

VOLUME 3 GENERAL TECHNICAL ADMINISTRATION**CHAPTER 43 EVALUATE A CONTINUOUS AIRWORTHINESS MAINTENANCE PROGRAM****Section 1 Safety Assurance System: Evaluate a Part 121 and Part 135 Continuous Airworthiness Maintenance Program****Source Basis:**

- Section 43.3, Persons Authorized to Perform Maintenance, Preventive Maintenance, Rebuilding, and Alterations.
- Section 43.7, Persons Authorized to Approve Aircraft, Airframes, Aircraft Engines, Propellers, Appliances, or Component Parts for Return to Service After Maintenance, Preventive Maintenance, Rebuilding, or Alteration.
- Section 43.9, Content, Form, and Disposition of Maintenance, Preventive Maintenance, Rebuilding, and Alteration Records (Except Inspections Performed in Accordance with Part 91, Part 123, Part 125, § 135.411(a)(1), and § 135.419 of This Chapter).
- Section 119.1, Applicability.
- Section 119.5, Certifications, Authorizations, and Prohibitions.
- Section 119.49, Contents of Operations Specifications.
- Section 119.65, Management Personnel Required for Operations Conducted Under Part 121 of This Chapter.
- Section 119.67, Management Personnel: Qualifications for Operations Conducted Under Part 121 of This Chapter.
- Section 119.69, Management Personnel Required for Operations Conducted Under Part 135 of This Chapter.
- Section 119.71, Management Personnel: Qualifications for Operations Conducted Under Part 135 of This Chapter.
- Section 121.1, Applicability.
- Section 121.133, Preparation.
- Section 121.135, Manual Contents.
- Section 121.137, Distribution and Availability.
- Section 121.363, Responsibility for Airworthiness.
- Section 121.365, Maintenance, Preventive Maintenance, and Alteration Organization.
- Section 121.367, Maintenance, Preventive Maintenance, and Alterations Programs.
- Section 121.368, Contract Maintenance.
- Section 121.369, Manual Requirements.
- Section 121.371, Required Inspection Personnel.
- Section 121.373, Continuing Analysis and Surveillance.
- Section 121.375, Maintenance and Preventive Maintenance Training Program.
- Section 121.379, Authority to Perform and Approve Maintenance, Preventive Maintenance, and Alterations.

- **Section 121.380, Maintenance Recording Requirements.**
- **Section 121.563, Reporting Mechanical Irregularities.**
- **Section 121.701, Maintenance Log: Aircraft.**
- **Section 121.703, Service Difficulty Reports.**
- **Section 121.705, Mechanical Interruption Summary Report.**
- **Section 121.707, Alteration and Repair Reports.**
- **Section 121.709, Airworthiness Release or Aircraft Log Entry.**
- **Section 135.1, Applicability.**
- **Section 135.21, Manual Requirements.**
- **Section 135.23, Manual Contents.**
- **Section 135.65, Reporting Mechanical Irregularities.**
- **Section 135.413, Responsibility for Airworthiness.**
- **Section 135.415, Service Difficulty Reports.**
- **Section 135.417, Mechanical Interruption Summary Report.**
- **Section 135.423, Maintenance, Preventive Maintenance, and Alteration Programs.**
- **Section 135.426, Contract Maintenance.**
- **Section 135.427, Manual Requirements.**
- **Section 135.429, Required Inspection Personnel.**
- **Section 135.431, Continuing Analysis and Surveillance.**
- **Section 135.433, Maintenance and Preventive Maintenance Training Program.**
- **Section 135.437, Authority to Perform and Approve Maintenance, Preventive Maintenance, and Alterations.**
- **Section 135.439, Maintenance Recording Requirements.**

3-3866 REPORTING SYSTEM. Use Safety Assurance System (SAS) automation and the associated Data Collection Tools (DCT).

3-3867 OBJECTIVE. This section provides the information, policy, and guidance that the inspector needs to evaluate a Title 14 of the Code of Federal Regulations (14 CFR) part 119 certificate holder's Continuous Airworthiness Maintenance Program (CAMP) according to applicable 14 CFR regulations and Federal Aviation Administration (FAA) policy. For the purpose of this section, a CAMP, Maintenance, Preventive Maintenance, and Alteration Program are the same.

NOTE: This order contains references to other sections of FAA Order 8900.1, Flight Standards Information Management System (FSIMS). For example, inspectors can find guidance for evaluating required inspections both in this section and in Volume 3, Chapter 43, Section 2. When another section(s) exists, the inspector should refer to the guidance in each section(s), as applicable, when evaluating a CAMP.

3-3868 GENERAL.

A. Legal Basis of Air Carrier Maintenance Programs. To understand why 14 CFR parts 121 and 135 govern persons and the performance of all air carrier maintenance while other regulations, such as 14 CFR part 145, do not, it is essential to understand Title 49 of the

United States Code (49 U.S.C.). The following information on 49 U.S.C. helps explain the different standards used for developing regulations for air commerce and regulations for air transportation.

1) Title 49 U.S.C. Title 49 U.S.C. § 44701 is the primary authority for all air carrier 14 CFRs. Title 49 U.S.C. § 44701 requires the FAA to promote the safe flight of civil aircraft in air commerce by prescribing regulations and standards in the interest of safety.

2) Air Commerce. When prescribing regulations and standards, 49 U.S.C. § 44701 also requires the FAA to:

- Consider an air carrier’s duty to provide service with the highest possible degree of safety in the public interest;
- Consider differences between air transportation and other air commerce; and
- Classify a regulation or standard appropriate to the differences between air transportation and other air commerce.

a) Title 49 U.S.C. § 40102 defines the term “air commerce” as:

- Foreign air commerce;
- Interstate air commerce;
- Transportation of mail by aircraft;
- Operation of aircraft within the limits of a Federal airway; and
- Operation of aircraft that directly affects, or may endanger safety in, foreign or interstate air commerce.

b) Operations in air commerce include almost every type of operation except air transportation.

3) Regulations. Consistent with the requirements of 49 U.S.C. § 44701, the FAA regulates aircraft operations at different levels of safety. Therefore, FAA regulations that govern air carrier operations (air transportation) and the operations of other air commerce have different structures to reflect the differences between these two segments of the aviation industry. Establishing appropriate standards and regulatory requirements is a risk-management process, and the underlying legal structure provides for more than one level of acceptable risk appropriate to different types of flight operations. Air transportation regulations are all-inclusive and stand alone, whereas the regulations governing other air commerce are not. Similarly, the scope of responsibility for those in air transportation operations is very broad and not shared (e.g., the certificate holder is responsible for the performance of maintenance and airworthiness of its aircraft), whereas in other air commerce, the scope of responsibility is relatively narrow and commonly shared (e.g., the owner/operator in 14 CFR part 91 is responsible for having maintenance performed on its aircraft, and the mechanic is responsible for the performance of maintenance and airworthiness of the aircraft). The regulations in parts 119, 121, and 135 relate directly to air carrier maintenance programs and reflect the highest possible degree of safety in the public interest. The regulations in 14 CFR parts 43, 65, 91, and 145 do not necessarily reflect the highest possible degree of safety in the public interest. This section contains specific references to relevant regulations in subsequent paragraphs.

4) Performance-Based Regulations. Most of the parts 121 and 135 maintenance regulations appear in a performance-based format. The performance-based regulatory approach focuses on measurable outcomes, rather than prescriptive processes, techniques, or procedures. Performance-based regulation leads to defined results without specifying directions or instructions regarding how to obtain those results. This approach permits these regulations to apply to a wide variety of certificate holders and still have the same standards. For example, the performance-based regulations in part 121, § 121.367 and part 135, § 135.425 apply equally to all operators, regardless of number of aircraft. The defined result is always an airworthy aircraft that the certificate holder has properly maintained for operations in air transportation. Performance-based regulation also permits the regulation to remain current in the face of advances in technology or methodology.

5) Acceptable Means of Compliance. Performance-based regulation also explains what constitutes an acceptable means of compliance. This section shows acceptable methods of compliance with the performance-based maintenance program regulatory requirements, including descriptions of processes, techniques, and procedures that will lead to the defined results in the maintenance regulations. The certificate holder should tailor its maintenance program to its particular and specific operation; therefore, regulations cannot provide a single means of compliance that applies to all certificate holders required to develop and implement an air carrier maintenance program.

6) Continuous Airworthiness Program (CAP). The FAA introduced the CAP in a Final Rule at 29 Federal Register (FR) 6522 on May 20, 1964. “CAP” is a colloquial term for “CAP.” This 1964 rulemaking was the FAA’s response to safety concerns and discoveries of weaknesses in the maintenance programs of some certificate holders that the FAA found during accident investigations and surveillance of operator maintenance activities. The FAA designed the air carrier CAP to strengthen requirements for air carrier safety management activities. Each one of the air carrier maintenance program elements described in this section was a part of 29 FR 6522.

7) Requirements for a CAMP. The regulations require a CAMP for part 119-certificated air carriers operating under parts 121 and 135 with aircraft that have a passenger-seating configuration, excluding any pilot seat, of 10 or more seats. For operations, this guidance applies to any aircraft using the maintenance program provisions of § 135.411(a)(2). It also applies to air carriers choosing to maintain its aircraft under a CAMP as provided in § 135.411(b) and air carriers choosing to operate under § 135.364, Extended Operations (ETOPS), as provided in § 135.411(d).

B. Maintenance Program Authorization. The FAA does not approve air carrier maintenance programs because there is no regulation that requires approval. However, the FAA issues air carrier operations specifications (OpSpecs) to the certificate holder, authorizing it to use a maintenance program and the certificate holder maintenance manual required by the FAA regulations. Tailored to the certificate holder’s specific operating context and the requirements of its individual operations, the OpSpecs convey the general terms of regulations into specific terms, conditions, and limitations. The FAA amends the OpSpecs as circumstances dictate. Issued by the FAA, OpSpecs are legally binding through specific regulatory language

(refer to part 119, § 119.33 for the applicable language). See Volume 3, Chapter 18, Section 1 for additional information on OpSpecs.

C. Air Carrier Maintenance Program Objectives.

1) Program Objectives. The certificate holder's maintenance program must ensure the following three specific program objectives stated in §§ 121.367 and 135.425 in order to provide the highest possible level of safety in air transportation:

- a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed in accordance with the certificate holder's maintenance manual;
- b) Competent personnel, and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and
- c) Each aircraft released to service is airworthy and has been properly maintained for operation under the applicable part.

2) Continuing Analysis and Surveillance System (CASS). The certificate holder's maintenance program must also have a system of continuing surveillance, investigation, data collection, analysis, corrective action, and corrective action followup that ensures all parts of its maintenance program are effective and are being performed in accordance with the certificate holder's manual. "Effective" means that the certificate holder is achieving the desired results according to the maintenance program objectives and the standards that the certificate holder set. "Program performance" means that all personnel, including certificate holder maintenance providers (MPs), are following the certificate holder's program as it has documented in its manual.

3) CAMP Elements. When evaluating a CAMP submitted by a part 121 or part 135 certificate holder, aviation safety inspectors (ASI) should ensure the program includes the following 10 elements:

- Airworthiness responsibility.
- Certificate holder maintenance manual.
- Certificate holder maintenance organization.
- Accomplishment and approval of maintenance and alterations.
- Maintenance schedule.
- Required Inspection Items (RII).
- Maintenance recordkeeping system.
- Contract maintenance.
- Personnel training.
- CASS.

NOTE: The manufacturer's recommended inspection program must not be accepted as meeting the regulatory requirements of the 10 elements of the CAMP.

NOTE: Individual explanations of each of these 10 elements appear in paragraphs 3-3869 through 3-3878.

3-3869 ELEMENT 1—AIRWORTHINESS RESPONSIBILITY.

A. Responsibility for Aircraft Maintenance.

1) Part 119 Certificate Holder Responsibilities. Consistent with §§ 121.363 and 135.413, the certificate holder (as a part 119 certificate holder,) is primarily responsible for the airworthiness of its aircraft and the performance of all of the maintenance or alterations on its aircraft. A keyword in the previous statement is “primarily,” which recognizes responsibilities associated with other persons that perform maintenance for the certificate holder. The certificate holder’s certificate makes it a maintenance entity. Under its certificate, it may accomplish its own maintenance, preventive maintenance, or alterations, or it can use other persons who are not direct employees to accomplish that work. Parts 121 and 135 govern each person that the certificate holder uses, or that it employs, for any maintenance, preventive maintenance, or alteration of its aircraft (refer to §§ 121.1(b) and 135.1(a)(2)). Each person whom the certificate holder uses must be under the certificate holder’s direction and control and must follow the certificate holder’s maintenance program. Recognizing parts 121 and 135 as the governing regulations for the performance of all air carrier maintenance by all persons is important to understanding why other regulations such as part 145 do not govern air carrier maintenance.

2) Maintenance Responsibilities. For any work completed on the certificate holder’s aircraft, the certificate holder retains direct and primary responsibility for performing and approving all maintenance and alterations, whether it accomplishes that work or someone else does it for them (e.g. an MP, such as a repair station). The certificate holder always retains primary responsibility for the performance and approval of the maintenance completed by an MP.

B. Differences Between Programs. The following table provides a comparison of the differences between air carrier maintenance programs (air transportation) and part 91 general aviation inspection programs (air commerce).

Table 3-125. Air Carrier Maintenance Programs and Part 91 General Aviation Inspection Programs

Element	14 CFR Parts 121 and 135 Air Carriers	14 CFR Part 91 Owners/Operators
Use of a maintenance or an inspection program.	Required to use a maintenance program for its aircraft.	Required to use an inspection program.
Responsibilities within the relevant program.	Responsible for the performance of maintenance in accordance with its maintenance program and manual, as well as the airworthiness of its aircraft, including airframes, aircraft engines, propellers, appliances, and parts thereof.	Responsible for maintaining the aircraft in an airworthy condition (part 91, § 91.403).
	The wording in part 91 is deliberately different from the wording in parts 121 and 135 and is consistent with the difference between air carriers and other air commerce as described in 49 U.S.C. § 44701.	
	Responsible for the development and use of the maintenance program and manual, determining the method of performing maintenance, a required inspection list, a CASS, a maintenance organization that can exercise operational control over maintenance operations, and other items that collectively and systematically serve to ensure that each aircraft has been properly maintained for operations in air transportation and is airworthy.	Responsible for the selection of an existing inspection program, scheduling aircraft for inspection, and ensuring that persons authorized to perform and approve maintenance, preventive maintenance, and alterations repair and approve discrepancies that occur between scheduled inspections.

Element	14 CFR Parts 121 and 135 Air Carriers	14 CFR Part 91 Owners/Operators
	Must determine what maintenance is required, how to do it, when to do it, perform that maintenance, and approve its own aircraft for return to service. May authorize another person to accomplish the maintenance work, but the other person must carry out the maintenance work according to the certificate holder's maintenance program and manual. The certificate holder retains the responsibility for the proper completion of maintenance (part 121, § 121.363 or part 135, § 135.413).	Must make the aircraft available to authorized and certificated person(s) who accomplish inspections and other maintenance.
	Along with the FAA oversight, it is the primary authority with regard to its maintenance program. Holds the primary responsibility for the performance of maintenance in accordance with its maintenance program and manual, as well as the airworthiness of its aircraft, including airframes, aircraft engines, propellers, appliances, and parts thereof.	The authorized and certificated person(s) has the responsibility to perform the maintenance properly in accordance with the manufacturer's manual and to approve the aircraft for return to service. The owner/operator does not have this responsibility. However, the owner/operator is responsible for ensuring that maintenance personnel make appropriate entries in the aircraft maintenance records indicating that the aircraft has been approved for return to service.

3-3870 ELEMENT 2—AIR CARRIER MAINTENANCE MANUAL. Also see Volume 3, Chapter 32, Sections 6, 7, 8, and 11.

A. Air Carrier Maintenance Manual Requirements.

1) Maintenance Manuals. The FAA regulations (refer to §§ 121.133, 121.369, 135.21, and 135.427) require the certificate holder to have a maintenance manual. It is a required part of the certificate holder manual system. Some certificate holders call their manuals “specifications” and some use other terms. Traditionally, the certificate holder has geared its maintenance manual toward maintenance performed in-house by its employees. If the certificate holder chooses to use another person to perform maintenance for it, it must have well-defined maintenance procedures in its manual for the MP to follow.

2) Revising Maintenance Manuals. The certificate holder's maintenance manual must be easy to revise and have procedures for keeping all parts of the manual up-to-date. The manual may be electronic or in another form.

3) Current and Available Manual. The certificate holder must make copies of its manual or appropriate portions of it (and changes or additions) available to those persons required to comply with it. Additionally, the certificate holder must furnish its manual to principal inspectors (PI) assigned to the certificate holder. Each person who receives a manual or appropriate parts from the certificate holder must keep it up-to-date.

4) Interface Attribute. The certificate holder's maintenance manual should interface with other certificate holder manuals, such as those required by part 121 subpart G and § 135.21. Interfaces occur in a procedure where the responsibility for accomplishing work is transferred from one person, work group, or organization to another. For example, if an aircraft discrepancy occurs during flight operations, and the discrepancy must be fixed, operations transfers control to maintenance. When maintenance is finished, it transfers control back to operations. Procedures must be detailed to ensure the smooth transfer of work and information.

5) Other Related Regulations. Other regulations that relate to air carrier manual requirements are part 43, § 43.13(c), §§ 121.135, 121.137, 135.23, and 135.427.

B. Role of the Air Carrier Maintenance Manual.

1) Standardization. The certificate holder's maintenance manual is its key to standardized, consistent accomplishment and administration of its maintenance program. The certificate holder's maintenance manual:

- a) Identifies, describes, and defines its maintenance program; and
- b) Provides instructions and procedures to administer, use, manage, and amend its program.

2) Organization and Format. The certificate holder's maintenance manual is a company publication, and the certificate holder has sole responsibility for its organization and content; however, others may compile and publish it for the certificate holder. The certificate holder's maintenance manual may be electronic.

C. Major Sections of the Typical Air Carrier Maintenance Manual.

1) Organization of the Certificate Holder's Maintenance Manual. The certificate holder's maintenance manual should have a practical organization. Typically, it will have at least three sections covering administrative policies and procedures; detailed instructions for the administration, management, and accomplishment of the elements of its maintenance program; and technical data that describes maintenance standards, methods, techniques, and procedures.

2) Administrative Policies and Procedures. The primary function of this part of the certificate holder's manual is as a management and administrative tool for organizing, directing, amending, and controlling its maintenance program. Usually, the certificate holder will

place required organizational charts delineating the functions, relationships, and lines of authority between its organizational elements and personnel in its manual. The certificate holder may list position descriptions, duties, responsibilities, and specific authority and responsibility attributes for each position within its maintenance organization in its manual. The authority and responsibility attributes that the certificate holder incorporates should show who has overall authority and/or responsibility and who has direct authority and/or responsibility for given functions.

3) Instructions for the Administration, Management, and Accomplishment of the Maintenance Program.

a) This section contains detailed instructions for the certificate holder's management of the various functions and interrelationships of each maintenance program element, such as maintenance time limitations, recordkeeping, Airworthiness Directive (AD) management, maintenance program management and oversight, contract maintenance management and oversight, and personnel training. This section usually includes a description of the certificate holder's scheduled maintenance tasks, procedural information, and detailed instructions (or specific certificate holder maintenance manual references) for accomplishing its maintenance tasks. Additionally, the certificate holder should describe criteria for initiating functional evaluation flights (see part 91, § 91.407) in this part of the maintenance manual, along with the procedural requirements for them. In this portion of the certificate holder's manual, the certificate holder should also include criteria and procedural information for unscheduled inspections, such as those associated with lightning strikes, tail strikes, exceeding engine temperature, hard or overweight landings, and any very high-load event.

b) The certificate holder should have a comprehensive process in the unscheduled maintenance portion of its manual that addresses those rare, extremely high-load events that occur to aircraft. Specifically, the certificate holder should have inspection processes that it should use following certain high-load events. These particular high-load events are those for which flight data might facilitate the subsequent inspection process. The certificate holder should consider the events listed below as most significant:

1. Flight Events:

- A severe turbulence encounter,
- Extreme maneuvers,
- Exceeding speed limitations, and
- Heavy stall buffet.

2. Ground Events:

- Hard landings,
- Overweight landings,
- Drift landings resulting in excessive side/drag load, and
- High Energy Wide Area Blunt Impact (HEWABI).

c) Typically, the Original Equipment Manufacturer (OEM) will include detailed inspection instructions that the certificate holder should follow after these high-load events. The objective of these instructions is to detect aircraft damage following an in-service flight or ground event. While there are many conditions that can result in high loads on the airframe and subsequent structural damage, the FAA considers the use of flight data in the certificate holder's inspection process to be particularly beneficial for the events identified above.

d) The use of composites in aircraft structures and other components has increased fuel savings by reducing weight without sacrificing structural strength. These characteristics are vital to meeting the demands of the aerospace industry. However, damage from a HEWABI event may not be clearly visible. Certificate holders should include inspection procedures in their maintenance program to be utilized when a HEWABI event has occurred. HEWABI events are impacts that are spread over a large area of the composite structure and may cause considerable structural damage with minimal external indications. A high-energy impact is when the type, force, or cause is significant with or without the result of damage a person can visually see. High-energy impacts must be reported and addressed.

e) The certificate holder's processes for evaluating these events should address an appropriate indication that an event has occurred, an evaluation of the severity of the event, and coordination with the manufacturer, as appropriate.

f) The certificate holder's special inspection procedures for high-load events should:

- Identify that a very high-load event has occurred;
- Assure that indications of structural damage are found in an initial inspection;
- Involve the OEM, if necessary;
- Provide a process for additional inspections that are designed to identify all of the structural damage; and
- Provide a process for approval for return to service.

D. Technical Data That Describes Maintenance Standards, Methods, Techniques, and Procedures.

1) Program Management and Technical Data. This section of the certificate holder's manual concerns detailed procedures for accomplishing specific tasks (e.g., methods, techniques, technical standards, measurements, calibration standards, operational tests, structural repairs). The certificate holder should also include procedures for aircraft Weight and Balance (W&B), jacking, lifting, shoring, storage, cold-weather operations, towing, aircraft taxi, and aircraft cleaning. The certificate holder can derive its maintenance manual contents from the manufacturer's publications. However, based on the certificate holder's particular service experience, organization, and operating context, the FAA expects the certificate holder to continuously modify and customize its maintenance manual as necessary for the continuing success of its maintenance program. This is one of the desired outcomes of a well-functioning CASS.

2) ADs. The certificate holder is required to accomplish the provisions of 14 CFR part 39 ADs. The certificate holder should have a management process in its manual for evaluating, accomplishing, and verifying ADs. The certificate holder's AD management process (see Volume 3, Chapter 59, Section 1, Safety Assurance System: Evaluating an Airworthiness Directives Management Process) should contain the following six elements: planning, support, provisioning, implementing, recording, and auditing. The certificate holder may not operate the aircraft that an AD applies to except in strict compliance with the provisions of the AD. Therefore, it is extremely important that the certificate holder include in its AD process provisions to ensure that:

- a) It reviews ADs for applicability to its aircraft;
- b) It submits and receives FAA approval for an alternative method of compliance (AMOC), if needed;
- c) It accomplishes the requirements of the AD within the timeframe specified in the AD;
- d) It keeps records of the accomplishment and current status of each AD that applies to its aircraft; and
- e) Any subsequent maintenance or alteration to its aircraft does not remove the maintenance or alteration that the AD mandated.

NOTE: If the certificate holder does subsequently remove the AD-mandated maintenance or alteration, it will be in violation of part 39 and may introduce an unsafe condition into its aircraft. It would also make the required records for that particular AD inaccurate.

3) Manufacturer's Service Publications. Refer to Advisory Circular (AC) 20-77, Use of Manufacturers' Maintenance Manuals, and FAA Order 8620.2, Applicability and Enforcement of Manufacturer's Data (these documents list situations when Service Bulletins (SB) would be regulatory).

4) Work Cards.

a) Work cards (or task cards), while not a specific regulatory requirement, have evolved as a best practice. The FAA considers work cards to be part of the certificate holder's manual and the certificate holder's maintenance program. They are the "what to do" and "how to do it" parts of the certificate holder's responsibility to accomplish maintenance and alterations on its aircraft. A certificate holder uses work cards as a simple means of complying with regulations for performing maintenance as well as maintenance recordkeeping. The certificate holder's work cards provide detailed, concise procedural instructions that organize and control its maintenance activities while providing a means to ensure that its maintenance activities comply with its certificate holder maintenance manual. It is an easy way for the certificate holder to make sure that its maintenance and other personnel are following its procedures. The certificate holder must document its process for developing and controlling work cards in its manual. If the certificate

holder develops its own work cards based on a manufacturer's instructions, it must ensure that they have transcribed the information completely and accurately.

b) The certificate holder should give special attention to work cards involving required inspections and flight control systems to ensure they are accurate, and contain complete and relevant technical data and drawings. The certificate holder should include discrete (separate or distinct) tasks with individual inspection sign-off requirements for post-rigging verification. Another function of the work card is to document the certificate holder's maintenance activities, providing a means for the certificate holder to comply with air carrier maintenance recordkeeping requirements. Work cards may also document the results of inspections, checks, and tests for data collection and analysis. The certificate holder conducts work-in-progress audits of work card activities under its CASS to ensure that each individual who accomplishes work on its aircraft is following its manual.

5) Airworthiness Limitations Section (ALS). Part 25 appendix H, § H25.4 states,

“a) The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth—

(1) Each mandatory modification time, replacement time, structural inspection interval, and related structural inspection procedure approved under 25.571.

(2) Each mandatory replacement time, inspection interval, related inspection procedure, and all critical design configuration control limitations approved under 25.981 for the fuel tank system.

(3) Any mandatory replacement time of EWIS components as defined in section 25.1701.

(4) A limit of validity of the engineering data that supports the structural maintenance program (LOV), stated as a total number of accumulated flight cycles or flight hours or both, approved under 25.571. Until the full-scale fatigue testing is completed and the FAA has approved the LOV, the number of cycles accumulated by the airplane cannot be greater than $\frac{1}{2}$ the number of cycles accumulated on the fatigue test article.

(b) If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: “The Airworthiness Limitations section is FAA-approved and specifies maintenance required under 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved.”

a) Section 91.7(a) requires operation of aircraft in an Airworthy condition. Included in this obligation is the requirement to perform any maintenance or inspections specified in the ALS in effect at the time the aircraft's Airworthiness Certificate (or Export Certificate) was originally issued, and in accordance with the ALS, as specified in §§ 43.16 and 91.403(c), unless an alternative has been approved by the FAA.

b) In accordance with 14 CFR part 21, § 21.31(c), a product's type design includes the ALS, and any change to the ALS is considered a change to type design, whether the change is a revision to the inspections and/or limits, or a new ALS for products not originally certificated with an ALS. Any changes to ALS including, but not limited to, threshold, interval, and task description must be coordinated with the Aircraft Certification Office (ACO) responsible for certification or validation of aircraft.

c) Periodically, a new or revised ALS may be issued by a design approval holder (DAH), or other entity, as a type design change. For new aircraft that have the revised ALS included in their type design, operators are required to comply with this revised ALS for the aircraft manufactured as of the ALS revision date. For existing aircraft manufactured under a previous ALS revision, changes to ALS are not mandatory unless an AD is issued to resolve an unsafe condition, or other rule that would make the new ALS retroactive and mandatory. Aircraft owner/operators may voluntarily incorporate an ALS revision into their maintenance and inspection program requirements for existing aircraft that are not otherwise covered by the revision or as required by an AD.

3-3871 ELEMENT 3—AIR CARRIER MAINTENANCE ORGANIZATION.

A. General Organizational Requirements. The certificate holder's maintenance organization must be able to perform, supervise, manage, and amend its program; manage and guide its maintenance personnel; and provide the direction necessary to achieve its maintenance program objectives. The regulations require the certificate holder to include a chart or a description of its maintenance organization in its manual. Part 121 subpart L, part 135 subpart J, and portions of part 119 subpart C discuss maintenance organization requirements. These organizational regulations apply to the certificate holder's organization, as well as any other organization that provides maintenance services for the certificate holder. A chart is a good way to show the certificate holder's assignment of overall and direct authorities and responsibilities.

B. Required Maintenance Organization Management Positions. Section 119.65 includes specific requirements for maintenance management positions for operations under part 121. A Director of Maintenance (DOM) and a chief inspector, or equivalent positions, are required by the regulations; however, they are not all of the management positions that the certificate holder will need to administer and manage its maintenance organization.

1) Parts 121 and 135 Required Positions. For operations conducted under part 121, § 119.65 requires the certificate holder to have qualified individuals serving full-time as the DOM and chief inspector, or in equivalent positions. If necessary for the certificate holder's operation, the certificate holder can ask the FAA for a deviation from the types and numbers of required part 121 or 135 management positions.

2) Chief Inspector. For operations that the certificate holder conducts under part 135, § 119.69 requires the certificate holder to have a qualified individual serving in the DOM management position, but there is no regulatory requirement for a part 135 chief inspector management position. However, as a best practice, the certificate holder should have an individual in its part 135 maintenance organization that has direct responsibility for the RII function, as well as those other duties, responsibilities, and functions normally associated with a part 121 chief inspector. Additionally, § 135.429(b) implies a supervisor for the certificate holder's inspection unit.

3) Management Personnel. The regulations require the certificate holder to state the duties, responsibilities, and authority of each of its management personnel in its manual. The certificate holder should state who has overall authority and/or responsibility, and who has direct authority and/or responsibility for a given process. In addition, the certificate holder must notify the FAA when it makes changes in its part 119 required management personnel or when it has a vacancy in one of those positions.

C. Required Air Carrier Maintenance Organization Structure.

1) Structure. The regulations that define an air carrier maintenance organization are broad given the different types and sizes of air carriers. It is not possible for a single means of compliance or a single organizational chart to apply to all the different types and sizes of air carrier organizations.

2) Accountable Person. The certificate holder should designate a single manager (person or position) to have authority, overall responsibility, and accountability for managing and implementing the certificate holder's entire maintenance program, including all inspection functions. The inspection functions and the required inspection functions are part of the certificate holder's maintenance program.

3) Organizational Functions. The FAA recommends that the certificate holder's maintenance organization have three general organizational functions to ensure that the certificate holder conducts all operations to the highest possible degree of safety. If the certificate holder is a larger organization, it may have different departments for each level while in the smallest organizations, the certificate holder may carry out these functions through one or two individuals, possibly as a collateral duty. Generally, these three organizational functional levels include:

- a) Mechanics and/or inspectors performing the work at the first level (operations);
- b) Middle managers and supervisors at the second level (tactics); and
- c) The maintenance program accountable manager at the third level (strategy).

4) Authority and Responsibility. The FAA expects the certificate holder to assign clear authority and responsibility in its maintenance organization, including responsibility for the overall maintenance program and all of its elements and functions. The certificate holder's manual should include a position description with each position's duties and responsibilities in

order to prevent a fragmented organizational system with a high risk for confusion over who is responsible for a given element, process, or task. The inspector should watch for hidden duties and responsibilities where the certificate holder shows a person's duty and/or responsibility in a process but not in the position description.

a) "Authority" means the power to design or change fundamental policy or procedures without having to seek higher-level approval. Authority is permission; it is a right coupled with an autonomous power to accomplish certain acts, or to order others to act. Often one person grants another authority to act, such as an employer to an employee, a corporation to its officers, or a governmental empowerment to perform certain functions.

b) "Responsibility" means a person's obligation to ensure the successful completion of a task or function. Responsibility includes accountability for the action to carry out a task or function.

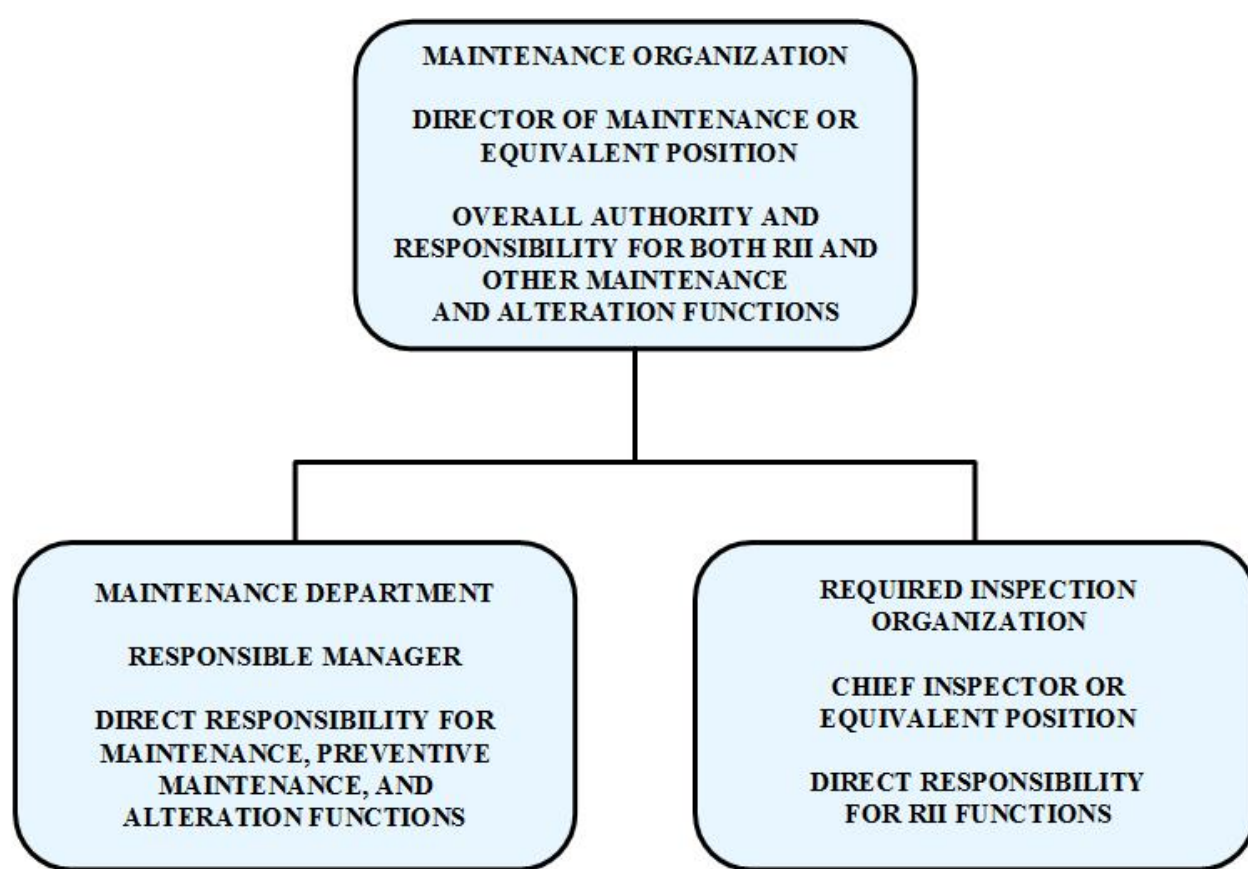
D. Maintenance and Inspection Organizations.

1) Regulatory Requirements. If the certificate holder performs maintenance and required inspections or if other persons perform these functions for the certificate holder, there is a clear regulatory requirement in §§ 121.365 and 135.423 for a maintenance organization and a required inspection organization. There is no regulatory requirement to separate these organizations. However, there is a requirement to separate the functions that each organization performs.

NOTE: Do not confuse "inspection" with "required inspection" when evaluating the certificate holder's organization. "Inspection" is normally associated with an inspection department that performs scheduled type inspections on the aircraft such as "C" and "D" checks. However, "required inspection," when used within the context of part 121, has a very specific meaning. A certificate holder is not required by regulation to have an inspection department that performs scheduled inspections (although this is desirable), but a certificate holder is required by regulation to have a required inspection organization that performs required inspections.

2) Organization. Sections 121.365(c) and 135.423(c) require the certificate holder to organize the performance of all maintenance functions (e.g., inspection, repair, overhaul, and the replacement of parts) to separate the function of required inspections from the function of the other maintenance, preventive maintenance, and alteration activities. This organizational separation must be below the level of administrative control where the certificate holder exercises overall responsibility for the required inspection functions as well as the other maintenance, preventive maintenance, and alteration functions. See Figure 3-141 for a representative organizational chart.

Figure 3-141. Typical Part 121 Organizational Chart Showing the Organizational Separation of the Required Inspection Items Function and the Other Maintenance, Preventive Maintenance, and Alteration Functions



3-3872 ELEMENT 4—ACCOMPLISHMENT AND APPROVAL OF MAINTENANCE AND ALTERATIONS.

A. Accomplishment of Maintenance.

1) Performing Maintenance. As a maintenance entity, the certificate holder has authorization under §§ 43.3(f), and 43.7(e), and §§ 121.379, and 135.437 to perform maintenance on its own aircraft and to approve them for return to service without obtaining any other maintenance certification. In addition, §§ 121.379 and 135.437 provide clear authority for the certificate holder, under its air carrier certificate, to perform maintenance on behalf of other certificate holders that conduct operations under the same part as the certificate holder.

2) Airman Certificate. Each individual who makes an airworthiness determination on the certificate holder's behalf must hold an appropriate airman certificate. Sections 121.378 and 135.435 require that any individual who the certificate holder puts directly in charge of performing maintenance hold an airman certificate. Sections 121.371 and 135.435 require that any individual the certificate holder authorizes to perform its RII holds an appropriate airman certificate. Sections 121.709 and 135.443 require that anyone who the certificate holder

authorizes to issue an approval for return to service holds an appropriate airman certificate. The certificate holder's DOM and chief inspector must hold an airman certificate with Airframe and Powerplant (A&P) ratings. All of these requirements for an airman certificate are imposed on the certificate holder, not the individual. The individual performing the function is not exercising the privileges of his or her certificate because the privileges of the airman certificate do not include the performance of part 121 requirements. Additionally, the authority to perform the required part 121 function derives from the certificate holder's certificate, not the individual's airman certificate. The certificate holder accomplishes all maintenance and approval for return to service on its aircraft under its certificate holder certificate by its maintenance organization or persons authorized by it, not by any individual or organization under their own individual certificate. There is, however, one exception to the individual airman certificate requirement. It occurs if the certificate holder arranges for a certificated repair station (CRS) located outside the U.S. to perform maintenance. At such repair stations, individuals directly in charge of performing maintenance or required inspections are not required to hold an FAA airman certificate.

B. Alterations and Repairs. Sections 121.367 and 135.425 require certificate holders to have an inspection program and a program covering other maintenance, preventive maintenance, and alterations.

1) Accomplishment of Alterations and Repairs. The policies and procedures for the accomplishment of alterations and repairs must be contained in the certificate holder's manual, as required by §§ 121.369 and 135.427. Part 43 appendix A contains a list of repairs and alterations considered major. However, the certificate holder should not consider the list to be all-inclusive. Rather, they should consider the list to be examples of major repairs and alterations. The certificate holder must also consider the definitions in § 1.1 for major and minor repairs or alterations when classifying repairs and alterations. The certificate holder should have detailed major and/or minor classification procedures in its manual to evaluate each repair or alteration on a case-by-case basis, using such factors as the certification basis of the aircraft; classification of the structure as primary, secondary, or a primary structural element; or classification as a fail-safe, safe-life, or damage-tolerant structure. It is the certificate holder's responsibility to properly classify the repair or alteration as major or minor. Under §§ 121.379 and 135.437, major repairs and alterations must be completed in accordance with technical data approved by the FAA. However, the methods, techniques, and practices used to perform minor repairs and alterations are informally referred to as "acceptable data."

2) Air Carriers' Use of Engineering Authorizations/Engineering Orders (EA/EO). Certificate holders may use EA/EOs as an acceptable format for documenting procedures for accomplishing maintenance, alterations, and repairs to aircraft, propellers, powerplants, accessories, and components. Section 43.13(c) states: "Special provisions for holders of air carrier operating certificates and operating certificates issued under the provisions of Part 121 or 135 and Part 129 operators holding operations specifications. Unless otherwise notified by the administrator, the methods, techniques, and practices contained in the maintenance manual or the maintenance part of the manual of the holder of an air carrier operating certificate or an operating certificate under part 121 or 135 and part 129 operators holding operations specifications (that is required by its operating specifications to provide a continuous airworthiness maintenance and inspection program) constitute acceptable means of compliance with this section." The certificate holder must have policy and procedures in their

maintenance and alteration program that outline the use of EA/EOs. The authority for certificate holders to perform and approve maintenance, preventive maintenance, and alterations is contained in §§ 121.379 and 135.437.

3) Deactivating Malfunctioning Systems or Components. Many certificate holders perform alterations to their aircraft to deactivate malfunctioning systems or components that cannot be repaired immediately. These alterations are performed to maintain safety and to mitigate potential hazards that could be caused by a defect in an adjacent system. These alterations may include the removal or relocation of equipment to deactivate a system. The Minimum Equipment List (MEL) is intended to permit operation with inoperative items of equipment for a period of time until repairs can be accomplished. These alterations to deactivate systems or components using EA/EOs should not be confused with the approved MEL procedures; rather, it is in addition to the MEL and contained within the certificate holder's maintenance/alteration program.

4) Return to Service. For an aircraft to be returned to service in an Airworthy condition, the following instruments and equipment may not be removed from the aircraft per an EA/EO, deactivated per an EA/EO, or included in the MEL:

a) Instruments and equipment that are either specifically or otherwise required by the airworthiness requirements under which the aircraft is type certificated and which are essential for safe operations under all operating conditions.

b) Instruments and equipment required by an AD to be in operable condition unless the AD provides otherwise.

c) Instruments and equipment required for specific operations by part 121 or 135.

5) Alterations Performed by On-Call Contract MPs. In the event that the certificate holder has an aircraft with a malfunctioning system or component at a location where the certificate holder has no company maintenance personnel, the certificate holder may utilize an on-call contract MP to perform maintenance or alterations on its aircraft. Regardless of where the aircraft is located or who is performing maintenance, the certificate holder should have a structured process in their manual that allows an MP to alter their aircraft, by deactivating aircraft systems or components, when these alterations are necessary for the continued safe operation of the aircraft. When the certificate holder uses an MP to accomplish maintenance or alteration activities on its aircraft, that MP becomes part of the certificate holder's maintenance organization and is under the certificate holder's control. The certificate holder must determine that the MP does the work satisfactorily according to the certificate holder's manual and standards. The aircraft must be returned to service in an Airworthy condition. The certificate holder's maintenance control personnel typically administer, control, and direct all on-call MPs. The scope, complexity, and limits of the type of maintenance and alterations that may be performed by the MP must be outlined in the certificate holder's manual. However, §§ 121.363 and 135.413 make it clear that the certificate holder remains primarily responsible for all of the maintenance performed by the MP on its aircraft.

C. Airworthiness Release Form or Aircraft Log Entry and Approval for Return to Service. After performing any maintenance on its aircraft, the certificate holder must approve it for return to service before the certificate holder may operate it. The certificate holder must issue an approval for return to service under § 121.709 or § 135.443, as appropriate.

D. Scope of Maintenance. The certificate holder must provide instructions in its maintenance program and maintenance manual for maintenance and alterations encompassing “what to do,” “when to do it,” “how to do it,” and “was it completed properly” in at least three major areas:

1) Scheduled Maintenance. Scheduled maintenance consists of all the individual maintenance tasks performed according to the maintenance time limitations (maintenance schedule). The certificate holder’s scheduled maintenance activities should include procedural instructions for the maintenance tasks and requirements to record the results of the inspections, checks, tests, and other maintenance. The certificate holder’s procedures should also provide for time-related activities such as recurring ADs, Certification Maintenance Requirements (CMR), and life-limited parts retirement.

2) Unscheduled Maintenance. Unscheduled maintenance includes procedures, instructions, and standards for maintenance that occurs on an unscheduled or unforeseen basis. A need for unscheduled maintenance may result from scheduled maintenance tasks, pilot reports, or unforeseen events, such as high-load events, hard or overweight landings, tail strikes, ground damage, lightning strikes, or an engine over-temperature. In the certificate holder’s maintenance manual, the certificate holder should include instructions and standards for the accomplishment and recording of unscheduled maintenance and detailed procedures for recording all types of unscheduled maintenance.

E. Specific Maintenance Requirements for Major Aircraft Components.

1) Certificate Holder’s Engine Maintenance Program. The certificate holder’s engine maintenance program should cover the maintenance of installed engines and off-wing engines for each engine model it operates. Usually, the installed engine maintenance requirements will be contained in the maintenance time limitations. In addition to procedural information, the off-wing program described in the certificate holder’s maintenance manual should provide shop scheduling information or intervals for cleaning, adjusting, inspecting, testing, and lubricating each part of the engine requiring that maintenance. The certificate holder should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required when the engine is in the shop.

2) Task-Oriented Engine Maintenance. In response to improvements in engine design and reliability, and responding to the needs of industry, the FAA allows air carriers to utilize task-oriented engine maintenance programs, which allow air carriers to operate certain engines without overhauling those engines at an established time-in-service interval. Currently, engine reliability has improved to a level where the safety of the operations is not impacted to an unacceptable level by the use of a task-oriented engine maintenance program. The air carriers or engine manufacturers may refer to these engine maintenance programs as: Task Oriented, Task Centered, Task Based, On-Condition, or Condition Monitoring programs.

a) A task-oriented engine maintenance program is a preventive and primary maintenance process that requires that an aircraft engine and powerplant system components be inspected periodically or checked against some appropriate physical standard to determine if the engine can continue in service. The standard ensures that the engine is removed from service before failure during normal operation. These standards may be adjusted based on operating experience or tests, as appropriate, in accordance with a certificate holder's CAMP.

b) The task-oriented engine maintenance program should be based on methods, techniques, and practices prescribed in the current engine manufacturer's maintenance manual, instructions for continued airworthiness (ICA) prepared by the engine manufacturer, or other methods, techniques, and practices acceptable to the FAA.

c) The program should include a scheduled maintenance task. A scheduled maintenance task is a maintenance action that the certificate holder performs at regular scheduled intervals so that it can ensure the engine can continue to perform its intended function within its operating context.

d) When evaluating a task-oriented engine maintenance program, the Certificate Holding District Office (CHDO) should ensure:

1. The certificate holder's overall maintenance schedule objective of the engine maintenance program is to do the correct tasks at the correct interval.

2. The program is designed so the certificate holder can discover a hidden failure before engine degradation leads to an unplanned event.

3. If the certificate holder decides to increase or decrease task intervals to its engine maintenance program, it goes through the same justification process as it would for any other change to the maintenance schedule.

4. The engine maintenance program takes into account the need to manage risk to an acceptable level, as well as the practical limitations that the certificate holder must face when addressing the service life of the engine.

5. The certificate holder's CASS monitors the engine maintenance program to verify that it is effective and producing the desired results. The certificate holder's CASS will be its principal source of information that might indicate a needed change to its maintenance schedule.

e) The FAA authorizes the certificate holder maintenance schedule through the certificate holder's OpSpecs, and the FAA expects the certificate holder to correct any deficiencies in its maintenance schedule. Under §§ 121.373 and 135.431, if the certificate holder does not make needed changes, the FAA can require it to change its maintenance schedule or any other element of the engine maintenance program found deficient.

f) The following tasks may not be changed without approval from the appropriate ACO, or Maintenance Review Board (MRB), or other office of responsibility, as applicable: retirement times for life-limited items, airworthiness limitation items (ALI), CMRs,

structural sampling periods that the MRBs impose, Maintenance Review Board Report (MRBR) Failure Effect Categories 5 and 8, critical design configuration control limitations (CDCCL), and compliance times for airworthiness directives. The time in service remaining for the specified life limit is expressed in the appropriate parameter (e.g., hours, cycles, or calendar-time).

g) On some engines, each cycle of operation at maximum take-off thrust rating may be equivalent to two cycles at normal take-off thrust rating. This ratio must be applied when determining accumulated cycles.

NOTE: The CHDO should ensure the task-oriented engine maintenance program is able to determine an engine's condition so that the certificate holder can remove the engine from service prior to failure.

h) Aircraft Evaluation Group (AEG) technical support for engines can be obtained from the Propulsion and APU AEG branch in Burlington, Massachusetts.

3) Auxiliary Power Unit Maintenance (APU) Program. If the certificate holder's aircraft have APUs, it should include APU maintenance as part of its maintenance program. Usually, the installed APU requirements will be contained in the maintenance time limitations. In addition to procedural information, the certificate holder's maintenance manual should provide shop scheduling information or intervals for cleaning, adjusting, inspecting, testing, and lubricating each part of the APU requiring that maintenance. The certificate holder should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required when the APU is in the shop.

4) Propeller Maintenance Program. If applicable, the certificate holder's propeller maintenance program should cover the maintenance of installed propellers and off-wing propellers for each model it operates. Usually, the installed propeller system scheduled maintenance requirements will be contained in the maintenance time limitations. In addition to procedural information, the off-wing program described in the certificate holder's manual should provide shop scheduling information or intervals for cleaning, inspecting, adjusting, testing, and lubricating each part of the propeller system requiring that maintenance. The certificate holder should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required at these periods. Some propeller manufacturers make propellers of composite materials and, therefore, may require unique tools, repair procedures, and specialized training for maintenance personnel.

F. Parts and Appliances Maintenance Program. For the most part, this component of the certificate holder's maintenance program covers shop operations, which may include both scheduled and unscheduled tasks. The certificate holder may conduct these shop operations at some location other than where it performs maintenance on its aircraft. The certificate holder's parts and appliance maintenance program should cover both installed parts and appliances and off-wing maintenance for each part and appliance model that it operates. Usually, the installed part and appliance scheduled maintenance requirements will be contained in the maintenance time limitations. In addition to procedural information, the off-wing program described in the certificate holder's maintenance manual should provide shop scheduling information or intervals for cleaning, adjusting, inspecting, testing, and lubricating each component of the part and

appliance requiring that maintenance. The certificate holder's maintenance manual should include the degree of inspection, the applicable wear tolerances, and the work required when the part or appliance is in the shop.

G. Maintenance and Preventive Maintenance Personnel Duty Time Limitations.

Within the United States, § 121.377 requires that the certificate holder or the certificate holder MP relieve each person performing maintenance or preventive maintenance from duty for a period of at least 24 consecutive hours during any 7 consecutive days, or the equivalent thereof within any 1 calendar-month. There are no equivalent duty time requirements in part 135. The general rule in § 121.377 is intended to reduce the likelihood of fatigue-related maintenance errors in certificate holder operations. The regulation also permits persons to work continuously in any 1 calendar-month, provided they are given time off and away from work equal to the actual hours they would have been relieved from duty if had they worked 6 days with the 7th day off throughout the specific calendar-month under consideration. The certificate holder or MP must give relief from duty in increments of no less than 24 consecutive hours. The certificate holder must document its control methods for duty time limits in its manual. It may accept the certificate holder MP's methods of control; however, the certificate holder is primarily responsible and accountable for ensuring compliance. The certificate holder should document its process for verifying compliance with maintenance duty time limits through its CASS audits.

3-3873 ELEMENT 5—MAINTENANCE SCHEDULE/TIME LIMITATIONS.

A. Maintenance Schedule/Time Limitations Overview. Sections 119.49 and 121.135(b) require the certificate holder to have maintenance time limitations, also called a maintenance schedule.

1) Determining Maintenance Time Limitations. Sections 119.49 and 121.135(b) permit the certificate holder to use standards for determining its maintenance time limitations. This language is the regulatory basis of the FAA-approved reliability programs developed in the 1960s. The maintenance time limitations set out the what, how, and when of the certificate holder's scheduled maintenance effort. Although in the past the schedule included only basic overhaul limits and other general requirements, today it includes a specific list of each individual maintenance task and its associated time limit. The regulations are broad enough to permit the certificate holder to organize all of these individual tasks into a series of integrated scheduled work packages of its own design that provide a continuous succession of necessary or desirable scheduled maintenance tasks for the certificate holder's entire aircraft. Most aircraft manufacturers have a document, sometimes called a Maintenance Planning Document (MPD), that incorporates MRBR items into scheduled checks for a particular model aircraft. The certificate holder can use this document as a basis for developing its own maintenance schedule.

2) Evaluating Time Limitations. When evaluating time limitations on parts 121 and 135 certificate holders, an ASI should ensure:

a) That the time limitations portion of their program covers the entire aircraft as it is currently configured, and is not only excerpts or references from the aircraft manufacturer's maintenance manual that address some, but not all, of the time limitations and ICA.

b) If a small air carrier chooses to use a web-based maintenance tracking program as their time limitations, that program must list all items and maintenance/inspection tasks with their respective scheduled maintenance interval. The certificate holder must maintain full responsibility for their maintenance program and ensure the currency and accuracy of their time limitations document. The certificate holder cannot transfer responsibility of their time limitations document to the aircraft manufacturer or to the administrator of a commercially available maintenance tracking program.

c) The time limitations section depicts every time sensitive maintenance task having a scheduled interval for performing maintenance on any component or system of that aircraft in its current configuration. This may include, but is not limited to:

1. Scheduled inspections,
2. Individual maintenance tasks,
3. Replacement of life-limited items,
4. ALISs,
5. Servicing and lubrication tasks,
6. Corrosion prevention program tasks,
7. Aging aircraft fatigue/damage tolerance programs,
8. CMRs,
9. Supplemental Structural Inspections (SSID),
10. Electrical wiring interconnection system (EWIS),
11. Replacement of components requiring periodic overhaul or repair, and
12. Recurring ADs.

B. FAA's Role in Relation to the Maintenance Schedule. The FAA authorizes the certificate holder maintenance schedule through the certificate holder's OpSpecs, and the certificate holder's CASS monitors that schedule to verify that it is effective and producing the desired results. The certificate holder's CASS will be its principal source of information that might indicate a needed change to its maintenance schedule. The FAA expects the certificate holder to correct any deficiencies in its maintenance schedule. Under §§ 121.373(b) and 135.431(b), if the certificate holder does not make needed changes, the FAA can require it to change its maintenance schedule or any other element of its maintenance program found deficient.

C. Maintenance Schedule Contents—General. The maintenance schedule should contain the following information:

1) What (Unique Identifier). This is the item that the certificate holder intends to maintain. In most cases, this is the item listed in the MRBR, which was determined using Maintenance Steering Group-3 (MSG-3) logic. The certificate holder's identifier should be specific enough to allow the individual that it assigns to do the scheduled maintenance task to identify the item easily and accurately.

2) How (Task). The scheduled maintenance task to be completed in order to maintain the item. A scheduled maintenance task is a maintenance action that the certificate holder performs at regular, scheduled intervals so that it can ensure that the item can continue to perform its intended function within its operating context; so that the certificate holder can discover a hidden failure; or to ensure that a hidden function is available.

3) When (Frequency). Frequency is the time-in-service interval between the times when the certificate holder accomplishes a scheduled maintenance task. The certificate holder may measure time-in-service intervals in calendar-time, operational hours, flight cycles, or any other appropriate parameter. In addition, for task management, inventory, and audit purposes, the certificate holder should identify, on the maintenance schedule, the task or work card associated with each scheduled maintenance task. This way, the certificate holder can ensure that it accomplishes all of its scheduled maintenance tasks according to its schedule.

4) Maintenance Schedule Objective. The certificate holder's overall maintenance schedule objective is to do the correct tasks at the correct interval. Keep in mind that more maintenance is not always a good idea, so if the certificate holder decides to decrease intervals or add tasks, it should go through the same justification process as it would for any other change to the maintenance schedule.

D. Standards for Determining Maintenance Time Limitations. Sections 119.49 and 121.135 permit the certificate holder to have standards for determining its maintenance time limitations. In the past, we used this language as the regulatory basis for FAA-approved reliability programs that evolved during the 1960s. These programs were based on Airlines for America's (A4A) (was Air Transport Association of America, Inc. (ATA)) now obsolete process-based Maintenance Steering Group-2 (MSG-2) decision logic that focused on failure rates and maintaining individual parts of the aircraft. Consistent with the continuous evolution of aviation, MSG-2 became obsolete in 1980 with the advent of A4A's task-based MSG-3 decision logic. MSG-3 focused on aircraft systems and a loss of function rather than on individual part failure. In any case, the management of these MSG-2 process-based programs was actuarial analysis. Certificate holders used the failure rates of a part to determine, through a probability process, the likelihood that the part would have a similar failure rate in the future. The standard was the acceptable failure rate. Certificate holders used a failure rate alert program with upper control limits (UCL) and lower control limits (LCL) to track part failure rates. The certificate holder was obliged to take action only when the failure rate deviated from the probability-based prediction (i.e., exceeded the UCL or the LCL). If the part did not respond, the certificate holder had authorization to move the UCL or LCL to make the failure rate within the alert program limits.

1) Reliability Centered Maintenance (RCM). During the 1970s, after collecting a large amount of operational data over time, the industry came to the realization that using failure

rates and alert programs was not the most effective way of managing scheduled maintenance. Using the vast amount of operational data that was available, United Airlines, Inc. (UAL) developed and published a report in 1978 under a U.S. Department of Defense (DOD) contract entitled “Reliability-Centered Maintenance (RCM).” This very significant document was in stark contrast to the previous part failure rate focus. RCM focused on the loss of function of an aircraft system. RCM determined that not everything fails the same way; failures occur according to different failure patterns. RCM also determined that not everything requires the same type of maintenance; there are four different types of scheduled maintenance. RCM also took into account the different consequences (safety, operational, and economic) of a loss of function, as well as system functional redundancy and inherent design safety when determining if scheduled maintenance was required. In some cases, RCM determined that no scheduled maintenance was required. This resulted in doing only required maintenance, and lowered the maintenance burden.

2) MSG-3 Decision Logic. The RCM document was the major basis for the ATA’s development of the MSG-3 decision logic in 1980. Since then, most aircraft manufacturers have used A4A’s MSG-3 decision logic to help them develop scheduled maintenance requirements for their new products. Besides providing organization and flow to the deliberative process, the primary attribute of the MSG-3 process is that the user can develop initial scheduled maintenance requirements without the operational data that are required to determine the need for scheduled maintenance tasks. Using the techniques of the MSG-3 decision logic, it is simple to decide what tasks are required to be included in an initial scheduled maintenance program. However, the MSG-3 decision logic does not contain task interval selection decision logic to help the user determine where to set the task intervals, or how to adjust them after service is initiated. Using the MSG-3 process, initial task intervals are set based on knowledge of the design, and the best judgment of the working group members. As a result, validation of initial interval selections must occur when the aircraft begins service and starts generating the operational data that were not available when the initial intervals were set.

3) Effective Scheduled Maintenance. An inherent function of the certificate holder’s CASS is to determine the effectiveness of its scheduled maintenance effort through operational data collection and analysis activity. The certificate holder should use this important function to determine the level of scheduled maintenance effectiveness and to make the changes necessary to achieve the standard of effectiveness that the certificate holder has set. Effective means that “it is producing the desired results.” Thus, from an operational standpoint, an indicator of effectiveness of the certificate holder’s scheduled maintenance effort is the availability of its aircraft for flight operations. If the certificate holder’s aircraft are unavailable for flight operations for maintenance reasons, then the certificate holder’s scheduled maintenance program may not be as effective as it should be. There are other elements of the certificate holder’s maintenance program besides the scheduled maintenance element that may be deficient as well, but the certificate holder’s CASS procedures will identify the root cause and help it identify and make the adjustments/changes necessary to achieve the level of flight operations availability (the result) that it has set.

E. Maintenance Schedule Development. The aircraft’s MRBR is the baseline document for the certificate holder to use in developing its maintenance schedule. Industry, manufacturers, and the FAA participate in the development of the MRBR using the MSG-3 process. The aircraft manufacturer compiles, publishes, and keeps current the MRBR for a

specific aircraft model and series. The FAA approves the MRBR for use by U.S. air carriers. The tasks and their frequencies are listed in the report form part of the ICA required by part 25 appendix H. The FAA develops the MRBR to be compatible with regulations and policies, and it will assist the certificate holder and the inspector in the development and evaluation process of the certificate holder's initial maintenance program. The MRBR outlines the initial minimum scheduled maintenance/inspection requirements for developing a maintenance schedule for the airframe, engines, systems, and components of a particular aircraft model/series. It is important to note that the FAA uses the MRBR as a baseline/starting point for a new entrant air carrier in the development of its maintenance schedule. Therefore, the latest version of the MRBR or Maintenance Type Board Report (MTBR) must be used as a basis for any application. Once the maintenance schedule is in place, the certificate holder's experience and CASS will be the main determining factors for changes to the schedule. It is also important to note that a revision to the MRBR alone does not automatically constitute an approval basis for a certificate holder to change its existing maintenance schedule. See Volume 3, Chapter 64, Section 1 for information on how to evaluate proposed task interval/time limitation adjustments for maintenance programs, and Volume 8, Chapter 2, Section 7 for more information about the MRBR process.

1) Additional Maintenance Schedule Considerations. The maintenance schedule should also include instructions for the following items:

- a) Section 121.1105, Aging Airplane Inspections and Records Reviews. (These are performed by FAA safety inspectors or FAA Designed Airworthiness Representative (DAR)).
- b) Section 121.1107, Repairs Assessment for Pressurized Fuselages.
- c) Section 121.1109, Supplemental Inspections.
- d) Section 121.1111, Electrical Wiring Interconnection Systems (EWIS) Maintenance Program.
- e) Section 121.1113, Fuel Tank System Maintenance Program.
- f) Section 121.1117, Flammability Reduction Means.
- g) Reduced Vertical Separation Minimum (RVSM) maintenance task.
- h) ETOPS maintenance requirements (if applicable).
- i) Corrosion Prevention and Control Program (CPCP) task.
- j) CMR tasks.
- k) CDCCLs items.
- l) High Intensity Radio Frequency (HIRF) protection items.
- m) AD management process.

2) Air Carrier Developed Maintenance Task. Based on the certificate holder's particular service experience, organization, and operating context, the FAA expects the certificate holder to continuously modify and customize its maintenance task as necessary for the continuing success of its maintenance program. This is one of the desired outcomes of a well-functioning CASS. In order to maintain the highest level of safety the certificate holder may develop its own specific maintenance tasks (e.g., methods, techniques, technical standards, measurements, calibration standards, and operational tests). These certificate holder-developed maintenance tasks should be based on methods, techniques, and practices acceptable to the FAA.

3) High-Pressure Cylinder's Maintenance Program Requirements. Each operator of a U.S.-registered aircraft must have maintenance and recordkeeping procedures consistent with its particular regulatory requirements for each high-pressure cylinder installed on the aircraft. For specific guidance see Volume 3, Chapter 57, Section 1, Safety Assurance System: Maintenance Requirements for High-Pressure Cylinders.

4) Aircraft Drinking Water Rule Requirements. The primary purpose of the Aircraft Drinking Water Rule (ADWR) is to ensure that safe and reliable drinking water is provided to aircraft passengers and crew. Drinking water safety on airlines is jointly regulated by the Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and FAA. EPA regulates systems that supply water to airports and onboard aircraft. The FDA regulates water used in food and drink preparation and water supply lines for the aircraft. The FAA oversees airline operation and maintenance programs, including the potable water system. The EPA has developed guidance documents and a National Database System to help certificate holders comply with ADWR.

F. Maintenance Schedule Acceptance or Approval.

1) Without an Approved Reliability Program. For the certificate holder that does not have or is not seeking FAA approval for a reliability program, the inspector will use Volume 3, Chapter 64, Section 1 to verify that the certificate holder has accounted for all of the applicable maintenance/inspection requirements listed in the applicable MRBR. As required in Volume 3, Chapter 64, Section 1 if differences exist, the inspector will require the certificate holder to properly substantiate and justify those differences. The inspector may contact the airworthiness person assigned to the aircraft at the appropriate Aircraft Evaluation Group (AEG) (http://www.faa.gov/about/office_org/field_offices/aeg/) for assistance. If the inspector finds the certificate holder's maintenance schedule acceptable, the inspector will issue OpSpecs D089, Maintenance Time Limitations Section in accordance with Volume 3, Chapter 18, Section 6. Current policy requires Time Limitations to be approved by the FAA. The Table in OpSpecs D089 requires the Manual/Document Date as a control to ensure that the Time Limitations Document being used by the certificate holder is the same document approved by the Certificate Holding District Office. The practice of identifying a chapter "as revised" within OpSpec D089 is not appropriate.

2) With an Approved Reliability Program. For the certificate holder that has or is seeking FAA approval for a reliability program, the inspector will verify that the certificate holder has accounted for all of the applicable maintenance/inspection requirements listed in the applicable MRBR in its maintenance schedule. Since the FAA considers the maintenance

schedule to be part of the certificate holder's reliability program, the inspector should review the schedule as part of the evaluation of the certificate holder's reliability program in accordance with Volume 3, Chapter 40, Section 1. The inspector should note that FAA policy regarding the certificate holder using the MRBR as a basis for determining its initial time limitations also applies to the certificate holder that has an approved reliability program. However, once the FAA approves the certificate holder's reliability program, the certificate holder must make any changes to its maintenance schedule in accordance with the policies and procedures (standards for determining time limitations) contained in its approved program. If the inspector finds the certificate holder's maintenance schedule acceptable, the inspector will issue OpSpecs paragraph D074, Reliability Program Authorization—Entire Aircraft, or OpSpecs paragraph D075, Reliability Program Authorization—Airframe, Powerplant, Systems or Selected Items, as applicable in accordance with Volume 3, Chapter 18, Section 6. The FAA does not issue D089 to certificate holders also issued OpSpecs D074 or D075.

3-3874 ELEMENT 6—RII. Also see Volume 3, Chapter 43, Section 2.

A. RIIs.

1) Tasks as RIIs. Sections 121.369(b) and 135.427(b) require the certificate holder to designate certain tasks as RIIs. The certificate holder must designate those items of maintenance and alteration that it must inspect (required inspections), including at least those that could result in a failure, malfunction, or defect that endangers the safe operation of the aircraft if the person performing the maintenance or alteration does not do it properly, or if they use improper parts or material. If the certificate holder uses an to perform maintenance and alterations for it, it may authorize a provider's employee to accomplish its RII requirement if the certificate holder's manual satisfies the regulatory requirements as outlined in subparagraph 3-3874B. The certificate holder must issue its authorization to an individual rather than a group or company. Consistent with the regulations, the certificate holder remains primarily responsible for the performance of each RII accomplished by the other person.

2) Making RII Lists. The certificate holder must identify specific items of inspection for each aircraft type (it is inappropriate to designate entire systems as RIIs). The certificate holder should develop a process for creating and managing RII lists. Typical sources of information for RII list management include: requests to add to or modify the RII list, findings from the certificate holder's CASS, and modifications to aircraft.

NOTE: There is nothing preventing the certificate holder from including additional items in its RII list that are not required by regulation. However, the certificate holder should consider and ensure that by doing so, it does not diminish the significance of an RII (additional inspection given to maintenance performed on a safety of flight item).

3) RIIs and Safety. The RIIs relate directly to flight safety. The certificate holder should consider all of its RIIs with the same safety of flight consideration and emphasis even if accomplishing an individual RII adversely affects its flight schedule, relates to a scheduled or an unscheduled task, or arises at an awkward time or at an inconvenient location.

B. RII Procedures, Standards, and Limits.

1) List of Other Persons. The certificate holder's manual must include a list of persons with whom it has arranged for any required inspections (refer to §§ 121.369(a) and 135.427(a)) both within its organization and within other organizations that perform maintenance on the certificate holder's behalf. This listing must include a designation by occupational title of the personnel authorized to perform each required inspection (refer to §§ 121.369(b)(3) and 135.427(b)(3)).

2) Certification. With consideration of the exceptions at §§ 121.378(a) and 135.435(a), each individual that the certificate holder grants an RII authorization to must hold an appropriate airman's certificate. The certificate holder must formally notify each of these individuals of their RII authorization as well as its scope (refer to §§ 121.371(d) and 135.429(e)).

3) RII Requirements. The certificate holder should clearly identify its RII requirements on work forms, job cards, and engineering orders or by any other method consistent with its maintenance program. A primary concept of the RII function is to prevent any person who performs any item of work from performing any required inspection of that work (refer to §§ 121.369(b)(7) and 135.427(b)(7)). FAA policy includes any person who provides training to another person on the work performed. Therefore, it is important that the certificate holder identify RIIs whenever possible so that everyone knows an RII is required. The certificate holder should also clearly state RII buy-back procedures (refer to §§ 121.369(b)(4) and 135.427(b)(4)).

4) Standards and Limitations. The certificate holder must set procedures, standards, and limits necessary for required inspections and acceptance or rejection of the RIIs (refer to §§ 121.369(b)(5) and 135.427(b)(5)). The certificate holder's RII policy and procedures should identify the specific RII criteria that includes the methods, standards and limits for performing each RII task. The certificate holder must also have those procedures, standards, and limits necessary for the acceptance or rejection of each of its RIIs. As the certificate holder will not find RIIs or procedures, standards, and limits for RIIs in an OEM manual, the certificate holder will have to develop these and put them in its manual. The certificate holder's manual must specify the method of performing required inspections (refer to §§ 121.369(b)(3) and 135.427(b)(3)).

5) Procedures. The certificate holder's manual must include procedures to ensure that it performs and completes all required inspections (refer to §§ 121.369(b)(6) and 135.427(b)(6)) before it releases the aircraft to service (refer to §§ 121.369(b)(9) and 135.427(b)(9)).

3-3875 ELEMENT 7—MAINTENANCE RECORDKEEPING SYSTEM.

NOTE: Additional information and policy on the air carrier maintenance recordkeeping system is contained in Volume 3, Chapter 31, Section 5 and Volume 3, Chapter 32, Section 1.

A. Reasons for Making and Keeping Maintenance Records. The certificate holder's primary reason to make and retain maintenance records is to show that the U.S. Standard Airworthiness Certificate on its aircraft is effective and that its aircraft is airworthy. The

Airworthiness Certificate is effective on the certificate holder's aircraft only as long as the certificate holder performs the maintenance and alterations according to the requirements of the FAA's regulations. If the certificate holder's required aircraft maintenance records are incomplete or inaccurate, it can render its aircraft's Airworthiness Certificate ineffective. Maintenance actions, in almost all cases, become intangible or abstract after the fact. Therefore, in order for the certificate holder to make a maintenance action tangible, it must make a record of that maintenance action. Additionally, making a record of certain summary information supports identification of the current inspection and airworthiness status of the certificate holder's aircraft.

B. Part 43 Requirements. Section 43.9(a) contains the basic requirement to make a maintenance record; however, § 43.9(b) indicates that the governing requirements for an air carrier are found in part 121 or 135. In other words, the recordkeeping requirements of § 43.9(a) do not apply to air carriers. However, the requirements of § 43.9(b) are consistent with the air carrier maintenance recordkeeping requirements of §§ 121.369(c) and 121.380(a) and (c), or §§ 135.427(c) and 135.439.

C. Work Performed by a Part 145 Repair Station.

1) Retaining Records. Title 14 CFR part 145, § 145.219 requires a CRS to retain certain records of maintenance that it performs. It also requires the repair station to make those records available to the FAA. However, these §§ 43.9(a) and 145.219 requirements do not apply when the repair station is accomplishing any work on the certificate holder's aircraft.

2) Copies of Records. The wording of § 145.205 regulations as well as §§ 119.1(c), 121.1(b), and 135.1(a)(2) compel a part 145 CRS to follow the procedures and requirements of the certificate holder's maintenance program and applicable sections of its maintenance manual when accomplishing any maintenance or alterations on the certificate holder's aircraft. Consequently, a CRS must use the performance standards of part 121 or part 135, including the recordkeeping requirements, instead of following the provisions in part 145 and its repair station manual. This is consistent with the requirements of The Paperwork Reduction Act, which does not permit the government to require two separate but identical sets of records. The responsibility for retaining records in accordance with the retention requirements of §§ 121.380(c) and 135.439(b) rests with the certificate holder, not the repair station. However, if a part 145 repair station wants to retain a copy of those records generated by working on the certificate holder's aircraft, FAA regulations do not preclude them from doing so. Asking the part 145 repair station to keep the certificate holder's records for the certificate holder is consistent with regulations, although the certificate holder is responsible for retaining them and making them available to the FAA. This is consistent with the requirements of § 119.59(c).

D. Penalties for Improper Air Carrier Maintenance Recordkeeping.

1) Importance of Maintenance Records. Maintenance records are important for:

- a) The certificate holder to fulfill its responsibility to determine the airworthiness status of its aircraft; and
- b) The FAA to continue its review of aircraft maintenance records as a direct means of determining the airworthiness and safety status of the certificate holder's aircraft.

2) Reviewing Maintenance Records. Because reviewing maintenance records is often the only direct means of determining the accomplishment of required maintenance, Federal law treats 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 and/or imprisonment.

E. Making and Keeping Required Records.

1) Recordkeeping System. FAA regulations (§ 121.369(c) or § 135.427(c)) require the certificate holder to have and use a recordkeeping system for the preparation, storage, and retention of required aircraft maintenance records. The certificate holder must document its system in its maintenance manual. The primary objectives of these systems are the generation, storage, retention, and retrieval of accurate and complete certificate holder aircraft maintenance records. As stated earlier, the certificate holder makes and retains these records to show the FAA that its aircraft have an effective U.S. Standard Airworthiness Certificate and are airworthy and capable of safe flight.

2) Record Locations. FAA regulations (i.e., § 119.59(b)(1)(ii)) also require the certificate holder to make and keep a listing that identifies the location of each record, document, and report that the certificate holder is required to make and keep, as well as a listing that identifies each person who is responsible for each of those records, documents, and reports.

3) Applicable ADs. FAA regulations §§ 121.380(a)(2)(vii) and 135.439(a)(2)(v) also require the certificate holder to keep a record of the current status of applicable ADs, including the date and methods of compliance and, if the AD involves recurring action, the time and date when the next action is required. Sections 121.369(c) and 135.427(c) require the certificate holder to have and use a recordkeeping system for the preparation, storage, and retention of required aircraft maintenance records.

F. When to Make Records Available to the FAA. Section 119.59(c) mandates that the air carrier must make its required maintenance records available to the FAA at any time when the FAA requires them.

G. Responsibility for Making Records Available to the FAA. Under § 119.59(b)(1)(ii), the certificate holder must make a list of persons in its organization that it has designated to be responsible for making each required maintenance record, document, or report available to the FAA upon request. The certificate holder must make a list of the location of each record, document, or report. The certificate holder must keep this list current and make it available to the FAA at its principal base of operations.

H. Required Records. The certificate holder is required to make and keep certain current status records. Sections 121.380 and 135.439 list current status recordkeeping requirements, which are explained as follows:

1) Total Time in Service. The total time in service of the airframe, each installed engine, and each installed propeller is a record that contains the time in service accrued since new or rebuilt, expressed in hours, landings, or cycles. It is important for the inspector and the

certificate holder to know that “rebuilt” does not have the same meaning as “overhauled” (refer to § 43.2(b)).

2) Current Status of Each Life-Limited Part. 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) The time in service since new, expressed in the appropriate parameter (e.g., hours, cycles, or calendar-time);
- b) The time in service remaining to the specified life limit expressed in the appropriate parameter (e.g., hours, cycles, or calendar-time);
- c) The specified life limit expressed in the appropriate parameter (e.g., hours, cycles, or calendar-time); and
- d) A record of any action that alters the part’s life limit or changes the parameter of the life limit.

NOTE: If the certificate holder conducts operations under part 135, total time in service and the current status of life-limited parts also includes rotors.

3) Time Since Last Overhaul. The listing of the time since last overhaul means a record that contains at least the following information:

- a) An identification of the item that requires overhaul and its associated scheduled overhaul interval;
- b) The time in service since the last overhaul was accomplished;
- c) The time in service remaining until the next scheduled overhaul is due; and
- d) The time in service when the next scheduled overhaul is due.

NOTE: The listing of time since last overhaul refers to summary current status information. The certificate holder should not confuse it 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) Current Inspection Status of the Aircraft. 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, each task, and their associated intervals required by the aircraft’s maintenance program;
- b) The time in service accrued since the last accomplishment of each of the scheduled inspection packages and tasks required by the aircraft’s maintenance program;

c) The time in service remaining until the next accomplishment of each of the scheduled inspection packages and tasks required by the aircraft's maintenance program; and

d) The time in service when the next accomplishment of each of the scheduled inspection packages and tasks required by the aircraft's maintenance program is due.

5) Current Status of Applicable AD. The current status of applicable ADs 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 applies;

b) The AD number (and/or regulatory amendment number);

c) The date when a person accomplishes the required action and the time in service expressed in the appropriate parameter (e.g., hours, cycles, and calendar-time);

d) If the requirement is recurring, the date when the next action is due, and the time in service expressed in the appropriate parameter (e.g., hours, cycles, and calendar-time); and

e) With regard to an AD, the method of compliance means a concise description of the action taken to comply with the requirements of the AD. If the AD or its referenced manufacturer's Service Bulletin (SB) 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 certificate holder uses an AMOC to comply with an AD, the method of compliance means a description of the AMOC and a copy of the FAA approval.

NOTE: The certificate holder should not confuse the current status listing of an AD or method of compliance with an AD record of accomplishment, which is a description of the work and who performed it and/or issued the approval for return to service. They are two separate and distinct records.

6) Current Major Alterations of Each Airframe, Engine, Propeller, and Appliance. A "listing" means a record that contains at least the following information:

a) A listing identifying each major alteration, as well as the associated item that has been altered; and

b) A description of, or reference to, the FAA-approved technical data that the certificate holder used to make the major alteration.

NOTE: If the certificate holder conducts operations under part 135, this listing must include all current major repairs, as well as major alterations, and it must include major repairs and major alterations to each rotor.

NOTE: The listing of the current major alterations in § 121.380(a)(2)(vii) refers to summary current status information record. The certificate holder should not

confuse this with a major alteration report required by § 121.707, which should contain at least the identification of the altered airframe, aircraft engine, propeller, or appliance. The report should provide a means of positively identifying each altered item and its technical data approval basis. The certificate holder should not confuse this listing with the requirement to submit a copy of each report of a major alteration to the FAA. There are two different requirements: one for a major alteration current status listing, and one for a report for each major alteration that the certificate holder accomplishes.

7) Airworthiness Release Form. All the records necessary to show that the certificate holder has met all requirements for the issuance of an Airworthiness Release Form support the use of an Airworthiness Release Form, which is not part of the aircraft maintenance logbook. While the regulatory requirement for these records does not provide a detailed list of these records, the FAA generally accepts this requirement to mean:

- a) Detailed records of all scheduled maintenance that has not been superseded by work of equivalent scope and detail;
- b) Detailed records of the last overhaul for items that required an overhaul;
- c) Detailed records of all unscheduled maintenance that has not been superseded by work of equivalent scope and detail; and
- d) Copies of the Airworthiness Release Form covering the last 60 calendar-days of operation.

I. Other Required Records and Reports. FAA regulations require the certificate holder to make other reports and records as discussed in this subparagraph. The certificate holder can use these records and reports to review its maintenance operations to determine the adequacy of the maintenance portion of its certificate holder manual and the effectiveness of its maintenance program elements. These records are one of the sources of information for the certificate holder's CASS. The FAA also uses these reports in its continuous oversight of the certificate holder's maintenance program activities.

1) Maintenance Log. Sections 121.701 and 135.65 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. These certificate holder maintenance log entries correspond to the maintenance recording requirements of § 43.9(b). The certificate holder also must ensure that each pilot in command (PIC) ensures that all mechanical irregularities occurring during flight time are entered in the maintenance log at the end of that particular flight time, consistent with §§ 121.563 and 135.65.

2) Airworthiness Release Form or Log Entry.

- a) The certificate holder's Airworthiness Release Form or Log Entry required by § 121.709 or § 135.443 corresponds to the approval for return to service requirements of §§ 43.5, 43.7(e), 121.379(b), and 135.437(b). Furthermore, parts 121 and 135 require the certificate holder to prepare either an Airworthiness Release Form or Log Entry before it can operate its

aircraft after it performs any maintenance, preventive maintenance, or alterations, whether it operates the aircraft in air transportation or not.

b) The certificate holder's approval for return to service certification and documentation required by § 121.709 or § 135.443 is a singular requirement, but the certificate holder may execute it in one of two ways:

1. The certificate holder may complete an Airworthiness Release Form and give it to the PIC. If the certificate holder uses an Airworthiness Release Form, it must keep it separate and distinct from the aircraft log. It is not included in the maintenance recordkeeping requirements. The separate and distinct requirement corresponds to the requirements in §§ 121.380(a)(1) and 121.709(d). In modern day environments, certificate holders are most likely to use the log entry method to comply with § 121.709 or § 135.443. Other than form or format, there is no legal or technical difference between an Airworthiness Release Form and a Log Entry.

2. If the certificate holder makes a log entry, it does not have to issue an Airworthiness Release Form. To avoid confusion and to be consistent with the regulations, the certificate holder should not identify this entry in the aircraft log as an airworthiness release. The FAA understands that few certificate holders use a separate Airworthiness Release Form.

c) Consistent with §§ 121.709(d) and 135.443(d), the certificate holder may include a statement in its manual that the signature of an authorized, appropriately certificated individual in the aircraft log constitutes an approval for return to service under the certificate holder's maintenance program. The authorized signature constitutes the four certification statements in §§ 121.709(b)(2) and 135.443(b)(2) without restating each one of them. If the certificate holder has this provision stated in its manual, it is very important it maintains control for its use. The certificate holder must prepare its Airworthiness Release Form or Log Entry in accordance with procedures in its manual and must include the following four certifications consistent with statutory considerations for operations with the highest degree of safety in the public interest:

- The work was performed in accordance with the requirements of the certificate holder's manual;
- All items required to be inspected were inspected by an authorized person who determined the work was satisfactorily completed;
- No known condition exists that would make the aircraft non-airworthy; and
- So far as the work performed is concerned, the aircraft is in condition for safe operation.

d) An appropriately certificated individual who the certificate holder authorizes to make the Airworthiness Release Form or Log Entry on its behalf must sign the Airworthiness Release Form or Log Entry.

NOTE: An authorized mechanic or repairman on the certificate holder's behalf under its part 121 or part 135 certificate authorizations must sign the

Airworthiness Release Form or Log Entry. This is consistent with the requirements and authorizations of §§ 43.7(e), and 121.379(b), or §§ 135.437(b), and 121.709(b)(3), or § 135.443(b)(3).

NOTE: Consistent with regulations, no individual may issue an Airworthiness Release Form or make a maintenance log entry unless the certificate holder has authorized them.

NOTE: Because a part 145 repair station is not an individual, these same regulations preclude accomplishment of the certificate holder's Airworthiness Release Form or Log Entry by a part 145 CRS. With one exception, an authorized, certificated individual (as described in §§ 121.709 and 135.443) must execute the Airworthiness Release Form or Log Entry according to the certificate holder's procedures. The repair station may employ the authorized individual, but they are acting on the certificate holder's behalf, not on behalf of the repair station. This is consistent with §§ 119.1(c) and 121.1(b), or § 135.1(a)(2).

e) The certificate holder's maintenance manual should include detailed procedures for accomplishing the Airworthiness Release Form or Log Entry after it accomplishes any maintenance on its aircraft. The certificate holder's procedures should include controls designed to ensure that it does not operate its aircraft after it accomplishes any maintenance, preventive maintenance, or alteration unless it completes the Airworthiness Release Form or maintenance Log Entry.

f) The certificate holder's maintenance manual should include detailed procedures for qualifying and authorizing each individual that it uses to accomplish its § 121.709 or § 135.443 Airworthiness Release Form or Log Entry. These procedures should include a positive, readily available means for the certificate holder to document and transmit the authorization to the individual, including the scope and limitations of their authorization.

3) Service Difficulty Reports (SDR). Also see Volume 8, Chapter 5, Section 6. The certificate holder is required to make SDRs in accordance with §§ 121.703 and 135.415. While analysis of these reports can help the certificate holder to identify deficiencies within its maintenance program, these reports are also the FAA's primary means of gathering information for their SDRs.

4) Mechanical Interruption Summary Reports (MISR). Also see Volume 3, Chapter 32, Section 14. Sections 121.705 and 135.417 require certificate holders to make MISRs. These reports document the inability of the certificate holder's aircraft to arrive at its scheduled destination because of mechanical difficulties. This is a prime indicator of deficiencies in the effectiveness of the certificate holder's maintenance program. Moreover, root cause analysis of these events is one of the certificate holder's most useful means of oversight of the level of effectiveness of its maintenance program.

J. Requirements for Reports of Major Alterations and Major Repairs.

1) Part 121 Major Repair and Major Alteration Reports. If the certificate holder conducts operations under § 121.707 requires it to make a report of each major alteration and

major repair. The certificate holder must submit the major alteration report and make the major repair report available to the FAA for inspection. This falls under § 119.59 requirements. Certificate holders do not have to use FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance), to report a major alteration or major repair that the certificate holder or MP accomplished.

2) Part 135 Major Repair and Major Alteration Reports. If the certificate holder conducts operations under part 135, there is no requirement that requires it to submit reports of major alterations or major repairs. However, while a report is not required, the records of aircraft maintenance or alteration are required and the certificate holder must make them available to the FAA when requested.

NOTE: The certificate holder should not confuse these alteration and repair reports with the current status listing of major alterations required under part 121 or the current status listing of major repairs and alterations required under part 135.

K. Requirements for Historical or Source Records. The certificate holder does not have to keep historical or source records to prove that the required records (e.g., current status records §§ 121.380 and 135.439) that it must make, keep, and make available to the FAA are true and accurate. Inherent with the requirements and objectives of an air carrier maintenance program, the certificate holder must have a system to prepare, store, and retain its required maintenance records; it must monitor that system under its CASS to ensure that it is following its procedures and that they are effective. This ensures that the certificate holder's required records are true and accurate. The certificate holder does not need to indefinitely keep records such as the in-service history of life-limited parts (traceability back to birth) or the accomplishment of an AD. However, remember that there are severe criminal penalties for falsifying or failing to make or keep air carrier records.

L. Acceptable Records. Consistent with the FAA regulations, unless there is evidence to the contrary, an aircraft maintenance record produced by the certificate holder's maintenance recordkeeping system should be acceptable by itself, without other historical or source records. The important consideration here is that the certificate holder has a sound and properly working recordkeeping system. The certificate holder may wish to archive certain source documentation records that it used to introduce parts or components into its maintenance system. These records may include documents such as the manufacturer's invoice for new parts, export certificates of airworthiness, documentation of a major repair or alteration, or other similar information that may be useful in the future. The certificate holder may also have business reasons to maintain historical records or may do so of its own choice. The certificate holder is only legally required to make, retain, and produce for FAA review those records clearly outlined in 14 CFR.

3-3876 ELEMENT 8—CONTRACT MAINTENANCE. Also see Volume 6, Chapter 2, Section 42.

A. MPs. Sections 121.368(a)(1) and 135.426(a)(1) define an MP as any person who performs maintenance, preventive maintenance, or an alteration for a certificate holder other than a person who is trained by and employed directly by that certificate holder. This section uses the

following terms related to contract maintenance, outsource maintenance, outsource contract maintenance, outsource MP, and essential maintenance.

1) Contract Maintenance. Contract maintenance means any maintenance, preventive maintenance, or alterations accomplished by an MP or non-certificated entity on behalf of a part 121 or 135 certificate holder.

2) Essential Maintenance. Essential maintenance encompasses any on-wing RII accomplished after any maintenance or alteration. This maintenance, if completed improperly or if improper parts or materials were used, would result in a failure effect that would endanger the continued safe flight and landing of the aircraft. Essential maintenance is the accomplishment of the certificate holder's RII(s), on-wing. Essential maintenance does not encompass any off-wing maintenance.

3) Manual Requirements. Regulations require the certificate holder to list in its manual each person it arranges for the performance of any of its required inspections, other maintenance, preventive maintenance, or alterations. This requirement applies to all MPs that the certificate holder has (directly) arranged for the performance of maintenance, preventive maintenance, and alterations such as a repair station. It does not apply to persons who perform contract maintenance for the repair station under § 145.217. This policy only applies to the list required by §§ 121.369(a) and 135.427(a). It does not apply to any other regulation which contains any form of the word "arrange." The regulations also require the certificate holder to identify each of its MPs by name, location, and a general description of the work they perform. See Volume 6, Chapter 2, Section 42 for the MP reporting requirements of §§ 121.368(h) and 135.426(h).

B. Responsibility for Maintenance Performed by Others.

1) Contract Maintenance. When the certificate holder uses an MP to accomplish all or part of the maintenance activities on its aircraft or its component parts, that MP becomes part of the certificate holder's maintenance organization and under the certificate holder's control. However, §§ 121.363 and 135.413 make it clear that the certificate holder remains primarily responsible for all of the maintenance performed by that MP on its aircraft. The certificate holder must determine that the MP has the capability to do the certificate holder's work on its behalf, manage its work, and determine that it does the work satisfactorily according to the certificate holder's manual and standards. Because the MP must perform all work on the certificate holder's aircraft in accordance with the certificate holder's maintenance manual and its maintenance program, the certificate holder must also provide the MP with appropriate material from its maintenance manual for that work.

2) Air Carrier Policy and Procedures. The certificate holder must ensure that the MP follows the procedures in the certificate holder's manual that it has provided. The certificate holder should accomplish this through work-in-progress audits while the MP is actually accomplishing the work. The certificate holder's manual system should accommodate work performed for it by each MP. The policy and procedures portion of the certificate holder's maintenance manual should assign clear authority and responsibilities and outline procedures for its personnel to administer, control, and direct all contract maintenance. The certificate holder

should arrange the technical material that it provides for the use and guidance of the MP. Refer to §§ 121.369(b)(10) and 135.427(b)(10).

3) Airworthiness Agreement. When possible, the certificate holder should have a written contract with anyone performing contract maintenance for it on a continuing basis. This will help ensure that the MP addresses the certificate holder's responsibilities. In the case of major operations, such as engine, propeller, or airframe overhaul, the contract should include a specification for the work. The certificate holder should include or reference that specification in its manual system. See Volume 6, Chapter 2, Section 42.

C. Unscheduled Maintenance Performed Away from Regular Facilities. Sometimes, the certificate holder will need maintenance performed on its aircraft while it is away from its regular maintenance facilities. The certificate holder also may need maintenance services on short notice. The certificate holder's maintenance manual should include procedures for obtaining these services under these unanticipated conditions. The certificate holder should never use the term "emergency maintenance" to describe short notice unscheduled maintenance, as such terms imply to the certificate holder's employees and its MP that FAA regulations and the certificate holder's procedures do not have to be followed. "Emergency" means that a serious situation has occurred unexpectedly, involves a peril to life or property, and demands immediate action (e.g., an out-of-commission aircraft parked on an airport ramp could hardly constitute a peril to life or property). The certificate holder should outline the procedural steps that it will take to control and direct the unscheduled maintenance accomplished by its MP. Unscheduled, short-notice requirements for maintenance do not void the certificate holder's responsibility to determine that its MP has the organization, adequate facilities and equipment, competent personnel, and appropriate portions of the certificate holder's manual for the work the MP needs to complete. The certificate holder must make these determinations before any MP starts to work on its aircraft. These procedures and method of determination should be in the certificate holder's manual.

D. Airworthiness Release Form or Aircraft Log Entry. Sections 121.379(b) and 135.437(b) authorize the certificate holder to approve its aircraft, airframes, aircraft engines, propellers, or appliances for return to service after it accomplishes any maintenance, preventive maintenance, and alterations. These sections do not authorize any person other than the certificate holder to approve its aircraft for return to service. Sections 121.709(b) and 135.443(b) outline requirements for those personnel making a Log Entry or issuing a certificate holder Airworthiness Release Form under part 121 or part 135 on the certificate holder's behalf. These regulations require a certificated repairman, or certificated A&P mechanic that the certificate holder authorizes, to make the Log Entry or issue the Airworthiness Release Form for the certificate holder. These regulations clearly do not authorize a repair station certificated under part 145 or any other entity to make an Airworthiness Release Form or Log Entry on the certificate holder's behalf. The regulations set forth clear personnel qualification requirements for each individual the certificate holder so authorizes. The approval for return to service authority remains solely with the certificate holder. An individual may not issue an approval for return to service for the certificate holder's aircraft unless the certificate holder authorizes them to do so.

1) Log Entry or Airworthiness Release Form. The certificate holder must designate each individual authorized to execute the Log Entry or Airworthiness Release Form for it by name and occupational title. The individual making the Log Entry or Airworthiness Release Form acts as the certificate holder's authorized agent. He or she certifies that they accomplished the maintenance according to the certificate holder's maintenance manual and maintenance program procedures and that no known condition exists that would make the aircraft non-airworthy. This arrangement does not reduce the responsibility of maintenance personnel to accomplish maintenance functions or tasks in accordance with the certificate holder's manual.

2) Procedures for Log Entry or Airworthiness Release Form. Consistent with §§ 121.709(b)(1) and 135.443(b)(1), the certificate holder's maintenance manual must include the procedures for making an aircraft Airworthiness Release Form or Log Entry. Our regulations require the certificate holder to make a Log Entry or complete an Airworthiness Release Form before it can operate its aircraft for any reason after the certificate holder has accomplished any maintenance. The certificate holder is required to make a Log Entry or an Airworthiness Release. Other than form or format, there is no legal or technical difference between an Airworthiness Release Form and a Log Entry.

E. Evaluating New Contract MPs. Before the certificate holder can use an MP for the first time, it must determine that the MP candidate complies with pertinent requirements of part 121 subpart L or part 135 subpart J. In most cases, the certificate holder would conduct an onsite audit. The certificate holder must demonstrate, through this audit or by some other means, that the MP has an adequate organization, adequate facilities and equipment, and competent personnel, and is capable of performing the work consistent with the requirements of the certificate holder's program. The certificate holder should use a risk assessment process to determine whether or not to accomplish an onsite audit. The certificate holder's risk assessment should take into account what happens (the failure effect) when the aircraft part or aircraft system that the MP works on fails. If the failure effect is safety, the certificate holder procedures should mandate an initial onsite audit along with recurrent onsite audits, as well as the posting of an employee who is assigned audit and oversight duties as resident at the MP's facility.

NOTE: Since the failure effect of parts and systems that come under essential maintenance relates to safety, the FAA expects the certificate holder to have policies and procedures to qualify, supervise, and control these MPs, which should include onsite audits.

F. Continuing MP Oversight. Ensuring that each one of the certificate holder's MPs is in continuous compliance is a major function of the certificate holder's CASS. The certificate holder should use its risk-based process for establishing a schedule for auditing and inspecting each of its MPs. Inherent with a risk-based process, the certificate holder may determine that some of its MPs do not require an onsite audit. Consistent with the "performance" wording of § 121.373 or § 135.431, the audits that the certificate holder accomplishes should be primarily work-in-progress audits that serve to determine that the certificate holder's MPs are following the certificate holder's manual. The audits should be accomplished by trained auditors, and the results analyzed by trained analysts. The results of the analysis should permit the certificate holder to determine each MP's continuing compliance with part 121 subpart L or part 135

subpart J, as appropriate, and the certificate holder's maintenance program. Refer to §§ 121.368(f) and 135.426(f).

G. Using a CRS as One of the Certificate Holder's MPs.

1) Repair Stations. If the certificate holder decides to exercise its authority under § 121.379 or § 135.437 to make arrangements with other persons to accomplish contract maintenance for it as provided in its manual, the certificate holder may choose to make these arrangements with an FAA-CRS, but these rules do not require the certificate holder to do so. The scope of the certificate holder's authorization to make arrangements for maintenance is very broad; it can make arrangements for maintenance with any "person" as that term is defined in § 1.1, as long as that person accomplishes the certificate holder's maintenance in accordance with its CAMP. Although the § 1.1 term "person" includes a CRS, it also includes anyone who does not hold an FAA certification.

2) Regulatory Requirements. The requirements that the certificate holder uses to qualify an MP that holds a current part 145 repair station certificate and an MP who does not hold a current part 145 repair station certificate should be exactly the same. Consistent with § 119.1(c), § 121.1(b), or § 135.1(a)(2), each person, whether certificated or not, that is employed or used by the certificate holder for any maintenance, preventative maintenance, or alteration of the certificate holder's aircraft is required to comply with the part 121 requirements and the certificate holder's maintenance program requirements, not part 65 or 145 requirements.

3) Approval for Return to Service. The certificate holder's § 121.379(b) or § 135.437(b) authorization to approve its aircraft for return to service after maintenance extends to the work accomplished under its § 121.379(a) or § 135.437(a) authorization to make arrangements with other persons for maintenance.

3-3877 ELEMENT 9—PERSONNEL TRAINING. Also see Volume 3, Chapter 24, Sections 1 and 2.

A. Maintenance Program Training Requirements. Certain sections of part 121 subpart L and part 135 subpart J contain specific certificate holder maintenance training requirements. Sections 121.375 and 135.433 require the certificate holder to have a training program that ensures it informs each person (including inspection personnel) who determines the adequacy of work completed for the certificate holder about procedures, techniques, and new equipment in use, and that each person is competent to perform his or her duties. There is an additional implied training requirement in part 121 subpart L and part 135 subpart J based on the certificate holder's responsibility to provide competent personnel for the proper performance of its maintenance program. A training program is the logical means for ensuring maintenance personnel are competent. FAA regulations allow the certificate holder to develop a training program that fits its particular needs.

B. Types of Training. Some of the possible types of training in the certificate holder's training program are initial training, recurrent training, specialized training, competency-based training, and MP training. The certificate holder should select the appropriate training for its personnel, including its MP personnel, which the certificate holder should base on an assessment

of training needs. This assessment is a reflection of the required knowledge, skills, and ability to accomplish a given task or function properly and the current capability of those whom the certificate holder would assign a particular task or function.

C. Initial Training. The certificate holder should provide initial training right after it hires an employee, when its existing employees begin to work on new equipment, or when the certificate holder gives the employee a new assignment. The certificate holder's initial training program may include subjects such as:

- Employee indoctrination or orientation,
- Maintenance department policies and procedures,
- Maintenance recordkeeping and documentation,
- Aircraft systems or ground equipment,
- Specific skills (e.g., avionics, composite repair, aircraft run-up and taxi),
- Skills upgrade,
- Human factors (HF),
- Task-specific training,
- Hazardous materials (hazmats) or Environmental Protection Agency (EPA) regulations, and
- Occupational Safety and Health Administration (OSHA) regulations familiarization.

NOTE: The certificate holder's initial training should also include a competence-based assessment of employees. This evaluates an employee's previous training and experience and helps identify his or her specific individual training needs. The objective is to provide training that addresses the gap between required competence and the competence an individual already has.

D. Recurrent Training. Recurrent training is education occurring on a repetitive basis. The certificate holder must provide maintenance personnel with the information and skills necessary to maintain its standard of competence. This training also accommodates the introduction of new aircraft; aircraft modifications; new or different ground equipment; new procedures, techniques, and methods; or other new information. The certificate holder's recurrent training, although occurring on a repetitive basis, may not adhere to a defined schedule. The certificate holder should not provide repetitive information in recurrent training unless it is required to maintain personnel at a desired degree of competence. The certificate holder's recurrent training may include:

- Continuing competency training designed to maintain regulatory and certificate currency requirements.
- Refresher training on a seldom-accomplished task or seldom-used skill.
- Update training for particular tasks or skills. Update training can include training bulletins, bulletin-board items, self-study tasks, and computer-based instruction (CBI).
- Any other continuing education or training that it may not provide on a defined schedule.

E. Specialized Training. The certificate holder's specialized training should focus on competence in specific tasks or areas of responsibility, such as RII, borescope, nondestructive testing, or flight control rigging. The certificate holder might provide this training with initial or recurrent training. The certificate holder does not need to limit it to maintenance subjects, but instead may include management skills training for new supervisors, computer skills, or other training necessary because of a change in an individual's duties and responsibilities.

F. MP Training. The certificate holder's training program must provide appropriate information to each employee of an MP about its specific program. The training should include function-specific training appropriate to each person's job assignment or area of responsibility. The certificate holder does not need to provide training to MP personnel in areas that do not concern them. For example, training on aircraft log procedures and MEL procedures would not be required for aircraft interior cleaners, but would be required for maintenance personnel assigned to on call maintenance for the certificate holder.

NOTE: If the certificate holder's MP has specific types of training for its personnel, the certificate holder does not need to duplicate that training for those individuals. However, the certificate holder must ensure that its MP has actually provided the training and that the training meets the certificate holder's own needs and training standards. This could be a CASS work-in-progress audit.

G. Competency-Based Training. Although certificate holders historically have provided a specified number of maintenance training hours to ensure that employees have the competencies needed for their jobs, studies have shown that it may be better for the certificate holder to train to a competency-based standard. The certificate holder does not have to perform this type of training on a defined schedule or for a specific number of hours. Rather, the certificate holder should test each individual to evaluate what training he or she needs, and then use these evaluations to identify those personnel who retain a high level of subject competence and who may not require a particular block of instruction. Conversely, the certificate holder should also identify those individuals who require more training. Training to a competence level permits the certificate holder to tailor training programs to the specific requirements of the certificate holder's individual maintenance personnel and MPs.

1) When to Require Competency-Based Training. The certificate holder could use competency-based training to raise an employee's level of competence to that level required by the individual's duties and responsibilities. The certificate holder should have procedures to determine when an individual requires competency-based training. The certificate holder may determine the need for this type of training through pre- or post-employment testing, or through the analysis and corrective action functions of its CASS. If the certificate holder uses competency-based training, it should specifically address the lack of competence. In some instances, competency-based training may consist of an appropriately knowledgeable person simply reviewing procedures with an employee through on-the-job training (OJT). The certificate holder should design competency-based training to fix an immediate knowledge or skill deficiency and the training may focus on one individual or a small group. The certificate holder may include competency-based training in its initial or recurrent training requirements.

2) Competency Deficiencies. For those circumstances where the certificate holder identifies a competency deficiency through investigation of an event, the certificate holder's competency-based training should show an individual what happened, why it happened, and demonstrate, in a positive manner, how to prevent it from happening again.

3) Competency Improvement Training. The certificate holder should orient its competency improvement training toward correcting personnel competence deficiencies that the certificate holder has identified through its CASS.

3-3878 ELEMENT 10—CASS. Also see Volume 3, Chapter 44, Section 1 and Volume 3, Chapter 49, Section 1.

A. Background of the CASS. Introduction of the CASS requirement resulted from an FAA industry study of a series of maintenance-related certificate holder accidents occurring during the 1950s. The study found that, in many cases, the primary causal factor of an accident was a fundamental weakness or weaknesses in the certificate holder maintenance program. The study found that, in some cases, maintenance personnel did not follow the manual and failed to accomplish required maintenance tasks or failed to accomplish the tasks correctly. In other cases, the study found that the maintenance program, even when followed as planned and documented, was not effective in preventing the situation that led to the accident. It did not produce the desired results.

1) Regulations. Responding to this finding, the FAA introduced regulations (§§ 121.373 and 135.431) that require the certificate holder to establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its maintenance program.

2) Correcting Deficiencies. These regulations further require that the certificate holder include a process in its CASS to correct any deficiency identified in its maintenance program, regardless of whether the certificate holder did the work or had an MP do the work.

B. CASS is a Safety Management Tool. A CASS is the certificate holder's system for managing safety as it relates to maintenance functions. As a tool to manage safety, it is part of the overall structure of policies and procedures that the certificate holder uses to ensure its operations are to the highest possible degree of safety. It is a structured, methodical process that helps the certificate holder reach its maintenance program objectives. CASS is the only management system mandated by regulation. If the certificate holder uses it properly, its CASS becomes an inherent way of doing business for it and helps the certificate holder to promote a culture of safety in its company by providing a formal process for its employees to identify and correct safety deficiencies. The objectives of measuring and continuously improving the performance (program execution) and effectiveness (program results) of a major function (maintenance) apply equally to all safety-related maintenance program functions that the certificate holder must manage.

C. Basic CASS Processes.

1) CASS Processes. The certificate holder's CASS is a risk-based, closed-loop system that has four basic processes:

a) **Surveillance.** An information gathering/audit process the certificate holder uses to collect data to measure the certificate holder's program execution and results.

b) **Analysis.** An analysis process the certificate holder uses to identify any maintenance program deficiencies and any necessary corrective actions.

c) **Corrective Action.** A planning process the certificate holder uses to ensure that it implements its corrective actions.

d) **Follow-up.** A performance measurement process that the certificate holder uses to verify that its corrective actions are effective. This is also an information-gathering and analysis process, thereby closing the loop.

2) Using an Audit Program. During the first step (surveillance) the certificate holder will gather and obtain data using an audit program to support measurement of performance (program execution). The certificate holder should have a well-structured audit program based on risk assessment and accomplished by individuals trained and skilled specifically at auditing. Consistent with the wording of the regulation, the certificate holder's primary type of audit should be work-in-progress audits that evaluate if the worker is following the manual. The certificate holder's auditors would also look at areas such as manuals and other maintenance technical data, aircraft condition, actual in-process maintenance practices, training, publications, and ground operations. In addition, information-gathering to obtain data that will support the measurement of effectiveness (program results) is generally a collection of flight operational data such as accidents/incidents, mechanical delays and cancellations, in-flight engine shutdowns, unscheduled landings, engine performance, pilot logbook write-ups, and unconfirmed components or parts removals.

3) Data Analysis. In the second step, the certificate holder will analyze the data to identify indications of maintenance program weaknesses. Individuals experienced and/or trained as analysts should accomplish the certificate holder's data analysis. One of the certificate holder's key objectives here is not only to identify a weakness, but also to determine its root cause. This is where the certificate holder's knowledge of human factors becomes critical.

4) Developing Corrective Action. Based on the results of the certificate holder's analysis, the third step is for the certificate holder to develop a corrective action, if necessary, taking human factors into account so that its corrective action is likely to be successful. Once the certificate holder determines what the corrective action is, it will develop and implement a corrective action plan.

5) Conduct a Follow-up Measurement Process. To close the loop, the fourth step of the certificate holder's CASS will have the certificate holder conduct a follow-up measurement process using surveillance and analysis to verify that its corrective action has effectively corrected the deficiency that it identified. The certificate holder can design this follow-up data-gathering process specifically for the issue of interest, or it can make it a part of its continuing surveillance that is the first step of its CASS. Determining if the certificate holder needs a special information-gathering procedure is part of its analysis that it accomplished in step three.

6) Aspects of Surveillance. Both the initial and follow-up surveillance can and should have proactive and reactive aspects to them. In the case of audits by auditing systems and procedures, as well as specific transactions, the analysis of audit results can identify weaknesses in a process. Correcting these weaknesses before a problem results is a proactive approach. An audit also may uncover a missed or improper maintenance action. Investigating this finding and correcting the immediate problem is a reactive process. Developing and implementing a corrective action to prevent a similar future event is equally important for improving the maintenance program, and the regulations require it. Similarly, the certificate holder's analysis of operational performance data from a systems point of view can result in identification of a system's weakness before a specific unwanted event (such as a cancellation) occurs, which is a proactive process. Investigating and correcting an undesirable operational event related to the maintenance program after it has occurred, though reactive, also is a necessary and desirable procedure.

D. Risk-Based Decisions. All effective CASSs take into account the need to manage risk to an acceptable level, as well as the practical limitations that the certificate holder must face when addressing deficiencies. Consequently, the certificate holder must set priorities and make choices for planning audits and other information-gathering activities, analyzing data, and selecting and implementing corrective actions. The certificate holder should tie setting such priorities directly to a risk assessment process, so that the resulting maintenance program achieves its objectives.

E. Scope of CASS. CASS monitors all 10 elements of the certificate holder's maintenance program:

- Airworthiness responsibility,
- Certificate holder maintenance manual,
- Certificate holder maintenance organization,
- Accomplishment and approval of maintenance and alterations,
- Maintenance schedule,
- RIIs,
- Maintenance recordkeeping system,
- Contract maintenance,
- Personnel training, and
- CASS.

F. CASS Design Principles.

1) Attributes of System Safety.

- Clear authority,
- Clear responsibility,
- Specific written procedures,
- Effective controls,
- Performance measures, and
- Well-defined interfaces.

2) CASS Design. These six system safety attributes should be the starting point for the design of the certificate holder's CASS. It should be clear who in the certificate holder's organization is responsible for and has authority over the CASS. The certificate holder should not divide responsibility/authority into two or more parts due to the likely possibility that activity such as auditing and operations data analysis are poorly coordinated. Typically, in addition to an individual with overall CASS responsibility, the certificate holder should have a management board or committee to ensure good communications and coordination of all CASS functions and to maintain regular senior level management involvement. This oversight group also can provide a form of control over critical aspects of the certificate holder's CASS operation and measure the performance and effectiveness of the CASS itself.

3) CASS Interfaces. In addition to the many elements within the certificate holder's maintenance organization, there are many interfaces between the CASS and functions or organizational elements of a typical certificate holder that are outside maintenance. Some of the more obvious examples are engineering, flight operations, purchasing, safety, and the FAA. It is also important that the certificate holder defines and coordinates its CASS relationships to its other programs (if they exist) well, such as internal evaluation programs, flight operations quality assurance (FOQA) programs, voluntary disclosures, and Aviation Safety Action Programs (ASAP).

G. CASS Personnel Requirements.

1) Effective CASS Skills. An effective CASS requires certain skills that the certificate holder may not have readily available within its maintenance organization. For example, auditing skills are not automatically inherent in those skilled in accomplishing maintenance. Analysis skills, particularly those related to root cause determination, risk analysis, and human factors, are specialized skills and generally require specific training and experience.

2) Sharing Personnel. All operators, but particularly smaller ones, can share required CASS personnel. The certificate holder may choose to have its personnel perform CASS functions as a collateral duty, and it may choose to hire someone outside its organization to accomplish some or all of its CASS functions. However, it is essential that the certificate holder recognize the need for knowledge and skills in its CASS that do not necessarily coincide with those knowledge and skills resulting from many years of maintenance experience repairing aircraft.

H. Related Guidance Material. For more information, consult current editions:

1) ACs:

- AC 120-16, Air Carrier Maintenance Programs;
- AC 120-42, Extended Operations (ETOPS and Polar Operations);
- AC 120-73, Damage Tolerance Assessment of Repairs to Pressurized Fuselages;
- AC 120-79, Developing and Implementing an Air Carrier Continuing Analysis and Surveillance System;

- AC 120-84, Aging Aircraft Inspections and Records Reviews;
- AC 120-97, Incorporation of Fuel Tank System Instructions for Continued Airworthiness into Operator Maintenance or Inspection Programs (Including Change 1);
- AC 120-98, Operator Information for Incorporating Fuel Tank Flammability Reduction Requirements into a Maintenance or Inspection Program (Including Change 1); and
- AC 120-102, Incorporation of Electrical Wiring Interconnection Systems Instructions for Continued Airworthiness into an Operator's Maintenance Program (Including Change 1).

2) FAA Order 8900.1:

- Volume 3, General Technical Administration;
- Volume 6, Surveillance; and
- Volume 10, Safety Assurance System Policy and Procedures.

3-3879 ISSUE OPSPECS. The FAA authorizes the use of a CAMP through the issuance of OpSpec D072, Aircraft Maintenance – Continuous Airworthiness Maintenance Program (CAMP) Authorization. Table 1 must contain the following information:

A. Authorized Aircraft. Each of the aircraft authorized to be maintained in accordance with the CAMP by make, model, and series (M/M/S).

B. CAMP Documents. The document(s) that encompass all 10 elements of the CAMP by assigned name and document number (if available). The certificate holder may have multiple manuals that encompass the CAMP. The PI may elect to list all the manuals encompassing the CAMP or if one manual references all the other manuals, then preferably he or she may list only that particular manual.

RESERVED. Paragraph 3-3880 through 3-3881.