Handbook; vol. 2, chs. 161, 164, and 165

*B. Forms:*

- FAA Form 8000-4, Air Agency Certificate
- FAA Form 8000-4-1, Repair Station Operations Specifications
- FAA Form 8060-4, Temporary Airman Certificate
- FAA Form 8310-3, Application for Repair Station Certificate and/or Rating
- FAA Form 8400-6, Preapplication Statement of Intent
- FAA Form 8610-2, Airman Certificate and/or Rating Application, if applicable

*C. Job Aids.* None.

### 5. PREAPPLICATION PHASE.

*A. Respond to an Initial Inquiry.*

*(1)* Discuss with the applicant the following subjects, to include:

*(a)* The necessary technical expertise required by the applicant's proposed organization, to include the following:

- Aviation-related experience
- Proposed organizational structure
- Knowledge of the specific maintenance functions to be performed

*(b)* The rating required for the type of work to be accomplished.

*(c)* The requirements for sufficient personnel to meet the demands of the proposed repair station. This includes at least one certificated person with appropriate ratings that coincide with the ratings sought.

*(d)* Facility requirements for the ratings sought, to include:

- The need for climate-controlled conditions
- The size of the facility
- Appropriate test equipment
- Special tools, etc.

*(e)* The necessity of having current technical data available before certification. Technical data will include the following:

- 14 CFR
- Airworthiness Directives, (AD)
- Type certificate data sheets (TCDS), if applicable
- AC's, as required
- Processes, e.g., maintenance processes
- Manufacturer's service manuals, instructions, and service bulletins (SB).

**NOTE: Appliance manufacturer's maintenance manuals or instructions, though not specifically approved by the FAA, are considered to be in compliance with §§ 43.7, 65.95, 121.379(b), 135.437(b), and 145.51.**

*(2)* Furnish FAA Form 8400-6 to the applicant with instructions to complete and submit it to the district office in whose area the parent facility is located.

*B. Initiate the Certification Process.* Upon receipt of a completed and signed PASI from the region, the assigned district office must accomplish the following:

*(1)* For a satellite certification coordinate with certificate-holding district office (CHDO) of the parent repair station.

*(2)* Coordinate with the district office manager/designee to determine the control of the following:

- Supervision of the certification process
- Makeup of the certification team

*(3)* The designated certification team will process the PASI as follows:

*(a)* Obtain a precertification number from AFS-620.

*(b)* Check the "Information only" block and enter the date the PASI was forwarded to the region.

*(c)* In the "Remarks" section, enter "Proceeding with formal certification"' and show the precertification or final certificate number.

*(4)* The certification project manager (CPM) will contact the applicant to arrange a preapplication meeting.

*C. Conduct a Preapplication Meeting.* Meet with the applicant to discuss questions, if any, concerning the certification process, regulatory requirements, the formal application and attachments, etc. Accomplish the following during the meeting(s):

*(1)* Discuss the regulations applicable to the proposed maintenance operation.

*(2)* Provide the applicant with the following material:

*(a)* A copy of AC 145-3, Guide for Developing and Evaluating Repair Station Inspection Procedures Manuals, current edition;

*(b)* A copy of FAA Form 8310-3, Application for Repair Station Certificate and/or Rating; and

*(c)* Copies of FAA Form 8610-2, Repairman Application, if applicable.

*(3)* Inform the applicant that a formal application package for a domestic repair station certificate must contain the following material:

*(a)* A completed FAA Form 8310-3;

*(b)* Two copies of the IP manual;

*(c)* A letter requesting the application be processed and indicating when facilities and equipment will be ready for formal inspection;

*(d)* A letter of compliance;

*(e)* An application for repairman certificate and letter of recommendation, if applicable;

*(f)* When a Limited Rating is requested, the make and model of the particular item(s) to be maintained and the nature of the work to be performed;

*(g)* When approval of a Class 2 Propeller Rating is being sought, a list by make of the propeller; and

*(h)* When a Specialized Service Rating is requested, a copy of the approved specification for the work to be performed.

**7. FORMAL APPLICATION PHASE.**

*A. Receive the Formal Application.* Ensure that all documents have been submitted and are complete.

*B. Evaluate the Application Package.* Based on the initial survey of the application package, a decision must be made whether or not to continue with the certification process.

*C. Conduct an Application Meeting.* Any open questions concerning the package must be answered before proceeding to the next phase. This should be done in the most effective way possible, e.g., meetings or correspondence.

**9. DOCUMENT COMPLIANCE PHASE.**

*A. Review the Application Package.* Review the content of each submitted document for regulatory compliance. The documents to be reviewed include:

*(1)* A completed FAA Form 8310-3;

*(2)* Inspection Procedures Manual (refer to vol. 2, ch. 164, Evaluate FAR Part 145 Inspection Procedures Manual/Revision);

*(3)* The letter of compliance;

*(4)* Application for repairman certificate and letter of recommendation, if applicable;

*(5)* The list of makes and models of the particular item(s) to be maintained and the nature of the work to be performed for any Limited Ratings;

*(6)* The list by make of the propeller for a Class 2 Propeller Rating; and

*(7)* A copy of the approved specification for the work to be performed for a Specialized Service Rating, when applicable.

*B. Document any Deficiencies.* If deficiencies are found in any document, return it to the applicant with a letter outlining the deficient areas. Inform the applicant that the certification process will not continue until all deficiencies are resolved.

**11. DEMONSTRATION AND INSPECTION PHASE.**

*A. Coordinate and Schedule an Inspection.* Coordination is required between the CPM, team members, and the applicant.

*B. Perform a Housing and Facility Inspection.* During the Demonstration and Inspection Phase, inspect the repair station facilities to ensure that the work being done is protected from weather elements, dust, and heat. Ensure that workers are protected to the point that the quality of their work will not be impaired (refer to vol. 2, ch. 165, Evaluate FAR Part 145 Repair Station's Facilities and Equipment). In addition, inspect the following:

*(1)* The inspection system, refer to vol. 2, ch. 164, to ensure:

*(a)* Employees are familiar with and are capable of performing their assigned duties; and

*(b)* Facilities are capable of supporting manual procedures.

*(2)* Maintenance recordkeeping system to ensure compliance with § 145.61.

*(3)* The system for reporting serious defects or unairworthy conditions to ensure compliance with § 145.63.

*C. Evaluate Maintenance Organization.* Ensure the following:

*(1)* The number of personnel is sufficient to satisfy the volume and type of work to be performed, as required by § 145.39;

*(2)* Individuals directly in charge of a maintenance functions are appropriately certificated;

*(3)* A personnel roster is available and includes all supervisory and inspection personnel; and

*(4)* Supervisory and inspection personnel employment summaries are available.

*D. Analyze Deficiencies.*

*(1)* If deficiencies are noted, notify the applicant in writing. If appropriate, meet with the applicant to review deficiencies in detail; and

*(2)* Corrective action must be taken and the CPM notified in writing by the applicant, in order for the certification process to continue. Each deficiency and corrective action must be fully documented and recorded in the certification file.

**13. CERTIFICATION PHASE.**

*A. Prepare Certificates.* When the applicant has met all regulatory requirements, the CPM will accomplish the following:

*(1)* Complete blocks 6-9 of FAA Form 8310-3, to show:

- Findings and recommendations
- Any remark or discrepancy noted during inspection
- Date of inspection
- Office and signature of the CPM

*(2)* Prepare FAA Form 8000-4, Air Agency Certificate, which must be signed by the district office manager.

*(3)* Prepare FAA Form 8000-4-1, Repair Station Operations Specifications. The operations specifications, showing the limitations to be issued, will be signed by the appropriate Airworthiness ASI. These limitations may be listed on separate operations specifications pages.

**NOTE: The Air Agency Certificate and operations specifications for a satellite repair station will be issued by the district office in which the satellite is located. A copy will be forwarded to the CHDO of the parent organization.**

*(4)* If applicable, issue FAA Form 8060-4, Temporary Airman Certificate, with appropriate ratings.

*B. Prepare Certification Report.* Ensure that a certification report is prepared. The report must include the name and title of each ASI on the certification team. The report is signed by the CPM and contains at least the following:

- A copy of the PASI
- FAA Form 8310-3, completed
- A letter of compliance
- A copy of the Air Agency Certificate issued
- A copy of the issued operations specifications
- A copy of any Temporary Airman Certificate issued
- A summary of all discrepancies encountered during the inspection

**15. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task will result in one of the following:

- Issuance of a certificate and operations specifications
- A letter to the applicant indicating the certificate is denied
- A letter to the applicant confirming termination of the certification process by the applicant

*C. Distribute Certification Report.* Distribute the completed report as follows:

- Retain the original certification report in the district office
- Forward one copy of the certificate report to all involved district and regional offices

*D. Document Task.* File all supporting paperwork in the certificate holder/applicant's office file and update the Vital Information System (VIS).

**17. FUTURE ACTIVITIES.** The district office must ensure that there is an orderly transition from the certification process to certificate management.

# CHAPTER 188. EVALUATE PART 147 AVIATION MAINTENANCE TECHNICIAN SCHOOL FACILITIES, EQUIPMENT, MATERIALS, TOOLS AND RECORDS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A.* Maintenance: 3230

*B. Avionics:* 5230

**3. OBJECTIVE.** This chapter provides guidance for evaluating the facilities, equipment, materials, and tools for an Aviation Maintenance Technician School (AMTS). Such an evaluation occurs as part of an original certification, addition of a rating, curriculum change, or change of location.

**5. GENERAL.**

*A. Definitions.*

*(1) Common Hand Tools*: Small, ordinary tools such as ratchets, sockets, etc.

*(2) Instructional Aids:* Equipment used to instruct, such as mock-ups, diagrams, visual aids, aircraft, engines, components, etc.

*(3) Shop Equipment:* Machinery, fabricating devices, spray paint equipment, battery chargers, etc.

*(4) Special Tools:* Highly specialized tools such as tensiometer, micrometers, torque wrenches, etc.

*B. Appropriate Equipment and Facilities.* An AMTS must have instructional equipment and suitable facilities appropriate to the ratings taught and approved by the Federal Aviation Administration (FAA). Materials and tools must be of a type, quantity, and quality appropriate to the needs of the curriculum and the number of students.

**7. PRE-INSPECTION ACTIVITY.**

*A. Initial Certification.* The certification team will approve the curriculum before formal inspection of the facility. During the Preapplication Meeting, the Certification Project Manager (CPM) may request a briefing and an informal inspection of the facility. The applicant may request that an aviation safety inspector (ASI) informally evaluate the facility to see if it appears to be within the guidelines of Title 14 of the Code of Federal Regulations (14 CFR). This may be accomplished before completion of the facility, but only after submitting FAA Form 8400-6, Preapplication Statement of Intent (PASI).

*B. Added Rating/Curriculum/Location Change.* To add a rating or execute a change in curriculum or location that affects facilities, equipment, materials, or tools, etc., the office manager or airworthiness unit supervisor will determine whether one ASI or a team is necessary to accomplish the site inspection.

*(1)* To add a rating, see the appropriate sections on changes to curriculum in vol. 2, ch. 187, Evaluate FAR Part 147 Aviation Maintenance Technician School's Curriculum/Revision and Instructor Qualifications; and the appropriate sections on changes to equipment, materials, tools and records found below.

*(2)* For changes to curriculum, see curriculum requirements as found in vol. 2, ch. 187.

*(3)* For change in location, the district office must make a detailed analysis of the change in plans and their effect on the following:

*(a)* The students in training, whether or not in actual attendance during the time of the change.

*(b)* Loss of instructional hours as shown in the curriculum. There must not be a loss of instructional hours.

*(c)* The school's method of meeting the certification requirements particularly space requirements and curriculum per 14 CFR part 147, §§ 147.15 and 147.21.

*(4)* Approval shall be granted to the school in writing.

*(5)* If a change has been made without approval, the district office shall begin an enforcement investigation procedure.

*C. Change of FAA District.* When the location is a change to another FAA district, the application for approval must be directed to the district office that has current certificate responsibility. The originating district office will contact and coordinate directly with the receiving district office. The school maintains the responsibility of the originating district office until the change is approved.

**9. DEMONSTRATION ACTIVITY.** Ensure compliance with regulations as follows:

*A.* Facilities meet the requirements of §§ 147.13 and 147.15.

*B.* Instructional aids meet the requirements of § 147.17.

*C.* Materials, tools, and shop equipment meet the requirements of § 147.19.

**11. FACILITIES.** The instructional equipment, shop equipment, hand tools and physical layout of the building must meet the requirements outlined in §§ 147.15, 147.17, and 147.19. The ASI should keep in mind that the facility must constitute an environment suitable for learning.

*A. Classroom Areas.* An area suitable for classroom instruction may not be suitable for lab and/or shop. With appropriate scheduling and consideration of factors such as ventilation, lighting, noise, and temperature control, an area appropriate for lab and/or shop may be acceptable for classroom instruction.

*B. Shop Environment.* Ventilation must be such that fumes from painting, fueling, degreasing, doping facilities, etc., are properly removed from the immediate work area and are not allowed to pass into other instructional areas.

*C. Facility Size and Location.*

*(1)* Facilities must be adequate to hold the number of authorized students participating in any of the shop/lab projects designated for that area.

*(2)* Facilities must be located and classes scheduled so that students can travel between classes without cutting into instructional time. ASI's should pay special attention to situations in which the students cannot go easily and quickly from one class to another.

**13. EQUIPMENT.**

*A. Instructional Equipment.*

*(1)* The instructional aids required in § 147.17 must be appropriate to the scope and depth of the curriculum of the school. The ASI shall determine whether the complexity of instructional aids is appropriate to the specific teaching level of the subject item.

*(2)* In some situations, the school may choose to use active aircraft for instructional purposes in the shop. This is permissible as long as the aircraft is on the premises at the time of instruction. The ASI shall remind the school that active aircraft used to comply with § 147.17(a)(2) and (d) become part of the approved instructional equipment and must be available as specified in § 147.37.

*(3)* The ASI shall ensure compliance with requirements for the ratio of instructional equipment to students in each shop course. Section 147.17(2)(c) requires that not more than eight students may work at any one unit of equipment at a time. However, the ASI may determine whether eight students are too many to complete a certain project safely and competently, such as live aircraft that are used for the demonstration of gear retraction systems.

*B. Shop Equipment.*

*(1)* The ASI must determine if enough equipment is in place and in satisfactory operating condition to serve the student enrollment adequately and meet shop project requirements.

*(2)* The equipment must be located so that it can be operated in a safe and efficient manner. Large standing equipment must be installed securely. Large pieces of equipment should be placed to provide sufficient aisle space so that the students can move about freely. The ASI must determine if the floor is free from clutter and items such as extension cords.

**15. MATERIALS.** The school must have sufficient materials in stock and properly stored to provide for the approved student enrollment. In order to ensure adequate instruction, the amount and variety of stocks should directly reflect the requirements of the curriculum.

**17. TOOLS.**

*A. Tool Standards.* For subjects taught at Level 3, all tools required to meet “return to service” standards must be in satisfactory working condition and of the proper kind for their intended purpose. Section 147.19 requires the school to have an adequate supply of materials and tools appropriate to the curriculum of the school.

*B. Student Hand Tool Policy.* The school may either provide common hand tools or require students to furnish their own. In either case, the school must establish a policy on provision of common hand tools. Any tools that the school requires the student to furnish must be listed in the curriculum. The school will furnish special tools, such as cylinder hold down wrenches, micrometers, etc.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of Title 14 of the Code of Federal Regulations (14 CFR) parts 43, 65 and 147, including Appendices A, B, C, and D
- Previous experience with certification or surveillance of 14 CFR part 147 schools is desirable

*B. Coordination.* This task requires coordination with aviation safety inspector's (ASI) (avionics) and certification team members, as appropriate.

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

*A. References:*

- FAA Order 8300.5, Aviation Safety Inspector, General Aviation Job Function Reference Guide, current edition
- The school curriculum

*B. Forms:*

- FAA Form 8310-6, Aviation Maintenance Technician School Certificate and Rating Application
- FAA Form 8000-4, Air Agency Certificate (for initial certification)

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review the Applicant's File.* Before inspecting the facility, review the applicant's application and district office file. Check for any previous violation history. Review previous correspondence. Check the curriculum or proposed curriculum for currency. Take a copy of the curriculum and facility layout to the school site.

*B. Inspect the Facility.* Compare the curriculum against the instructional aids, shop equipment and hand tools at the site. Compare the physical layout with the facility layout plan.

*(1)* Check the instructional aids for agreement with the curriculum. Determine if the items required for each course are actually at the site as required by the approved student level.

*(2)* Determine whether all instructional aids are actually operable and safe to use. For example, a retractable landing gear instruction device should operate properly.

*(3)* Ensure that adequate stocks of operational/maintenance instructions, parts manuals, and technical data are at the site, according to the requirements of the curriculum.

*(4)* Determine if the number and size of classrooms and shop areas are consistent with the facility layout submitted with the curriculum. Ensure that the lighting and ventilation are adequate.

*(5)* Verify that the tools, materials, and shop equipment match the inventories/descriptions required by the curriculum. Ensure that these items are stored properly.

*(6)* Verify that a recordkeeping system is in place for tool inventory, calibration, and the updating of technical instructional materials.

*(7)* Inform the applicant of any discrepancies noted. Make a record of such deficiencies in the remarks section of FAA Form 8310.6, as appropriate.

### 7. TASK OUTCOMES.

*A. Complete a PTRS Data Sheet.*

*B. Facility Approved.*

*(1)* For an initial certification or added rating, complete FAA Form 8310-6, as applicable. Attach the appropriate documents, as required. Make a copy of the form and all pertinent documents and retain a copy for the district office file.

*(2)* For a curriculum or location change that affects facilities, equipment or tools, complete FAA Form 8310-6, as applicable. Retain a copy of the form for the district office file.

*C. Facility Disapproved.*

*(1)* Mark FAA Form 8310-6 “disapproved” and return to the applicant with attachments. Retain a copy for the office file.

*(2)* Write a letter to the applicant stating the reasons for disapproval. Advise applicant to resubmit a new application when the discrepancies are corrected. Upon receipt of a new application, reschedule the facility inspection.

### 9. FUTURE ACTIVITIES. Routine surveillance.

# [CHAPTERS 189 THROUGH 201 RESERVED]

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# CHAPTER 211. CONDUCT AN ACCIDENT INVESTIGATION

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3702/3703

*B. Avionics:* 5702/5703

**3. OBJECTIVE.** This chapter provides guidance for conducting an accident investigation in accordance with FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, current edition.

**5. GENERAL.**

*A.* Since this order does not supersede FAA Order 8020.11, it is recommended that both orders be used during the aircraft accident investigation.

*B. Pre-Accident Plan.* Each Flight Standards District Office (FSDO), should have a pre-accident plan that is tailored to that office's specific requirements (geographic location, climate, staffing, resources, etc.). The success of an accident investigation often depends on how well the pre-accident plan is kept current, rehearsed, and carried out.

**7. RESPONSIBILITIES.**

*A. Federal Aviation Administration (FAA) Responsibilities.* FAA accident investigation responsibilities include the following:

*(1)* Ensuring the following:

*(a)* That all facts and circumstances leading to the accident are recorded and evaluated; and

*(b)* That actions are taken to prevent similar accidents in the future.

*(2)* Determining the following:

*(a)* If there was a violation of the Title 14 of the Code of Federal Regulations (14 CFR);

*(b)* If the performance of FAA facilities or functions was a factor;

*(c)* If the performance of non-FAA owned and operated Air Traffic Control (ATC) facilities or navigational aids was a factor;

*(d)* If the airworthiness of U.S.-certificated aircraft was a factor;

*(e)* If the competency of U.S.-certified airmen, air agencies, commercial operators, air carriers, or airports was a factor;

*(f)* If the regulations were adequate;

*(g)* If the airport certification safety standards or operations were involved;

*(h)* If the air carrier/airport security standards or operations were involved; and

*(i)* If airmen medical qualifications were involved.

*B.* The FAA will conduct and submit factual reports of the investigation to the National Transportation Safety Board (NTSB) on accidents delegated to the FAA by the NTSB. This delegation of certain NTSB accident investigation responsibilities is exercised under § 304(a)(1) of the Independent Safety Board Act of 1974.

*(1)* The FAA is obligated to supply all resources essential to producing aircraft accident reports, (manpower, travel, inspection, testing, wreckage recovery, security guards, etc.)

*(2)* Regional Flight Standards Division managers or their delegated representatives are authorized to order such services and commit the funds for these activities.

*C.* The authority to conduct autopsies and tests of the remains of persons aboard the aircraft at the time of the accident may be delegated by the Administrator to a medically-qualified official or medically-qualified employee of the FAA. Designated aviation medical examiners are not deemed to be officials or employees for this purpose.

*D. FAA and NTSB Investigation Agreements.* NTSB and FAA agreements for accident investigations are found in FAA Order 8020.11.

*E. Regional Divisions and Branches in Aircraft Accident Investigations.* In order to meet agency requirements, other FAA personnel may be required to participate in an accident investigation. In these situations, a representative is designated to coordinate the division/branch responsibilities and provide assistance and required reports to the FAA investigator-in-charge (IIC).

*F. FAA IIC's Responsibilities.* The FAA shall at all times have an IIC designated as its principal representative. The designation of the IIC constitutes that person's authority to procure and use the services of all needed FAA personnel, facilities, equipment, and records.

*(1) General Responsibilities.* The FAA IIC directs and controls all FAA participation in the investigation until the accident investigation is complete. During the assignment as FAA IIC, responsibility is direct to the Associate Administrator of Aviation Safety, ASF-1, through the Manager of the Accident Investigation Division, AAI-100.

*(2) NTSB-Conducted Accident Investigation.*

*(a)* The FAA IIC is under the control and direction of the NTSB IIC. If the FAA is the first to arrive at the accident site, then the FAA representative is in charge until the NTSB arrives.

*(b)* The FAA IIC will be the point of contact for any information that the NTSB makes available to be used for necessary corrective action, to include the following:

- Documents
- Any other evidence obtained and developed during the investigation
- Any tentative recommendations

(3) *FAA-Delegated Accident Investigations.* When accident investigations are delegated to the FAA by the NTSB, the FAA IIC becomes an authorized representative of the NTSB. This includes all of the investigative authority prescribed in the applicable NTSB regulations. Refer to FAA Order 8020.11.

**NOTE: All further references in this Section to the IIC will be referring to the FAA IIC.**

*G. FAA Participant Responsibilities.*

*(1)* Participants are responsible to the IIC in all matters related to the investigation, to include obtaining consent before doing the following:

*(a)* Withdrawing from the investigation;

*(b)* Submitting requested reports; and

*(c)* Supplying information or reports to any person outside their assigned group.

*(2)* Personnel representing the FAA organizational element authorized access to the accident scene are subject to the requirements of the above paragraph. These personnel shall provide the IIC with reproducible copies of all reports that they have prepared or received during the investigation.

*(3)* FAA personnel not specifically assigned as participants or support personnel are not permitted at the scene of an accident without the knowledge and consent of the IIC.

*H.* Other Agency or Organizational Responsibilities. Detailed responsibilities for other agencies or organizations can be found in FAA Order 8020.11.

## 9. TYPES OF AIRCRAFT ACCIDENT INVESTIGATIONS.

*A. Military Accident Investigations.*

*(1)* A "function of the FAA" is defined as involvement of the following:

*(a)* An FAA employee or designee;

*(b)* An FAA facility;

*(c)* FAA procedures, directives, or publications;

*(d)* An FAA-certificated civilian airman;

*(e)* An FAA-certificated joint use airport;

*(f)* An aircraft and/or equipment common to both civil and military aviation; and

*(g)* Common interest environmental factors.

*(2)* When a "function of the FAA" is involved, participation in military accident investigations is provided for by Title 49 of the United States Code (49 U.S.C.). For information on procedures, see Armed Forces Regulations/ Department of Transportation (DOT) Order AFR 127-11.

*(3)* The military commander-in-charge of the investigation is responsible for making a determination of FAA involvement and will include this in the notification to the FAA.

*(4)* In a military aircraft accident (mishap) in which a mutual interest exists but no FAA function is or may be involved, the FAA can request to participate in the investigation. Requests for participation shall be forwarded to the appropriate military safety center, following coordination with the Accident Investigation Division, AAI-100.

*B. Agricultural Aircraft Accident Investigation.*

*(1)* The IIC should use extreme caution when arriving at an accident site in which an agricultural aircraft is involved, as the site may be contaminated with hazardous chemicals or "economic poisons." If this is the case, protective clothing or other appropriate cautions may be required during the investigation.

*(2)* If there is any question as to what type of substance is on board the aircraft, the IIC should make every attempt to contact the operator to identify the substance and determine whether there are any associated risks before allowing anyone on the site.

*C. Foreign Accidents.*

*(1)* When U.S.-registered or U.S.-manufactured aircraft are involved in an accident/incident in a foreign country, they will be investigated in accordance with FAA Order 8020.11.

*(2)* When foreign-registered aircraft are involved in an accident/incident in the U.S., that accident/incident will

be handled the same as a U.S. civil aircraft accident/incident investigation.

*D. Ultralight Vehicle Accidents.* Even though the FAA does not get involved in an ultralight accident investigation, it is the IIC's responsibility to determine if there was a violation of the regulations. The initial telephone notification should have sufficient information for the IIC to determine if an on-site investigation is required to investigate a possible violation. If necessary, refer to 14 CFR part 103.

*E. Public Use Aircraft.* For accident investigations of public use aircraft, refer to FAA Order 8020.11.

**11. POST-NOTIFICATION ACTIVITIES.**

*A. Delegated Investigation.* Certain steps have to be taken to initiate FAA delegated investigations. The facilities of the Regional Operations Center (ROC) can be used to establish the necessary contacts and coordination with the following:

*(1)* Law enforcement or airport authorities for the following:

*(a)* Wreckage and site security;

*(b)* Information on accessibility of the accident site and environmental conditions; and

*(c)* Arrangements for local travel to the site, etc.

*(2)* Coroner or nearest Aviation Medical Examiner (AME), for arrangements for proper autopsies and toxicological tests, etc.

*(3)* Manufacturer, operator, or owner for specific assistance, such as documents, certificates, data, etc.

*(4)* Flight Service Station (FSS), Air Traffic Center, and tower facilities for the following:

*(a)* Preliminary information on flight plan and pilot's intent;

*(b)* Radio communications; and

*(c)* Flight progress reports, etc.

*(5)* National Weather Service, FAA facilities, or certified observers for relevant weather information.

*B. Office Coordination.*

*(1)* Coordination will be necessary to ensure that response time to an accident investigation is as brief as possible.

*(2)* Coordination should be established to give local authorities the name of the IIC and the expected time of arrival. Before departing, the IIC should designate an initial contact point to which messages can be sent during the transient status.

*C. Investigation Equipment.* The diversity of aircraft accidents makes it difficult to have all the necessary equipment available. Certain items commonly used in every investigation should be kept in readiness. Each office must develop its own requirements. Further details are provided in FAA Order 8020.11.

*D. Safety at the Site.* This is an area of vital importance and needs to be addressed by the IIC when planning the investigation. Aspects to be considered include both inspector and bystander safety.

*(1)* Some items to be considered by the IIC include the following:

*(a)* Shifting wreckage on steep slopes or in deep snow;

*(b)* Pressurized systems and components, including hydraulic, pneumatic, and oxygen systems;

*(c)* Blowout (explosion) of damaged landing gear tires;

*(d)* Ejection seat cartridges in military or ex-military aircraft;

*(e)* Loaded weapons, such as when law enforcement agencies or hunters were known to be aboard;

*(f)* Electrically charged wreckage;

*(g)* Weak ice when wreckage is located on ice;

*(h)* Reactions of toxic agents present in a fire; and

*(i)* Hazardous agricultural chemicals.

*(2)* Some actions to be considered by the IIC include the following:

*(a)* Wearing gloves when handling wreckage and using hard hats when working inside or under wreckage.

*(b)* Delaying the handling of wreckage if there is any reason to suspect the presence of hazardous cargo, including radioactive materials or chemicals, until the necessary checks have been made and the site has been declared safe.

*(c)* Taking into account the advice of local experts such as forest rangers, mountain rescue teams, surveyors, and law enforcement personnel as to the type of protection and precautions needed in certain terrain.

*(d)* Providing for first aid, shelter, food, water, and fuel due to unexpected weather or equipment failures that may isolate the investigational team in remote areas.

*(e)* Setting up a communications system for the logging-in and logging-out of personnel operating in remote areas.

*(f)* Controlling access to the site to ensure bystander safety.

*E. Accident Site Preservation.* Preservation of the accident site is of primary importance to a successful accident investigation. Removal of survivors and victims, fire fighting, and removal of hazardous materials can damage the accident site, but may be necessary before the start of the investigation. The IIC is responsible for securing the site to ensure preservation.

*F. Rotorcraft Wreckage Considerations.* The IIC should be aware that the investigation of a rotorcraft accident may present problems that would not be encountered in an airplane accident investigation. When the IIC is not thoroughly familiar with rotorcraft engineering and aerodynamics, assistance should be requested. Some unique considerations include the following:

*(1)* Rotating components that separate in flight, may produce unpredictable scatter patterns, while the heavy items in single-rotor rotorcraft tend to be clustered together around and beneath the mast.

*(2)* In general, a rotorcraft is very intolerant of mechanical and maintenance deficiencies and operations outside of its performance envelope.

*G. Witness Statements.*

*(1)* If a violation is suspected there are additional requirements for the handling of witness statements. These requirements include the following:

*(a)* If a witness objects to a copy of their statement being used, they must be informed that they may be subpoenaed if enforcement action is taken.

*(b)* If a witness does not object, a copy of the statement should be requested from the NTSB IIC on NTSB investigated accidents. For delegated investigations, the original statement will be forwarded to the NTSB with the accident report and a copy retained for enforcement purposes, as required.

**NOTE: If NTSB forms are accepted for use as witness statements, remove all NTSB references on the form before using the statement for enforcement purposes.**

*(2)* For further guidance on witness statements, see FAA Order 8020.11.

*H. Progress Reports.* Progress reports to AAI-100 will be done in accordance with FAA Order 8020.11.

*I. On-Site Survey.* During the time spent at the accident site there should be a continual gathering of facts by all involved inspectors. The IIC should be continually evaluating this evidence for possible consideration as a contributing factor.

*(1)* Some evidence to be considered includes the following:

*(a)* Missing extremities such as wing or stabilizer tips, vertical stabilizer tip, propeller or rotor tips;

*(b)* Missing flight control surfaces such as rudder, elevators, ailerons, flaps, stabilizers, spoilers, slats, and tabs;

*(c)* Missing structure;

*(d)* Pre-impact versus post-crash fire evidence;

*(e)* Metal fatigue versus instantaneous breaks;

*(f)* In-flight versus impact breaks;

*(g)* Positive versus negative G-forces;

*(h)* Overloading or out of center-of-gravity evidence;

*(i)* Evidence of aircraft attitude at impact;

*(j)* Controlled versus uncontrolled attitude at impact;

*(k)* Engine power at impact;

*(l)* Systems operation prior to impact;

*(m)* Evidence of G-force at impact;

*(n)* Post-crash flight control positions;

*(o)* Cockpit documentation;

*(p)* Evidence of impact before final terrain contact, such as damage to trees, wires, buildings, terrain, poles, or obstructions;

*(q)* Witness statements; and

*(r)* Fuel contamination or exhaustion.

*(2)* NTSB probable cause statistics show that a high percentage of accidents are caused by human error. Therefore the IIC must consider other elements that could have contributed to the cause of the accident. The following is a partial list of areas of consideration:

*(a)* Possible fatigue factors;

*(b)* Crew qualifications;

*(c)* Medical factors;

*(d)* Peer group pressures;

*(e)* Over extension of capabilities; and

*(f)* Drug and/or alcohol usage.

**13. AIRCRAFT ACCIDENT REPORT PACKAGE.** For a complete explanation of responsibilities see FAA Order 8020.11.

**15. ACCIDENT/INCIDENT INFORMATION.** For release of information, see FAA Order 8020.11.

**17. POST ON-SITE INVESTIGATION ACTIVITIES.** The IIC's responsibilities do not end with the conclusion of the on-site investigation. Some of the activities necessary after completion of the on-site investigation might include the following:

*A.* Testing and tear-down of aircraft components and parts in accordance with the manufacturer's manuals;

*B.* Comparing the aircraft's certificated performance with the performance under the conditions existing at the time of the accident. Simulator or actual flight tests may be required;

*C.* Reviewing all relevant certification standards (aircraft, airmen, carriers, airport facilities, schools, repair stations, etc.) for factors that may have contributed to the accident;

*D.* Documenting the pilot's flying background, experience, training, medical history, and certification;

*E.* Documenting the pilot's preparation and execution of the flight. This could entail contacting the FSS, the tower and Air Traffic Center facilities involved, and obtaining final transcripts of all recorded communications, as required;

*F.* Documenting all pertinent weather data, such as pilot briefings, forecast weather, actual weather, Pilot Weather Report (PIREP), Significant Meteorological Information (SIGMET), etc.; and

*G.* Submitting safety proposals in the form of accident prevention recommendations.

**19. VIOLATIONS.** If, at any time during the investigation, facts are revealed that indicate a violation of the 14 CFR the, IIC should follow the procedures in volume 2, chapter 213, Conduct a Violation Investigation.

**21. DOWNGRADING AN ACCIDENT TO AN INCIDENT.** If a determination is made that the accident should be downgraded to incident status, the IIC will accomplish the following:

*A.* Notify the appropriate FSS that the accident has been downgraded to incident status;

*B.* When the downgrade is subsequent to issuance of the NTSB Form 6120.19A, notify AFS-620 and the NTSB by sending both offices a copy of the original NTSB Form 6120.19A with the word “Downgraded” written across the form; and

*C.* Follow the procedures outlined in volume 2, chapter 212, Conduct an Incident Investigation.

**23. ACCIDENT INVESTIGATION RECORDS DISPOSAL.** Accident investigation records shall be disposed of in accordance with FAA Order 8020.11.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

*B. Coordination.* This task requires coordination with unit supervisors, the Regional Operations Center (ROC), the appropriate Flight Service Station (FSS), and the National Transportation Safety Board (NTSB) Investigator-In-Charge (IIC), as applicable.

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

*A. References (current edition):*

- Office Procedures/Policy Manual
- Federal Aviation Administration (FAA) Order 1200.23, Public Availability of Information
- FAA Order 2150.3, Compliance and Enforcement
- FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting
- FAA Order 8300.10, volume 2, chapters 210, Introduction to Conducting Accident and Incident Investigations, Processing a Violation Package, and Responding to a Complaint, and 212, Conduct an Incident Investigation, and 213, Conduct a Violation Investigation

*B. Forms.* See FAA Order 8020.11, appendix 1, for complete listing.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Receive Initial Notification.*

*(1)* Record the initial accident information.

*(a)* If notification is made by the FSS, verify that the they have enough information to initiate an FAA Form 8020-9, Aircraft Accident/Incident Preliminary Notice.

*(b)* If notification is made by an operator, call the FSS and give them the information required to initiate an FAA Form 8020-9.

*(c)* If notification is made by ROC, call the FSS and give them the information required to initiate an FAA Form 8020-9.

*(2)* Determine the type of accident, such as the following:

- Air carrier
- Agricultural
- Military

*(3)* Ensure that the FSS initiates FAA Form 8020-9.

*(4)* Notify the ROC to contact the appropriate personnel and agencies as required by the category of accident.

*(5)* If the NTSB conducts the investigation, respond to the type of investigation as determined by the NTSB, to include the following:

*(a)* Initiate the preparation of the FAA effort.

*(b)* Determine FAA responsibility in accordance with office policy.

*(6)* If the investigation is delegated to the FAA, contact the appropriate office personnel according to office policy and request the following:

*(a)* Assignment of FAA IIC; and

*(b)* Determination of whether the investigation will be accepted as a delegated investigation as follows:

- If accepted, initiate the organization of investigation effort
- If not accepted, initiate the effort to determine the FAA responsibility

*B. Initiate Organization of Investigation.*

*(1)* If the accident involves an Air Traffic Center, the IIC should request the following information, as required:

*(a)* Flight progress strips;

*(b)* Air traffic center (ATC) tapes;

*(c)* Radar printouts; and

*(d)* Weather information.

*(2)* Determine what specialties will be required based on the initial accident information submitted (e.g., operations, airworthiness, avionics, aviation medical examiner (AME), coroner, pathologist, etc.).

*(3)* Request technical support from the Flight Standards District Office (FSDO) manager or the appropriate

office representative according to office policy and procedures.

*(4)* Brief all participants on their responsibilities and the preliminary accident information.

*(5)* Designate an office coordinator at the FSDO in accordance with the office procedures/policy manual.

*(6)* Contact the nearest local law enforcement agency and/or airport security to:

*(a)* Provide accident site security until the arrival of FAA or NTSB personnel.

*(b)* Ensure that rescue operations have been initiated.

- If rescue operations have not been initiated, take the necessary steps to begin rescue operations, if necessary
- Determine if specialized personnel and/or equipment are required to begin or continue rescue operations

*(7)* Obtain the accident investigation kit from the FSDO and proceed to the accident site.

*C. Perform Preliminary On-Site Investigation (FAA Delegated Inspection).*

**NOTE: The IIC must ensure that sufficient data is gathered to complete all applicable NTSB supplemental forms.**

*(1)* Determine if the accident site is safe for performance of investigation procedures.

*(a)* If it has been determined that the aircraft accident site is not safe for the preliminary investigation, contact the appropriate state, local, or federal authorities for assistance in controlling the hazard.

*(b)* If it has been determined that the aircraft accident site is safe for the investigation procedures, continue with preliminary investigation.

*(2)* Ensure accident site security has been properly established.

*(3)* Conduct an on-site briefing of participants, to include the following:

*(a)* Assigning responsibilities to each of the participants (e.g., photographic, witness statements, etc.);

*(b)* Assigning a time and place to meet after the preliminary investigation has been completed; and

*(c)* Passing out any forms, instructions, or other material necessary for participants to accomplish their assigned duties.

*(4)* Determine the circumstances and factors surrounding the condition of personnel aboard aircraft, to include possible medical laboratory analysis, such as the following:

*(a)* Passengers - toxicity; and

*(b)* Crewmembers - drugs, alcohol, etc.

*(5)* Determine the status of fatalities and injured, if applicable, to include the following:

*(a)* Who the medical personnel working at the accident site are/were;

*(b)* Where injured were taken; and

*(c)* Where remains have been taken and if autopsies are required. If autopsies are required:

- Make necessary arrangements
- Provide toxicology kit for crewmember autopsies

*(6)* Determine if mechanical laboratory analysis may be needed and how specimens will be obtained and transported, to include the following:

- Fuel samples
- Oil samples
- Metallurgy tests

*(7)* Ensure that the Emergency Locator Transmitter (ELT) has been deactivated.

*(8)* Ensure that Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR) have been deactivated, if applicable.

*(9)* Obtain the aircraft type, model, N-number, and serial number.

*(10)* Ensure that personal items have been tagged and secured.

*(11)* Obtain any eyewitness and survivor statements, to include the following:

*(a)* Securing copies of statements made prior to the inspectors arrival; and

*(b)* Recording the names, addresses, and phone numbers of any eyewitnesses, survivors, relatives, etc., as applicable.

*(12)* Determine the type of cargo, such as the following:

*(a)* Hazardous materials;

*(b)* Passenger baggage;

*(c)* Livestock; and

*(d)* General cargo.

*(13)* If a fire was involved, determine how the fire was started.

*(14)* Obtain all of the required weather information.

*(15)* Assess the topographical features of the accident site, such as the following:

- Visible damage path
- Actual location of wreckage
- Obstructions

*(16)* Determine if engineering assistance is required.

*(17)* Photograph the wreckage and any area associated with the accident to obtain an overall view of the site.

*(18)* Prepare a wreckage distribution diagram which includes, if appropriate, body distribution.

*(19)* Secure the aircraft records and pilot logbooks, if available.

*D. Perform Wreckage Investigation.*

*(1)* Record external flight control positions (e.g., rudder, elevators, ailerons, flaps, slats, spoilers, stabilizers, tabs, etc.). Tag any parts as necessary.

*(2)* Record all of the data from the cockpit flight control indicators.

*(3)* Document the cockpit instrument readings.

*(4)* Document the condition of cabin/cockpit area.

*(5)* Document the burn pattern, if applicable.

*(6)* Identify and document any structural failures and missing components.

*(7)* Determine and record the amount of remaining fuel.

*(8)* Obtain fuel, oil, and hydraulic fluid samples, as required.

*E. Conclude Field Phase Investigation.*

*(1)* Use NTSB Form 6120.15, Release of Aircraft Wreckage and/or Parts, to release the wreckage to the owner or the owner's designated representative.

*(2)* Use FAA Form 8020-2, Aircraft/Part Identification and Release Tag, to release the wreckage if the occurrence has been downgraded to an incident.

*(3)* Review the witness statements to determine if the following is required:

*(a)* Re-interviewing of important witnesses.

*(b)* Acquiring additional witness statements.

*(4)* Obtain preliminary findings of pathologist, coroner, or medical examiner, including crash injury information, as applicable.

*(5)* Obtain preliminary toxicology results by calling the FAA/Civil Aeromedical Institute (C.A.M.I.) laboratory.

*(6)* Interview injured occupants, if applicable.

**NOTE: Consent of the treating physician may be required.**

*(7)* Obtain injury status of all surviving aircraft occupants, if applicable.

*(8)* Request copies of the activity logs and investigative reports of involved law enforcement agencies, fire fighting, rescue services, and search and rescue organizations, as applicable.

*(9)* Obtain and review copies of pertinent newspaper photographs and other media recordings, to check for items that may require follow-up.

*(10)* Obtain appropriate local maps (city, airport, topographical, aeronautical, etc.) and/or aerial photographs.

*(11)* Obtain data or information from the pilot's last departure point or home base (aircraft loading, refueling, maintenance, pilot's intent, etc.).

*(12)* Review the NTSB Accident Form 6120.4 and all applicable report supplements to ensure that all locally available data is documented or requested. This applies especially to the following:

*(a)* Pilot training, certification, experience, background, medical condition, etc.;

*(b)* Aircraft registration, airworthiness certificates, aircraft records, etc.;

*(c)* Air Traffic Center communications, flight tracking radar plots, etc.;

*(d)* Weather information;

*(e)* Airport conditions at the time of accident; and

*(f)* Condition of pertinent Navigational Aids (NAVAID), Instrument Landing System (ILS), etc.

*(13)* Invite appropriate participants to observe the teardown or testing of retained parts and to participate in other follow-up activities, as applicable.

*(14)* Confirm any agreements made to forward copies of specified documents, records, and manuals directly to the IIC.

*(15)* Obtain the necessary information and documentation needed to fulfill all of the FAA financial obligations, to include the following:

*(a)* Guard services;

*(b)* Assistance from hired personnel;

*(c)* Rental equipment; and

*(d)* Storage and transport of wreckage.

*(16)* Inform the FSDO of the status of the investigation, to include the following:

*(a)* Current findings;

*(b)* Additional required tasks; and

*(c)* Estimated time of return to the FSDO or next destination.

*(17)* For delegated accidents complete NTSB Form 6120.19A within five working days from the date of the accident. Distribute the report as follows:

*(a)* Original to delegating NTSB Field Office; and

*(b)* Copy to AFS-620.

*(18)* For NTSB conducted investigations, obtain a completed copy of NTSB Form 6120-19A from the NTSB IIC and forward the form to the AFS-620.

*(19)* Debrief all FAA participants prior to their departure from the accident site.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task will result in the following:

*(1)* If the accident investigation was conducted by the NTSB, completion of the reports requested by the NTSB group chairman.

*(2)* If the accident investigation was delegated to the FAA, completion of NTSB Form 6120-4 and required supplements. Do not release the report until all FAA deficiencies uncovered in the investigation have been reviewed and comments made by the appropriate manager.

*(3)* A letter that includes recommendations for accident prevention. Distribution should be in accordance with FAA Order 8020.11, as applicable.

*(4)* A completed FAA Form 8020-16.

*(5)* An assembled and submitted accident investigation report package, per FAA Order 8020.11.

*(6)* Distribution of the accident reports in accordance with FAA Order 8020.11.

*(7)* Submittance of a Malfunction or Defect (M or D) Report, or a Service Difficulty Report (SDR), if the accident is determined to be maintenance or service related.

*C. Document the Task.* Place a copy of all aircraft accident investigation related material in the appropriate FSDO file.

# CHAPTER 227. EVALUATE APPLICANT'S REFUELING PROCEDURES

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3356

*B. Avionics:* 5356

**3. OBJECTIVE.** This chapter provides guidance for evaluating an applicant's refueling procedures and facilities.

**5. GENERAL.**

*A.* An applicant must have procedures for handling and dispensing aircraft fuels. The following must be included as components of the applicant's manual:

- Dispensing equipment procedures
- Electrostatic protection procedures
- Contamination protection procedures
- Related recordkeeping procedures

*B.* The applicant's manuals must include procedures for vendors and contractors. Title 14 of the Code of Federal Regulations (14 CFR) does not establish standards for fueling facilities, but this does not relieve the applicant of overall responsibility for conducting those operations within established industry standards.

**7. FUELS.**

*A. Aviation Gasoline (AVGAS).* The naming system for the grades of aviation gasoline is derived from the general term "AVGAS" followed by the grade marking. The grades are identified by their performance numbers, as recognized by all military and commercial specifications, e.g., 80, 100LL, and 100.

*(1)* The naming system for AVGAS grades is printed on all containers in white letters and numbers on a red background.

*(2)* Storage containers are also marked with a circular band around the piping, the color of which matches the dye in the AVGAS flowing through the line. The dyes are red for AVGAS 80, blue for AVGAS 100LL, and green for AVGAS 100. A minimum 4-inch wide band is recommended. If the pipeline is painted the color of the AVGAS, then no banding is needed.

*B. Jet Fuels.* The classifications of aviation turbine fuels are universally referred to as "jet fuels."

*(1)* The naming system for the jet fuel is printed on all containers in white letters on a black background to distinguish it from aviation gasoline.

*(2)* Examples of jet fuel storage container markings include the following:

*(a)* Jet A fuel containers marked with a single 4-inch wide (minimum) black band around the piping;

*(b)* Jet A-1 fuel containers marked with two 4-inch wide (minimum) black bands; and

*(c)* Jet B-1 fuel containers marked with three 4-inch wide (minimum) yellow bands.

**9. GEOGRAPHIC CONSIDERATIONS.** Inspections of contract fueling facilities by the office having the geographic responsibility must be coordinated with the certificate-holding district office (CHDO).

**11. REVIEWING THE MANUAL.** Aviation safety inspectors (ASI) (maintenance) must determine whether the applicant's manual contains appropriate instructions for storage and dispensing of aviation fuels. The instructions must be in accordance with current industry standards.

**13. INSPECTING THE FACILITIES.** The ASI (maintenance) are responsible for ensuring that the applicant's facilities comply with the manual procedures and established industry standards. For contracted services, it is still the applicant's responsibility to ensure adherence to their manual procedures and standards.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 121, 125, 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 coordination with the applicant.

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

*A. References:*

- 14 CFR part 173
- Advisory Circular (AC) 150/5230, Aircraft Fuel Storage, Handling, and Dispensing on Airports, current edition
- National Fire Protection Association (NFPA) Pamphlets 407 and 70
- FAA Order 8300.10, appropriate certification chapters

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review the Applicant's Manual.* Ensure that the manual indicates whether services will be performed by the operator or contracted out.

*(1)* Review the applicant's manual to ensure that it defines the following:

- Lines of authority and responsibilities
- The applicant's training program
- The vendor's training program, if applicable

*(2)* Ensure that the manual contains procedures for the following:

- Inspection of incoming fuels
- Elimination of fuel contamination
- Use of dispensing equipment
- Refueling and defueling, by specific make and model of aircraft

*(3)* Ensure that the manual includes procedures for record retention and ongoing inspections of the following:

- Fuel (millipore checks, etc.)
- Storage facilities and dispensing equipment
- Filters
- Safety equipment
- Training programs for servicing personnel
- Individual training records
- Vendors (in accordance with applicant's program)

*(4)* If the manual is acceptable at this point, continue on to the facilities inspection. If the manual is unacceptable, return it to the applicant for corrections and/or revisions.

*B. Inspect the Facility.*

*(1)* Ensure that:

*(a)* Personnel training requirements are documented and current;

*(b)* Training is conducted according to the manual curriculum;

*(c)* Piping is marked and color coded to identify fuel type and grade; and

*(d)* Control/cutoff valves are clearly marked with instructions for emergency use, e.g., on/off.

*(2)* Ensure that the fuel farm/storage area provides for the following:

- Proper security (fenced and posted)
- Proper display of “Flammable” and “No-Smoking” signs
- Markings to identify type/grade of fuel

*(3)* Ensure that the equipment includes the following:

- A positive low point sump
- Adequate fire extinguishers

*(4)* Ensure that fuel filters/filter separators contain, at a minimum, the following:

- An inlet strainer
- Inflow and outflow filter/separators sized to match maximum pump flow capacity
- Differential pressure check system
- Positive water defense system
- Sump drain with outlet located to facilitate capture of outflow
- Fuel sampling (millipore or equivalent) fittings downstream of all filters and filter/separators

*(5)* Ensure that hoses, nozzles and outflow connectors are:

*(a)* Specifically designed and tested for delivery of aviation fuels;

*(b)* Controlled by spring-loaded, non-bypassable automatic (deadman) fuel flow cutoff valves;

*(c)* Equipped with dust cap or other feature that will minimize contaminant introduction into fuel/system;

*(d)* Equipped with non-bypassable 100 mesh nozzle/connector screens; and

*(e)* Color coded to identify fuel type.

*(6)* Ensure that electrical equipment, switches, and wiring are of a type or design approved for use in hazardous locations (explosion proof, e.g., free of exposed conductors, contacts, switches, connectors, motors, etc.).

*(7)* Verify that grounding and bonding equipment ensures that piping, filters, tanks, and electrical components are electrically bonded together and interconnected to an adequate electrical ground. The system should have ground wires, bonding wires, and clamps adequate to facilitate prompt, definite electrical ground connection between fueler/pit/cabinet, grounding system, and aircraft being fueled.

*(8)* Ensure that fuel tenders and fueling pits have the following:

*(a)* Appropriate markings displayed, e.g., “DANGER,” “FLAMMABLE,” “NO SMOKING,” fuel grade, standard hazardous material placard, filter due dates, and emergency fuel shutoff;

*(b)* Appropriately placed fire extinguishers; and

*(c)* Air filter/spark arrestor and a leak-free exhaust system terminating in a standard baffled original equipment type muffler, if equipped with internal combustion engine.

*C. Debrief Applicant.* If any deficiencies are noted, discuss possible corrective actions.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Certification Task.* Successful completion of this task will result in continuation of the certification task in accordance with the appropriate certification process.

*C. Document the Task.* File all supporting paperwork in the applicant's office file.

# CHAPTER 241. APPROVE AREA NAVIGATIONAL SYSTEMS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

- *Avionics:* 5432

**3. OBJECTIVE.** This chapter provides guidance for approving area navigational systems.

**5. GENERAL.** The aviation safety inspector (ASI), may need to refer to specific advisory circular(s) (AC) and regulations for individual systems in order to accomplish this approval.

*A. Approvals.* Field approval for an Area Navigation System (RNAV) should not be considered unless the applicant has provided previously approved data. This data must be in the form of a Type Certificate (TC) or Supplemental Type Certificate (STC) for an airplane or rotorcraft of like or similar configuration using approved system components.

*(1)* For Title 14 of the Code of Federal Regulations (14 CFR) part 121 operators, inertial navigation systems and dopplers must meet the requirements specified in 14 CFR part 121, appendix G, before formal approval. Under these requirements an STC must be obtained by the applicant.

*(2)* Installation approvals of other types of area navigation equipment should be obtained with an STC. However, approval can also be obtained by submission of substantiating data with either an FAA Form 337 or an air carrier engineering authorization.

*(3)* The applicant must furnish all of the installation data necessary to determine the adequacy of the installation. Such data should include the following:

- Manufacturer's instructions
- Electrical schematics and failure protection
- Installation information and/or photographs
- Substantiation of structural changes
- Determination of capability of electrical system and failure protection to handle additional load
- Any other data determined necessary for approval

*(4)* FAA approved manufacturer service bulletins which lists approved instructions for the installation of certain RNAV may be used.

*(a)* In some cases, the facility making the installation has demonstrated its ability to install this equipment on a representative number of similar type installations through field approvals.

*(b)* References to previous approvals on FAA Form 337 would constitute previously-approved data and may not require a separate field approval. In this case, a letter from the Flight Standards District Office (FSDO) or General Aviation District Office authorizing the installation facility to perform similar installations would be appropriate.

*(c)* Alterations which do not differ appreciably from previously-approved changes may not require new or additional approval.

*B.* An installation may be approved for Visual Flight Rules (VFR) operation after meeting the provisions discussed above. The aircraft should be placarded to limit the use of the RNAV to VFR only, unless the aircraft itself is limited to VFR.

*C.* Systems do not require VFR approval before IFR approval. An application for Instrument Flight Rules (IFR) approval should contain data substantiating that the equipment and installation meet the criteria in AC 90-45, appendix A, Approval of Area Navigation Systems for Use in the U.S. National Airspace System, current edition.

*D. Original VFR Approval Changes to IFR Approval.* Operators have installed RNAV's in a variety of aircraft for use in VFR operations only. Operators have the option of upgrading these systems to allow for IFR operations as well.

*(1)* When such a request is received, an FAA Form 337 should be prepared on which the approval for IFR operations will be properly documented. Item 8 of FAA Form 337 should provide at least the following information:

- Reference to FAA Form 337 which recorded the original VFR RNAV installation
- Data to confirm that the requirements of AC 90-45, appendix A, paragraphs 2 and 3, have been met
- If a flight test is conducted, a statement to document the modes of IFR operation for which the system is being approved

*(2)* The data approval stamp, properly completed, should be placed in block 3 of FAA Form 337.

*(3)* If the aircraft has an FAA-approved flight manual, a supplement to the manual may be prepared and submitted for approval, in accordance with regional procedures.

*(a)* An additional copy of FAA Form 337 detailing the original installation must accompany the flight manual supplement approval request.

*(b)* The date of the flight manual supplement must not be later than the approval for return to service date, as shown on FAA Form 337.

*(4)* If the aircraft does not have an FAA-approved flight manual, then information on equipment operating limitations and manufacturer's operating instructions must be provided to the pilot by means of a placard.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent
- Identification and authorization to perform field approvals by the regional Flight Standards Division

*B. Coordination.* Engineering assistance should be obtained for a field approval unless the aviation safety inspector (ASI) has previous experience with area navigation installations and feels competent to make such an approval.

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

*A. References (current editions):*

- Title 14 CFR part 121, appendix G
- Advisory Circular (AC) 20-101, Omega and Omega/VLF Navigation Systems Approvals for Use in the Conterminous United States and Alaska
- AC 20 121, Airworthiness Approval of Airborne Loran-C Systems for Use in the U.S. National Airspace System
- AC 25-4, Inertial Navigation Systems
- AC 90-45, appendix A, current edition, Approval of Area Navigation Systems for Use in the U.S. National Airspace System
- AC 120-31, Operational and Airworthiness Approval of Airborne Omega Radio Navigation Systems as a Means of Updating Self-Contained Navigation Systems
- AC 120-33, Operational Approval of Airborne Long-Range Navigation Systems for Flight Within the North Atlantic Minimum Navigation Performance Specifications Airspace
- AC 120-37, Operational and Airworthiness Approval of Airborne Omega Radio Navigational Systems as a Sole Means of Long Range Navigation Outside the United States
- AC 121-13, Self-Contained Navigation Systems (Long-Range)
- FAA Order 8300.10, vol. 2, ch. 1, Perform Field Approval of Major Repairs and Major Alterations

*B. Forms:*

- FAA Form 337, Major Repair and Alteration

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Follow the Procedures Detailed in the Applicable AC(s).*

*B. Review the Operator's Data.* Review STC(s) and installation data, as applicable. Extra consideration must be given to the following:

*(1)* Manufacturer's instructions and limitations, including necessary modification and calibration of all units in the system and previously installed equipment.

*(2)* Interface with auxiliary equipment, sensor inputs, meter loading and sensitivity, etc.

*(3)* Any reasonable probable failure of the equipment which would cause a flight hazard or affect the normal operation of required equipment to which it is connected.

*(4)* Display location.

*C. Conduct Inspections, as necessary.*

*(1)* Conduct a conformity inspection to ensure the installation conforms to the approved data.

*(2)* Monitor the ground operational/functional check performed by the installing agency.

*(3)* Ensure that the aircraft is appropriately placarded regarding the limitations of the equipment.

*D. Review FAA Form 337.*

*(1)* Ensure that certification dates of flight and/or bench tests are provided.

*(2)* Ensure that limitations on types of approval are clearly stated in block 8 of FAA Form 337 and on any required approved operations specifications.

*E. Review the Operator Training Programs.* Ensure that the operator establishes training programs on the new equipment and reviews the existing programs on associated equipment. In addition, accomplish the following:

- Conduct spot checks of the training records
- Observe the actual training sessions
- Ensure that the training emphasizes the new equipment, new maintenance techniques, and new procedures and standards

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B.* Completion of this task may result in the following:

- Approval of the installation of the equipment
- If the facility making the installation has demostrated its ability to install the equipment on a representative number of similar type installations through field approvals, an approval letter sent by the FSDO or General Aviation District Office authorizing the installation facility to perform similar installations

**9. FUTURE ACTIVITIES.** None.

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# CHAPTER 18. CONDUCT A REEXAMINATION TEST OF A MECHANIC OR AN INSPECTION AUTHORIZATION UNDER TITLE 49 OF THE UNITED STATES CODE

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3532

*B. Avionics:* 5532

**3. OBJECTIVE.** This chapter provides guidance and describes procedures for determining whether an airman of questionable competence is qualified to exercise the privileges of a particular certificate or rating.

**5. GENERAL.**

*A. Authority.* Title 49 of the United States Code (49 U.S.C.) § 44709 (formerly 609 of the FA Act of 1958) authorizes the Administrator to reexamine any airman at any time. If an airman fails to comply with a request for reexamination, § 44709 provides legal procedures to enforce reinspection or reexamination. Punitive enforcement action may be undertaken during the reexamination process, as necessary. FAA Order 2150.3, Compliance and Enforcement Program, contains detailed information on the enforcement aspects of § 44709 actions.

*B. Cause for Reexamination.* The reconsideration of an airman's competence is a serious issue and requires that there be ample cause. In most cases, a reexamination will follow the investigation of an accident or incident apparently caused by the airman's incompetence.

**7. BASIS FOR REEXAMINATION TEST.** The aviation safety inspector (ASI) will determine whether a reexamination test is necessary based on personal knowledge, reliable reports, or evidence obtained through an accident, incident, or enforcement investigation.

*A. Notification.* The ASI will notify the airman by letter that a reexamination is necessary. The letter must be sent via certified mail and include a return receipt. The letter should state that the Federal Aviation Administration (FAA) is promoting air safety by ensuring the airman's competence through reexamination of the applicable skills and knowledge. In no way should it suggest that the FAA considers the reexamination a punishment for an act the airman may have committed.

*B. Contents of Reexamination Letter.* The reexamination letter must specify the following:

*(1)* The reasons for the reexamination, such as an accident, incident, or occurrence;

*(2)* The specific certificate and/or rating(s) in question;

*(3)* The specific subject area(s) or skill(s) under review, if appropriate;

*(4)* The type of reexamination (knowledge, oral, practical);

*(5)* The category and class of aircraft required, as applicable;

*(6)* The location of the district office where the reexamination will take place (typically left to the discretion of the airman); and

*(7)* A reasonable time limit for the accomplishment of the reexamination. The reexamination normally occurs within 15 days after the airman receives the letter of notification.

**9. SPECIAL CONSIDERATIONS.**

*A. Handling an Airman's Response to a Reexamination Letter at an Office Other than the Requesting Office.* In most cases, the office issuing the reexamination letter conducts the reexamination test and undertakes any needed enforcement action. However, an airman may contact a different district office. In such a case, the receiving district office must contact the requesting office.

*(1)* Immediately upon scheduling the reexamination test, the ASI must inform the requesting office of the appointment and request a copy of the original reexamination letter;

*(2)* After completion of the test, the receiving office forwards a copy of the test results to the requesting office; and

*(3)* If enforcement action is necessary as a result of the test, the ASI who conducted the reexamination advises the office manager. The requesting and receiving office managers should coordinate responsibility for the enforcement action. See FAA Order 2150.3.

*B. Airman Scheduling Appointment at a Later Date.* An airman may request an appointment for the reexamination beyond the time limit stated in the letter. The airman either

must schedule the reexamination within a reasonable time, or place the certificate and/or rating on temporary deposit at the district office. If the airman chooses temporary deposit, an ASI issues a 30-day temporary airman certificate with specific limitations. The Airmen Certification Branch, AFS-760, should be notified if the certification or authorization is placed on temporary deposit.

*C. Airman Refusal to Submit to Reexamination.* If the airman does not submit to a reexamination within the stated time limit, the investigating district office shall initiate emergency enforcement action to suspend the airman's certificate.

*(1)* The ASI should fill out section A of FAA Form 2150-5, Enforcement Investigation Report, citing 49 U.S.C. § 44709. Any documentation supporting the need for reexamination, a copy of the original notification letter, and any evidence of the efforts made to obtain voluntary reexamination should be attached. The investigating district office shall forward a copy of FAA Form 2150-5 through channels to the regional counsel.

*(2)* The regional counsel will continue enforcement action if the evidence submitted is sufficient to establish that the airman is not qualified to hold the certificate or ratings, or that air safety and the public interest require such action.

*(3)* This emergency order suspends the certificate, ratings, or authorization until the airman agrees to reexamination and proves qualified to continue to hold the certificate and exercise its privileges.

*D. Voluntary Cancellation of Certificate, Rating, or Authorization.* The airman may volunteer to surrender the certificate in question for cancellation. If this occurs, the airman has no re-issuance rights other than passing all knowledge, oral, and practical tests.

**11. REEXAMINATION FOR A MECHANIC CERTIFICATE.** To conduct a reexamination test, use FAA Form 8610-2, Airman Certificate and/or Rating Application. The reexamination should be accomplished according to the appropriate practical test standards for the certificate or rating involved. The ASI conducting the reexamination test should hold the same ratings for which the airman is being tested.

*A. Extent of Reexamination.* The ASI should test the airman only in the areas specified in the letter of reexamination; but the ASI may note other deficient areas during the reexamination that may constitute reason for failure of the test. If either situation occurs, the ASI should discontinue the reexamination and inform the airman that he or she has failed the test based on the deficiency noted.

*B.* The ASI may conduct the reexamination using an oral or knowledge test if the area to be reexamined is one of knowledge rather than of skill. The ASI may design the knowledge test or seek assistance from a specialist in the Operations Standards Development Section, AFS-631. In addition, AFS-631 specialists are available to conduct the retest, as requested by the ASI.

*C. Standards.* The airman must meet the appropriate practical test standards for the applicable certificate or rating. The airman cannot be tested to a more difficult standard than initial certification requires. The field office conducting the reexamination may select a Designated Mechanic Examiner (DME) to conduct the test, for appropriate compensation.

**13. REEXAMINATION FOR AN INSPECTION AUTHORIZATION.** The reexamination should be given according to testing standards appropriate for the authorization.

*A. Extent of Reexamination.* The ASI should test the airman only in the areas specified in the letter of reexamination. If the suspected deficiency is a skill rather than knowledge, consideration should be given to reexamination for a mechanic certificate.

*B. Knowledge Reexamination.* The field ASI may design the knowledge test or seek assistance from a specialist in AFS-631.

**15. REEXAMINATION RESULTS.**

*A. Airman Satisfactorily Completes Reexamination.* Upon successful completion of the reexamination, the ASI will issue a letter of results to the airman. If the airman's certificate was on temporary deposit, it will be returned to the airman. The airman then may continue to exercise the privileges of the certificate and/or rating.

*B. Airman's Performance Is Unsatisfactory.* If the reexamination test was unsatisfactory, the ASI will issue a letter of results. The airman must be informed in detail of each deficiency and the pending enforcement action. Legal enforcement action must be taken to revoke the airman's certificate, rating, or authorization. See FAA Order 2150.3, chapter 8.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites.* This task requires knowledge of Title 14 of the Code of Federal Regulation (14 CFR) part 65.

*B. Coordination.* This task may require coordination with the ASI (operations). It may also require coordination with regional counsel and other Flight Standards district offices (FSDO).

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

*A. References:*

- 14 CFR parts 1, 13 and 65
- FAA Order 2150.3, Compliance and Enforcement, current edition
- AC 65-19, Inspection Authorization Study Guide, current edition

*B. Forms:*

- FAA Form 2150-5, Enforcement Investigative Report
- FAA Form 8060-4, Temporary Airman Certificate
- FAA Form 8610-1, Mechanic's Application for Inspection Authorization
- FAA Form 8610-2, Airman Certificate and/or Rating Application

*C. Job Aids:*

- Figure 18-1, Letter of Notification of Reexamination
- Figure 18-2, Letter of Results

### 5. PROCEDURES.

*A. Need for Reexamination Test.* Determine if a reexamination test is necessary. If a reexamination test is required, send a letter of notification to the airman.

*(1)* Ensure that an airman scheduling a reexamination test provides the ASI with the following information:

*(a)* The office and person who issued the reexamination letter and the reasons for the reexamination;

*(b)* The certificate and/or ratings being reexamined;

*(c)* The kind of aircraft specified, if applicable;

*(d)* Any areas of special emphasis; and

*(e)* The time limit (date) for completing the examination.

*(2)* Ask the airman to bring the letter of notification to the reexamination.

*(3)* Request a copy of the original letter from the issuing district office, if applicable.

*B. Schedule Appointment.* Schedule a date, time, and location for the reexamination test.

*(1)* If the airman's knowledge is in question, administer the knowledge test and obtain the results before scheduling the oral and practical tests.

*(2)* If the requested date is beyond the time limit in the letter, and the delay is excessive or unjustified, accomplish one of the following:

*(a)* Suggest that the airman attempt to make the appointment within the time limit.

*(b)* Recommend that the airman place the certificate on temporary deposit.

*(3)* If the airman refuses to comply with either option, advise the airman that emergency legal enforcement action will be initiated to suspend the certificate or rating.

*(a)* Refer to FAA Order 2150.3 for emergency suspension procedures.

*(b)* If another district office issued the reexamination letter, advise that office of the situation. If another office is handling the enforcement investigation, forward any records of telephone conversations, visits, and other evidence needed for the enforcement report.

*(4)* If another office issued the letter of notification, inform that office of the date, time, and location of the reexamination.

*C. Prepare the Reexamination Test.*

*(1)* Determine which subject areas and related tasks are to be examined. If a knowledge test is required, devise the test or contact AFS-631 for assistance. If oral and practical tests are required, identify the related tasks. If a DME will administer the oral and practical tests, discuss the tasks to be tested with the DME.

*(2)* Prepare an agenda for the reexamination appointment. At the appointment, collect the airman's documentation.

*(a)* Compare the airman's copy of the letter of notification to the district office copy to verify that they are the same.

*(b)* Assist the airman in completing the application. Review the application for accuracy.

*(c)* Inspect acceptable forms of identification to establish the airman's identity.

- For an inspection authorization, have the airman complete blocks 1 through 4b on FAA Form 8610-1. Indicate in block 12 (Remarks) that the application is for a reexamination of an inspection authorization and print “44709 Retest” across the form.
- For a mechanic, have the airman complete section I of FAA Form 8610-2 and sign in section IV. Mark the certificate or ratings being tested in the header of the form. Indicate that the application is for a re-examination of a mechanic under Title 49, U.S.C. on the line labeled “Specify Rating” and print “44709 Retest” across the form. Use the “Remarks”section on the back of the application to identify subjects to be tested during the oral and practical test.

*(d)* If there is a problem with the application, the aircraft documents, or the airman's identity, return the application and any documentation to the airman. Explain what must be corrected before the reexamination test can be conducted.

*D. Conduct the Test.*

*(1)* Review with the airman the areas to be covered in the reexamination. Resolve any questions or concerns the airman may have.

*(2)* Conduct the reexamination test according to the agenda, using the devised test and practical test standards, and any related tasks.

*(a)* If a knowledge test is required, record the results in the “Remarks” section of the application; and

*(b)* If oral and/or practical tests are required, the administering ASI should use the reverse side of the FAA Form 8610-2 to record the results.

*(3)* Upon completion of the test, inform the airman immediately of the results and the options open to the airman.

**7. TASK OUTCOMES.**

*A. File a Completed PTRS Data Sheet.*

*B. Satisfactory Reexamination.* If the airman's performance was satisfactory, issue a letter of results indicating the satisfactory status of the rating or certification (figure 18-2).

*(1)* If another office originally issued the letter of notification, inform that office of the results and forward a copy of the letter of results.

*(2)* If the airman's certificate or authorization is on temporary deposit pending the results of the reexamination, return the certificate or authorization immediately.

*C. Unsatisfactory Reexamination.* If the airman's performance was unsatisfactory and a repeat test would be inappropriate, have the airman surrender the certificate, rating, or authorization for cancellation or begin legal enforcement action to revoke the certificate, rating, or authorization. (See FAA Order 2150.3.)

*(1)* Inform the airman that the certificate, rating, or authorization can be reissued only after the airman has passed all knowledge, oral, and practical tests.

*(2)* If the airman refuses to comply, advise the airman that emergency legal enforcement action will be taken to revoke the certificate or rating.

*(3)* If another office requested the reexamination, forward a copy of the results to that office. If enforcement action is required, inform the district office manager so that the requesting and receiving offices can coordinate.

*D. Inspector's Report.* Complete the application as described in FAA Order 8610.4 or AC 65-19, as appropriate. Attach required documentation and forward the completed file to AFS-760.

**9. FUTURE ACTIVITIES.**

*A.* The airman may return for further reexamination, as needed. Follow procedures as above.

*B.* Possible enforcement investigation in connection with the reexamination may be necessary. (See vol. 2, ch. 213, Conduct Violation Investigation.)

**FIGURE 18-1**
**LETTER OF NOTIFICATION OF REEXAMINATION**

FAA Letterhead

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Date

Airman's Name and Address

Dear _____:

Investigation of the *[accident, incident, occurrence, or other event that led to the reexamination]*, which occurred on [*date and time]*, at *[location]*, involving you as a [*describe airman's role*], gives reason to believe that a reexamination of your airman competency is necessary under Title 49 of the United States Code.

Therefore, we request that you appear at or telephone this office no later than 10 days from receipt of this letter to arrange for the reexamination. The reexamination will consist of appropriate *[insert grade of certificate or rating*] practical test maneuvers with emphasis on *[include any special emphasis items]*.

If you elect to take the reexamination at another Flight Standards District Office (FSDO), please advise us by completing and returning the enclosed notification form in the self-addressed envelope which is enclosed for your convenience.

If you do not accept this opportunity for reexamination by the date indicated above, it will be necessary for us to start proceedings to suspend your mechanic certificate and/or inspection authorization certificate unless other arrangements are made. A reasonable later date may be arranged when required by circumstances beyond your control.

Please note that the incident which occurred on [*insert date*], is still under investigation to determine whether enforcement action is appropriate. If enforcement action is to be taken you will be advised in a separate letter.

Inspector [*name of inspector*] is available to discuss this matter and provide any information to assist you.

Signed by Inspector Making Report

_____
District Office Address

Dear Inspector [*name*]:

I have made an appointment with_____Flight Standards District Office for reexamination at _____[*time*] on _____[*date*].

Signed by Airman

**[THIS PAGE INTENTIONALLY LEFT BLANK]**

**FIGURE 18-2**
**LETTER OF RESULTS**

FAA Letterhead

Date

Airman's Name and Address

Dear _____:

This letter is to inform you that a reexamination of your ability to exercise the privileges of *[type of certificate or rating]*, conducted on [*date*], at [*location*], was satisfactory.

- If enforcement action was pending or the airman certificate was suspended pending reexamination, inform the airman that a copy of this letter is being forwarded to the Regional Counsel.

The results of this reexamination are a matter of record and will be forwarded to the Airman Certification Branch, AFS-760 in Oklahoma City, OK.

Signed by Inspector Conducting the Test

# CHAPTER 25. MONITOR AN AIR SHOW/AIR RACE

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3684 Air Show/3685 Air Race

*B. Avionics:* 5684 Air Show/5685 Air Race

**3. OBJECTIVE.** This chapter provides guidance for ensuring that those aircraft, authorized to participate in an air show or air race, comply with regulatory requirements and maintain the highest possible standards of safety.

**5. GENERAL.** The surveillance of air shows and/or air races is mainly an operations function. Aviation safety inspectors (ASI) (airworthiness) will work closely with ASI's (operations) in the surveillance of these aviation events.

*A. ASI Duties.* The airworthiness ASI's primary functions are to ensure the continued airworthiness of participating aircraft, monitor the safety practices of participating individuals, and ensure compliance with waivers and authorizations. The assigned ASI's duties include:

- Preseason evaluation meeting
- Evaluation of waivers and authorizations
- Recommendation of issuance or denial
- Air show/race surveillance
- Review of airman and aircraft certification

*(1) Review of Certification.* The review of airman and aircraft certification involves three main responsibilities:

*(a)* Review of the aircraft records to ensure that the state of inspection is current, if previous arrangements were made with the operator prior to the arrival of the aircraft at the show;

*(b)* Examination of the general condition of the aircraft; and

*(c)* Examination of the packing records of emergency parachutes to determine the status of inspection and overall condition.

*(2) Advance Notification.* To avoid last minute delays, the ASI should have the air show coordinator remind the participants to have the appropriate aircraft and packing records ready for inspection before the show. Early contact with the organizers of air show events is encouraged so that informational activities and accident prevention strategies can be planned.

*(3) Responsibility for Safety.* While the show sponsor is responsible for crowd control, ASI's should keep in mind the safety of the spectators. Any safety-related deficiencies shall be brought to the attention of the show/race monitor immediately.

*B. ASI Authority.*

*(1)* Although the ASI's authority is not limited to the following, the ASI is authorized to:

*(a)* Change the effective time and date of the waiver after proper coordination with the appropriate air traffic facility;

*(b)* Add performers to the Schedule of Events if all terms of the certificate of waiver or authorization can be met; and

*(c)* Cancel or delay any acts if it is deemed necessary in the interest of safety.

*(2)* Because of fluctuating weather conditions, sometimes participants will be unable to perform their normal routines. ASI's should avoid canceling an act if it is possible to cancel parts in order to allow the demonstration to continue in a modified form.

*(3)* Aviation events normally operate on very tight schedules; therefore, ASI's should not interrupt events except to address safety-related issues requiring immediate attention.

*(4)* During air shows and air races, ASI's will have frequent contact with the general aviation community. ASI's are encouraged to present a positive image.

*C. Aircraft Used in Parachute Operations.*

*(1)* Aircraft engaged in sport parachuting operations must be operated in accordance with the rules prescribed in Title 14 of the Code of Federal Regulations (14 CFR) part 91. Additionally, large aircraft may be subject to the applicability of 14 CFR part 125.

*(2)* Aircraft involved in parachute jumping operations may have been modified to accommodate the jumpers. Such modifications require documentation of approval by the Federal Aviation Administration (FAA).

*D. Special Situations.* For a large or complex event, the regional office may supplement these procedures to cover unique situations. ASI's should contact the Flight Standards District Office (FSDO) of the appropriate region for further guidance.

**7. MILITARY AIRCRAFT.**

*A.* Section 91.203 defines the certification requirements for civil aircraft.

*(1)* In order for surplus military aircraft to operate, they must possess an appropriate and current airworthiness certificate.

*(2)* When an airworthiness certificate is appropriate and when the aircraft does not conform to a type certificate (TC) or aircraft listing (surplus military aircraft), the aircraft must have an experimental certificate issued for exhibition and/or air racing.

*B.* Section 91.319 prescribes the requirements for operating limitations. The original issuance of an experimental certificate is the responsibility of a Manufacturing Inspection District Office (MIDO), but may be delegated to the FSDO. Necessary guidance for the issuance of experimental certificates and the accompanying operating limitations is provided in FAA Order 8130.2, Airworthiness Certification of Aircraft and Related Products, current edition.

*(1)* The operating limitations assigned to the aircraft must include the serial number of the aircraft and must be kept together with the airworthiness certificate. These materials will contain the required maintenance and operational limitations.

*(2)* Limitations will state that the aircraft shall not be flown unless it is maintained and operated in accordance with appropriate military technical publications or manufacturers' instructions for the aircraft. In many cases, the specific publications will be included.

*(3)* The aircraft limitations may also contain a statement to the effect that no person shall operate the aircraft unless the aircraft has had a condition inspection performed within the preceding 12 calendar months in accordance with appendix D of 14 CFR part 43, and has been found to be in a condition for safe operation. Within the record of the inspection, a statement should be included certifying that the aircraft has been inspected on a specific date in accordance with the scope and detail of appendix D of part 43, and found to be in a condition for safe operation. The entry should include the aircraft total time-in-service, and the name, signature, and certificate type and number of the person performing the inspection.

*C.* The ASI should verify that the airworthiness certificate is available and refer to the attached operating limitations for any specific information concerning area of flight, authorized maneuvers for which the aircraft has been tested and approved, type of maintenance necessary, and method of verifying that the aircraft is in a condition for safe operation.

*D.* Surplus military, and U.S. or foreign-manufactured turbine-powered airplanes, must be operated only by those persons authorized by Flight Standards personnel, via a letter of authorization (LOA). It is imperative that ASI's, when handling applications for such experimental exhibition certificates, ensure that the purpose is valid. ASI's should also advise the appropriate geographic FSDO via telephone of the application and furnish that FSDO with a copy of the certificate and operating limitations provided to the operator.

*E.* ASI's monitoring aviation events where a military jet aerobatics demonstration will be performed, must have satisfactorily completed on-the-job training in a military aviation event. This training should include participation in the feasibility determination, the preseason evaluation meeting, waiver preparation, and air show surveillance. District offices with no ASI who meets the above qualifications, should contact the regional air show coordinator to request training by a qualified ASI from another district office.

**9. INTEROFFICE COORDINATION.** District office managers should monitor air show activity within their geographical area regularly and communicate any significant issues to the regional air show coordinator. Issues requiring immediate attention (i.e., denial of application for waiver or authorization) should be reported immediately to the appropriate regional air show coordinator, who should forward any necessary information to AFS-802. In order to facilitate future handling of aviation event issues, the sharing of related information among district offices is encouraged.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 43, 65, and 91
- Completion of the Airworthiness Inspectors Indoctrination Course or previous equivalent
- Completion of on-the-job training and participation in the issuance of a certificate or waiver
- Completed surveillance of three aviation events accompanied by a qualified ASI
- For events with military aircraft, completion of on-the-job training in a military aviation event

*B. Coordination.* This task requires coordination with Operations ASI's, and may require coordination with regional specialists.

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

*A. References (current editions):*

- 14 CFR parts 1, 61, 103, 105, and 125
- FAA Order 8130.2, Airworthiness Certification of Aircraft and Related Products
- AC 91-45, Waivers: Aviation Events
- AC 103-7, The Ultra light Vehicle
- AC 105-2, Sport Parachute Jumping
- AC 125-1, Operations of Large Airplanes Subject to Federal Aviation Regulations Part 125

*B. Forms:*

- FAA Form 7711-1, Certificate of Waiver or Authorization

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review the Certificate of Waiver or Authorization.* Review FAA Form 7711-1 to determine the type of aircraft involved in the activity.

*B. Attend the Pre-Show Briefing.* Discuss any requirements regarding scheduling, inspection of the air show/air race aircraft, and related activities.

*C. Inspect the Participating Aircraft.*

*(1)* Review the aircraft records to ensure the following:

*(a)* The currency of the state of inspection; and

*(b)* Modifications made to aircraft to accommodate sport parachutists have documentation of field approval by the FAA, or a supplemental type certificate (STC).

*(2)* Inspect the aircraft for the following:

*(a)* The aircraft's general condition;

*(b)* Modifications made for the accommodation of sport parachute jumping;

*(c)* Current status of operating limitations for door removal, if applicable. (Consult AC 105-2 for a list of aircraft that have been flight-tested for operating limitations with the door removed); and

*(d)* Airworthiness certificates, registration certificates, and operating limitations, as appropriate.

*D. Inspect Parachutists' Equipment.* Inspect parachutists' equipment to ensure the following:

*(1)* The main parachute has been packed within the previous 120 days;

*(2)* The auxiliary parachute has been packed by a certificated and appropriately rated rigger;

*(3)* The equipment has been manufactured under a TC or Technical Standard Order (TSO), or is a personnel-carrying military parachute;

*(4)* The auxiliary parachute has been packed by a certificated person within the time requirements prescribed by § 105.43;

*(5)* The certificated parachute rigger's seal has been installed properly; and

*(6)* The parachute packs and harness are in good condition.

*E. Brief Air Show/Air Race Inspector-in-Charge.* Bring any safety-related deficiencies to the immediate attention of the ASI in charge of monitoring the air show/air race.

*F. Perform Supplemental Procedures, As Required.* Contact the FSDO of the appropriate region for further guidance, as appropriate.

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B. Document Task.* Coordinate all supporting paperwork with the ASI in charge of monitoring the air show/air race.

### 9. FUTURE ACTIVITIES. None.

# CHAPTER 41. INSPECT SECTION 135.411(a)(1) OPERATOR'S MAINTENANCE RECORDS

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3358

*B. Avionics:* 5358

**3. OBJECTIVE.** This chapter provides guidance for inspecting an operator's aircraft maintenance records under Title 14 of the Code of Federal Regulations (14 CFR) part 135, § 135.411(a)(1).

**5. GENERAL.** Aircraft maintenance records include any record documenting the performance of work on an aircraft. Principal inspectors must inspect an operator's aircraft maintenance records to ensure that the records meet the requirements of 14 CFR.

**7. SURVEILLANCE CRITERIA.** During surveillance of an operator's aircraft maintenance records, the principal inspectors must determine that all of the work was based on instructions, procedures, or information that has been approved previously or accepted by the FAA. Such data could be in the form of:

- manufacturer's manuals
- service bulletins
- service letters
- data included in the operator's approved inspection and/or maintenance programs
- approved engineering orders or authorizations
- airworthiness directives (AD)
- Other accepted documents

**9. IDENTIFYING PERSONNEL.**

*A. Operators Operating Under Inspection Programs.* Operators operating under an inspection program are not authorized to approve aircraft for return to service. Therefore, the name and the certificate numbers of the person performing the work and the person approving the work must be provided.

*B. Operators Operating Under Continuous Airworthiness Maintenance Programs.* In the case of an operator operating under a continuous airworthiness maintenance program, a positive means of identification, such as employee identification number, is required for any person performing or approving work.

**11. RETAINING AIRWORTHINESS RELEASES.**

*A.* Operators operating under a continuous airworthiness maintenance program need only retain the record of each airworthiness release until the work is repeated or superseded by other work or for one year after the work is performed.

*B.* Operators under an inspection program do not require airworthiness releases.

**13. TOTAL TIME-IN-SERVICE RECORDS.** Total time-in-service continues for the life of the aircraft. Engine rebuilding and certifying to zero time-in-service must not be confused with a zero time since overhaul certification. Zero time since overhaul certification does not affect the calculation of total time in service. When an engine is rebuilt to zero time, the total time-in-service is zero.

**15. LIFE-LIMITED PARTS.** Operators must have current status of life-limited items. This record indicates the present accumulated time-in-service of each life-limited item. The operator must be able to verify the accumulated time-in-service of all life-limited items. This is done by providing records for the item showing each segment of its operation in service since its manufacture. This may be accomplished by one of the following:

- A record audit trail providing a record of the time-in-service of the item
- A time audit trail providing a record of continuous time-in-service

**17. RECORDS OF OVERHAUL.** An operator must maintain overhaul records of any item required to be overhauled by the operator's inspection or maintenance program. These records must be maintained until the work is superseded or repeated by work of equivalent scope and detail.

**19. INSPECTION STATUS.** Inspection status defines the work that has been and is scheduled to be performed in accordance with the inspection or maintenance program. The inspection status records must show the following:

- Type of most recent inspection
- The time at which that inspection was performed
- The time since the most recent inspection expressed in terms of hours, cycles, or calendar time

- The scheduled time and type of the next inspection

**21. AD'S.** The operator must maintain the current status of all applicable AD's for the operator's equipment. Some acceptable sources of procedures for compliance with AD's are:

- Service bulletins
- Service letters
- Specific instructions provided in the AD
- Approved engineering orders or authorizations

**23. MAJOR ALTERATIONS AND MAJOR REPAIRS.** An operator is required to retain major alteration and repair records.

**25. REPAIR STATION RECORDS OF WORK PERFORMED ON OPERATOR'S AIRCRAFT.**

*A.* Repair stations performing work for operators are required by regulations to accomplish the work in accordance with the operator's program.

*B.* Repair stations are required to retain records of work for 2 years. Some operators have reported that maintenance records are not always available from repair stations beyond the 2 year retention period. To avoid this situation, operators should be advised to require a copy of the work documentation from the repair station at the time that the work is performed. The operator is always responsible for obtaining and retaining these records required by the Administrator.

## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 91 and 135
- Successful completion of the Airworthiness Inspectors Indoctrination Course or equivalent
- Familiarity with the type operation being inspected

*B. Coordination.*

*(1)* This task requires coordination between the principal inspectors and may be required with AFS-620.

*(2)* If a geographic unit is performing this inspection, coordination with the certificate-holding district office (CHDO) must be maintained.

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

*A. References:*

- 14 CFR parts 39, 43, 65, and 145

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Schedule Inspection.* Inspection schedule is determined, as applicable, by:

- CHDO
- Flight Standards District Office (FSDO)
- Office with geographic responsibility

*B. Review Office File.*

*C. Inspect Maintenance Records.* Ensure that the operator has retained the required maintenance/alteration/inspection records for each aircraft, including airframe, engine, propeller, rotor, and appliances.

*(1)* For operators operating under a continuous airworthiness maintenance program, these records must include the following:

*(a)* A description of the work performed (data acceptable to the Administrator), including date of completion.

*(b)* If the person performing the work is not an employee of the operator, the following personnel data must be provided:

- Name
- Certificate number
- Kind of certificate held

*(c)* The signature or other positive identification of the person approving the work.

*(2)* For operators operating under an inspection program, these records must include the following:

*(a)* A description of the work performed (data acceptable to the Administrator), including date of completion.

*(b)* For the person performing the work, the following personnel data must be provided:

- Name
- Certificate number
- Kind of certificate held

*(c)* The signature and certificate number of the person approving the work.

*D. Ensure that the Operator Has Maintained Records of Airworthiness Releases.*

*(1)* For operators operating under a continuous airworthiness maintenance program, records of airworthiness releases must be maintained until the airworthiness release is repeated or superseded, or for at least 1 year.

*(2)* Operators operating under an inspection program are not required to have airworthiness releases, but are required to maintain their aircraft in accordance with parts 43 and 91.

*E. Inspect the Total Time-in-Service Records.* Ensure that the operator maintains records for total time-in-service for the airframe, engine, propeller, and rotors.

*F. Inspect Life-Limited Parts Records.* Ensure that the operator maintains records for life-limited parts for the following:

- Airframe
- Engine
- Propeller
- Appliances
- Rotor

*G. Inspect Overhaul Record.* Ensure that the operator has records of all parts required to be overhauled that include the time since last overhaul (hours, cycles, or calendar date).

*H. Inspect Inspection Status Records.* Ensure that the operator has records of the current inspection status that include the following information:

- Type, date, and time (hours, cycles, or calendar date) of inspection and next due date
- Aircraft total time-in-service

*I. Inspect AD Records.* Ensure that the operator has records of AD compliance that include the following information:

- The AD number, with its latest revision number and date
- The method of compliance
- The next due date and time of a recurring AD

*(1)* Include the surveillance of AD in all work programs where an operator performs maintenance. Accomplish AD verification by the following methods:

*(a)* Accomplish actual surveillance of the AD. To ensure that the AD is properly complied with, a review of all paperwork such as Environmental Assessment (EA), Engineering Order (EO), workcards, maintenance manual references and service bulletins should be included.

*(b)* Accomplish physical verification of previous AD.

*(2)* Ensure that the PTRS comment code relates to the Air Transport Association of America's aircraft codes of AD being inspected. Include in the comments the numbers of the verified AD and highlight any AD's found in noncompliance.

*J. Inspect Major Alterations and Major Repairs Records.* Ensure that the operator maintains a current record of all major alterations and major repairs.

*K. Inspect Record System.* Ensure that the operator's records are being maintained in accordance with a record-keeping system.

*L. Analyze Findings.* Evaluate all deficiencies to determine if corrective actions will be required.

*M. Debrief Operator.* Discuss the results of the inspection. Advise the operator of deficiencies discovered during the inspection and discuss how to resolve them.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B.* Completion of this task can result in the following:

- If inspection was performed by the office having geographic responsibility, a report of any deficiencies submitted to the CHDO
- A letter from the CHDO informing the operator of the results of the inspection
- Enforcement Investigation Report, as applicable

*C. Document Task.* File all supporting paperwork in the operator/applicant's office file.

**9. FUTURE ACTIVITIES.** None.

# CHAPTER 91. INSPECT PART 141 PILOT SCHOOL AIRCRAFT

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3650

*B. Avionics:* 5650

**3. OBJECTIVE.** This chapter provides guidance for conducting surveillance of a Title 14 of the Code of Federal Regulation (14 CFR) part 141 certificated pilot school to ensure that aircraft, programs, and systems are in compliance with part 141.

**5. GENERAL.**

*A.* It is of the utmost importance that training aircraft be properly maintained. Minor malfunctions that may be controlled by an experienced pilot could place the relatively inexperienced student pilot in a critical situation.

*B.* Training aircraft are subject to greater wear and deterioration because of frequent takeoffs and landings. This is particularly true in aircraft with retractable gear. The engines of training aircraft are also very vulnerable to overheating and rapid cooling damage.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 43, 65, 91, and 141
- Familiarity with the type of equipment to be used by applicant
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

*B. Coordination.* This task will require coordination with aviation safety inspectors (ASI) (maintenance, avionics, and operations).

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

*A. References:*

- 14 CFR parts 45, 47, 133, and 137
- FAA Order 8300.10, Airworthiness Inspector's Handbook; vol. 2, ch. 38, Evaluate FAR Part 91 Operator's Maintenance Records; and vol. 3, ch. 97, Inspect FAR Part 145 Domestic Repair Station

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review any General Aviation Alerts/Weekly Summaries.* Review for trends and problem areas regarding the make(s) and model(s) of aircraft the operator is using in the training program.

*B. Inspect the Aircraft.*

*(1)* Ensure the following:

- The aircraft is properly certificated
- The Airworthiness certificate and registration are properly displayed
- The aircraft is in an airworthy condition for safe operations
- The aircraft are equipped to perform functions appropriate for the course of training

*(2)* Inspect the special purpose equipment installed on the aircraft, such as external load equipment, agricultural dispensing equipment, and modifications for handicapped students, for approved data.

*(3)* Ensure that the equipment installed in aircraft to be used for radio navigation and instrument training is operational and complies with the minimum requirements of 14 CFR part 91, §§ 91.171 and 91.172.

*C. Inspect the Aircraft Maintenance Records.*

*(1)* Inspect the aircraft maintenance and alteration records to determine whether aircraft have a current, appropriate inspection, and meeting 14 CFR requirements. Ensure compliance with applicable Airworthiness Directives (AD) and life-limited parts requirements.

*(2)* Ensure that current weight and balance information is available to the pilot of the aircraft.

*D. Inspect the Maintenance Facilities.* Ensure that the school has access to facilities and equipment sufficient to maintain the school's aircraft.

*E. Inspect Contract Agencies.* If the operator uses contractors, such as repair stations, to perform maintenance, (refer to vol. 3, ch. 97).

*F. Analyze Results.* Review the inspection findings and determine whether the operation is in compliance with regulations.

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B. Completion of this task will result in one of the following:*

*(1)* If all aircraft are found airworthy, the records are in compliance, and the facilities are satisfactory, notify the operator or the operator's representative of the inspection results.

*(2)* If deficiencies are found on the aircraft and/or facilities, provide a written confirmation of the deficiencies.

**9. FUTURE ACTIVITIES.** During future surveillance activities, direct special attention to areas in which deficiencies were found.

# CHAPTER 98. INSPECT PART 145 FOREIGN REPAIR STATION

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3650

*B. Avionics:* 5650

**3. OBJECTIVE.** This chapter provides guidance for inspecting a Title 14 of the Code of Federal Regulations (14 CFR) part 145 certificated foreign repair station.

**5. GENERAL.**

*A.* This inspection will be conducted as a result of a work program requirement, a previous surveillance effort, allegations of improper maintenance, or component failure trends. The inspection, based on these reasons, may be a comprehensive in-depth inspection or may just cover specific areas related to a specific job function.

*B.* The aviation safety inspector (ASI) should carefully review the regulations, identify the applicable sections, and proceed to conduct the inspection for compliance. While conducting the inspection, the ASI should verify that the facility and personnel are capable of performing the maintenance functions as listed in the operations specifications.

*C.* Inspection of a foreign repair station should be done in the same manner as a domestic station, but the use of uncertificated personnel may require additional attention by the ASI to the "return to service process."

*D.* Before the inspection, the Civil Air Authority (CAA) of the country where the repair station is located, should be invited to participate in the inspection, if they so desire. As a courtesy, the U.S. Embassy in the country should be notified.

**7. CONDUCTING THE INSPECTION.** Repair stations can vary from a one-man operation to a large overhaul facility. Based on the size and complexity of the repair station, the certificate-holding district office (CHDO), may need to form an inspection team capable of effectively evaluating all aspects of the operation.

*A. Repair Stations Doing Work Away From a Fixed Location.* Inspections of these stations will be conducted by the Flight Standards District Office (FSDO) where the work is being performed. The ASI from the geographical office performing the inspection should maintain good communications with the repair station's CHDO in matters regarding procedures, manuals, equipment, personnel, etc.

*B. Parts Inspection Procedures.* All incoming parts must be inspected in accordance with the procedures in the certificate holder's manual. In addition the procedures must ensure traceability of all foreign and domestic parts.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR part 145
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent
- Previous experience with part 145 operations

*B. Coordination.* This task may require coordination with other specialties or district offices, the certificate holder, the affected U.S. Embassy, and the CAA of the country involved.

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

*A. References:*

- 14 CFR parts 43, 121, 125, and 135
- Advisory Circulars, as applicable

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Evaluate the Certificate Holder's Documentation.* Inspect the following:

*(1)* Repair station certificates to ensure that:

*(a)* Certificate is displayed in the repair station and is visible to the public.

*(b)* Certificates in the repair station are identical to those in CHDO file.

*(c)* Ratings are appropriate for the work being done.

*(2)* Personnel roster to ensure that:

*(a)* Staffing consists of enough qualified, knowledgeable personnel to perform the work for which the certificate holder is rated.

*(b)* Certificate holder's roster of supervisory and inspection personnel is current and reflects all personnel assigned to these duties.

*(c)* Certificate holder's roster includes all authorized signatures for “Return to Service.”

*(3)* Technical and regulatory data used by the station to ensure that:

*(a)* Technical data is appropriate for the maintenance or alterations to be performed.

*(b)* Data is current, accurate, and complete.

*(c)* Data is in the certificate holder's possession and easily accessible to all personnel.

*(4)* Forms and records to ensure that:

*(a)* Station records are completed and retained as required.

*(b)* Required reports have been submitted, e.g., Malfunction or Defect reports.

*B. Inspect the Certificate Holder's Facilities.* Inspect the following:

*(1)* General housing and facilities to ensure that:

*(a)* Housing and facilities are sufficient for the work being performed for the ratings held.

*(b)* Work areas are situated to protect parts and subassemblies during the work process.

*(c)* General housekeeping is satisfactory.

*(2)* Stockroom to ensure that:

*(a)* Parts and materials are protected against damage and deterioration.

*(b)* Certificate holder has a system for identifying and segregating serviceable, repairable, and rejected parts and materials.

*(c)* Life-limited components are controlled.

*(3)* Special facilities, as applicable, to ensure that:

*(a)* Instrument shop environmental conditions are in accordance with the manufacturers standards.

*(b)* Segregation of components during assembly and disassembly is accomplished using suitable trays, racks or stands.

*(4)* Special tools and equipment to ensure all required items are within calibration criteria, to include traceability to one of the following:

*(a)* The National Institute of Standards and Technology.

*(b)* Standard established by the item's manufacturer.

*(c)* If foreign manufactured, the standard of the country where the item was manufactured, if approved by the Administrator.

**NOTE: Special tools and equipment includes those recommended by the manufacturer of the product or an FAA acceptable equivalent.**

*C. Review of Certificate Holder's Inspection Procedures Manual.* Evaluate the following:

*(1)* Inspection system to ensure that the system is in operation as described in the inspection procedures manual.

*(2)* Manual distribution to ensure:

*(a)* All supervisory and inspection personnel are in possession of the current manual.

*(b)* All other copies of the manual must be current with content of copy in the CHDO.

*(c)* Manual is available to all repair station personnel.

*(3)* Procedures governing work being accomplished away from the repair station, if applicable, to ensure accomplishment per part 145, § 145.51.

*D. Observe and Inspect Maintenance Functions.*

*(1)* Ensure that the performance of work for part 121 and 125 operators is being performed in accordance with the specific operator's manual, per § 145.2.

*(2)* Ensure that maintenance being performed is in accordance with approved procedures.

*(3)* Ensure that maintenance functions being contracted to outside agencies is current with the listing required by § 145.11.

**NOTE: If a previously contracted function is to be done by the repair station, the repair station must be reinspected and must show the capability to meet the requirements to perform that function.**

*E. Conduct Debriefings.* Brief certificate holder on results of surveillance. Discuss any deficiencies and corrective actions.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Completion of this task can result in the following:*

- Successful inspection
- A letter to the certificate holder describing all deficiencies

*C. Document Task.* File all supporting paperwork in the CHDO file.

**9. FUTURE ACTIVITIES.** Schedule and conduct a follow-up inspection, as applicable.

# CHAPTER 115. MONITOR DESIGNATED AIRWORTHINESS REPRESENTATIVE

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

- *Maintenance*: 3677

**3. OBJECTIVE.** This chapter provides guidance for conducting surveillance of Designated Airworthiness Representatives (DAR).

**5. GENERAL.** The aviation safety inspector (ASI), should receive from the designee the following information, as appropriate upon renewal:

*A.* The number of airworthiness certificates issued.

*B.* The number of export airworthiness approval tags issued (FAA Form 8130-3, Export and/or Conformity Certification).

*C.* The number of conformity inspections conducted.

**7. DAR AUTHORITY AND RESPONSIBILITY.**

*A.* The DAR's managing office will ensure that designees perform their authorized functions only within the geographic boundaries of that managing office. However, that managing office may authorize a DAR to perform authorized functions outside of their geographic boundaries, including other countries, on a trip-by-trip basis.

*(1)* Such authorizations must be in writing and issued only if the managing office has the ability to adequately monitor and supervise the DAR.

*(2)* Periods over 30 working days should not be granted unless justification for additional functions warrants an extension. The Federal Aviation Administration (FAA) geographic office, where the work is to be conducted, must concur with the extension.

*(3)* Prior to performing authorized functions in another country, the DAR must notify the Civil Aviation Authority (CAA) of that country in writing. The notification must include the DAR's authorization, anticipated activities, and expected length of stay. The DAR must send a copy of the written notification to the FAA managing office. When practicable, the CAA and FAA notifications will be provided at least 15 days in advance of the DAR's arrival. An informational copy of the authorization will be maintained by the DAR for review by the CAA or their representatives(s) upon request.

*B.* The application forms for the various airworthiness certificates or approvals requesting certifications must be signed by the applicant or the agent. An organization appointed as a DAR should be allowed to sign these certificates only as a repair station, not as a DAR. Any irregularities or deficiencies related to the product certificated, may result in termination of the designee's appointment.

**9. TRAINING REQUIREMENTS.**

*A.* The managing FAA office is responsible for providing indoctrination training for newly appointed DAR. The managing office must also provide on-going training, as needed.

*B.* The managing office will prescribe the formal DAR standardization training course for all designees, within each two-year period.

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of 14 CFR parts 65 and 183
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

*B. Coordination.* This task may require coordination with AFS-633.

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

*A. References (current editions):*

- FAA Order 8000.62, Designated Airworthiness Representatives Qualification Criteria, Selection, and Appointment Procedures
- FAA Order 8130.2, Airworthiness Certification of Aircraft and Related Approvals
- FAA Order 8130.23, Aircraft Certification Service Representatives of the Administrator

*B. Forms:*

- Advisory Circular (AC) Form 8050-72, Export Certificate of Airworthiness Number Assignment Card
- FAA Form 8130-3, Export and/or Conformity Certification

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review Designated Airworthiness Representative's Activity Reports.* Ensure that the requirements detailed in FAA Order 8000.62 are met.

*B. Provide Information and Materials, as Required.* Ensure that materials are provided in accordance with current directives. Provide the necessary FAA forms required for the performance of the designee's authorized function(s). Ensure that the designee is aware of the schedule for the required standardization course.

*C. Maintain a File of Each Assigned Designee's Accomplishments.*

*D. Ensure that the Designee is Performing Only Those Functions within the Limits of the Authorization.*

*(1)* Ensure that functions are performed in accordance with pertinent regulations and related FAA policies, practices, and procedures.

*(2)* Ensure that designees function only within the geographical boundaries of the managing office, except when authorized in writing to function elsewhere.

*(3)* Ensure that the designee visits the managing office within seven days of completion of each certification/approval performed outside the geographic area.

*(4)* Ensure that the designee submits all required documentation for each certification to the managing office within seven days of accomplishment.

*E. Accompany the Designee During an Inspection at Least Twice a Year.* Ensure that satisfactory inspection techniques, methods, and procedures are being used.

*F. Ensure that the Designee Contacts the Managing Office for Direction or Instructions, as Needed.* Ensure that the designee contacts the office prior to the issuance of any airworthiness certificates or export airworthiness approvals for Class One products. Ensure that the designee contacts the office prior to becoming involved in any type certification or supplemental type certification activity.

*(1)* Ensure that the designee refers to FAA Order 8130.2 for procedures pertinent to the accountability of AC Form 8050-72.

*(2)* Ensure that any contact with a foreign airworthiness authority or FAA engineering is made through the FAA managing office.

### 7. TASK OUTCOMES.

*A. File a PTRS Data Sheet.*

*B. Review the Certification Files Forwarded by DAR.*

*C. Evaluate Results of Surveillance.* Document any discrepancies and discuss them with the designee. If no steps are taken by the designee to correct the discrepancies, take the appropriate action, which may include cancellation of the authorization.

**9. FUTURE ACTIVITIES.** Continue surveillance and provide assistance as needed. Inform any designee requiring an undue amount of assistance that FAA resources are limited and that the designation may be terminated should the designee become too much of a burden on FAA personnel resources.

# CHAPTER 128. PROCESS SERVICE DIFFICULTY REPORT

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3325

*B. Avionics:* 5325

**3. OBJECTIVE.** This chapter provides guidance on how to process a Federal Aviation Administration (FAA) Form 8070-1, Service Difficulty Report.

**5. GENERAL.** The completion of a Service Difficulty Report (SDR) requires careful review of the reported discrepancy and supporting data. An effective evaluation of the extent of the problem and its causes is essential for determining corrective action.

*A. Evaluating Operator Report.* The operator submits a Mechanical Reliability Report and may choose the format used for reporting. Title 14 of the Code of Federal Regulations (14 CFR) parts 121 and 135, §§ 121.703 and 135.415 list reportable discrepancies and corresponding regulatory requirements. The inspector must review the submitted report to determine if an SDR is necessary.

*B. Reporting of Significant Problems.* If the initial evaluation indicates a serious airworthiness problem, the inspector should immediately contact AFS-643 (Safety Data Analysis Section) and the Regional office. The appropriate FAA Aircraft Certification Office (ACO) and Aircraft Evaluation Group (AEG) responsible for the product must be informed of the equipment service difficulty and any recommendations for corrective actions. Corrective action recommendations may include the following:

- Airworthiness Directives (AD)
- Product modifications
- Revised inspection techniques
- Directed safety investigations

*C. Checking for Trends.* If the opportunity exists, the inspector should review prior reports for possible trends (e.g., vendor problems, manufacturer equipment problems, training, and/or procedural problems).

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the equipment involved
- Knowledge of the regulatory requirements of 14 CFR parts 121 and 135, as applicable

*B. Coordination.* This task may require coordination with operations inspectors, other district offices, AFS-643, FAA ACO, and appropriate AEG, and equipment manufacturers.

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

*A. References:*

- Parts 43 and 145
- FAA Order 8010.2, Flight Standards Service Difficulty Program, current edition
- Manufacturer's and operator's manuals

*B. Forms:*

- FAA Form 8070-1, Service Difficulty Report

*C. Job Aids:*

- FAA Order 8010.2, Appendix 2

### 5. PROCEDURES.

*A. Review the Operator Report.* Review the submitted report to determine if an SDR is required. Examine the following:

- The level of detail provided
- Applicability of corrective action, if submitted
- Suitability of suggested corrective action
- Programs for routine and non-routine maintenance
- Contractual arrangements
- Training programs
- Enforcement of non-compliance findings

*B. Review the SDR.* If the operator submits a completed FAA Form 8070-1 or acceptable substitute (such as an electronic transmittal), review for completeness and accuracy.

*C. Electronic Transmittal of the SDR.* Maintenance Reliability Reports is now operational and is available to operators. Information and assistance will be provided by AFS-643 to operators desiring to input data electronically. Although optional electronic reporting does not alter the reporting requirements of § 121.703, the electronic transmittal will measurably reduce the time between service difficulties and data base entry.

*(1)* For reports which are submitted electronically, the data base can be updated with supplemental information by revising the original report and submitting it by using the same operator control number. The computer will key in the operator control number and overwrite the original record with the corrected record.

*(2)* For more information concerning electronic transmittals, contact AFS-643 at (405) 954-6494 or write to the following office:

**Supervisor, Safety Data Analysis Section**
**AFS-643**
**P.O. Box 25082**
**Oklahoma City, Oklahoma 73125**

*D. Conduct an Investigation.* If the evaluation indicates that follow-up action is required to determine the cause of the discrepancy, inspect the following areas, as applicable:

- Aircraft, engine, propeller, components, and accessories
- Appropriate maintenance records
- Maintenance procedures
- Training procedures and records
- Vendor sources

*E. Identify and Correct Discrepancies.*

*(1)* If the investigation reveals inadequacies in the operator's maintenance or inspection procedures, ensure that procedures are changed to prevent a recurrence of the discrepancy.

*(2)* If the investigation reveals a lack of training and/or inadequate training, evaluate the training program and incorporate procedural changes to correct the deficient areas.

*(3)* If the investigation reveals a serious manufacturing defect, contact the following immediately:

- The appropriate regional office
- The Safety Data Analysis Section, AFS-643
- The appropriate engineering branch

### 7. TASK OUTCOMES.

*A. File PTRS Data Sheet.*

*B.* Completion of this task may result in the following:

- Follow-up action for discrepancies
- Enforcement action for regulatory noncompliance

*C. Complete FAA Form 8070-1.* Ensure that all related information is complete, including all recommendations and operator's data. Forward the completed package to AFS-643.

*D. Document the Task.* Retain the operator's report and a copy of the SDR in the operator's office file in case any type of follow-up action is needed.

**9. FUTURE ACTIVITIES.** None.

# CHAPTER 131. INSPECT OPERATOR'S MAINTENANCE FACILITY

## SECTION 1. BACKGROUND

**1. PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

*A. Maintenance:* 3619

*B. Avionics:* 5619

**3. OBJECTIVE.** This chapter provides guidance for inspecting an operator's maintenance/contract maintenance facility for regulatory compliance with Title 14 of the Code of Federal Regulations (14 CFR) parts 121, 125, 133, 135 or 137.

**5. GENERAL.** The maintenance inspection is performed to ensure that adequate housing, equipment, spare parts, technical data, and qualified personnel are being utilized to satisfactorily complete all maintenance functions.

**7. PERFORMING THE INSPECTION.**

*A. Equipment Identification.* Inspectors should be aware of the type of aircraft being operated. The operations specifications will identify the type of aircraft authorized for use.

*B. Previous Inspection Reports.* Previous inspection reports, correspondence, and other documents in the district office files should be reviewed to determine if there are any open items or if any areas are identified that require special attention.

*C. Facilities.* The maintenance facility is required to perform maintenance in accordance with the operator's maintenance manuals. The inspector should use these documents to determine what special equipment, housing, and environmental conditions are necessary to perform the work. For example, the manufacturer may require special stands, hand tools, or a dust-free environment to repair a specific item.

*D. Contract Maintenance Arrangements.* If any maintenance will be performed by a contract facility, an inspection must be performed at the contractor's facility. During the inspection the inspector must determine if the contractor has adequate facilities and personnel to perform the contracted work. The inspector must keep in mind that the contract maintenance facility is an extension of the operator's overall maintenance organization. Maintenance performed by the contractor must be in accordance with the operator's approved maintenance program.

*(1)* For inspections of a contract maintenance facility located out of the geographic boundaries of the certificate-holding district office (CHDO), assistance should be requested from the Flight Standards District Office (FSDO) in which the facility is located. A list of contractor management personnel to be contacted can be obtained from the operator.

*(2)* The operator's manuals must be reviewed to determine the levels of maintenance performed at the contract maintenance facility.

*(3)* The contract maintenance facilities should be inspected to ensure that they are properly certificated and rated for the scope of work performed, e.g., aircraft, power plant, propeller, components, and accessories.

*E. Enforcement History.* Inspectors should check the Enforcement Information Subsystem (EIS) to determine if there are any areas that require special attention. If a contract maintenance organization is used, it should also be checked.

*F. Approved Flight Manual.* The approved flight manual for 14 CFR parts 133 and 137 operators, should be reviewed to determine the type of equipment being used. Based on the listed equipment, this review will help determine if the maintenance base has the necessary tools and equipment to service the aircraft and associated devices, e.g., external load devices (rotorcraft) and spraying devices (agricultural operators).

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## SECTION 2. PROCEDURES

### 1. PREREQUISITES AND COORDINATION REQUIREMENTS.

*A. Prerequisites:*

- Knowledge of the regulatory requirements of parts 121, 135, 125, 133, and 137, as applicable.
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent.
- Familiarity with the type of operation being inspected.

*B. Coordination.* This task requires coordination between the assigned Principal Airworthiness Inspectors.

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

*A. References:*

- 14 CFR parts 43, 65, and 145
- SFAR 36
- 49 CFR Part 173
- Operator's maintenance manual
- Operations specifications

*B. Forms.* None.

*C. Job Aids.* None.

### 5. PROCEDURES.

*A. Review the Operator's Data.* Review the following:

*(1)* The district office files to determine if any chronic or open items exist, status of Enforcement Investigation Reports, exemptions, etc.

*(2)* The operator's maintenance manuals to determine the level of maintenance accomplished and the complexity of operation at the maintenance facility

*(3)* The operator's operations specifications to determine the maintenance and inspection program content and complexity

*B. Inspect the Operator's Technical Library.* Ensure that all required technical data is available and current. If data is on microfiche, ensure that readers are available and serviceable. The data must include the following, as applicable:

- Operations specifications
- Operator's general maintenance manual
- Aircraft manufacturers' manuals
- Propeller, appliance, engine, and emergency equipment manufacturer's manuals
- Manufacturer's and vendor's service bulletins/ letters
- Applicable Federal Aviation Regulations
- Applicable Airworthiness Directives
- Applicable type data sheets/Supplemental Type Certificates
- Approved Flight Manual

*C. Inspect the Aircraft Maintenance Record Retention System.* See vol. 3, ch. 42, Inspect FAR Part 121 Operator's Maintenance Records or ch. 44, Inspect FAR Part 135 (10 or More) Operator's Maintenance Records, as applicable.

**NOTE: Sample a representative number of aircraft records to ensure the integrity of the system.**

*D. Inspect the Maintenance Organization.* Ensure the following:

*(1)* Staffing meets maintenance needs based on the complexity of operation.

*(2)* Responsibilities are separated between inspection and maintenance sections.

*(3)* Maintenance and inspection management personnel are qualified.

*E. Inspect the Operator's Maintenance Facilities.* Using the operator's manual as a reference, inspect the following:

*(1)* Parts and storage areas, to ensure:

*(a)* Adequate spare parts are available to support complexity of operation.

*(b)* Receiving inspections are accomplished in accordance with operator's manual.

*(c)* Shelf life-limits are established for items, and that these items are controlled in accordance with operator's manual or manufacturer's recommendations.

*(d)* Components and hardware are properly identified, protected, and classified as to serviceability.

*(e)* Segregation of serviceable and unserviceable components and hardware is maintained.

*(f)* Hazardous materials are suitably segregated and stored.

*(2)* Special tools and test equipment, to ensure:

*(a)* Serviceability and calibration are accomplished in accordance with operator's manual.

*(b)* All required items are serviceable and within calibration criteria, to include traceability to one of the following:

- The National Institute of Standards and Technology
- Standard established by the item's manufacturer
- If foreign manufactured, the standards of the country where manufactured, if approved by the Administrator

*(c)* Appropriate types and quantities are available.

*(d)* Proper storage and protection is utilized.

*(3)* Fuel/oil storage and dispensing facilities, if operated and maintained by operator. (See vol. 3, ch. 135, Monitor Operator's Refueling Procedures.)

*(4)* Deicing chemical storage and dispensing equipment, if applicable. The following must be inspected to ensure compliance with the operator's manual:

*(a)* Chemical storage and dispensing

*(b)* Serviceability of equipment

*(c)* General condition and safety of storage areas

*(d)* Training of personnel in operator's deicing procedures

**NOTE: If deicing services are provided on a contract basis, ensure that the contractor meets the above requirements.**

*(5)* Support shops (avionics, sheet metal, engine etc.), to ensure:

*(a)* All required technical data is current and available. If data is on microfiche, ensure that readers are available and serviceable.

*(b)* Staffing reflects complexity of shop.

*(c)* Personnel are properly trained, qualified, and authorized.

*(d)* Procedures for shift turnover are in place and properly utilized.

*(e)* All required special tooling and equipment is available, serviceable, and within calibration criteria.

*(f)* Maintenance tasks and inspection functions are being accomplished in accordance with operator's maintenance manual.

*(g)* Safety equipment is available and serviceable.

*(h)* Individual shop storage areas are maintained to same standards as main storage area.

*(i)* Work areas do not conflict with each other, e.g., lathe next to avionics repair area.

*(j)* Lighting, ventilation, and general housekeeping are adequate.

*(6)* Hangar facilities, to ensure:

*(a)* Facilities are adequate for work being performed.

*(b)* Staffing reflects the complexity of work being performed.

*(c)* Personnel are properly trained, qualified, and authorized.

*(d)* Procedures for shift turnover are in place and properly utilized.

*(e)* Special equipment and tooling is available, serviceable, and calibrated, if applicable.

*(f)* Safety procedures are established and adhered to.

*(g)* Procedures direct the flow and control of all maintenance and inspection records.

*(h)* Lighting, ventilation and general housekeeping are adequate.

*(7)* Hangar ground support equipment, to ensure the equipment is serviceable and appropriate for the work being performed.

*F. Inspect the Engineering Department, if Applicable.* Ensure the following:

*(1)* Staffing is adequate for complexity of as signed duties.

*(2)* Personnel are qualified.

*(3)* All required technical data is current and available.

*(4)* Engineering orders are accomplished and recorded in accordance with operator's manual.

*(5)* Major repair and alterations are accomplished in accordance with FAA-approved data, (See vol. 2, ch. 1).

*(6)* Major repair reports are retained and available.

*(7)* Major alterations are being reported per 14 CFR § 21.707(b).

**NOTE: Review a representative sample of operator generated Engineering Orders to ensure that the program is being followed and items are being properly categorized (major vs. minor).**

*G. Inspect the Inspection Department.* Ensure the following:

*(1)* Designated staffing is adequate for complexity of operation.

*(2)* Delegated staffing (Required Inspection Items) is at reasonable level.

*(3)* System ensures that inspection personnel are trained, qualified, and properly authorized.

*H. Inspect the Maintenance Control, if Applicable.*

*(1)* Ensure the following:

*(a)* Staffing is adequate for the complexity of the operation and that personnel are trained and qualified.

*(b)* Technical data is available and current.

*(c)* Communications system provides effective communication between all departments and stations.

*(2)* Review the activity/turnover log to look for trends and to evaluate the general effectiveness of the overall maintenance program.

*I. Inspect the Maintenance Production/Planning Control, if Applicable.* Ensure the following:

*(1)* Staffing is adequate for the complexity of the operation.

*(2)* Planning system is effective, e.g., inspection/overhaul scheduling, facility scheduling, parts forecast, personnel requirements, and communication with other departments.

*(3)* The system provides for scheduling corrections of deferred and carryover maintenance items.

**NOTE: Randomly sample a representative number of open and completed work packages to ensure the effectiveness of the system.**

*J. Inspect Aircraft.* Inspect any available aircraft to determine the quality of maintenance being performed. (Refer to vol. 3, ch. 1, Introduction to Aircraft and Equipment, ch. 2, Conduct Spot Inspection of Operator's Aircraft, and ch. 3, Conduct Ramp Inspection of Operator's Aircraft.)

*K. Analyze Findings.* Upon completion of inspection, record all deficiencies noted and determine the appropriate corrective action(s) to be taken.

**7. TASK OUTCOMES.**

*A. File PTRS Data Sheet.*

*B. Completion of this task may result in the following:*

- Letter to the operator confirming results of the inspection
- Enforcement Investigation Reports, as necessary

*C. Document the Task.* File all supporting paperwork in the operator's office file.

**9. FUTURE ACTIVITIES.** If deficiencies are noted during surveillance, schedule a follow up inspection.

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# CHAPTER 7. POWERPLANT REPAIRS

**1. BACKGROUND.** This chapter provides classifications of turbine engine structural parts and the general classifications of engine repairs.

**3. TURBINE ENGINE PART CLASSIFICATIONS.** Although each manufacturer may not use the identical terminology used below, what they use will be equivalent to the following:

*A.* Structural engine parts include the following:

- All frames
- All casings/housings
- Engine mounts and associated engine structures
- Complete rotor assemblies

*B.* Engine frames include the following:

- Front frames or front bearing support
- Compressor rear frame
- Turbine mid-frame
- Turbine rear-frame or rear bearing support

*C.* Engine combustion casings/housings include the following:

- Fan casing
- Compressor, low and high
- Combustor casing/housing
- Turbine casing/housing
- Accessory gear-case housing

**5. ENGINE REPAIR CLASSIFICATIONS.** The following will apply to modular designed turbine engines, non-modular designed turbine engines, and reciprocating engines, as applicable:

*A. Modular Design Turbine Engines.* The following repair classifications will apply:

*(1)* The changing of modules are not considered a major repair.

*(2)* The disassembly of a module may be a major repair. This will be determined by the engine manufacturers repair/overhaul manual.

*B. Non-Modular Design Turbine Engines.* The disassembly of any of the main sections of a turbine engine should be considered a major repair. The main sections consist of the following:

- Fan section
- Compressor section, low and high pressure
- Combustion section
- Turbine section
- Accessory section

*C. Reciprocating Engines.* Major and minor repairs to structural parts of reciprocating engines are classified as follows:

*(1)* Major repairs include the following:

- Welding of crankcases
- Machining operations necessitated by a weld repair
- Crankshaft grinding
- Camshaft re-contouring and similar complex precision machining
- Boring of crankshaft and camshaft bosses
- Machining of oil-pump housings and accessory drive pads following weld repairs

*(2)* Minor repairs include simple machine operations, such as spot facing, lapping and grinding valves, and reaming valve guides in accordance with the manufacturer's overhaul and service instructions.

*D.* Further guidance on major and minor repairs, approved data, and approval for return to service can be found in vol. 2, ch. 1, Perform Field Approval of Major Repairs and Major Alterations.

# APPENDIX 1. ACRONYMS AND ABBREVIATIONS

This appendix contains many acronyms and abbreviations for both old as well as new Airworthiness terms that are used throughout this Handbook. Inspectors can refer to the following alphabetical listing of frequently used acronyms and abbreviations and their meanings when using this Handbook.

| | |
|---|---|
| **14 CFR** | Title 14 of the Code of Federal Regulations |
| **49 U.S.C.** | Title 49 of the United States Code |
| **A/FD** | Airport/Facility Directory |
| **A&P** | Airframe and Powerplant |
| **AAD** | Automatic Activation Device |
| **AAIP** | Approved Aircraft Inspection Program |
| **AC** | Advisory Circular |
| **ACCSS** | air carrier cabin safety specialists |
| **ACE** | aerobatic competency evaluator |
| **ACO** | Aircraft Certification Office |
| **ACR** | airman certification representative |
| **AD** | Airworthiness Directives |
| **ADA** | Airline Deregulation Act |
| **ADF** | automatic direction finding |
| **AEE** | Office of Environment and Energy |
| **AEG** | Aircraft Evaluation Groups |
| **AEM** | Area Equivalent Method |
| **AES** | Automated Exemption System |
| **AFM** | Approved Flight Manual |
| **AFS** | Office of Flight Standards Service |
| **AFS-1** | Director of Flight Standards Service |
| **AFSS** | automated flight service station |
| **AFTN** | aeronautical fix telecommunication |
| **AH** | alert height |
| **AGL** | above ground level |
| **AIDS** | Accident Incident Data Subsystem |
| **Air Oper VIS** | Air Operator Vital Information Subsystem |
| **AIP** | Aeronautical Information Publication |
| **ALS** | Advance Life Support |
| **AMA** | Aviation Mechanic Airframe |
| **AME** | Aviation Medical Examiner |
| **AMG** | Aviation Mechanic General |
| **AMP** | Aviation Mechanic Powerplant |
| **AMTS** | Aviation Maintenance Technician School |
| **ANM** | Seattle Aircraft Evaluation Group |
| **AOD** | Automatic Opening Device |
| **AOG** | Aircraft on the Ground |
| **APP** | Accident Prevention Program |
| **APPM** | Accident Prevention Program Manager |
| **APU** | Auxiliary Power Unit |
| **ARA** | Airborne Radar Approach |
| **ARFF** | Aircraft Rescue and Fire Fighting Equipment |
| **ARINC** | Aeronautical Radio, Inc. |

| | |
|---|---|
| **ASAS** | Aviation Safety Analysis System |
| **ASI** | aviation safety inspector |
| **ASR** | Airport Surveillance Radar |
| **AST** | aviation safety technician |
| **ASTM** | American Society for Testing and Materials |
| **ASW** | Southwest Aircraft Evaluation |
| **AT** | Air Traffic |
| **ATA** | Air Transportation Association |
| **ATC** | air traffic control |
| **ATE** | Automatic Test Equipment |
| **ATP** | airline transport pilot |
| **ATPE** | airline transport pilot examiner |
| **BFA** | Balloon Federation of America |
| **BITE** | Built-In Test Equipment |
| **BLS** | Basic Life Support |
| **CAA** | Civil Aviation Authority |
| **CAB** | Civil Aviation Board |
| **CAIS** | Comprehensive Airmen Information Subsystem |
| **CAM** | Civil Aviation Manuals |
| **CAMI** | Civil Aero Medical Institute |
| **CAMP** | Continuous Airworthiness Maintenance Program |
| **CAN** | Center Area NOTAM |
| **CAR** | Civil Air Regulations |
| **CASE** | Coordinating Agencies for Supplier's Evaluation |
| **CASFO** | Civil Aviation Security Field Office |
| **CASP** | Continuous Analysis and Surveillance Program |
| **CBI** | Computer Based Instruction |
| **CDL** | Configuration Deviation List |
| **CE** | commercial pilot examiner |
| **CFI** | certificated flight instructor |
| **CFR** | Code of Federal Regulations |
| **CG** | Center of Gravity |
| **CHDO** | certificate holding district office |
| **CIRE** | commercial and instrument rating examiner |
| **CM** | Condition Monitoring |
| **CMO** | Certificate Management Office |
| **CMP** | Configuration Maintenance Procedures |
| **CMR** | Certification Maintenance Requirements |
| **COB** | Close of Business |
| **CON MON** | Condition Monitoring |
| **CPL** | commercial pilot license |
| **CPM** | certification project manager |
| **CRW** | canopy relative work |
| **CVR** | Cockpit Voice Recorder |
| **CTA** | control areas |
| **d/b/a** | doing business as |
| **DARS** | Designated Airworthiness Representatives |
| **DAS** | Designated Alteration Station |
| **DBA** | Other Business Names |
| **DER** | Designated Engineering Representative |

| | |
|---|---|
| **DFDAU** | Digital flight dar |
| **DH** | decision height |
| **DME** | distance measuring equipment |
| **DNL** | Decibel Noise Level |
| **DOD** | Department of Defense |
| **DOT** | Department of Transportation |
| **DPE** | designated pilot examiner |
| **DPRE** | Designated Parachute Rigger Examiners |
| **DS** | Discard |
| **EA** | Environmental Assessment |
| **EA/EO** | Engineering Change Authorization/ Order |
| **EAA** | Experimental Aircraft Association |
| **EIR** | Enforcement Investigation Report |
| **EIRS** | Enforcement Investigative Reports |
| **EIS** | Enforcement Information Subsystem |
| **EIS** | Environmental Impact Statement |
| **ETOPS** | Extended-Range Operation With Two-Engine Airplanes |
| **FAA** | Federal Aviation Administration |
| **FA Act** | Federal Aviation Act of 1958 |
| **FAR** | Federal Aviation Regulations |
| **FCAA** | Foreign Civil Aviation Authority |
| **FCC** | Federal Communications Commission |
| **FD** | flight director |
| **FDC** | flight data center |
| **FDR** | Flight Data Recorder |
| **FIE** | flight instructor examiner |
| **FIR** | flight information regions |
| **FIRC** | flight instructor refresher clinic |
| **FL** | flight level |
| **ELT** | Emergency Locator Transmitter |
| **FM** | flight manual |
| **FMCS** | flight management computer systems |
| **FMS** | flight management system |
| **FOI** | fundamentals of instructing |
| **FOIA** | Freedom of Information Act |
| **FONSI** | Finding of No Significant Impact |
| **FSAS** | Flight Standards Automation System |
| **FSDO** | Flight Standards District Office |
| **FSS** | flight service station |
| **FTD** | flight training device |
| **GM** | General Manuals |
| **GPS** | global positioning system |
| **GSGC** | Ground School Graduation Certificate |
| **GTD** | ground training device |
| **HAZMAT** | hazardous material |
| **HEL** | Helicopter |
| **HEMES** | Helicopter Hospital Emergency Medical Evacuation |
| **HF** | high frequency |
| **HT** | Hard-Time |
| **HUD** | heads-up display |
| **JAD** | Job Aid Disc |
| **JAR** | Joint Airworthiness Regulations |
| **IAP** | instrument approach procedures |

**ICAO** International Civil Aviation Organization

**ICAS** International Council of Air Shows

**ICS** Intercom Systems

**IFO** International Field Office

**IFP** Instrument Foreign Pilot

**IFR** instrument flight rules

**IFSD** in-flight shut down

**IGA** international general aviation

**IIC** inspector-in-charge

**ILS** instrument landing system

**IMC** instrument meteorological conditions

**IN/FC** Inspection/Functional check

**INM** Integrated Noise Model

**INS** inertial navigation system

**IRA** Instrument Rating Airplane

**IRS** inertial reference systems

**ISC** Industry Steering Committee

**ISIS** Integrated Safety Information Subsystem

**ISO** International Standards Organization

**ISS** inertial sensor system

**JAR** Joint Airworthiness Requirements

**LAHSO** land-and-hold-short operations

**LEI** Letter of Investigation

**LIBRA** Logical Information Based on Reliability

**LOA** letter of authorization

**LORAN** long-range navigation

**LRN** long-range navigation

**LRNS** long-range navigation system

**LRUS** Line Replaceable Units

**LU/SV** Lubrication/Servicing

**MC/FPE** military competency/foreign pilot examiner

**MEL** minimum equipment list

**MEL** Multi-engine Land

**MES** Multi-engine Sea

**MIDOS** Manufacturing Inspection District Offices

**MIS** Mechanical Interruption Summary Reports

**MISRS** Mechanical Interruption Summary Reports

**MLS** microwave landing system

**MMEL** Master Minimum Equipment List

**MMF** Manufacturer Maintenance Facility

**MNPS** Minimum Navigation Performance Specification

**MOS** Military Occupational Speciality

**MRB** Maintenance Review Board

**MRB** Material Review Board

**MRR** Mechanical Reliability Reports

**MSG** Maintenance Steering Group

**MSL** mean sea level

**MTBF** Mean Time Between Failure

**NFPA** National Fire Protection Association

**NAO** Noise Abatement Officer

**NAS** National Airspace System

| | |
|---|---|
| **NASIP** | National Aviation Safety Inspection Program |
| **NAT** | North Atlantic navaid navigational aid |
| **NAT/MNPS** | North Atlantic Minimum Navigation Performance Specifications |
| **NAVAID** | Navigational Aid |
| **NEPA** | National Environmental Policy Act of 1969 |
| **NDB** | nondirectional beacon |
| **NDI** | Non-destructive Inspection |
| **NDPER** | National Designated Pilot Examiner Registry |
| **NEB** | National Examiner Board |
| **NFDC** | National Flight Data Center |
| **NM** | nautical miles |
| **NOPAC** | North Pacific |
| **NOTAM** | Notice to Airmen |
| **NTSB** | National Transportation Safety Board |
| **OC** | On-Condition |
| **OCA** | oceanic control areas |
| **OJT** | on-the-job training |
| **OP/VC** | Operational/Visual check |
| **OST** | Office of the Secretary of Transportation |
| **OTAC** | Outside-the-Aircraft Check |
| **PAI** | principal avionics inspector |
| **PAR** | Precision Approach Radar |
| **PASI** | Preapplication Statement of Intent |
| **PCA** | Positive Control Area |
| **PCA** | primary category aircraft |
| **PE** | private pilot examiner |
| **PIC** | pilot-in-command |
| **PMA** | Parts Manufacturer Authorization |
| **PMI** | Principal Maintenance Inspector |
| **POI** | principal operations inspector |
| **PPE** | proficiency pilot examiner |
| **PPH** | Policy Procedures Handbook |
| **PPM** | PTRS Procedures Manual |
| **PSRAB** | Propulsion System Reliability Assessment Board |
| **PTRS** | Program Tracking and Reporting Subsystem |
| **PTS** | practical test standards |
| **RAIM** | receiver autonomous integrity monitoring |
| **RII** | Required Inspection Items |
| **RNAV** | Area Navigation |
| **ROC** | Regional Operations Center |
| **RS** | Restoration |
| **RT** | Remedial Training |
| **RTCA** | Radio Technical Commission of Aeronautics |
| **RVR** | runway visual range |
| **RVSM** | Reduced Vertical Separation Minimum |
| **SA** | selective availability |
| **SAE** | Society of Automotive Engineers |
| **SDR** | Service Difficulty Report |
| **SEL** | Single Engine Land |
| **SES** | Single Engine Sea |

| | |
|---|---|
| **SFAR** | Special Federal Aviation Regulations |
| **SIC** | second-in-command |
| **SIGMET/ AIRMET** | Significant Meterological Information Airmen's Meterological Information |
| **SODA** | Statement of Demonstrated Ability |
| **SOIR** | simultaneous operations on intersecting runways (replaced by LAHSO) |
| **SPG** | Special Planning Group |
| **SRM** | Structural Repair Manuals |
| **STC** | supplemental type certificate |
| **TAF** | terminal weather forecasts |
| **TALTAR** | Tactical Landing Approach Radar |
| **TBO** | Time between overhauls |
| **TC** | type certification |
| **TCA** | Appliance Type Approval |
| **TCDS** | type certificate data sheet |
| **TCE** | training center evaluator |
| **TCO** | training course outline |
| **TRSB** | Time Reference Scanning Beam |
| **TSO** | technical standard order |
| **TSOA** | Technical Standard Order Authorization |
| **UHF** | Ultra High Frequency |
| **USNOF** | United States NOTAM Office |
| **USPA** | United States Parachute Association |
| **VFR** | visual flight rules |
| **VHF** | very high frequency |
| **VIS** | Vital Information Subsystem |
| **VLF** | very low frequency |
| **VMC** | minimum controllable airspeed |
| **VMC** | visual meteorological conditions |
| **VOR** | VHF omni-directional radio range |
| **Vref** | approach speed |

# APPENDIX 2. INSPECTOR FEEDBACK

**INFORMATION CURRENCY.** The Continuous Airworthiness and Maintenance Division, AFS-300, has developed a revision process to ensure that the information contained in this handbook is current and correct. Any comments regarding content, whether to point out deficiencies or suggest improvements, should be directed to AFS-340. All comments will be reviewed and the handbook amended as appropriate. An inspector feedback sheet is provided on the following page for your convenience. If an issue requires immediate clarification, please fax to AFS-340 at (703) 661-0274, or simply mail to the following address:

Handbook Project Manager
General Aviation and Commercial Branch, AFS-340
P.O. Box 16787
Dulles International Airport
Washington, D.C. 20041

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**INSPECTOR FEEDBACK SHEET**

Subject:[X] Order 8300.10, Airworthiness Inspector's Handbook, Change No. _____

To: Handbook Project Manager
General Aviation and Commercial Branch, AFS-340
P.O. Box 16787
Dulles International Airport
Washington, D.C. 20041

Fax: (703) 661-0274

Please check all appropriate items. Attach a copy of the affected pages.

[ ] An error (procedural or typographical) has been noted in volume _____, chapter _____, section _____, paragraph _____ on page _____.

[ ] Recommend Volume _____, chapter _____, section _____, paragraph _____, page _____, be changed as follows: (Attach separate sheets if necessary).

[ ] Recommend a change to national policy in volume _____, chapter _____, section _____, paragraph _____, on page _____ as follows:

[ ] In a future change to this order, please cover the following subject (briefly describe what you want added):

[ ] Regional handbook standardization representative recommendation:

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

Submitted by: _____ Date: _____

Telephone Number: _____ Routing Symbol: _____

Telemail Address: _____

# APPENDIX 3. HANDBOOK BULLETINS

Handbook bulletins serve the function of providing, on an interim basis, information relevant to the handbook. The Continuous Airworthiness Maintenance Division, AFS-300, will incorporate the material into the handbook at a later date. Due to the enormous amount of bulletins published, they will no longer be contained in the handbook.

They can be retrieved via the internet, Flight Standards Home Page URL: http://www.faa.gov/avr/afshome.htm.

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# APPENDIX 5. AIRLINE/MANUFACTURER MAINTENANCE PROGRAM DEVELOPMENT DOCUMENT

This appendix has been provided by the Air Transport Association of America (ATA) for official FAA use only. This information gives a detailed analysis of the Maintenance Steering Group process and is intended to be the primary guidance on this subject.

This appendix will be updated as ATA updates their document.

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# ATA MSG3

## Operator/Manufacturer Scheduled Maintenance Development

### Revision 2001.1

Air Transport Association of America, Inc.
1301 Pennsylvania Ave., N.W., Suite 1100
Washington, D.C. 20004-1707

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## For Technical Information and Change Submissions

For technical information or to recommend an alteration or amendment to this specification, please submit the recommendation and any supporting documentation to ATA:

E-mail: pubs@air-transport.org
1-202-626-4000
Fax: 1-202-626-4181

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# Transmittal Letter

Oct. 07, 1993

AIRLINE/MANUFACTURER MAINTENANCE PROGRAM DEVELOPMENT DOCUMENT (MSG-3)

Mr. Michael F. Rioux
Vice President, Engineering,
Maintenance and Materiel
Air Transport Association of America
Washington, DC 20004-1707
Dear Mr. Rioux

The Maintenance Review Board (MRB) Policy Board chairman has reviewed the Airline/Manufacturer Maintenance Program Development Document MSG-3, Revision 2, dated September 12, 1993. Minor discrepancies have been discussed with Mr. Dave Nakata.

The Federal Aviation Administration's Flight Standards Service, hereby, accepts MSG-3, Revision 2, dated September 12, 1993, as the guideline document for the development of future MRB reports.

Sincerely,

Frederick J. Leonelli
Manager, Aircraft Maintenance Division

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# Highlights

**Prepared By:**

Maintenance Steering Group - 3 Task Force

Air Transport Association of America

**Release History**

Revision 2001.1: March, 2001

Revision 2000.1: March 2000 (reformatted into an electronic document)

Revision 2: September 12, 1993

Revision 1: March 31, 1988

Originally Issued September 30, 1980

**Revision 2001.1 (Revised March, 2001)**

| Location | Description of Change |
|---|---|
| All | Corrected all appropriate textual references from "scheduled maintenance program" to simply "scheduled maintenance." |
| Heading 2-3-4.1 | Expanded guidance to cover acceptable assumptions as to the flight crew "normal duties" in determining whether or not a functional failure is evident. |
| Heading 2-3-5.2 | Deletion of requirement to forward Category 6 items without task to the ISC/MRB. |
| Subject 2-3-7 | Significantly expanded the guidance of this entire Section on Task Interval Determination. |
| Section 2-5 | Section rewritten to incorporate enhanced zonal analysis. |
| Section 2-6 | New section to describe analysis for Lightning/High Intensity Radiated Field (L/HIRF). |
| Appendix A. | Added use of a mirror and a distance reference to the definition of General Visual Inspection, removed "visual" from the definition of Detailed Inspections, enhanced the definition of Functional Failure, and added a number of new terms to the Glossary. |

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# Preface

Airline and manufacturer experience in developing scheduled maintenance for new aircraft has shown that more efficient programs can be developed through the use of logical decision processes.

In July, 1968, representatives of various airlines developed Handbook MSG-1, "Maintenance Evaluation and Program Development," which included decision logic and inter-airline/manufacturer procedures for developing scheduled maintenance for the new Boeing 747 aircraft.

Subsequently, it was decided that experience gained on this project should be applied to update the decision logic and to delete certain 747 detailed procedural information so that a universal document could be made applicable for later new type aircraft. This was done and resulted in the document, entitled, "Airline/ Manufacturer Maintenance Program Planning Document," MSG-2. MSG-2 decision logic was used to develop scheduled maintenance for the aircraft of the 1970's.

In 1979, a decade after the publication of MSG-2, experience and events indicated that an update of MSG procedures was both timely and opportune in order for the document to be used to develop maintenance for new aircraft, systems or powerplants.

An ATA Task Force reviewed MSG-2 and identified various areas that were likely candidates for improvement. Some of these areas were the rigor of the decision logic, the clarity of the distinction between economics and safety, and the adequacy of treatment of hidden functional failures. Additionally

A. The development of new generation aircraft provided a focus, as well as motivation, for an evolutionary advancement in the development of the MSG concept.

B. New regulations which had an effect on maintenance programs had been adopted and therefore needed to be reflected in MSG procedures. Among those were new damage tolerance rules for structures and the Supplemental Structural Inspection program for high time aircraft.

C. The high price of fuel and the increasing cost of materials created trade-off evaluations which had great influences on maintenance program development. As a result, maintenance programs required careful analysis to ensure that only those tasks were selected which provided genuine retention of the inherent designed level of safety and reliability, or provided economic benefit.

## MSG-3, Original Revision

Against this background, ATA airlines decided that a revision to existing MSG-2 procedures was both timely and appropriate. The active participation and combined efforts of the FAA, CAA/UK, AEA, U.S. and European aircraft and engine manufacturers, U.S. and foreign airlines, and the U.S. Navy generated the document, MSG-3. As a result there were a number of differences between MSG-2 and MSG-3, which appeared both in the organization/presentation of the material and in the detailed procedural content. Howe ver, MSG-3 did not constitute a fundamental departure from the previous version, but was built upon the existing framework of MSG-2 which had been validated by ten years of reliable aircraft operation using maintenance based thereon.

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The following reflects some of the major improvements and enhancements generated by MSG-3 as compared to MSG-2.

1. Systems/Powerplant Treatment:

   MSG-3 adjusted the decision logic flow paths to provide a more rational procedure for task definition and a more straightforward and linear progression through the decision logic.

   MSG-3 logic took a "from the top down" or consequence of failure approach. At the outset, the functional failure was assessed for consequence of failure and was assigned one of two basic categories:

   A. SAFETY

   B. ECONOMIC

   Further classification determined sub-categories based on whether the failure was evident to or hidden from the operating crew. (For structures, category designation was "significant" or "other" structure, and all functional failures were considered safety consequence items).

   With the consequence category established for systems/powerplants, only those task selection questions pertinent to the category needed to be asked. This eliminated unnecessary assessments and expedited the analysis. A definite applicability and effectiveness criteria was developed to provide more rigorous selection of tasks. In addition, this approach helped to eliminate items from the analytical procedure whose failures had no significant consequence.

   Task selection questions were arranged in a sequence such that the most preferred, most easily accomplished task, was considered first. In the absence of a positive indication concerning the applicability and effectiveness of a task, the next task in sequence was considered, down to and including possible redesign.

2. Structures Treatment:

   Structures logic evolved into a form which more directly assessed the possibility of structural deterioration processes. Considerations of fatigue, corrosion, accidental damage, age exploration and others, were incorporated into the logic diagram and were routinely considered.

3. MSG-3 recognized the new damage tolerance rules and the supplemental inspection programs, and provided a method by which their intent could be adapted to the **Maintenance Review Board (MRB)** process instead of relying on type data certificate restraints. Concepts such as multiple failures, effect of failure on adjacent structure, crack growth from detectable to critical length, and threshold exploration for potential failure, were covered in the decision logic of the procedural material.

4. The MSG-3 logic was task-oriented and not maintenance process oriented (MSG-2). This eliminated the confusion associated with the various interpretations of **Condition Monitoring (CM)**, **On-Condition (OC)**, **Hardtime (HT)** and the difficulties encountered when attempting to determine what maintenance was being accomplished on an item that carried one of the process labels.

   By using the task-oriented concept, one would be able to view the MRB document and see the initial scheduled maintenance reflected for a given item (e.g., an item might show a lubrication task at the "A" frequency, and inspection/functional check at the "C" frequency and a restoration task at the "D"

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frequency).

5. Servicing/Lubrication was included as part of the logic diagram to ensure that this important category of task was considered each time an item was analyzed.

6. The selection of maintenance tasks, as output from the decision logic, was enhanced by a clearer and more specific delineation of the task possibilities contained in the logic.

7. The logic provided a distinct separation between tasks applicable to either hidden or evident functional failures; therefore, treatment of hidden functional failures was more thorough than that of MSG-2.

8. The effect of concurrent or multiple failure was considered. Sequential failure concepts were used as part of the hidden functional failure assessment (Systems/Powerplant), and multiple failure was considered in structural evaluation (Structures).

9. There was a clear separation between tasks that were economically desirable and those that were required for safe operation.

10. The structures decision logic no longer contained a specific numerical rating system. The responsibility for developing rating systems was assigned to the appropriate manufacturer with approval of the Industry Steering Committee.

## MSG-3, Revision 1

In 1987, after using MSG-3 procedures on a number of new aircraft and powerplants in the first half of the 1980's, it was decided that the benefits of the experience so gained should be used to improve the document for future application; thus, Revision 1 was undertaken.

This revised document includes changes developed by American and European airframe manufacturers, American and European airworthiness authorities, supplemented and agreed to by the Air Transport Association of America and other airline representatives.

The major improvements and enhancements reflected in items one through nine above were basically unchanged and remain applicable to this revised document.

The following are some of the more noteworthy revisions that have been incorporated:

1. Table of Contents and a List of Effective Pages: ADDED.

2. Clarification that MSG-3 is used to develop an "initial scheduled maintenance program."

3. The task - "Operating Crew Monitoring": DELETED.

4. Section addressing "Threshold Sample": REVISED.

5. Section addressing "Program Development Administration": DELETED.

6. "Top-down approach" - explanation of process: ADDED.

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7. "Visual Check" added to "Operational Check" task.
8. System/Powerplant and Structures logic diagrams: REVISED.
9. Task selection criteria table: ADDED.
10. Inspections:

    Detailed Inspection - REVISED.

    Directed Inspection - DELETED.

    External Surveillance Inspection - DELETED.

    General Visual Inspection - REVISED.

    Internal Surveillance Inspection - DELETED.

    Special Detailed Inspection - UNCHANGED.

    Walk Around Check Inspection - DELETED.
11. Clarification of hidden functional failure: "one additional failure."
12. Inspection/Functional Check task question revised.
13. Reference to a "User's Guide" for procedures related to administration and forms added.
14. Reference to "off-aircraft" deleted.
15. Operating Crew Normal Duties - "Normal Duties" revised to delete pre-flight and post-flight check list; added "on a daily basis" for frequency of usage with respect to normal crew duties.
16. Added that procedures for handling composite of other new materials may have to be developed.
17. Reference to specific U.S. Federal Air Regulations: DELETED.
18. Definition of "Operating": REVISED.
19. Defined logic for failures which may affect dispatch capability or involve the use of abnormal or emergency procedures. Failure-effect Category 6 is now identified as "Operational - Evident".
20. Noted that each MSI and SSI should be recorded for tracking purposes whether or not a task was derived therefrom.

## MSG-3, Revision 2

In 1993, MSG-3 Revision 2 was incorporated. The most significant changes introduced were:

1. To adapt MSG-3 logic procedures to assure development of tasks/intervals associated with the aircraft's certificated operating capabilities.
2. To provide guidelines which ensure that a consistent approach be taken with respect to tasks/intervals

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required to maintain compliance with Type Certification requirements.

3. To provide guidelines on the development of Corrosion Prevention and Control Programs.
4. To introduce procedures to determine the appropriate scheduled maintenance requirements for composite structure.
5. To revise inspection task definitions.

MSG-3 [Section 2-4] and its respective logic diagrams have been revised to add an evaluation process to insure the **Corrosion Prevention and Control Program (CPCP)** is considered in the evaluation of each **Structural Significant Item (SSI)** and every zone.

Damage Sources [Heading 2-4-3.1] now includes a discussion of non-metallic materials (composites).

Procedures [Heading 2-4-4.1] has been revised to add Procedure and Decision blocks for the CPCP evaluation and edited to produce a more ordered flow of the Procedure and Decision block numbers.

The Glossary - [Appendix A] Inspection Level Definitions have been revised to apply to Systems, Powerplants and Structures, and definitions related to CPCP have been added.

It is suggested, in order to fully comprehend the MSG-3 concept, that the entire MSG-3 document be reviewed and considered prior to accepting or modifying its approaches to maintenance development. A User's Guide or Policies and Procedures Handbook may be adopted with guidance and approval of the Industry Steering Committee.

## MSG-3, Revision 2001

In 2001, MSG-3 Revision 2001 was incorporated. The most significant changes introduced were:

1. Added distance requirement and use of a mirror to definition of General Visual Inspection (GVI).
2. Deleted "visual" from definition of Detailed Inspection, and substituted the term "used" for the word "necessary."
3. Corrected terminology throughout the document to change the product of MSG-3 from a "maintenance program" to simply "maintenance."
4. Guidance was added to [Heading 2-3-4.1]. to cover acceptable assumptions as to the flight crew "normal duties" in determining whether or not a functional failure is evident.
5. Expanded the wording on hidden functions of safety/emergency systems or equipment [Heading 2-3-4.3].
6 Deletion of the requirement to forward FEC 6 items without task to the ISC/MRB for review..
7. Significantly expanded the wording on "Interval Determination" [Subject 2-3-7].
8. Rewrote [Section 2-5] to incorporate enhanced zonal analysis.

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9. Added a section [Section 2-6] on analysis for Lightning/High Intensity Radiated Field (L/HIRF).

10. Added many more terms to the Glossary.

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# Chapter 1. General

## 1-1. Objective

It is the objective of this document to present a means for developing the scheduled maintenance tasks and intervals which will be acceptable to the regulatory authorities, the operators, and the manufacturers. The scheduled maintenance task and interval details will be developed by coordination with specialists from the operators, manufacturers, and the Regulatory Authority of the country of manufacture. Specifically, this document outlines the general organization and decision processes for determining scheduled maintenance requirements initially projected for the life of the aircraft and/or powerplant.

Historically, the initial scheduled maintenance tasks and intervals have been specified in **Maintenance Review Board (MRB)** Reports. MSG-3 is intended to facilitate the development of initial scheduled maintenance. The remaining maintenance, that is, non-scheduled or non-routine maintenance, consists of maintenance actions to correct discrepancies noted during scheduled maintenance tasks, other non-scheduled maintenance, normal operation, or data analysis.

This document addresses the development of scheduled maintenance using the MSG-3 analysis procedure. Any additional requirements developed, using different ground rules and procedures from MSG-3, must be submitted with selection criteria to the Industry Steering Committee for consideration and inclusion in the MRB Report recommendation.

## 1-2. Scope

For the purpose of developing an MRB report, MSG-3 is to be used to determine initial scheduled maintenance requirements. The analysis process identifies all scheduled tasks and intervals based on the aircraft's certificated operating capabilities.

## 1-3. Organization

The organization to carry out the scheduled maintenance development for a specific type aircraft shall be staffed by representatives of the airline operators purchasing the equipment, the prime manufacturers of the airframe and powerplant, and the Regulatory Authority.

### 1-3-1. Industry Steering Committee

The management of the scheduled maintenance development activities shall be accomplished by an **Industry Steering Committee** composed of members from a representative number of operators and representatives of the prime airframe and engine manufacturers. It shall be the responsibility of this committee to establish policy, set initial goals for scheduled maintenance check intervals, direct the activities of working groups or other working activity, carry out liaison with the manufacturer and other operators, prepare the final

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recommendations and represent the operators in contacts with the Regulatory Authority. The ISC should see that the MSG-3 process identifies 100% accountability for all **Maintenance Significant Items (MSI's)** and **Structural Significant Items (SSI's)**, whether or not a task has been derived from the analysis.

## 1-3-2. Working Groups

One or more Working Groups, consisting of specialist representatives from the participating operators, the prime manufacturer, and the Regulatory Authority, may be constituted. The Industry Steering Committee, alternatively, may arrange some other means for obtaining the detailed technical information necessary to develop recommendations for scheduled maintenance in each area. Irrespective of the organization of the working activity, written technical data must be provided that supports its recommendations to the Industry Steering Committee. After approval by the Industry Steering Committee, these analyses and recommendations shall be consolidated into a final report for presentation to the Regulatory Authority.

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# Chapter 2. Development of Scheduled Maintenance

## 2-1. General

It is necessary to develop scheduled maintenance for each new type of aircraft prior to its introduction into airline service.

### 2-1-1. Purpose

The primary purpose of this document is to develop a proposal to assist the Regulatory Authority in establishing initial scheduled maintenance tasks and intervals for new types of aircraft and/or powerplant. The intent is to maintain the inherent safety and reliability levels of the aircraft. These tasks and intervals become the basis for the first issue of each airline's maintenance requirements to govern its initial maintenance policy. Initial adjustments may be necessary to address operational and/or environmental conditions unique to the operator. As operating experience is accumulated, additional adjustments may be made by the operator to maintain efficient scheduled maintenance.

### 2-1-2. Approach

It is desirable, therefore, to define in some detail

a) The objectives of efficient scheduled maintenance.

b) The content of efficient scheduled maintenance.

c) The method by which efficient scheduled maintenance can be developed.

#### 1. Scheduled Maintenance Objectives

The objectives of efficient aircraft scheduled maintenance are

a) To ensure realization of the inherent safety and reliability levels of the aircraft.

b) To restore safety and reliability to their inherent levels when deterioration has occurred.

c) To obtain the information necessary for design improvement of those items whose inherent reliability proves inadequate.

d) To accomplish these goals at a minimum total cost, including maintenance costs and the costs of resulting failures.

These objectives recognize that scheduled maintenance, as such, cannot correct deficiencies in the inherent safety and reliability levels of the aircraft. The scheduled maintenance can only prevent deterioration of such inherent levels. If the inherent levels are found to be unsatisfactory, design modification is necessary to

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obtain improvement.

## 2. Scheduled Maintenance Content

The content of the scheduled maintenance itself consists of two groups of tasks

a) A group of scheduled tasks to be accomplished at specified intervals. The objective of these tasks is to prevent deterioration of the inherent safety and reliability levels of the aircraft. The tasks in scheduled maintenance may include:

(1) Lubrication/Servicing (LU/SV)

(2) Operational/Visual Check (OP/VC)

(3) Inspection/Functional Check (IN/FC)

(4) Restoration (RS)

(5) Discard (DS)

and

b) A group of non-scheduled tasks which result from:

(1) The scheduled tasks accomplished at specified intervals.

(2) Reports of malfunctions (usually originated by the operating crew).

(3) Data analysis.

The objective of these non-scheduled tasks is to restore the aircraft to an acceptable condition.

An efficient program is one which schedules only those tasks necessary to meet the stated objectives. It does not schedule additional tasks which will increase maintenance costs without a corresponding increase in reliability protection.

## 3. Method for Scheduled Maintenance Development

This document describes the method for developing the scheduled maintenance . Non-scheduled maintenance results from scheduled tasks, normal operation or data analysis.

Scheduled maintenance will be developed via use of a guided logic approach and will result in a task-oriented program. The logic's flow of analysis is failure-effect oriented.

Items that, after analysis, have no scheduled task specified, may be monitored by an operator's reliability program.

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## 2-2. Divisions of MSG-3 Document

The working portions of MSG-3 are contained in the next four (4) sections. Systems/Powerplant, including components and APU's, are considered in [Section 2-3]. Aircraft Structures is considered in [Section 2-4], Zonal Inspections in [Section 2-5] and L/HIRF is considered in [Section 2-6]. Each section contains its own explanatory material and decision logic diagram (as appropriate); therefore, it may be used independently of other MSG-3 sections.

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*Figure 2-2.1. Systems Powerplant Logic Diagram (Part 1 of 2)*

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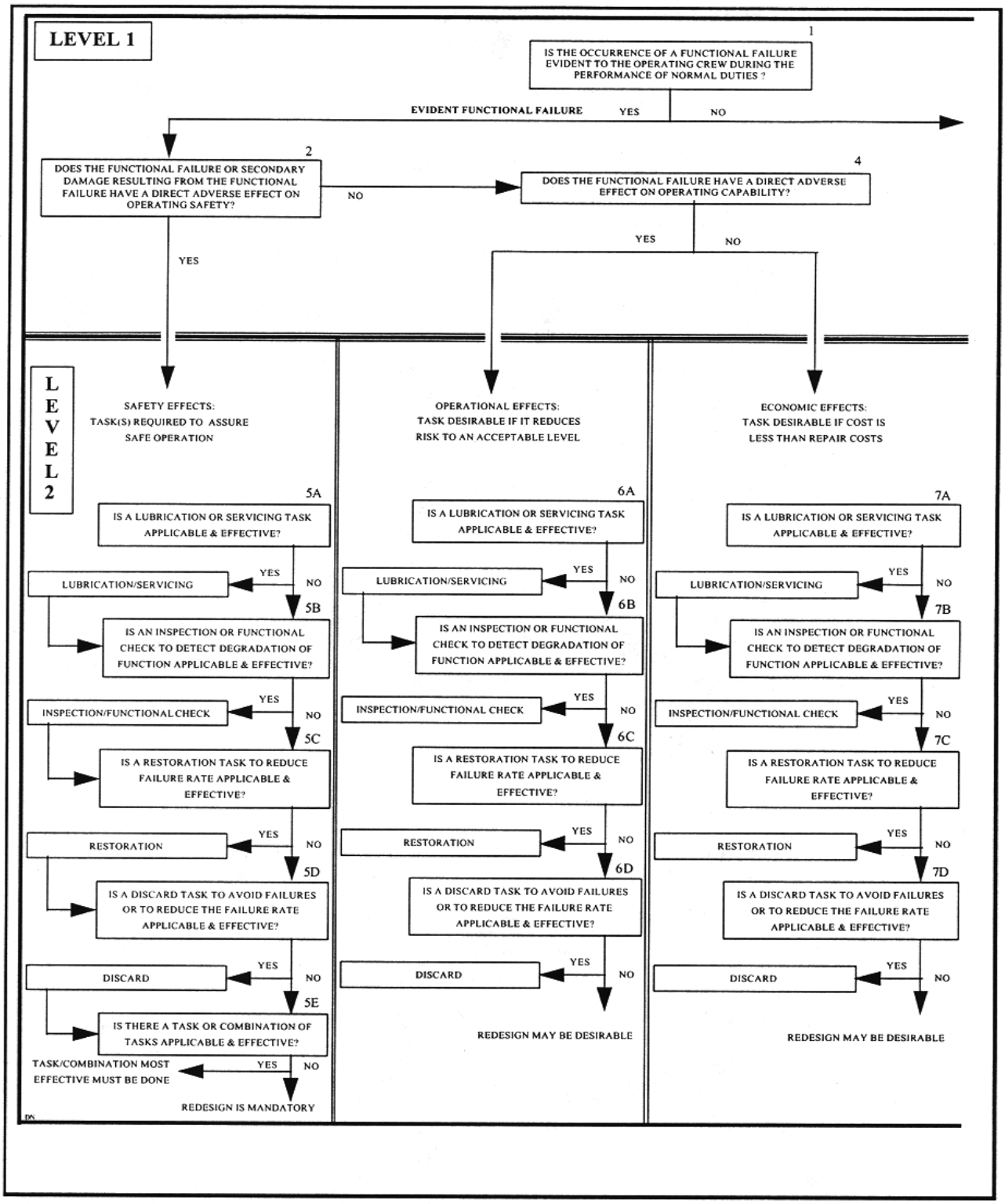


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*Figure 2-2.1. Systems Powerplant Logic Diagram (Part 2 of 2)*

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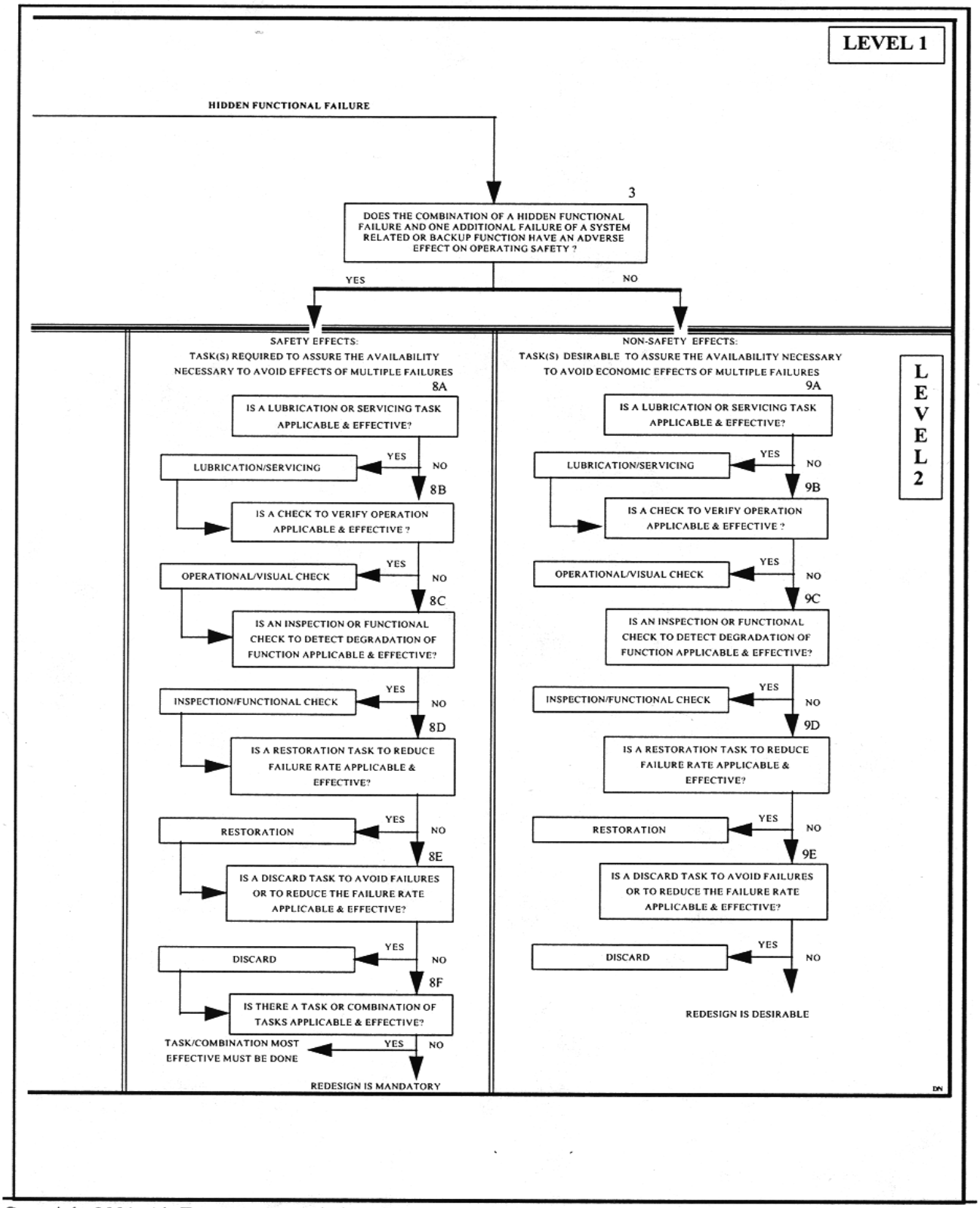


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## 2-3. Aircraft Systems/Powerplant Analysis Procedure

The method for determining the scheduled maintenance tasks and intervals for systems/powerplant, including components and APU's, uses a progressive logic diagram. A glossary of terms and definitions used in the logic diagram is listed in Appendix A. This logic is the basis of an evaluation technique applied to each maintenance significant item (system, sub-system, module, component, accessory, unit, part, etc.), using the technical data available. Principally, the evaluations are based on the item's functional failures and failure causes.

Before the actual MSG-3 logic can be applied to an item, the aircraft's significant systems and components must be identified. This process of identifying Maintenance Significant Items (MSI's) is a conservative process (using engineering judgment) based on the anticipated consequences of failure.

MSI's are those items identified by the manufacturer whose failure

a) could affect safety (on ground or in flight), and/or,

b) could be undetectable or are not likely to be detected during operations, and/or,

c) could have significant operational impact, and/or,

d) could have significant economic impact.

The initial list of MSI's is prepared by the manufacturer and submitted to the ISC for distribution to the appropriate Working Groups.

The top-down approach is a system of identifying the significant items on the aircraft. An acceptable process follows:

a) Partition the aircraft into major functional areas: ATA Systems and Sub-Systems.

b) Continue the process until sub-components which are not replaced on-aircraft are identified.

c) A candidate MSI is usually a system or sub-system and is, in most cases, one level above the lowest (on-aircraft) level identified in step "b." This level is considered the highest manageable level, i.e., one which is high enough to avoid unnecessary analysis, but low enough to be properly analyzed and ensure that all functions, failures, and causes are covered.

After the MSI's have been selected, the following must be identified for each MSI:

a) Function(s) - the normal characteristic actions of an item

b) Functional Failure(s) - Failure of an item to perform its intended function within specified limits

c) Failure Effect(s) - what is the result of a functional failure

d) Failure Cause(s) - why the functional failure occurs

Defining some functional failures may require a detailed understanding of the system and its design principles.

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For example, for system components having single element dual load path features, such as concentric tubes or back-to-back plates, the function of both paths should be analyzed individually. The degradation and/or failure of one path may not be evident.

When listing functions, functional failures, failure effects, and failure causes, care should be taken to identify the functions of all protective devices. These include devices with the following functions:

a) to draw the attention of the operating crew to abnormal conditions

b) to shut down equipment in the event of a failure

c) to eliminate or relieve abnormal conditions which follow a failure

d) to take over from a function that has failed

Protective function statements should describe the protective function itself, and should also include the words "if" or "in the event of" followed by a brief description of the events or circumstances that would activate or require activation of the protection. For example, "To open the relief valve to atmosphere in the event of system X pressure exceeding 300 psi."

Tasks and intervals required in the scheduled maintenance are identified using the procedures set forth herein. Both the economic and safety related tasks are included so as to produce initial scheduled maintenance tasks/intervals.

## 2-3-1. Task Analysis Procedure

Prior to applying the MSG-3 logic diagram to an item, a preliminary work sheet will be completed that clearly defines the MSI, its function(s), functional failure(s), failure effect(s), failure cause(s) and any additional data pertinent to the item; e.g., ATA chapter reference, fleet applicability, manufacturer's part number, a brief description of the item, expected failure rate, hidden functions, need to be on M.E.L., redundancy (may be unit, system or system management), etc. This work sheet is to be designed to meet the user's requirements and will be included as part of the total MSG-3 documentation for the item.

The approach taken in the following procedure is to provide a logic path for each functional failure. Each functional failure and failure cause must be processed through the logic so that a judgment will be made as to the necessity of a task. The resultant tasks and intervals will form the initial scheduled maintenance .

## 2-3-2. Logic Diagram

The decision logic diagram (Ref. [Figure 2-2.1]) is used for analysis of systems/powerplant items. The logic flow is designed whereby the user begins the analysis at the top of the diagram, and answers to the "YES" or "NO" questions will dictate direction of the analysis flow.

### 1. Levels of Analysis

The decision logic has two levels (Ref. [Figure 2-2.1])

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a) Level 1 (questions 1, 2, 3 and 4) requires the evaluation of each FUNCTIONAL FAILURE for determination of the Failure Effect Category; i.e., safety, operational, economic, hidden safety or hidden non-safety.

b) Level 2 (questions 5, 6 ,7, 8 and 9, "A" through "F", as applicable) then takes the FAILURE CAUSE(S) for each functional failure into account for selecting the specific type of task(s).

At level 2, the task selection section, paralleling and default logic have been introduced. Regardless of the answer to the first question regarding "Lubrication/Servicing", the next task selection question must be asked in all cases. When following the hidden or evident safety effects path, all subsequent questions must be asked. In the remaining categories, subsequent to the first question, a "YES" answer will allow exiting the logic.

| | |
|---|---|
| NOTE: | At the user's option, advancement to subsequent questions after deriving a "YES" answer is allowable, but only until the cost of the task is equal to the cost of the failure prevented. |

Default logic is reflected in paths outside the safety effects areas by the arrangement of the task selection logic. In the absence of adequate information to answer "YES" or "NO" to questions in the second level, default logic dictates a "NO" answer be given and the subsequent question be asked. As "NO" answers are generated the only choice available is the next question, which in most cases provides a more conservative, stringent and/or costly task.

## 2-3-3. Procedure

This procedure requires consideration of the functional failures, failure causes, and the applicability/ effectiveness of each task. Each functional failure processed through the logic will be directed into one of five Failure Effect categories.

## 2-3-4. Consequences of Failure (First Level)

The decision logic diagram (Ref. [Figure 2-2.1]) facilitates the identification of the tasks required. There are four first level questions.

### 1. Evident or Hidden Functional Failure

| | |
|---|---|
| **QUESTION 1:** | **IS THE OCCURRENCE OF A FUNCTIONAL FAILURE EVIDENT TO THE OPERATING CREW DURING THE PERFORMANCE OF NORMAL DUTIES?** |

This question asks if the operating crew will be aware of the loss (failure) of the function during performance of normal operating duties. Question 1 must be asked for each functional failure of the item being analyzed. The intent is to segregate the evident and hidden functional failures. The operating crew consists of qualified flight compartment and cabin attendant personnel who are on duty. Normal duties are those duties associated with the routine operation of the aircraft on a daily basis. Ground crew is not part of the operating crew. Flight crew "normal duties" are described (in part) in the Regulatory Authority approved sections of the Airplane Flight Manual (AFM) and must be accomplished by the flight crew. Working groups may consider

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these flight crew checks part of the operating crew's "normal duties" for the purpose of categorizing failures as evident in the MSG-3 analysis. It should be documented in the analysis whenever credit is taken for such flight crew checks.

Since the approved AFM is not available during the initial MSG-3 analysis, working groups should document all Level 1 failure analysis that is based on flight crew checks assumed to be included in the AFM. Once the AFM is approved, all Level 1 analyses based on such assumptions must be verified to ensure that these checks are included in the approved AFM. Level 1 analysis must be redone for any assumed flight crew check not included in the approved AFM. System failures which are indicated to the operating crew when performing their normal duties shall be considered as evident.

**NOTE:** Evidence of AFM tasks which are assumed in the MSG-3 Level 1 analysis submitted to the MRB must be available prior to the MRB Report approval; otherwise, the MSG-3 Level 1 analysis submitted to the MRB must be based on the assumption that these tasks are not part of the crew's normal duties.

A "YES" answer indicates the functional failure is evident; proceed to Question 2 (Ref. [Heading 2-3-4.2]).

A "NO" answer indicates the functional failure is hidden; proceed to Question 3 (Ref. [Heading 2-3-4.3]).

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## 2. Direct Adverse Effect on Safety

| | |
|---|---|
| **QUESTION 2:** | **DOES THE FUNCTIONAL FAILURE OR SECONDARY DAMAGE RESULTING FROM THE FUNCTIONAL FAILURE HAVE A DIRECT ADVERSE EFFECT ON OPERATING SAFETY?** |

**For a "YES" answer the functional failure must have a direct adverse effect on operating safety.**

Direct: To be direct the functional failure or resulting secondary damage must achieve its effect by itself, not in combination with other functional failures (no redundancy exists and it is a primary dispatch item).

Adverse Effect on Safety: Safety shall be considered as adversely affected if the consequences of the failure condition would prevent the continued safe flight and landing of the aircraft and/or might cause serious or fatal injury to human occupants.

Operating: This is defined as the time interval during which passengers and crew are on board for the purpose of flight.

A "YES" answer indicates that this functional failure must be treated within the Safety Effects category and task(s) must be developed in accordance with [Heading 2-3-5.1].

A "NO" answer indicates the effect is either operational or economic and Question 4 (Ref. [Heading 2-3-4.4]) must be asked.

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## 3. Hidden Functional Failure Safety Effect

**QUESTION 3: DOES THE COMBINATION OF A HIDDEN FUNCTIONAL FAILURE AND ONE ADDITIONAL FAILURE OF A SYSTEM RELATED OR BACK-UP FUNCTION HAVE AN ADVERSE EFFECT ON OPERATING SAFETY?**

This question is asked of each hidden functional failure which has been identified in Question 1.

The question takes into account failures in which the loss of the one hidden function (whose failure is unknown to the operating crew) does not of itself affect safety; however, in combination with an additional functional failure (system related or intended to serve as a back-up) has an adverse effect on operating safety.

For hidden functions of safety/emergency systems or equipment (see Glossary), the additional failure is the event for which this function of the system or equipment is designed, and in these cases, a FEC 8 is to be selected. This applies irrespective of whether the function is required by regulation or is carried as an operator option.

If a "YES" answer is determined, there is a safety effect and task development must proceed in accordance with [Heading 2-3-5.4].

A "NO" answer indicates that there is a non-safety effect and will be handled in accordance with [Heading 2-3-5.5].

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## 4. Operational Effect

**QUESTION 4: DOES THE FUNCTIONAL FAILURE HAVE A DIRECT ADVERSE EFFECT ON OPERATING CAPABILITY?**

**This question asks if the functional failure could have an adverse effect on operating capability:**

a) requiring either the imposition of operating restrictions or correction prior to further dispatch; or

b) requiring flight crew use of abnormal or emergency procedures.

This question is asked of each evident functional failure not having a direct adverse effect on safety. The answer may depend on the type of operation.

If the answer to this question is "YES", the effect of the functional failure has an adverse effect on operating capability, and task selection will be handled in accordance with [Heading 2-3-5.2].

A "NO" answer indicates that there is an economic effect and should be handled in accordance with [Heading 2-3-5.3].

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## 2-3-5. Failure Effect Categories (First Level)

Once the analysts have answered the applicable first level questions, they are directed to one of the five Effect Categories

a) Evident Safety (Category 5)

b) Evident Operational (Category 6)

c) Evident Economic (Category 7)

d) Hidden Safety (Category 8)

e) Hidden Non-Safety (Category 9)

## 1. Evident Safety Effects (Category 5)

The Evident Safety Effect category must be approached with the understanding that a task is required to assure safe operation. All questions in this category must be asked. If no effective task(s) results from this category analysis, then redesign is mandatory. The following is the logic progression for functional failures that have Evident Safety Effects.

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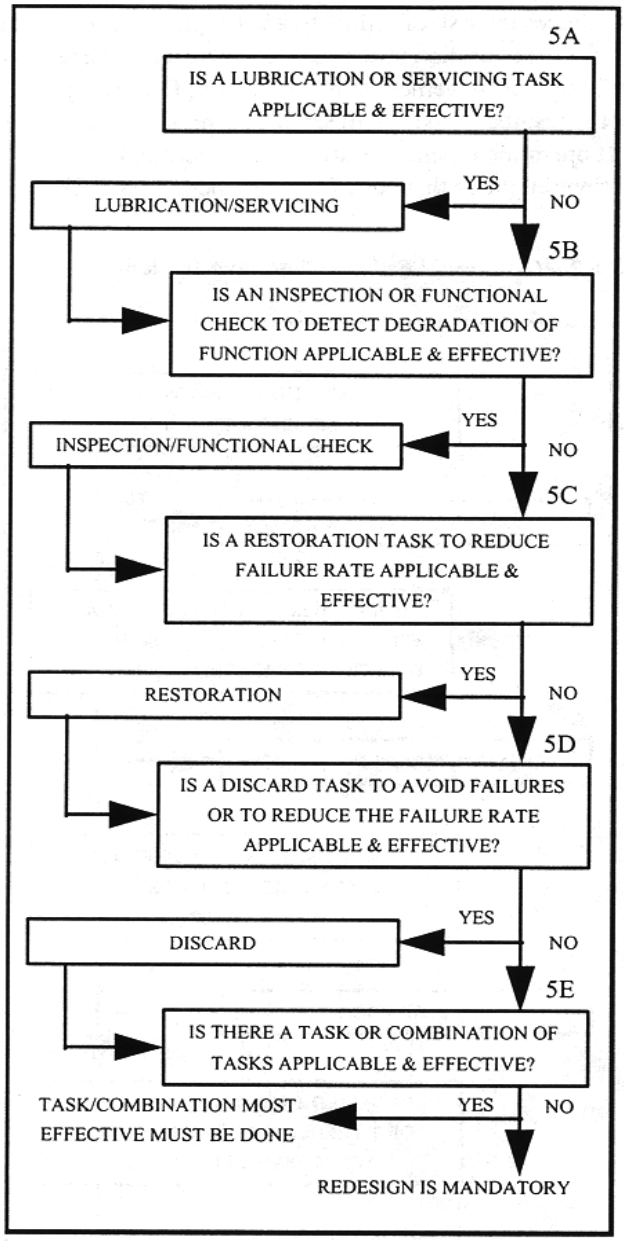
*Figure 2-3-5.1. Functional Failures that have Evident Safety Effects*

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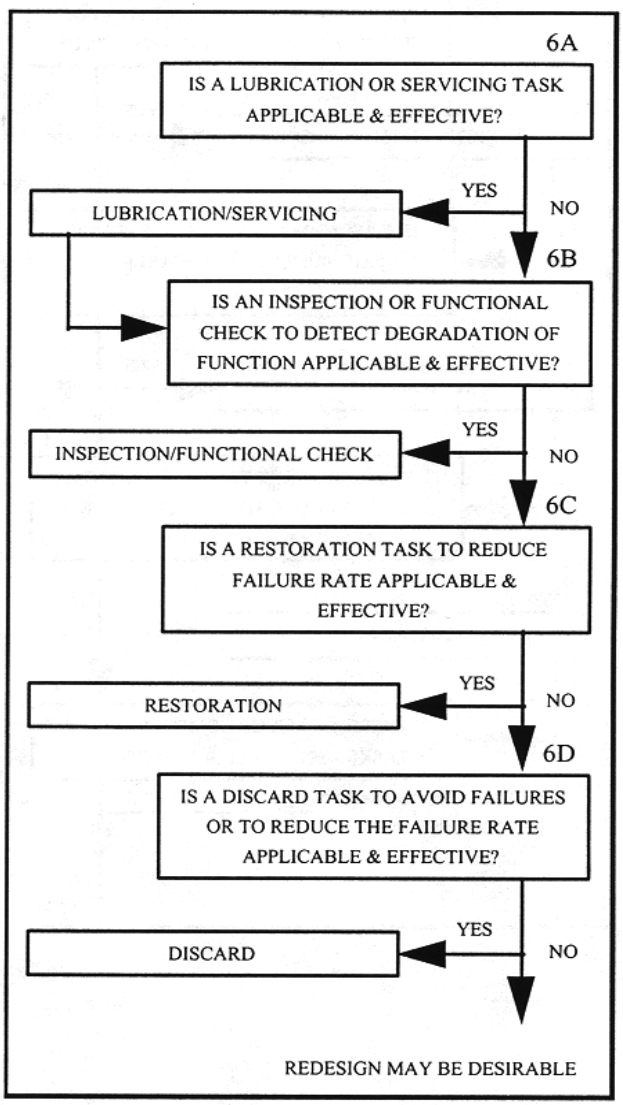
## 2. Evident Operational Effects (Category 6)

A task(s) is desirable if it reduces the risk of failure to an acceptable level. Analysis of the failure causes through the logic requires the first question (Lubrication/Servicing) to be answered. Either a "YES" or "NO" answer of question "A" still requires movement to the next level; from this point on, a "YES" answer will complete the analysis and the resultant task(s) will satisfy the requirements. If all answers are "NO", then no task has been generated. If operational penalties are severe, a redesign may be desirable. The following is the logic progression for functional failures that have Evident Operational Effects.

***Figure 2-3-5.2. Functional Failures that have Evident Operational Effects***

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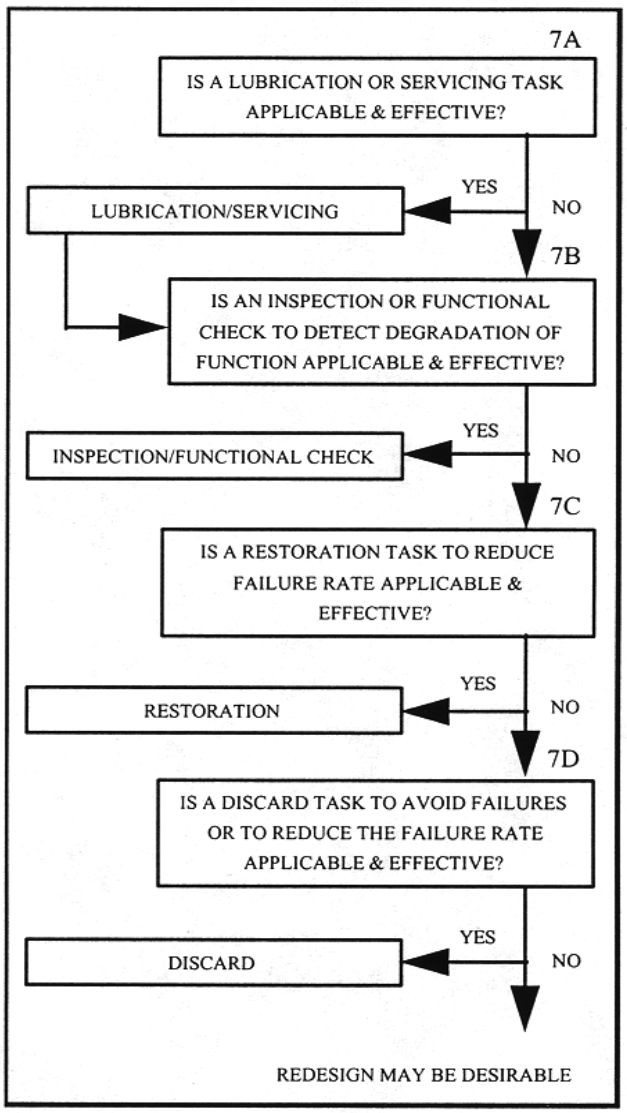
## 3. Evident Economic Effects (Category 7)

A task(s) is desirable if the cost of the task is less than the cost of repair. Analysis of the failure causes through the logic requires the first question (Lubrication/Servicing) to be answered. Either a "YES" or "NO" answer to question "A" still requires movement to the next level; from this point on, a "YES" answer will complete the analysis and the resultant task(s) will satisfy the requirements. If all answers are "NO", no task has been generated. If economic penalties are severe, a redesign may be desirable. The following is the logic progression for functional failures that have Evident Economic Effects.

***Figure 2-3-5.3. Functional Failures that have Evident Economic Effects***

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## 4. Hidden Function Safety Effects (Category 8)

The Hidden Function Safety Effect requires a task(s) to assure the availability necessary to avoid the safety effect of multiple failures. All questions must be asked. If there are no tasks found effective, then redesign is mandatory. The following is the logic progression for functional failures that have Hidden Function Safety Effects.

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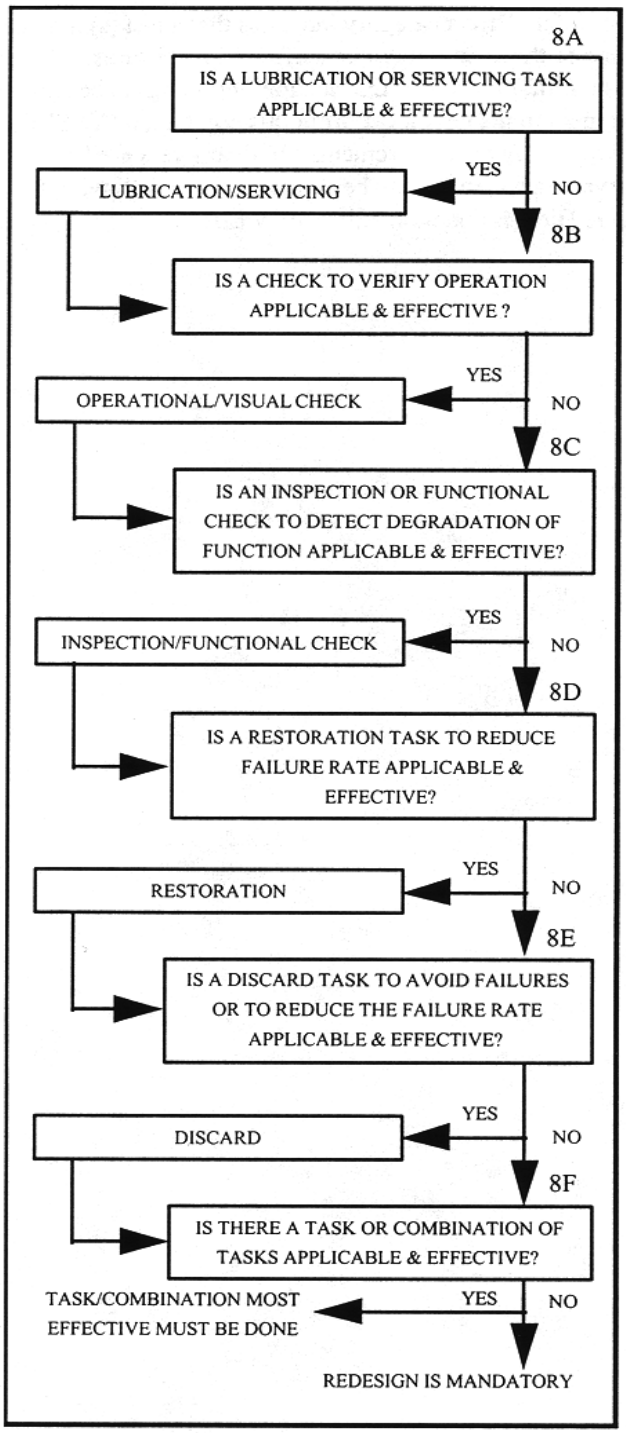
*Figure 2-3-5.4. Functional Failures that have Hidden Function Safety Effects*

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## 5. Hidden Function Non-Safety Effects (Category 9)

The Hidden Function Non-Safety Effect category indicates that a task(s) may be desirable to assure the availability necessary to avoid the economic effects of multiple failures. Movement of the failure causes through the logic requires the first question (Lubrication/Servicing) to be answered. Either a "YES" or "NO" answer still requires movement to the next level; from this point on, a "YES" answer will complete the analysis and the resultant task(s) will satisfy the requirements. If all answers are "NO", no task has been generated. If economic penalties are severe, a redesign may be desirable. The following is the logic progression for functional failures that have Hidden Function Non-Safety Effects.

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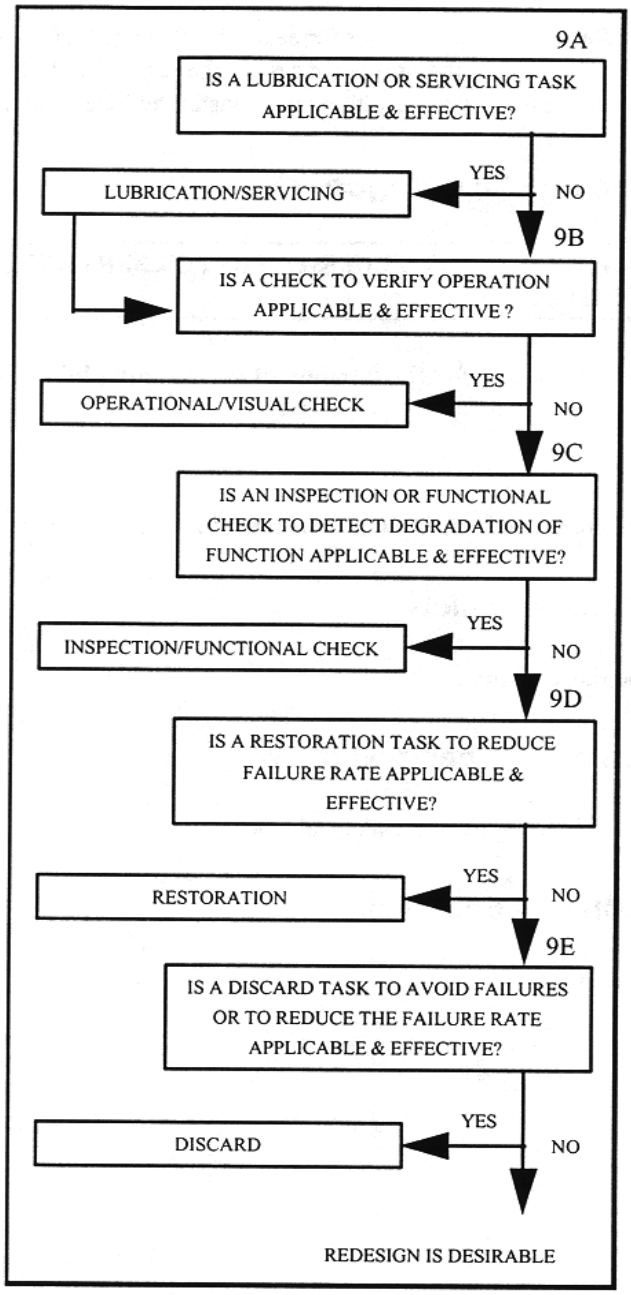
*Figure 2-3-5.5. Functional Failures that have Hidden Function Non-Safety Effects*

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## 2-3-6. Task Development (Second Level)

Task development is handled in a similar manner for each of the five Effect categories. For task determination, it is necessary to apply the failure causes for the functional failure to the second level of the logic diagram. There are six possible task resultant questions in the Effect categories as follows

## 1. Lubrication/Servicing (All Categories)

| | |
|---|---|
| **QUESTION 5A, 6A, 7A, 8A, 9A: EFFECTIVE?** | **IS A LUBRICATION OR SERVICING TASK APPLICABLE AND** |

**Any act of lubrication or servicing for the purpose of maintaining inherent design capabilities.**

### 1.1. Applicability Criteria

The replenishment of the consumable must reduce the rate of functional deterioration.

### 1.2. Effectiveness Criteria - Safety

The task must reduce the risk of failure.

### 1.3. Effectiveness Criteria - Operational

The task must reduce the risk of failure to an acceptable level.

### 1.4. Effectiveness Criteria - Economic

The task must be cost-effective.

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## 2. Operational/Visual Check (Hidden Functional Failure Categories Only)

**QUESTION 8B & 9B. IS A CHECK TO VERIFY OPERATION APPLICABLE AND EFFECTIVE?**

**An operational check is a task to determine that an item is fulfilling its intended purpose. The check does not require quantitative tolerances. This is a failure finding task.**

A visual check is an observation to determine that an item is fulfilling its intended purpose. The check does not require quantitative tolerances. This is a failure finding task.

### 2.1. Applicability Criteria

Identification of failure must be possible.

### 2.2 Effectiveness Criteria - Safety

The task must ensure adequate availability of the hidden function to reduce the risk of a multiple failure.

### 2.3. Effectiveness Criteria - Economic

The task must ensure adequate availability of the hidden function in order to avoid economic effects of multiple failures and must be cost-effective.

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# 3. Inspection/Functional Check (All Categories)

**QUESTION 5B, 6B, 7B, 8C & 9C. IS AN INSPECTION OR FUNCTIONAL CHECK TO DETECT DEGRADATION OF FUNCTION APPLICABLE AND EFFECTIVE?**

**An inspection is:**

A. DETAILED INSPECTION

An intensive examination of a specific item, installation or assembly to detect damage, failure or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate access procedures may be required.

OR

B. GENERAL VISUAL INSPECTION

A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance, unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or drop-light and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

OR

C. SPECIAL DETAILED INSPECTION

An intensive examination of a specific item, installation, or assembly to detect damage, failure or irregularity. The examination is likely to make extensive use of specialized Inspection Techniques and/or equipment. Intricate cleaning and substantial access or disassembly procedure may be required.

A functional check is a quantitative check to determine if one or more functions of an item performs within specified limits.

## 3.1. Applicability Criteria

Reduced resistance to failure must be detectable, and there exists a reasonably consistent interval between a deterioration condition and functional failure.

## 3.2. Effectiveness Criteria - Safety

The task must reduce the risk of failure to assure safe operation.

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## 3.3. Effectiveness Criteria - Operational

The task must reduce the risk of failure to an acceptable level.

## 3.4. Effectiveness Criteria - Economic

The task must be cost-effective; i.e., the cost of the task must be less than the cost of the failure prevented.

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# 4. Restoration (All Categories)

**QUESTION 5C, 6C, 7C, 8D, & 9D. IS A RESTORATION TASK TO REDUCE FAILURE RATE APPLICABLE AND EFFECTIVE?**

**That work necessary to return the item to a specific standard.**

Since restoration may vary from cleaning or replacement of single parts up to a complete overhaul, the scope of each assigned restoration task has to be specified.

## 4.1. Applicability Criteria

The item must show functional degradation characteristics at an identifiable age and a large proportion of units must survive to that age. It must be possible to restore the item to a specific standard of failure resistance.

## 4.2. Effectiveness Criteria - Safety

The task must reduce the risk of failure to assure safe operation.

## 4.3. Effectiveness Criteria - Operational

The task must reduce the risk of failure to an acceptable level.

## 4.4. Effectiveness Criteria - Economic

The task must be cost-effective: i.e., the cost of the task must be less than the cost of the failure prevented.

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# 5. Discard (All Categories)

**QUESTION 5D, 6D, 7D, 8E, 9E IS A DISCARD TASK TO AVOID FAILURES OR TO REDUCE THE FAILURE RATE APPLICABLE AND EFFECTIVE?**

**The removal from service of an item at a specified life limit.**

Discard tasks are normally applied to so-called single celled parts such as cartridges, canisters, cylinders, engine disks, safe-life structural members, etc.

## 5.1. Applicability Criteria

The item must show functional degradation characteristics at an identifiable age and a large proportion of units must survive to that age.

## 5.2. Effectiveness Criteria - Safety

A safe-life limit must reduce the risk of failure to assure safe operation.

## 5.3. Effectiveness Criteria - Operational

The task must reduce the risk of failure to an acceptable level.

## 5.4. Effectiveness Criteria - Economic

An economic-life limit must be cost-effective: i.e., the cost of the task must be less than the cost of the failure prevented.

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## 6. Combination (Safety Categories Only)

**QUESTION 5E. IS THERE A TASK OR COMBINATION OF TASKS APPLICABLE AND EFFECTIVE?**

**Since this is a safety category question and a task is required, all possible avenues must be analyzed. To do this, a review of the task(s) that are applicable is necessary. From this review the most effective task(s) must be selected.**

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## 7. Task Selection Criteria

***Table 2-3-6.1. Criteria for Task Selection***

| TASK | APPLICABILITY | SAFETY EFFECTIVENESS | OPERATIONAL EFFECTIVENESS | ECONOMIC EFFECTIVENESS |
|---|---|---|---|---|
| **LUBRICATION OR SERVICING** | The replenishment of the consumable must reduce the rate of functional deterioration. | The task must reduce the risk of failure. | The task must reduce the risk of failure to an acceptable level. | The task must be cost effective. |
| **OPERATIONAL OR VISUAL CHECK** | Identification of failure must be possible. | The task must ensure adequate availability of the hidden function to reduce the risk of a multiple failure. | Not applicable. | The task must ensure adequate availability of the hidden function in order to avoid economic effects of multiple failures and must be cost effective. |
| **INSPECTION OR FUNCTIONAL CHECK** | Reduced resistance to failure must be detectable, and there exists a reasonably consistent interval between a deterioration condition and functional failure. | The task must reduce the risk of failure to assure safe operation. | The task must reduce the risk of failure to an acceptable level. | The task must be cost effective; i. e., the cost of the task must be less than the cost of the failure prevented. |
| **RESTORATION** | The item must show functional degradation characteristics at an identifiable age, and a large proportion of units must survive to that age. It must be possible to restore the item to a specific standard of failure resistance. | The task must reduce the risk of failure to assure safe operation. | The task must reduce the risk of failure to an acceptable level. | The task must be cost effective; i.e., the cost of the task must be less than the cost of the failure prevented. |

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| TASK | APPLICABILITY | SAFETY EFFECTIVENESS | OPERATIONAL EFFECTIVENESS | ECONOMIC EFFECTIVENESS |
|---|---|---|---|---|
| **DISCARD** | The item must show functional degradation characteristics at an identifiable age and a large proportion of units must survive to that age. | The safe life limit must reduce the risk of failure to assure safe operation. | The task must reduce the risk of failure to an acceptable level. | An economic life limit must be cost effective; i.e., the cost of the task must be less than the cost of the failure prevented. |

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# 2-3-7. Systems/Powerplant Task Interval Determination

## 1. General

As part of the MSG-3 Logic-Analysis, the MWG (Maintenance Working Group) determines the interval of each scheduled maintenance task that satisfies both the applicability & effectiveness criteria. The MWGs should select the most appropriate interval for each maintenance task based on available data and good engineering judgement. In the absence of specific data on failure rates & characteristics, intervals for systems tasks are largely determined based on service experience with similar systems/components.

The information needed to determine optimum intervals is ordinarily not available until after the equipment enters service. In many cases previous experience with the same or a similar item serves as a guide. The difficulty of establishing "correct" intervals for maintenance tasks is essentially an information problem and one that continues throughout the operating life of the equipment.

A task should not be done more often than experience or other data suggests simply because it is easily accomplished (doing tasks more often than necessary increases the chance for maintenance-induced errors and may have an adverse effect on reliability and safety).

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## 2. Sources of Information

The MWG should consider the following in determining the most appropriate task interval:

- manufacturer's tests and technical analysis
- manufacturer's data and/or vendor recommendations
- customer requirements
- service experience gained with comparable or identical components and subsystems
- 'best engineering estimates'

In order to arrive at the 'best initial' maintenance interval for each task, each MWG must assess the interval based on all relevant data that is available. As part of this assessment, the MWG should consider answering the following questions in order to determine the most appropriate interval:

- What service experience is available for common/similar parts/components/systems on other aircraft that defines an effective task interval?
- What design improvements have been incorporated that warrant a longer interval between checks?
- What task interval is recommended by the vendor/manufacturer based on test data or failure analysis?

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## 3. Task Interval Parameters

Task intervals are established in terms of the measure of exposure to the conditions that cause the failure at which the task is directed. The most widely used usage parameters are:

- calendar time
- flight hours
- flight cycles
- Engine/APU hours/cycles.

Task interval determination consists of identifying the correct usage parameter and its associated numerical interval or the appropriate letter check. Both intervals expressed in usage parameters and/or letter checks are acceptable and may be used in line with specific procedures established for a given program. If an interval is to be expressed in a usage parameter, interval determination consists of the following steps:

- The first step is to define the predominant (governing) usage parameter(s). For many Systems/Powerplant tasks, flight hours is the predominant usage parameter; however, for some tasks, flight cycles or calendar time may be the predominant usage parameter. Intervals may also be expressed in terms of more than one usage parameter.
- The second step is to determine the interval in terms of the selected usage parameter subject to the criteria discussed below.

As a matter of convenience, usage of letter checks for individual tasks and the establishment of a check interval framework may be considered by the ISC; e.g., if no predominant usage parameter can be identified.

For some tasks, it may be appropriate for the MWG to consider specifying an initial interval that is different from the repeat interval.

## 4. Task Interval Selection Criteria

In addition to the general guidelines included in [Heading 2-3-7.1], the following detailed recommendations should be considered:

Lubrication/Servicing (failure prevention):

- The interval should be based on the consumable's usage rate, the amount of consumable in the storage container (if applicable) and the deterioration characteristics.
- Typical operating environments and climatic conditions are to be considered when assessing the deterioration characteristics.

Operational Checks & Visual Checks (failure-finding):

- Consider the length of potential exposure time to a hidden failure and the potential consequences if the hidden function is unavailable.

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- Task intervals should be based on the need to reduce the probability of the associated multiple failure to a level considered tolerable by the MWG.
- The failure-finding task and associated interval selection process should take into account any probability that the task itself might leave the hidden function in a failed state.

Inspections & Functional checks (potential failure finding):

- There should exist a clearly defined potential failure condition.
- The task interval should be less than the shortest likely interval between the point at which a potential failure becomes detectable and the point at which it degrades into a functional failure. (If the specific failure data is available, this interval may be referred to as the P to F interval.)
- It should be practical to do the task at this interval.
- The shortest time between the discovery of a potential failure and the occurrence of the functional failure should be long enough for an appropriate action to be taken to avoid, eliminate or minimize the consequences of the failure mode.

Restoration and Discard (failure avoidance):

- Intervals should be based on the "identifiable age" when significant degradation begins and where the conditional probability of failure increases significantly.
- Vendor recommendations based on in-service experience of similar parts should also be taken into consideration.
- A sufficiently large proportion of the occurrences of this failure should occur after this age to reduce the probability of premature failure to a level that is tolerable.

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## 5. "Access-Defined" Inspection Intervals

Occasionally, it is impossible to accomplish a task until a component/system is removed/displaced; the interval of such a task should be coordinated with the removal/displacement of that component/system.

If the component/system is removed/displaced at intervals shorter than what is required for the task, then the task interval should be defined by the MWG as the removal/displacement interval (scheduled or unscheduled). If the task interval is shorter than the removal/displacement interval, then an access-defined interval is not appropriate.

| | |
|---|---|
| NOTE: | If the MWG selects an access-defined interval, consideration should be given to defining a minimum interval between tasks. For example, if "Engine Change" is the access-defined interval, and the engine is removed soon after the last engine change due to an unscheduled event, the task should not be repeated unless a minimum number of hours have elapsed. |

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## 6. Certification Maintenance Requirements (CMRs)

In addition to those tasks and intervals established through MSG-3 analysis, scheduled maintenance tasks may arise within the FAR 25.1309 certification process.

A CMR is a required periodic task, established during the design certification of the airplane as an operating limitation of the type certificate. CMRs are a subset of the tasks identified during the type certification process. CMRs usually result from a formal, numerical analysis conducted to show compliance with catastrophic and hazardous failure conditions. A CMR is intended to detect safety significant latent failures that would, in combination with one or more other specific failures or events, result in a hazardous or catastrophic failure condition.

It is important to note that CMRs are derived from a fundamentally different analysis process than the maintenance tasks and intervals that result from MSG-3 analysis. The process for coordinating MSG-3 derived tasks with CMRs is described in detail in AC 25-19 and involves a Certification Maintenance Coordination Committee (CMCC) that may influence the MWG's interval decision.

## 7. Sampling

Sampling may be established for items defined in the Systems and Powerplant Analysis Procedures.

Sampling is an examination of a specific number of items at defined intervals in order to confirm that there are no unexpected degradation characteristics. Non-sampled items may continue in service until sampling results highlight the need for additional scheduled maintenance.

# 2-4. Aircraft Structural Analysis Procedure

This section contains guidelines for developing scheduled maintenance tasks for aircraft structure. These are designed to relate the scheduled maintenance tasks to the consequences of structural damage remaining undetected. Each structural item is assessed in terms of its significance to continuing airworthiness, susceptibility to any form of damage, and the degree of difficulty involved in detecting such damage. Once this is established, scheduled structural maintenance can be developed which can be shown to be effective in detecting and preventing structural degradation due to fatigue, environmental deterioration, or accidental damage throughout the operational life of the aircraft. The structural maintenance task(s) developed as part of the scheduled structural maintenance are used to satisfy aircraft type certification and MRB requirements.

Mandatory replacement times for structural safe-life parts are included in the Airworthiness Limitations, required by the regulatory authorities as part of the Instructions for Continued Airworthiness. Some of the items requiring fatigue related inspections may also be included, as well as specific Corrosion Prevention and Control Program (CPCP) tasks which subsequently warrant inclusion, based on the in-service experience of the operators.

Requirements for detecting **Accidental Damage (AD), Environmental Deterioration (ED), Fatigue**

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**Damage (FD)**, and procedures for preventing and/or controlling corrosion form the basis for the MRB structural maintenance. However, all FD inspection requirements may not be available when the aircraft enters service. In such cases the manufacturer shall propose, prior to the entry of the aircraft into service, an appropriate time frame for completing the FD inspection requirements.

Procedures should be developed for composite or other new materials because damage characteristics may not follow those accepted for metallic structures.

## 2-4-1. Scheduled Structural Maintenance

The primary objective of the scheduled structural maintenance is to maintain the inherent airworthiness throughout the operational life of the aircraft in an economical manner. To achieve this, the inspections must meet the detection requirements from each of the AD, ED and FD assessments. Full account may be taken of all applicable inspections occurring in the fleet.

Inspections related to detection of AD/ED are applicable to all aircraft when they first enter service. Changes or adjustments can be made to these inspections based on individual operator experience, when approved by their local regulatory authority.

Additional maintenance tasks (related to ED) to control corrosion to Level 1 or better are applicable at a threshold which is established during the aircraft type certification process. These are based on manufacturer and operator experience with similar aircraft structure, taking into consideration differences in relevant design features e.g. choice of material, assembly process, corrosion protection systems, galley and toilet design etc. See also [Heading 2-4-1.5] entitled Corrosion Prevention and Control Program.

Inspections related to FD detection are applicable after a threshold, which is established during the aircraft type certification process. At the time the fatigue related inspections are implemented, sampling can be used, where it is applicable and effective. The fatigue related inspections are based directly on the manufacturer's approved damage tolerance evaluations and changes or adjustments by the operators require use of an approved procedure.

Where no service experience exists with similar structure, the structural maintenance requirements shall be based on manufacturer's recommendations.

Proposed initial scheduled maintenance checks, to be used as the basis for the structural maintenance, are established for each aircraft type by the Industry Steering Committee on the basis of:

a. Operator experience

b. Manufacturer's proposals

c. Considerations of systems analysis requirements

### 1. Structural Maintenance Tasks

As part of the structural maintenance development procedure, applicable and effective structural maintenance tasks are selected for each deterioration process of the SSI. To assure a direct correlation between the

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structural damage tolerance evaluations and the structural maintenance, it is necessary to describe each task.

To all extents possible, the inspection methods specified in the tasks should use the standard set of definitions included in the MSG-3 glossary. Changes and/or additions to the inspection methods and definitions must be approved by the Industry Steering Committee.

## 2. Inspection Thresholds

The inspection threshold for each SSI inspection task is a function of the source of damage as follows:

a. **Accidental Damage** - The first inspection (threshold) for accidental damage normally corresponds to a period equal to the defined repeat inspection interval, from the time of first entry into service.

b. **Environmental Deterioration** - The initial inspection thresholds for all levels of inspection are based on existing relevant service experience, manufacturers recommendations, and/or a conservative age exploration process.

c. **Fatigue Damage** - Inspections directly related to fatigue damage detection will occur after a threshold(s) to be established by the manufacturer and approved by the appropriate regulatory authority Thresholds are normally established as part of the damage tolerance certification requirements. These are subject to change as service experience, additional testing, or analysis work is obtained.

## 3. Repeat Inspection Intervals

After each inspection has been conducted, the repeat interval sets the period until the next inspection:

a. **Accidental Damage** - The repeat interval should be based on operator and manufacturer experience with similar structure. Selected intervals will normally correspond to single or multiple levels of the scheduled maintenance check intervals.

b. **Environmental Deterioration** - The repeat interval for detection/prevention/control of ED (corrosion, stress corrosion, etc.) should be based on existing relevant service experience and/or manufacturers recommendations.

c. **Fatigue Damage** - The repeat intervals for fatigue related inspections are based on the damage tolerance evaluations. These are used to demonstrate that applicable and effective inspections provide sufficient probability of detecting fatigue damage for each SSI.

## 4. Fatigue Related Sampling Inspections

Transport aircraft with the highest number of flight cycles are most susceptible to initial fatigue cracking in the fleet. This means that adequate inspections on such aircraft will provide the greatest benefits for timely detection of fatigue damage. Such sampling inspections are developed on the basis of appropriate statistical variables, including:

a. The number of aircraft inspected.

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b. The inspection methods and repeat intervals.

c. The number of flight cycles completed.

A list of SSIs that are suitable for a fatigue related sampling inspections will be established by the Structures Working Group and submitted to the Industry Steering Committee for approval and inclusion in the MRB report proposal. Full details of the fatigue related sampling inspections will be established by a joint operator/ manufacturer task force, based on the manufacturer's technical evaluations, prior to aircraft exceeding the fatigue damage threshold(s).

## 5. Corrosion Prevention and Control Programs (CPCP)

A Corrosion Prevention and Control Program should be established to maintain the aircraft's resistance to corrosion as a result of systematic (e.g. age related) deterioration through chemical and/or environmental interaction.

The program is expected to allow control of the corrosion on the aircraft to **Corrosion Level 1** or better. The CPCP should be based on the ED analysis, assuming an aircraft operated in a typical environment. If corrosion is found to exceed Level 1 at any inspection time, the corrosion control program for the affected area must be reviewed by the operator with the objective to ensure Corrosion Level 1 or better.

## 6. Age Exploration Process

An age exploration process may be desirable to verify the aircraft's resistance to corrosion deterioration before the Corrosion Prevention and Control Program Task Thresholds.

Guidelines for age exploration should be established by the Structures Working Group and submitted to the Industry Steering Committee for approval and inclusion in the scheduled structural maintenance tasks and intervals.

## 7. Zonal Inspections

Some parts of the inspection requirements for SSIs and most of the items categorized as Other Structure can be provided by the zonal inspections (Ref. [Section 2-5]).

Tasks and intervals included in the zonal inspections should be based on operator and manufacturer experience with similar structure. For structure containing new materials and/or construction concepts, tasks and intervals may be established based on assessment of the manufacturer's recommendations.

## 8. Inspection Results

The type certificate holder (manufacturer) and the operators will implement a satisfactory system for the effective collection and dissemination of service experience from the scheduled structural maintenance.

This process will supplement the system which is required by existing regulations for reporting occurrences

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of failures, malfunctions or defects (e.g. Service Difficulty Reports).

## 2-4-2. Aircraft Structure Defined

Aircraft structure consists of all load carrying members including wings, fuselage, empennage, engine mountings, landing gear, flight control surfaces and related points of attachment. The actuating portions of items such as landing gear, flight controls, doors, etc. will be treated as systems components and will be analyzed as described in [Section 2-3]. Attachment of the actuators to the airframe will be treated as structure.

### 1. Significant and Other Structure

Structure can be subdivided into items according to the consequences of their failure to aircraft safety as follows

a. A **Structural Significant Item (SSI)** is any detail, element or assembly, which contributes significantly to carrying flight, ground, pressure or control loads, and whose failure could affect the structural integrity necessary for the safety of the aircraft.

b. **Other Structure** is that which is judged not to be a Structural Significant Item. It is defined both externally and internally within zonal boundaries.

## 2-4-3. Damage Sources and Inspection Requirements

This section describes the damage sources and inspection requirements to be considered when developing the scheduled structural maintenance.

### 1. Damage Sources

The assessment of structure for the selection of maintenance tasks should consider the following damage sources

a. **Accidental Damage (AD)**, which is characterized by the occurrence of a random discrete event which may reduce the inherent level of residual strength. Sources of such damage include ground and cargo handling equipment, foreign objects, erosion from rain, hail, lightning, runway debris, spillage, freezing, thawing, etc., and those resulting from human error during aircraft manufacture, operation or maintenance that are not included in other damage sources.

The same sources of accidental damage as those considered for metallic materials are to be considered for non-metallic material such as composites. The consequence of a damage may not be readily apparent and may include internal damage, e.g., disbonding or delamination.

Large size accidental damage, such as that caused by engine disintegration, bird strike or major collision with ground equipment, will be readily detectable and no maintenance task assessment is required.

b. **Environmental Deterioration (ED)**, which is characterized by structural deterioration as a result of a chemical interaction with its climate or environment. Assessments are required to cover corrosion,

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including stress corrosion, and deterioration of non-metallic materials. Corrosion may or may not be time/usage dependent. For example, deterioration resulting from a breakdown in surface protection is more probable as the calendar age increases; conversely, corrosion due to galley spillage is a randomly occurring discrete event.

Stress corrosion cracking in a given environment is directly dependent upon the level of sustained tensile stress which may result from heat treatment, forming, fit-up, or misalignment.

In contrast to the environmental deterioration process of metallic structures, non-metallic structures such as composites are not normally susceptible to degradation due to the environment. However, the effect of long-term aging in an operating environment has to be taken into consideration when developing the structural maintenance.

c. **Fatigue Damage (FD)** which is characterized by the initiation of a crack or cracks due to cyclic loading and subsequent propagation. It is a cumulative process with respect to aircraft usage (flight cycles or flight hours).

## 2. Inspection Requirements

Inspection requirements in relation to the damage sources are as follows:

a. **Accidental Damage (AD)**, stress corrosion and most other forms of corrosion are random in nature and can occur any time during the aircraft service life. In such cases, inspection requirements apply to all aircraft in the fleet throughout their operational lives.

b. Most forms of corrosion are time/usage dependent and more likely to occur as the fleet ages. In such cases, operator and manufacturer experience on similar structure can be used to establish appropriate maintenance tasks (including CPCP tasks) for the control of environmental deterioration.

The deterioration of non-metallic structures such as composites has to be taken into consideration when establishing maintenance tasks. Appropriate inspection levels and frequencies should be based on existing relevant service experience and manufacturer's recommendations.

c. Detectable size fatigue cracking is not normally anticipated in primary airframe structure until the fleet has matured. Thereafter, scheduled structural maintenance may require revision.

For most transport aircraft structure, aircraft with the highest number of flight cycles are more susceptible to initial fatigue cracking in the fleet and are suitable candidates for a fatigue related sampling, should this be applicable and effective.

# 2-4-4. Scheduled Structural Maintenance Development

The scheduled structural maintenance tasks and intervals are based on an assessment of structural design information, fatigue and damage tolerance evaluations, service experience with similar structure and pertinent test results.

The assessment of structure for selection of maintenance tasks should include the following

a. The sources of structural deterioration:

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1. Accidental Damage
2. Environmental Deterioration
3. Fatigue Damage

b. The susceptibility of the structure to each source of deterioration.

c. The consequences of structural deterioration to continuing airworthiness

1. Effect on aircraft (e.g. loss of function or reduction of residual strength).
2. Multiple site or multiple element fatigue damage.
3. The effect on aircraft flight or response characteristics caused by the interaction of structural damage or failure with systems or powerplant items.
4. Inflight loss of structural items.

d. The applicability and effectiveness of various methods of preventing, controlling or detecting structural deterioration, taking into account inspection thresholds and repeat intervals.

## 1. Procedure

The procedure for developing structural maintenance is shown in the logic diagram (Ref. [Figure 2-4-4.1]) and described by a series of process steps (P1, P2, P3, etc.) and decision steps (D1, D2, D3, etc.) as follows:

a. The structural maintenance includes all aircraft structure which is divided into zones or areas (P1) and structural items (P2) by the manufacturer.

b. The manufacturer categorizes each item (D1) as structurally significant (SSI) (P3) or Other Structure (P4), on the basis of the consequences to aircraft safety of item failure or malfunction.

c. The same procedure is repeated until all structural items have been categorized.

d. Items categorized as Other Structure (P4) are compared to similar items on existing aircraft (d2). Maintenance recommendations are developed by the Structures Working Group (SWG) for items which are similar and by the manufacturer for those which are not, e. g., new materials or design concepts (P5). All tasks selected by the SWG (P6) are included in the scheduled structural maintenance (P15).

e. Inspection requirements for timely detection of Accidental Damage (AD) and Environmental Deterioration (ED) are determined for all SSIs (P7). These can be determined for individual SSIs or groups of SSIs which are suitable for comparative assessments on the basis of their location, boundaries, inspection access, analysis breakdown, etc. The manufacturer's rating systems (Ref. [Subject 2-4-5]) are used to determine these requirements.

f. The process (P7) is repeated until all SSIs are examined.

g. For each SSI, the maintenance requirements are determined (P8) such that the expectations of the CPCP (Ref. [Heading 2-4-1.5]) are fulfilled.

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h. The inspection requirement of the ED analysis is compared with the requirement of the CPCP (D9). If they are similar or identical, the ED task will cover the CPCP requirement. If the CPCP task requirement is not met, the ED task has to be reviewed and/or additional and separate CPCP tasks have to be determined (P9).

i. The process (P7, P8, D9) is repeated until all SSIs are examined.

j. All tasks, selected by the SWG, are included in the structural maintenance (P15).

k. The manufacturer categorizes each SSI as damage tolerant or safe-life (D3).

l. For each item categorized as safe-life (P10), the manufacturer determines the safe-life limit which is included in the aircraft Airworthiness Limitations (P14). No fatigue related inspection is required to assure continuing airworthiness.

m. All remaining SSIs are damage tolerant (P11) and the manufacturer determines if timely detection of fatigue damage is dependent on scheduled inspections. Scheduled fatigue related inspection may not be required for SSIs designed to carry the required load with damage that will be readily detectable during routine operation of the aircraft or indicated by safe malfunction (D4).

n. Visual inspections during appropriate scheduled maintenance checks are used, where applicable and effective, to provide the necessary fatigue damage detection opportunities (D5).

o. Applicable nondestructive inspection (NDI) methods, during appropriate scheduled maintenance checks, are used to provide necessary fatigue damage detection opportunities when visual inspections are inadequate (D6).

p. Details of the fatigue related inspection requirements are presented to the SWG who determine if they are feasible (D7). Improved inspection access and/or redesign of the SSI may be required if no practical and effective visual and/or nondestructive inspections are available (D8,P12). If this is not feasible for the manufacturer, the SSI must be categorized as safe-life (P10).

q. Fatigue related inspection requirements selected by the SWG are included in the preliminary Scheduled Structural Maintenance (P15).

r. To support Type Certification, selected SSIs (P13, P14) that will eventually be included in the fatigue related inspection should be listed in the Airworthiness Limitations document.

s. The FD analysis procedure is repeated for all damage tolerant SSIs.

t. Tasks from AD, ED, FD, and other structure analyses are listed in the Scheduled Structural Maintenance (P15).

u. The resulting maintenance requirements for all structure are submitted to the ISC for approval and inclusion in the MRB report proposal.

v. The structural maintenance portion of the Airworthiness Limitations should be included in a separate document and submitted to the appropriate Regulatory Authority (certification) for approval.

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*Figure 2-4-4.1. Structural Logic Diagram*

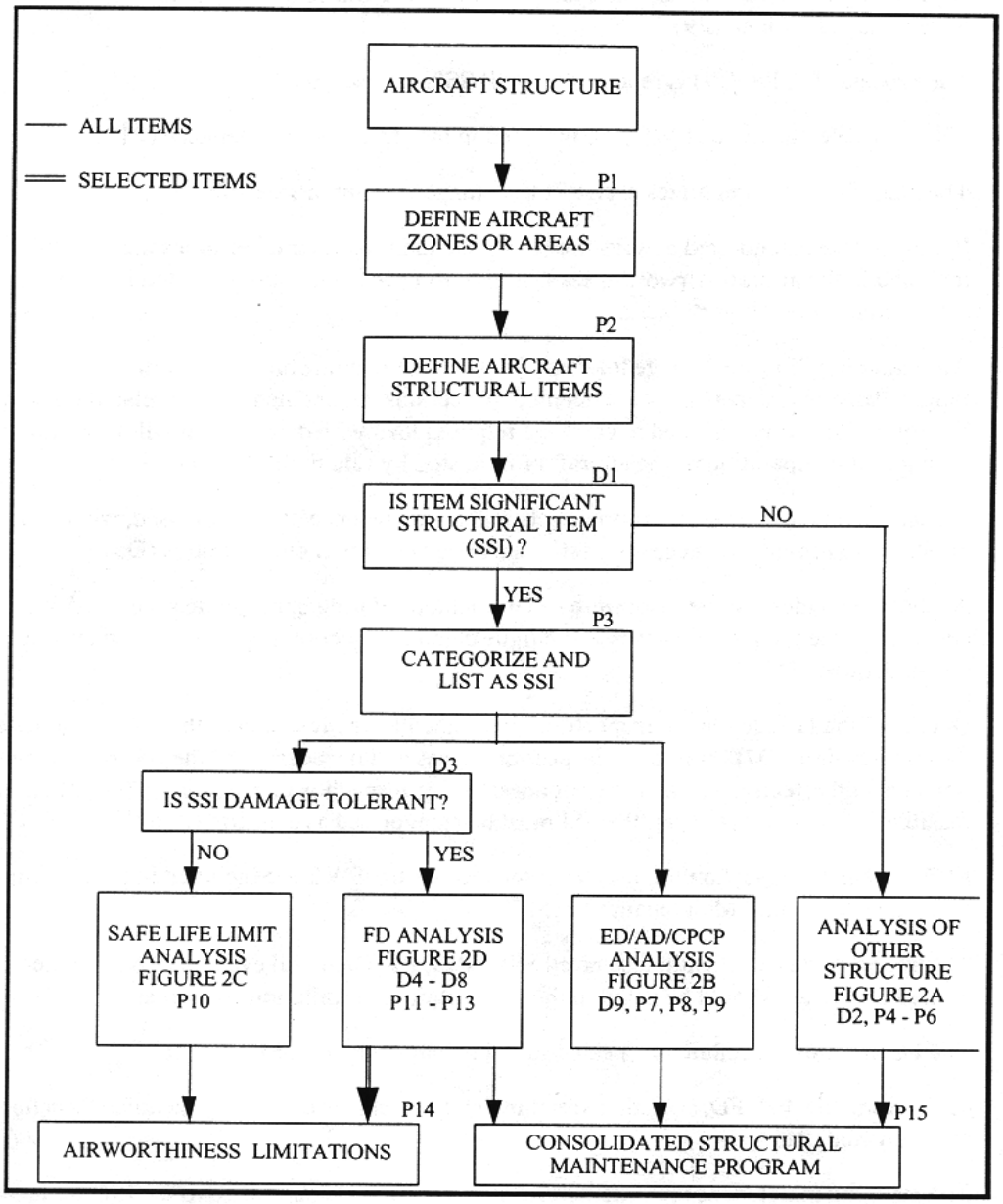


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***Figure 2-4-4.2. Other Structure Logic Diagram***

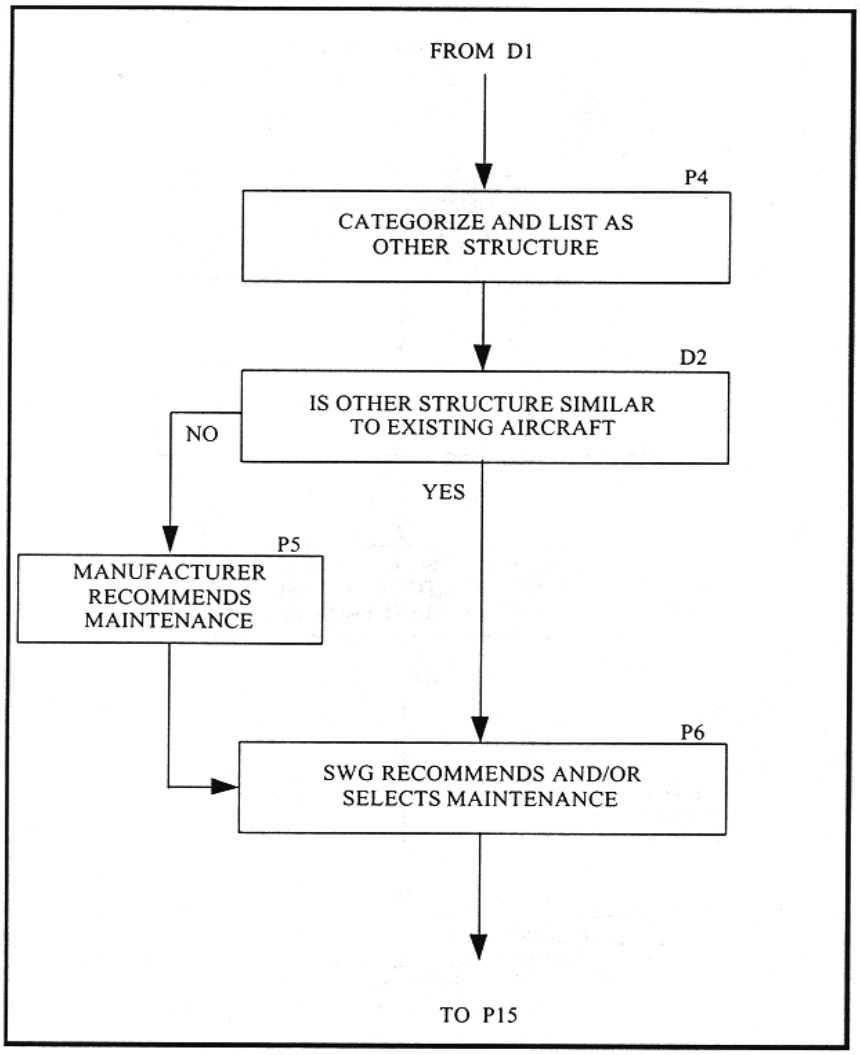


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*Figure 2-4-4.3. Accidental Damage and Environmental Deterioration Logic Diagram*

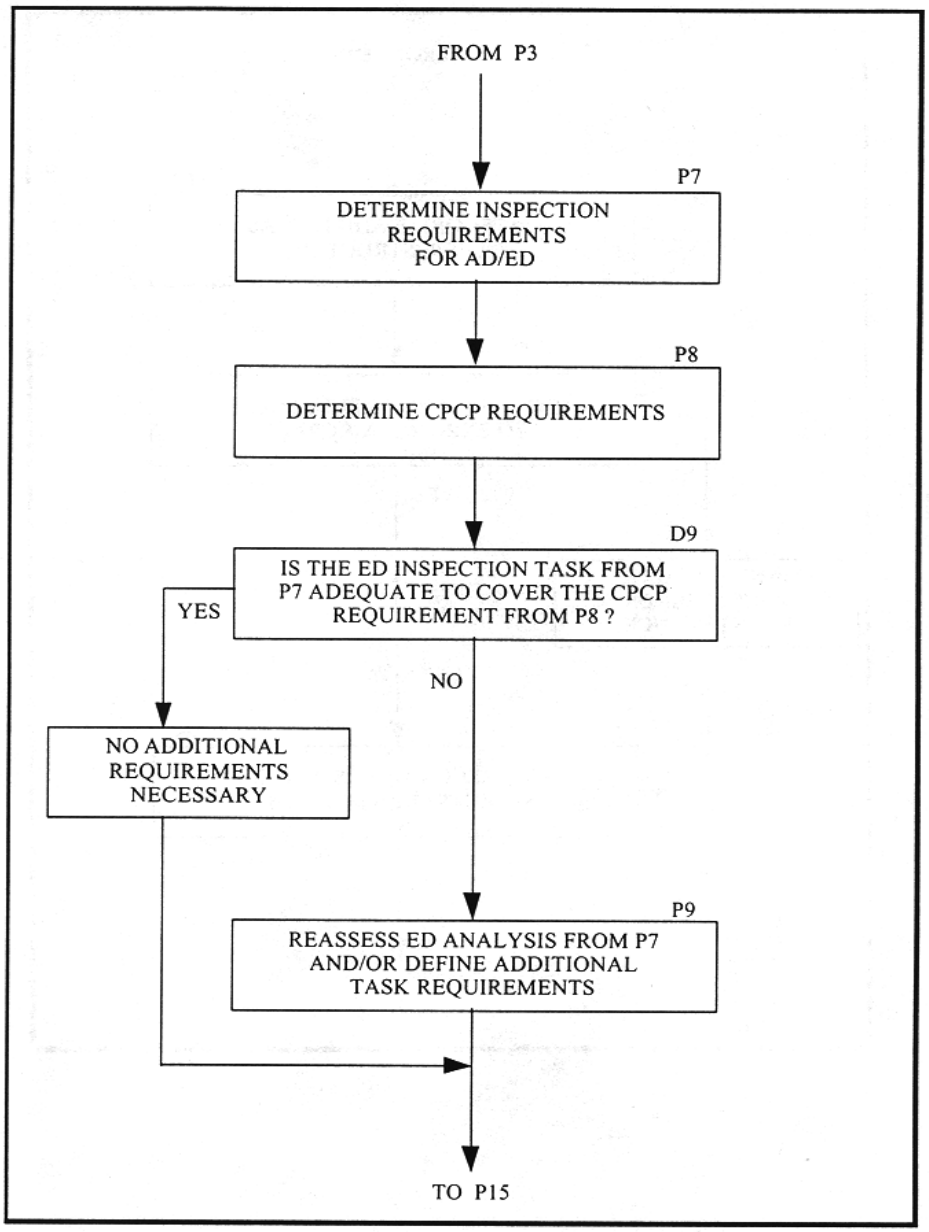


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***Figure 2-4-4.4. Safelife Limit Analysis Logic Diagram***

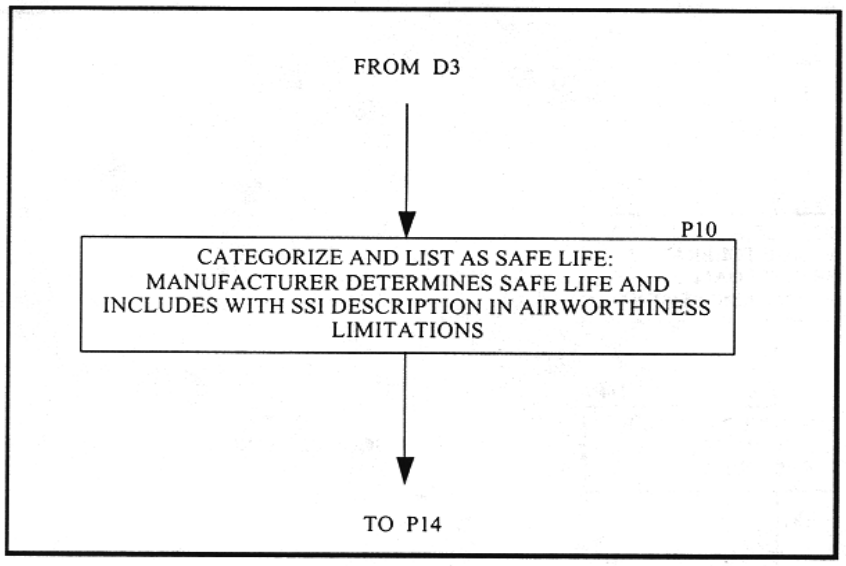


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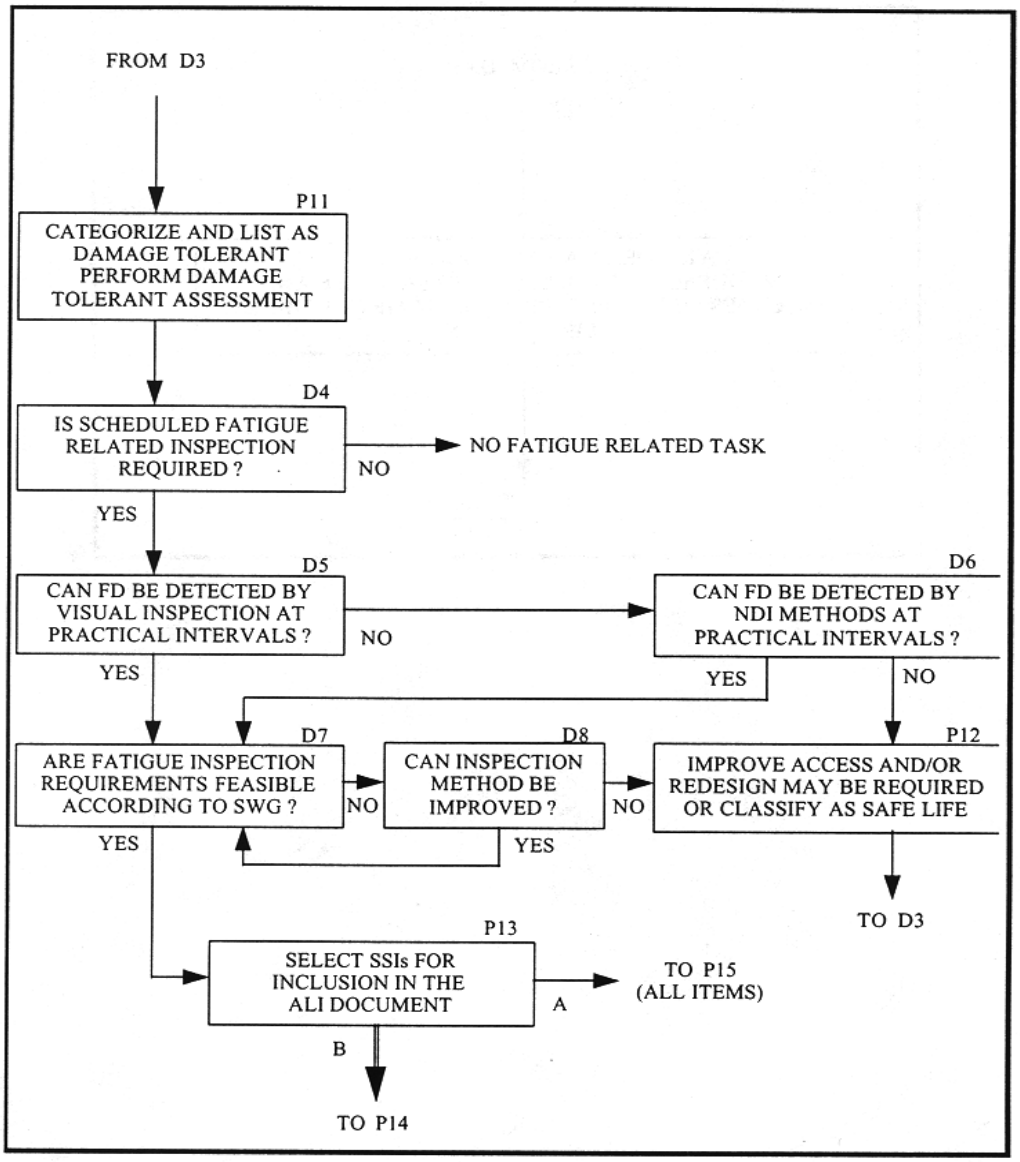
*Figure 2-4-4.5. Fatigue Damage Analysis Logic Diagram*

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## 2-4-5. Rating Systems for Structural Significant Items

As part of the scheduled structural maintenance development, it is necessary to rate each Structural Significant Item in terms of susceptibility (likelihood of damage) and detectability (timely detection of damage). This section provides guidelines to assist manufacturers in the development of suitable rating systems. The rating system should account for the susceptibility of the SSI to the likely source of damage and the likely type of deterioration of the SSI due to the damage source. Differences between metallic and non-metallic portions of the SSI's must be taken into account.

The scheduled structural maintenance tasks and intervals are developed on the basis of requirements to assure timely detection of Accidental Damage, Environmental Deterioration, and Fatigue Damage. Rating systems for AD and ED should be compatible to allow comparative assessments for each group of SSIs. Emphasis is placed on rating each SSI in relation to other SSIs in the same inspection area, leading to increased inspection emphasis for the most critical SSIs. Manufacturer and operator experience is a key ingredient for these evaluations.

Rating systems for FD should incorporate results from the manufacturer's residual strength and crack growth evaluations. The applicability and effectiveness of various inspection methods, detectable damage sizes and access requirements are key ingredients for these evaluations.

### 1. Rating Accidental Damage

Accidental damage rating systems should include evaluations of the following

a. Susceptibility to minor (not obvious) accidental damage based on frequency of exposure to and the location of damage from one or more sources, including:

   1. Ground handling equipment
   2. Cargo handling equipment
   3. Those resulting from human error during manufacture, maintenance, and/or operation of the aircraft, that are not included in other damage sources.
   4. Rain, hail, etc.
   5. Runway debris
   6. Lightning strike
   7. Water entrapment

b. Residual strength after accidental damage, normally based on the likely size of damage relative to the critical damage size for the SSI.

c. Timely detection of damage, based on the relative rate of growth after damage is sustained and visibility of the SSI for inspection. Assessments should take into account damage growth associated with non-chemical interaction with an environment, such as disbond or delamination growth

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associated with a freeze/thaw cycle.

Rating values should be assigned to groups of SSIs in the same inspection area on the basis of comparative assessments within the group.

## 2. Rating Environmental Deterioration

Environmental deterioration rating systems should allow for evaluations of susceptibility to and timely detection of corrosion and stress corrosion.

Susceptibility to corrosion is assessed on the basis of probable exposure to an adverse environment and adequacy of the protective system. For example:

a. Exposure to a deteriorating environment such as cabin condensation, galley spillage, toilet spillage, cleaning fluids, etc.

b. Contact between dissimilar materials (potential for galvanic activity).

c. Breakdown of surface protection systems; for example, deterioration of paint, primer, bonding, sealant, corrosion inhibiting compounds and cladding systems with the resulting corrosion of metallic materials or fluid incursion into permeable non-metallic materials, etc.

Material characteristics, coupled with the likelihood of sustained tensile stress, are used to assess susceptibility to stress corrosion.

Timely detection is determined by sensitivity to relative size of damage and visibility of the SSI for inspection.

| | |
|---|---|
| NOTE: | Rating system evaluations should be made taking into account the requirement for each operator to control the aircraft structure at corrosion Level 1 or better. |

## 3. Rating Fatigue Damage

The rating system must lead to inspections that provides a high probability of detecting fatigue damage in the fleet before such damage reduces any aircraft's residual strength below allowable levels. To achieve this, the rating system should consider the following:

a. Residual strength, including the effects of multiple site fatigue damage, where appropriate.

b. Crack growth rate, including effects of multiple site or multiple element fatigue damage, where appropriate.

c. Damage detection period which corresponds to the interval for the fatigue damage to grow from the threshold of detection (detectable) to the limiting size defined by "a" (critical). This period will vary according to the inspection method used, and may be influenced by structural parts or processes, e.g., sealant obscuring parts of the damage.

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d. Detection standards for applicable inspection methods.

| | |
|---|---|
| NOTE: | Estimated detectable crack lengths can be used for the fatigue damage detection evaluations required as part of aircraft type certification. |

e. Applicable inspection levels and methods (e.g., visual, NDI), directions (e.g., external, internal) and repeat intervals (e.g., C, 2C, 4C).

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# 2-5. Zonal Analysis Procedure

Zonal inspections may be developed from application of the Zonal Analysis Procedure. This requires a summary review of each zone on the aircraft and normally occurs as the MSG-3 analyses of structures, systems, and powerplants are being concluded. These inspections may subsequently be included in the Zonal Inspections.

This Zonal Analysis Procedure permits appropriate attention to be given to electrical wiring installations. Thus, as well as determining zonal inspections, the logic provides a means to identify applicable and effective tasks to minimize contamination and to address significant wiring installation discrepancies that may not be reliably detected through zonal inspection. These dedicated tasks may subsequently be included in the Systems and Powerplant tasks.

In top down analyses conducted under MSG-3, many support items such as plumbing, ducting, Other Structure, wiring, etc., may be evaluated for possible contribution to functional failure. In cases where a general visual inspection is required to assess degradation, the zonal inspection is an appropriate method.

## 2-5-1. Procedure

The following procedures may be used

a. Divide the aircraft externally and internally into zones as defined in [ATA iSpec 2200], (formerly ATA Spec 100).

b. For each zone, prepare a work sheet that identifies data such as: zone location and access, approximate size (volume), type of systems and components installed, typical power levels in any wiring bundles, features specific to L/HIRF protection, etc. In addition, assess potential for the presence of combustible material, either through contamination (e.g., dust and lint) or occurring by design (e.g., fuel vapor).

c. Develop rating tables to determine the repeat interval for a zonal inspection. Rating tables will permit the likelihood of accidental damage, environmental deterioration and the density of equipment in the zone to be taken into account.

d. For all zones containing systems installations, perform a standard zonal analysis using the rating tables from paragraph (c.) to define the extent and interval of zonal inspection tasks. Multiple zonal inspections may be identified for each zone with those having less frequent intervals requiring increased access requirements.

e. Identify zones that both contain electrical wiring and have potential for combustible material being present. For those zones, perform an enhanced zonal analysis that permits the identification of stand-alone inspections and tasks that minimize contamination by combustible materials. Rating tables addressing the potential effects of fire on adjacent wiring and systems, the size of the zone and the density of installed equipment may be used to determine the inspection level. General Visual Inspections may be found effective for the complete zone. Detailed Inspections may be found effective for specific items in a zone. Interval determination may be accomplished using rating tables that consider accidental damage and environment.

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f. Detailed Inspections and tasks to minimize contamination should be included in the Systems and Powerplant tasks. Since these are not system specific and do not have a Failure Effect Category, introduction in a dedicated section is suggested, for example, under ATA 20.

g. General Visual Inspections arising from the enhanced zonal analysis (paragraph e.) may be compared with the Zonal Inspections determined from the standard zonal analysis (paragraph d.). The former may be considered fully covered by the zonal inspection if the access requirement is the same and the proposed interval is at least as frequent. Otherwise, a stand-alone GVI should be included with the tasks identified in paragraph (f.).

h. General Visual Inspections arising from the systems, powerplants and structures may be compared with the Zonal Inspections determined from the standard zonal analysis (paragraph d.). Work sheets should record the interval proposed in the originating analysis. These GVIs may be considered fully covered by the zonal inspection if the access requirement is the same and the proposed interval is at least as frequent. Otherwise, a stand-alone GVI should be included within the MSI or SSI from which it was identified.

i. General Visual Inspections arising from the analysis of L/HIRF may be compared with the Zonal Inspections determined from the standard zonal analysis (paragraph d.). These GVIs may be considered fully covered by the zonal inspection if the access requirement is the same and the proposed interval is at least as frequent. Otherwise, a stand-alone GVI should be included within the Systems and Powerplants tasks as described in [Subject 2-6-1].

j. Visual Checks may be considered covered by the Zonal Inspections provided that the Systems Working Group that identified them consider that the failure would be noted and addressed during a zonal inspection. Otherwise, the task should remain in the Systems and Powerplants tasks where specific attention can be drawn to the item.

k. All tasks developed through application of the standard zonal analysis (paragraph d.) should be included in the Zonal Inspections. For accountability purposes, any General Visual Inspection or Visual Check originating from application of systems, powerplant or structures analyses should be referenced in the MRB Report zonal task. To avoid giving unjustified attention to these items, this should not be indicated on task/work cards.

A typical logic diagram is depicted in [Figure 2-5-1.1] and [Figure 2-5-1.2]. This is provided as a guide and may be customized to reflect individual company policies and procedures.

***Figure 2-5-1.1. Typical Zonal Analysis Procedure***

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**Figure 2-5-1.1. Typical Zonal Analysis Procedure**

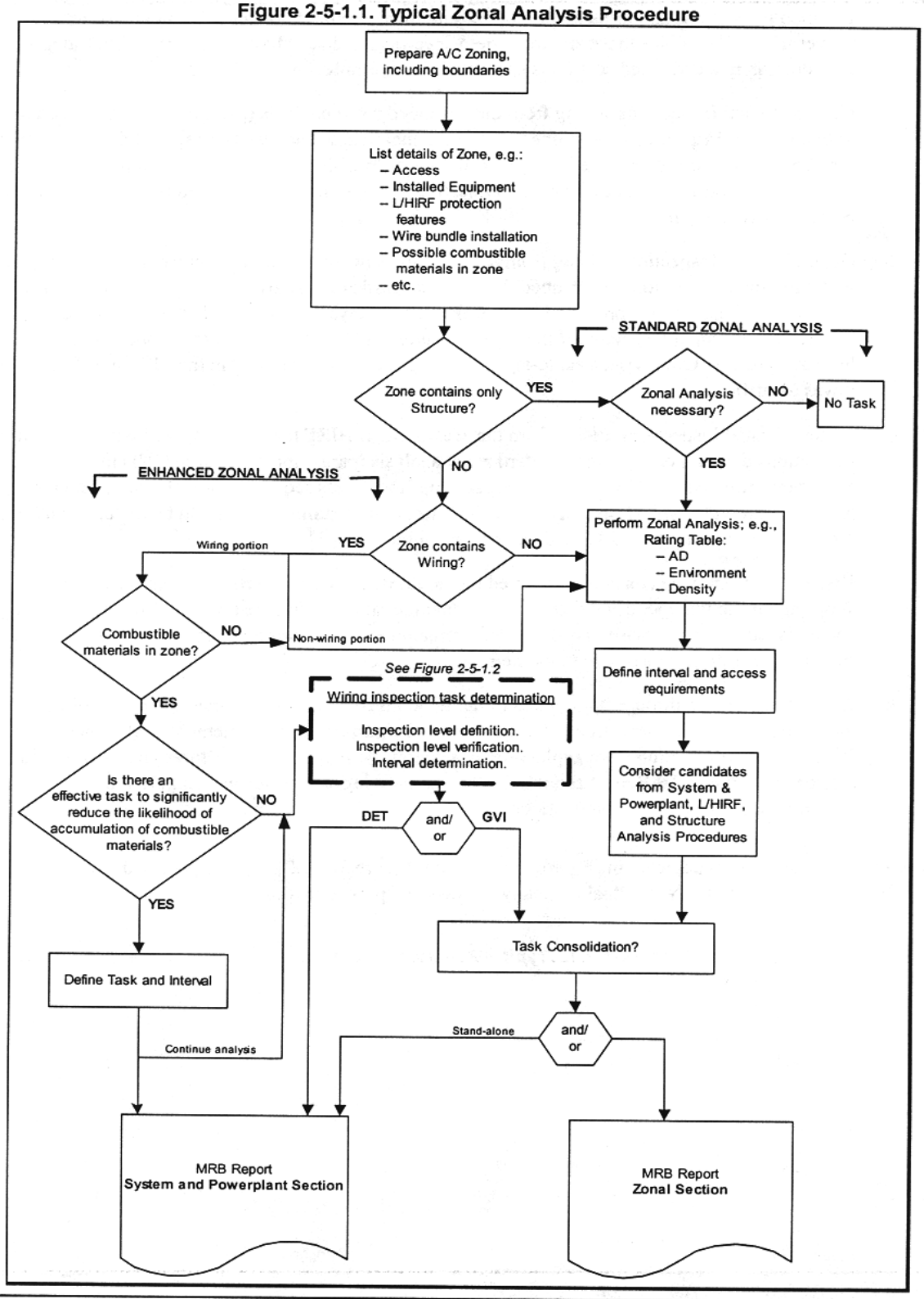


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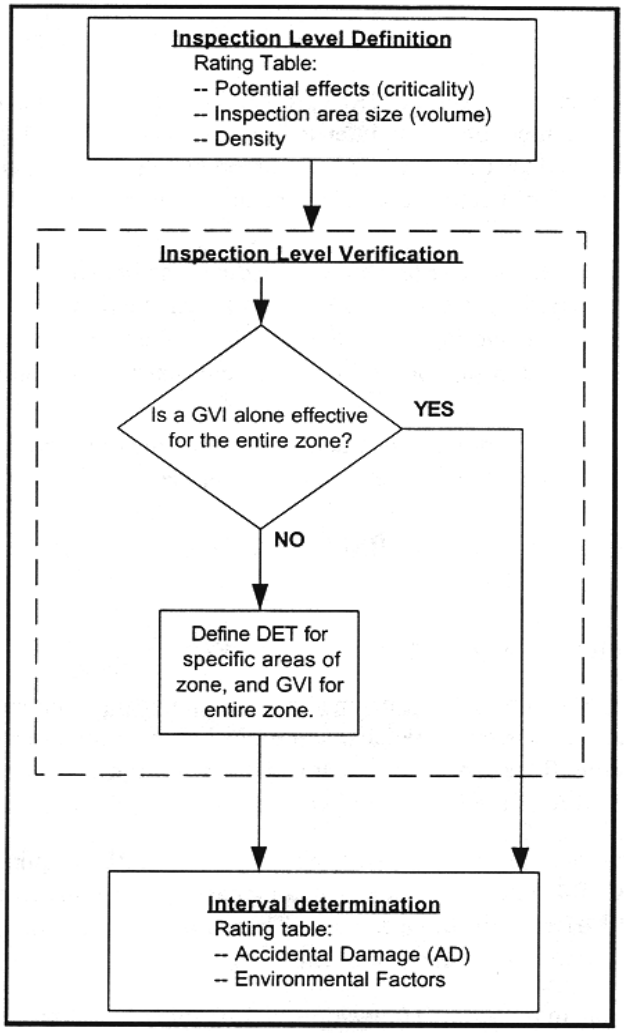
*Figure 2-5-1.2. Wiring Inspection Task Determination*




## 2-5-2. Zonal Inspection Task Intervals

Accomplishment intervals are based on hardware susceptibility to damage, the amount of activity in the zone, and operator and manufacturer experience with similar systems, powerplants and structures. When possible, intervals should correspond to those selected for targeted scheduled maintenance checks.

For a given zone, more than one task may be identified. In this case, the frequency of inspection is inversely proportional to the amount of access required; i.e., the more access required, the less the frequency of inspection.

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# 2-6. Lightning/High Intensity Radiated Field (L/HIRF) Analysis Procedure

Lightning/High Intensity Radiated Field (L/HIRF) protection systems have been identified for development of dedicated maintenance. The intent of this maintenance is to reduce the possibility that a single failure cause (such as a lightning strike), and the occurrence of a common failure cause (such as ED or AD) across redundant channels of L/HIRF protection, could impact aircraft airworthiness.

This section contains guidelines for development of scheduled maintenance tasks for aircraft L/HIRF protection systems. Each L/HIRF protective system item is evaluated in terms of its susceptibility to degradation from environmental deterioration and/or accidental damage. The L/HIRF protection system maintenance tasks are developed in support of the aircraft type certification and MRB report development.

Using a logic type analysis, the Working Group determines the type of scheduled maintenance task that is both applicable and effective along with the frequency (interval) of the task.

Lightning/High Intensity Radiated Field (L/HIRF) protection is rated for its criticality with respect to the consequences of the protection's failure.

L/HIRF maintenance is divided into two (2) distinct categories:

1. L/HIRF Protection within LRUs (contained in the Component Maintenance Manual, CMM). L/HIRF protection features are incorporated inside the LRU. Protection devices such as filter pin connectors, discrete filter capacitors and transient protection devices (tranzorbs) are installed within LRUs on one or more of the LRU interface circuits.

   The aircraft manufacturer will work with the suppliers of LRUs requiring L/HIRF protection to ensure that the CMM states the Supplier's maintenance philosophy to ensure the continued effectiveness of L/HIRF protective devices. The maintenance of this type of L/HIRF protection is not developed with the use of this document.

2. L/HIRF Protection on the aircraft (developed during this MSG-3 process, and contained is the subsequent MRB Report).
   All Level A and B L/HIRF protection on the aircraft (any protection not within an LRU) that was identified during L/HIRF certification must be analyzed. Normally this includes items such as shielded wires, raceways, bonding jumpers, connectors, composite fairings with conductive mesh, and the inherent conductivity of the structure, but may include aircraft specific devices, e.g., RF Gaskets.

   Level A systems are electrical and electronic systems whose failure would cause or contribute to a failure of function resulting in a catastrophic-failure condition of the aircraft.

   Level B systems are electrical and electronic systems whose failure would cause or contribute to a failure of function resulting in a hazardous-failure condition of the aircraft.

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## 2-6-1. L/HIRF Maintenance

The scheduled maintenance must cover all identified L/HIRF protection. The majority of this protection will be covered through the Zonal Inspections. Where this Zonal maintenance will not adequately identify degradation of the L/HIRF protection, additional scheduled maintenance may be generated.

### 1. L/HIRF Protection Analysis Focus

In order to narrow the focus of the analysis, the following concepts are accepted:

1. All visible L/HIRF protection (wires, shields, connectors, bonding straps, or raceways between connectors or termination points) may be covered by the Zonal Inspections.
2. L/HIRF protection within conduit or heatshrink, is covered in the Zonal Inspections by confirming integrity of the protective covering.
3. Inherent conductivity of the aircraft structure is covered by the Zonal Inspections. Corrosion concerns are addressed by the Structural Inspections.
4. Composite fairings with conductive mesh are covered by the Zonal Inspections.
5. Where the Zonal Inspections are not effective, additional analysis may produce other scheduled maintenance tasks.

### 2. L/HIRF Protection Analysis Ratings

L/HIRF protections require an analysis for the effects of Environmental Deterioration (ED) and Accidental Damage (AD) to determine what maintenance will effectively detect degradation.

Environment - consider the effects of the atmosphere, corrosive products, condensation, temperature, and vibration on the protection, with respect to degradation.

Susceptibility to Damage - consider the likelihood of damage during maintenance or damage during operations. Examples would be areas where connectors could be stepped on, or effects of de-icing fluid on a connector during winter operations.

### 3. Analysis Approval

Once the analysis is completed, the resulting maintenance tasks and intervals for all L/HIRF systems are submitted to the ISC for approval and inclusion in the MRB Report proposal.

### 4. Flowchart Description

The following is the intent of each block of the flow chart that follows:

Block 1 - "Title"

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Self-explanatory.

Block 2 - "Define Aircraft Zones"
Prior to accomplishment of L/HIRF analysis, it is necessary to have the Zones defined.

Block 3 - "Define Level A and B'
Defining what systems are Level A or Level B is a separate process from MSG-3, and is usually derived from a separate engineering report

Block 4 - Is it a Level A or B?"
Analysis for Level A will follow a separate flow path from Level B.

Block 5 - "Determine Inspection"
L/HIRF analysis will use an ED/AD assessment to determine task and interval for L/HIRF protection maintenance.

Block 6 - "Is it a Zonal Candidate?"
Wherever possible, credit will be taken for Zonal Inspections.

Block 7 - "Covered by Zonal Maintenance"
Assessment shows the Zonal Inspections are effective.

Block 8 - "Is Protection Similar?"
Is it possible to take credit for similar protection that has been evaluated to be effective on similar type aircraft?

Block 9 - "Manufacturer's Maintenance"
If there is no similar protection installed on another aircraft, the manufacturer can choose it's own method for task determination on Level B systems.

Block 10 - Working Group Recommendations"
Incorporation of the Working Group's recommendations.

Block 11 - "L/HIRF Maintenance"
All tasks roll into the L/HIRF Maintenance.

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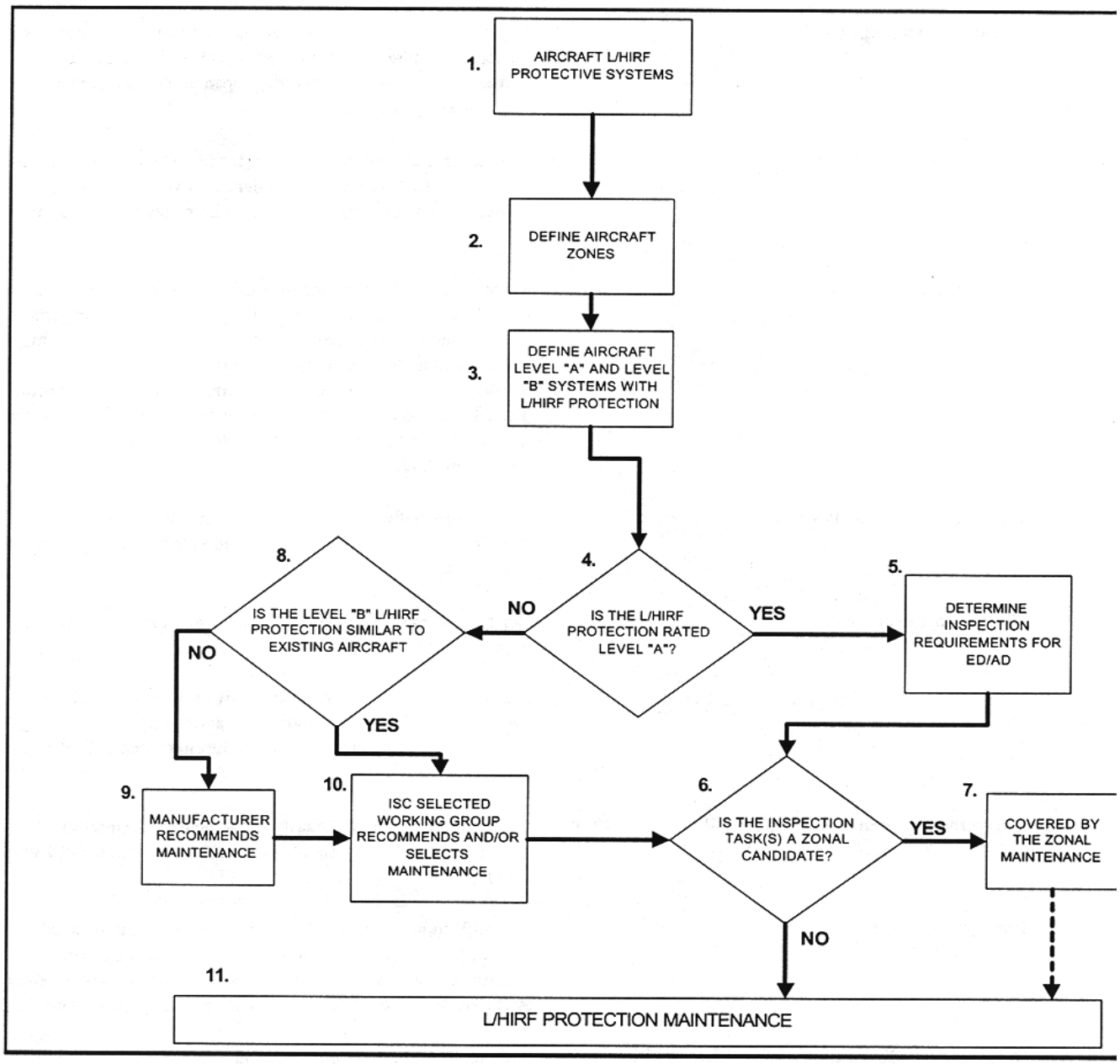
*Figure 2-6-2.1. L/HIRF Logic Diagram*

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# Appendix A. Glossary

| | |
|---|---|
| **Accidental Damage (AD)** | Physical deterioration of an item caused by contact or impact with an object or influence which is not a part of the aircraft, or by human error during manufacturing, operation of the aircraft, or maintenance practices. |
| **Age Exploration** | A systematic evaluation of an item based on analysis of collected information from in-service experience. It verifies the item's resistance to a deterioration process with respect to increasing age. |
| **Airworthiness Limitations** | A section of the Instructions for Continued Airworthiness that contains each mandatory replacement time, structural inspection interval, and related structural inspection task. This section may also be used to define a threshold for the fatigue related inspections and the need to control corrosion to Level 1 or better. The information contained in the Airworthiness Limitations section may be changed to reflect service and/or test experience or new analysis methods. |
| **Conditional Probability of Failure** | The probability that a failure will occur in a specific period provided that the item concerned has survived to the beginning of that period. |
| **Corrosion Level 1** | Corrosion damage that does not require structural reinforcement or replacement.<br>or<br>Corrosion occurring between successive inspections exceeds allowable limit but is local and can be attributed to an event not typical of operator usage of other aircraft in the same fleet (e.g. Mercury spill). |
| **Corrosion Prevention and Control Program (CPCP)** | A program of maintenance tasks implemented at a threshold designed to control an aircraft structure to Corrosion Level 1 or better. |
| **Damage Tolerant** | A qualification standard for aircraft structure. An item is judged to be damage tolerant if it can sustain damage and the remaining structure can withstand reasonable loads without structural failure or excessive structural deformation until the damage is detected. |
| **Delamination/Disbond** | Structural separation or cracking that occurs at or in the bond plane of a structural element, within a structural assembly, caused by in service accidental damage, environmental effects and/or cyclic loading. |
| **Discard** | The removal from service of an item at a specified life limit. |
| **Direct Adverse Effect on Operating Safety** | |

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| **Direct** | To be direct, the functional failure or resulting secondary damage must achieve its effect by itself, not in combination with other functional failures (no redundancy exists and it is a primary dispatch item). |
| **Adverse Effect on Safety** | Safety shall be considered as adversely affected if the consequences of the failure condition would prevent the continued safe flight and landing of the aircraft and/or might cause serious or fatal injury to human occupants. |
| **Operating** | This is defined as the time interval during which passengers and crew are on board for the purpose of flight. |
| **Economic Effects** | Failure effects which do not prevent aircraft operation, but are economically undesirable due to added labor and material cost for aircraft or shop repair. |
| **Environmental Deterioration (ED)** | Physical deterioration of an item's strength or resistance to failure as a result of chemical interaction with its climate or environment. |
| **Failure** | The inability of an item to perform within previously specified limits. |
| **Failure Cause** | Why the functional failure occurs. |
| **Failure Condition** | The effect on the aircraft and its occupants, both direct and consequential, caused or contributed to by one or more failures, considering relevant adverse operational or environmental conditions. |
| **Failure Effect** | What is the result of a functional failure. |
| **Fatigue Damage (FD)** | The initiation of a crack or cracks due to cyclic loading and subsequent propagation. |
| **Fatigue Related Sampling Inspection** | Inspections on specific aircraft selected from those which have the highest operating age/usage in order to identify the first evidence of deterioration in their condition caused by fatigue damage. |
| **Function** | The normal characteristic actions of an item. |
| **Functional Check** | A quantitative check to determine if one or more functions of an item performs within specified limits. |
| **Functional Failure** | Failure of an item to perform its intended function within specified limits. |
| **Hidden Function** | 1. A function which is normally active and whose cessation will not be evident to the operating crew during performance of normal duties.<br>2. A function which is normally inactive and whose readiness to |

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| | perform, prior to it being needed, will not be evident to the operating crew during performance of normal duties. |
| **Inherent Level of Reliability and Safety** | That level which is built into the unit and, therefore, inherent in its design. This is the highest level of reliability and safety that can be expected from a unit, system, or aircraft if it receives effective maintenance To achieve higher levels of reliability generally requires modification or redesign. |
| **Inspection - Detailed** | An intensive examination of a specific item, installation or assembly to detect damage, failure or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate access procedures may be required. |
| **Inspection - General Visual** | A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or drop-light and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked. |
| **Inspection - Special Detailed** | An intensive examination of a specific item, installation, or assembly to detect damage, failure or irregularity. The examination is likely to make extensive use of specialized Inspection Techniques and/or equipment. Intricate cleaning and substantial access or disassembly procedure may be required. |
| **Inspection - Zonal** | A collective term comprising selected general visual inspections and visual checks that is applied to each zone, defined by access and area, to check system and powerplant installations and structure for security and general condition. |
| **Interval (Initial - Repeat)** | Initial Interval - Interval between the start of service-life and the first task accomplishment<br>Repeat Interval - The interval (after the initial interval) between successive accomplishments of a specific maintenance task. |
| **Item** | Any level of hardware assembly (i.e., system, sub-system, module, accessory, component, unit, part, etc.). |
| **Letter Checks** | Letter checks are named collections of tasks (e.g., A-Check, C-Check, etc.) assigned the same interval. |
| **Lubrication and Servicing** | Any act of lubricating or servicing for the purpose of maintaining inherent design capabilities. |
| **Maintenance Significant Item - (MSI)** | Items identified by the manufacturer whose failure |

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a. could affect safety (on ground or in flight), and/or
b. is undetectable during operations, and/or
c. could have significant operational impact, and/or
d. could have significant economic impact

**Multiple Element Fatigue Damage**

The simultaneous cracking of multiple load path discrete elements working at similar stress levels.

**Multiple Site Fatigue Damage**

The presence of a number of adjacent, small cracks that might coalesce to form a single long crack.

**Non-metallics**

Any structural material made from fibrous or laminated components bonded together by a medium. Materials such as graphite epoxy, boron epoxy, fiber glass, kevlar epoxy, acrylics and the like are non-metallics. Non-metallics include adhesives used to join other metallic or non-metallic structural materials.

**Operating Crew Normal Duties**

**Operating Crew**

Qualified flight compartment and cabin attendant personnel who are on duty.

**Normal Duties**

Those duties associated with the routine operation of the aircraft, on a daily basis, to include the following:
a. Procedures and checks performed during aircraft operation in accordance with the Aircraft Flight Manual.
b. Recognition of abnormalities or failures by the operating crew through the use of normal physical senses (e.g., odor, noise, vibration, temperature, visual observation of damage or failure, changes in physical input force requirements, etc.).

**Operational Check**

An operational check is a task to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task.

**Operational Effects**

Failure effects which interfere with the completion of the aircraft mission. These failures cause delays, cancellations, ground or flight interruptions, high drag coefficients, altitude restrictions, etc.

**Other Structure**

Structure which is judged not to be a Structural Significant Item. "Other Structure" is defined both externally and internally within zonal boundaries.

**Potential Failure**

A defined identifiable condition that indicates that a degradation process is taking place that will lead to a functional failure.

**Protective Device**

Any device or system that has a function to avoid, eliminate or reduce the consequences of an event or the failure of some other function.

**P to F Interval**

Interval between the point at which a potential failure becomes detectable and the point at which it degrades into a functional

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| | failure. |
| **Residual Strength** | The strength of a damaged structure. |
| **Restoration** | That work necessary to return the item to a specific standard. Restoration may vary from cleaning or replacement of single parts up to a complete overhaul. |
| **Safe Life Structure** | Structure which is not practical to design or qualify as damage tolerant. Its reliability is protected by discard limits which remove items from service before fatigue cracking is expected. |
| **Safety (adverse effect)** | Safety shall be considered as adversely affected if the consequences of the failure condition would prevent the continued safe flight and landing of the aircraft and/or might cause serious or fatal injury to human occupants. |
| **Safety/Emergency Systems or Equipment** | A device or system that enhances the evacuation of the aircraft in an emergency or, if it does not function when required, results in a Failure Condition that might have an adverse effect on safety. |
| **Scheduled Maintenance Check** | Any of the maintenance opportunities which are prepackaged and are accomplished on a regular basis. |
| **Structural Significant Item - (SSI)** | Any detail, element or assembly, which contributes significantly to carrying flight, ground, pressure or control loads and whose failure could affect the structural integrity necessary for the safety of the aircraft. |
| **Structural Assembly** | One or more structural elements which together provide a basic structural function. |
| **Structural Detail** | The lowest functional level in an aircraft structure. A discrete region or area of a structural element, or a boundary intersection of two or more elements. |
| **Structural Element** | Two or more structural details which together form an identified manufacturer's assembly part. |
| **Structural Function** | The mode of action of aircraft structure. It includes acceptance and transfer of specified loads in items (details /elements /assemblies) and provides consistently adequate aircraft response and flight characteristics. |
| **Task Applicability** | A set of conditions that leads to the identification of a task type when a specific set of characteristics of the failure cause being analyzed would be discovered and/or corrected as a result of the task being accomplished. |
| **Task Effectiveness** | A specific set of conditions that leads to the selection of a task already identified to be applicable. Avoids, eliminates, or reduces the negative consequences of the failure to an extent that justifies |

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| | doing the task at the selected interval. |
| **Tasks - Maintenance** | An action or set of actions required to achieve a desired outcome which restores an item to or maintains an item in serviceable condition, including inspection and determination of condition. |
| **Threshold** | See "Interval - Initial". |
| **Threshold Period** | A period during which no occurrences of the failure can reasonably be expected to occur after the item enters into service. |
| **Visual Check** | A visual check is an observation to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task. |

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# Annex 1. References

[ATA iSpec 2200] *ATA Specification 2200. Information Standards for Aviation Maintenance.* Air Transport Association (www.air-transport.org), Washington, DC.

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# COMPREHENSIVE INDEX

**SUBJECT** **LOCATION**

**A**


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