



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

**AC 145-10**

**Date: 7/8/05**

# **ADVISORY CIRCULAR**



## **REPAIR STATION TRAINING PROGRAM**

Flight Standards Service  
Washington, D.C.

---

**Initiated By: AFS-300**

## PREFACE

This advisory circular (AC) provides information on developing the repair station employee training program required under Title 14 of the Code of Federal Regulations (14 CFR) part 145, section 145.163, categories of training, training program components, and sample training programs. This AC also provides an acceptable means, but not the only means, of showing compliance with 14 CFR section 145.163. Neither of the sample programs described in Appendixes 1 and 2 of this AC need to be used; they only represent a possible way to structure a training program that meets the requirements of the regulations. Each person subject to part 145 should develop his/her own program tailored to his/her individual operations. Because this AC contains only guidance on developing a training program, the word “should” used herein applies only to an entity that chooses to follow a particular suggestion without deviation. The FAA uses the word “capability” to describe the knowledge and skills required to properly accomplish assigned tasks. The word “competency” is used by EASA and many repair stations located outside the United States. These terms should be considered synonymous for the purposes of the training program and as used in this AC. This AC contains additional governmental, mandatory and non-mandatory subjects not specifically required by section 145.163. The FAA is aware that the additional training outlined in this AC exceeds that required by section 145.163, but feel is necessary to provide these subject samples as a guide for a complete and comprehensive safety directed program. If the repair station chooses to develop a training program with the additional non-regulatory subjects, only those required by regulation would be subject to FAA approval. One means of developing this type of program could include a separation of the regulatory and non-regulatory training subjects within the training manual.

/s/

James J. Ballough  
Director, Flight Standards Service

## CONTENTS

<b>CHAPTER 1. INTRODUCTION.....</b>	<b>1</b>
100. Purpose.....	1
<b>CHAPTER 2. BACKGROUND ON REPAIR STATION TRAINING.....</b>	<b>3</b>
200. General.....	3
201. Regulatory Requirements.....	4
202. Compliance Schedule.....	4
203. Manual Requirements.....	4
204. Program Scope and Complexity.....	5
<b>CHAPTER 3. CATEGORIES OF TRAINING AND COURSES OF STUDY.....</b>	<b>9</b>
300. General.....	9
301. Indoctrination (Initial and Recurrent Training.....	9
302. Technical Training.....	11
303. Recurrent Training.....	12
304. Specialized Training.....	13
305. Remedial Training.....	13
<b>CHAPTER 4. TRAINING PROGRAM BASIC COMPONENTS.....</b>	<b>15</b>
400. General.....	15
401. Needs Assessments.....	15
402. Area of Study and Course Definition.....	19
403. Identifying the Training Method.....	20
404. Training Sources.....	21
405. Qualifying Instructors.....	22
406. Measuring Training Effectiveness.....	22
407. Training Documentation.....	23
408. Interfaces with the Training Program.....	24
409. Special Considerations for Repair Stations Located Outside the United States.....	25
<b>CHAPTER 5. ADMINISTRATIVE INFORMATION.....</b>	<b>27</b>
500. How to Obtain Copies of Publications Referred to this AC.....	27
501. Requests for Information.....	27
<b>APPENDIX 1. SAMPLE TRAINING PROGRAM FOR LARGE/MEDIUM REPAIR STATION (9 pages).....</b>	<b>1</b>
<b>APPENDIX 2. SAMPLE TRAINING PROGRAM FOR SMALL REPAIR STATION (UNDER 10 EMPLOYEES) THAT PERFORMS WORK SOLELY FOR PART 91 OWNER/OPERATORS (5 pages).....</b>	<b>1</b>
<b>APPENDIX 3. RELATED CORRESPONDENCE (1 page).....</b>	<b>1</b>



## CHAPTER 1. INTRODUCTION

### 100. PURPOSE.

a. This AC provides information on developing the repair station employee training program required under Title 14 of the Code of Federal Regulations (14 CFR) part 145, section 145.163, categories of training, training program components, and sample training programs.

b. This AC provides an acceptable means, but not the only means, of showing compliance with part 145, section 145.163. Neither of the sample programs described in Appendixes 1 and 2 of this AC need to be used; they represent only a possible way to structure a training program that meets the requirements of the regulations. Each person subject to part 145 should develop his or her own program tailored to individual operations. Because this AC contains only guidance on developing a training program, the word “should” used herein applies only to an entity that chooses to follow a particular suggestion without deviation.

c. The FAA uses the word “capability” to describe the knowledge and skills required to properly accomplish assigned tasks. The word “competency” is used by the European Aviation Safety Agency (EASA) and many repair stations located outside the United States. These terms should be considered synonymous for the purposes of the training program and as used in this AC.

d. Entities wishing to become certificated under part 145, and those part 145 repair stations certificated prior to April 6, 2006, whether located within or outside the United States, should use this AC to develop the training program required by part 145.



## CHAPTER 2. BACKGROUND ON REPAIR STATION TRAINING

### 200. GENERAL.

a. Beginning April 6, 2006, persons applying for a repair station certificate under 14 CFR part 145 must submit a training program for FAA approval. Additionally, repair stations that were certificated prior to April 6, 2006, must submit a training program for approval by the last day of the month in which their 14 CFR part 145 certificate was originally issued. The program must ensure that individuals performing maintenance (including inspections), preventive maintenance, inspections, and alterations under the repair station certificate are capable of performing assigned tasks.

b. Though prior to the August 2001 rule change (No. 145-27, Repair Stations; Final Rule with Request for Comments and Direct Final Rule with Request for Comments (66 FR 41087, August 6, 2001)), part 145 did not include a specific requirement for a training program, the repair station needed to ensure persons were competent to perform assigned tasks. Only those repair stations performing maintenance or preventive maintenance functions for a 14 CFR part 121 or 135 certificate holder were required to have a training program to ensure each person who determines the adequacy of the work performed is fully informed about the procedures, techniques, and new equipment in use and is able to perform all associated duties.

c. Mechanics may acquire their initial skill through formal training, such as 14 CFR part 147 Aviation Maintenance Technician Schools (AMTS) or hands-on experience working under FAA-certificated airframe and powerplant (A&P) mechanics or in the military. Once an individual obtains a certificate, acquired experience can vary substantially, as well as the type or level of training. Therefore, repair stations need proper initial and recurrent training to ensure persons are capable of performing assigned tasks, even when the majority of the workforce may be certificated under 14 CFR part 65.

d. There are numerous categories of personnel employed by part 145 repair stations, with a variety of specialties. Hiring practices vary widely among repair stations with some employees having direct relevant experience, certification, and training, while others do not. There are maintenance personnel who work for temporary placement organizations, which permit repair stations to meet peak workload demands. Therefore, all employees that are assigned tasks to perform maintenance (including inspection), preventive maintenance, or alteration must be included in the training program to ensure they are capable of performing the specific assigned tasks of the particular repair station.

e. Section 145.163, promulgated in August 2001 under amendment No. 145-27, requires each repair station to establish a training program for employees who perform maintenance (including inspection), preventive maintenance, or alteration under the authority of the repair station's certificate. This training program will enhance aviation safety by ensuring each maintenance employee is fully capable of performing assigned tasks. The FAA understands that repair stations vary in size; therefore, it expects each repair station to have a training program appropriate to its organization and the work it performs.

f. The FAA notes that some part 145 repair stations have European Aviation Safety Agency (EASA) certifications. EASA part 145 contains licensing and training requirements for Approved Maintenance Organizations (AMO) that perform maintenance on articles of those operators under the regulatory control of European Union (EU) Member States. These EASA part 145 requirements can affect FAA part 145-approved repair stations that also have EASA approvals; since EASA requires maintenance human factors training as part of the Bilateral Aviation Safety Agreement (BASA) and Maintenance Implementation Procedures (MIP) with the United States. The FAA training program may include the requirements of other civil aviation authorities as long as the part 145 requirements are also met.

**201. REGULATORY REQUIREMENTS.** Beginning April 6, 2006, part 145 requires an applicant for certification and current FAA-certificated repair stations to submit a training program to the FAA for approval. The employee training program approved by the FAA must include initial and recurrent training requirements. The training program must ensure each employee assigned to a maintenance (including inspection), preventive maintenance, and alteration task is capable of performing the work. Upon training program approval by the FAA, the repair station will begin following its approved procedures. If a repair station accomplishes work for a part 121, 125, 129, or a part 135 operator, its program must ensure any employee assigned to tasks for these referenced operators are trained in accordance with that operator’s requirements.

**202. COMPLIANCE SCHEDULE.** The training program requirements are effective on April 6, 2006. The FAA developed a staggered compliance schedule for existing repair stations. An existing repair station may submit its training program to the FAA earlier than required.

**TABLE 1. TRAINING PROGRAM SUBMITTAL DATES**

<b>If you are—</b>	<b>Then you must submit your training program to the FAA—</b>
A repair station certificated before April 6, 2006 Examples: Your certificate was issued May 12, 1995, Your certificate was issued January 12, 2002	by the last day of the month in which your original certificate was issued Examples: by May 31, 2006, by January 31, 2007.
An applicant applying for a repair station certificate on or after April 6, 2006	with your application for a repair station certificate.

**203. MANUAL REQUIREMENTS.** The training program may be documented in the Repair Station Manual (RSM) or it may be in a separate manual. If the training program becomes part of the RSM, these procedures should distinguish between handling revisions to the approved training manual section from handling those revisions associated with the non-approved repair station manual. The procedures should also include how submitting revisions to the CHDO will be handled for the different types of manuals. If the training program is contained in a separate manual, that document may include the revision and notification provisions required by section 145.209(e).



## 204. PROGRAM SCOPE AND COMPLEXITY.

a. The purpose of the repair station's initial and recurrent training program is to ensure repair station employees performing maintenance (including inspection); preventive maintenance and alteration are capable of performing assigned tasks as required by section 145.163.

b. Each repair station's training program must be based on its individual operation and needs. When developing its training program, each repair station should consider its size, ratings, maintenance tasks associated with positions, and its employees' experience and skill levels.

c. Each individual employed by a repair station should have training based on the tasks associated with the person's job position. Therefore, each repair station should develop procedures for determining the training each employee requires. Also, not all repair station employees require the same level of training. To facilitate the development of the training requirements and courses of study, each repair station may wish to separate its staff into categories. Those persons that perform maintenance (including inspection), preventive maintenance or alteration tasks must be trained under the provisions of the approved training program required by part 145. Other employees may be trained under the part 145 training program, but their training should not be considered mandatory under the regulations. The following table shows two examples of types of categories a repair station might use:

**TABLE 3. EXAMPLE REPAIR STATION CATEGORIES**

Type of Repair Station	Example of Staffing Categories
Small to medium	<p>(1) Technicians and inspectors that perform maintenance, preventive maintenance, and alteration duties (including inspection).</p> <p>(2) Supervisors that perform maintenance, preventive maintenance, and alteration duties (including inspection).</p> <p>(3) Managers and support staff that perform maintenance, preventive maintenance, and alteration duties (including inspection).</p>
Larger	<p>(1) Technical personnel conducting maintenance, preventive maintenance, and alteration duties (including inspection) with authority for approval for return to service.</p> <p>(2) Technical personnel conducting maintenance, preventive maintenance, and alteration duties (including inspection) without authority for approval for return to service.</p> <p>(3) Inspection personnel.</p> <p>(4) Supervisor personnel that perform maintenance, preventive maintenance, or alteration functions and duties.</p>

d. Each repair station's training program should address:

(1) Indoctrination (initial and recurrent) training for new and existing employees covering the regulations and the repair station's operations, policies, and procedures (see paragraph 301);

(2) Initial technical requirements for new and existing employees taking on new tasks to ensure appropriate technical skills training is provided (see paragraph 302);

(3) Recurrent technical training for specific tasks or functions to ensure currency in existing or added capabilities (see paragraph 303);

(4) Specialized technical training or advanced training requirements for specific tasks or functions to ensure all employees accomplishing maintenance remain capable of performing assigned tasks (see paragraph 304); and

(5) Remedial technical training requirements to correct demonstrated lack of skill or knowledge deficiencies (see paragraph 305).

e. Each repair station's training program will vary in the number of courses, content, time requirements, training methods, and sources. One repair station may have separate indoctrination courses for technicians, inspectors, managers, and supervisors. Another repair station may have only one indoctrination course appropriate for all of its employees, including temporary personnel.

f. Consistent with its evolving systems safety certification and surveillance process, the FAA may ask the following questions to establish whether the training program meets the requirement for ensuring each employee performing maintenance, preventive maintenance, and/or alteration tasks is being trained or is capable of performing the assignment:

(1) Is there clear responsibility and authority? Did the repair station clearly identify the job title responsible for the different aspects of the training program? Did the repair station identify the job title with the authority to propose changes to the approved training manual?

(2) Are there written procedures? Are the repair station's training program policies and procedures written in its training manual or program document?

(3) Is there a measurement of effectiveness? Is there a method of determining whether the employee is capable of performing assigned tasks?

(4) Are there controls in place? Does the repair station have adequate procedural controls to ensure that all applicable elements of the training program are carried out in specific situations?

(5) Does the repair station identify and describe the interface between the training program and the individuals responsible for task assignments?

- (6) Are there written procedures that require the repair station to maintain personnel training records for two years?
- (7) Is the manual identified with applicable contact information such as company name, address, certificate number, telephone, fax, e-mail, etc.?
- (8) Does the control system include a distribution list identifying a particular manual to a person or location?
- (9) Does the manual contain an adequate revision system to allow an easy determination of currency?
- (10) Is there a procedure for submitting revisions to the CHDO for approval?
- (11) Does the training program have provisions for initial and recurrent training?
- (12) Are individual training requirements identified and documented?



### CHAPTER 3. CATEGORIES OF TRAINING AND COURSES OF STUDY

**300. GENERAL.** As previously mentioned, a repair station may divide its initial and recurrent training into the following areas of study for each category of employee:

- a. Initial, including:
  - Indoctrination
  - Technical training
  - Specialized technical training
- b. Recurrent.
- c. Remedial, based on demonstrated need.

#### **301. INDOCTRINATION (INITIAL AND RECURRENT) TRAINING.**

a. This is core training for all repair station personnel. The scope and depth of indoctrination training may vary based on the individual's assigned position. The repair station should determine the level of indoctrination training required for each job assignment, through its training needs assessment process described in paragraph 401.

b. The following subjects should be addressed in the training program, regardless of the repair station's size or ratings:

(1) CFR requirements, particularly those associated with the repair station maintenance functions and authority as reflected on the certificate and operations specifications.

(2) Company manuals, policies, procedures, and practices, including quality control processes, particularly those associated with ensuring compliance with maintenance (including inspection), preventive maintenance, and alteration procedures established to show compliance with 14 CFR part 145.

(3) Department of Transportation Hazardous Material requirements, general Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA), and other local, state, and federal laws requiring training for different categories of employees.

**NOTE: Do not confuse employee HAZMAT familiarization and training with the Regulatory requirement of DOT 49 CFR section 171.8 "hazmat employee/hazmat employer" training standards, which requires mandatory HAZMAT training for those personnel engaged in the shipping of hazardous materials.**

(4) Maintenance human factors.

**NOTE: Training in maintenance human factors is an essential part of an FAA-approved training program. The repair station's submitted training program and any revision thereto must include human factors elements. The human factors training procedures defined in the training program should be related to aviation maintenance, safety-related issues, existing legislation, where relevant, and/or some of the suggested elements below.**

c. The FAA concurs with European Authorities in that human factors training related to maintenance practices would provide an additional margin of safety to the repair industry. A human factors training program should be related to maintenance practices where possible. The following are suggested human factors elements for inclusion into a repair station training program:

- General/introduction to human factors
- Statistics
- Safety culture/organizational factors
- Human error
- Types of errors in maintenance task
- Human reliability
- Human performance and limitation
- Vision
- Hearing
- Stress
- Situational awareness
- Workload management

(5) Computer systems and software, as applicable to the repair station's maintenance (including inspection), preventive maintenance and alteration systems and procedures.

(6) Facility security.

**NOTE: Some of the subjects listed above do not fall under the direct purview of the FAA or the Flight Standards Service; however, the FAA recognizes that companies desire to have one training program for all employees. Repair stations are encouraged to distinguish between training required to comply with part 145 and other training that will be provided to employees in its training manual or program procedures.**

**302. TECHNICAL TRAINING.**

**a.** The repair station's technical training areas of study may be separate and distinct from indoctrination training and may apply to different categories of employees within a given job position. Technical training requirements should focus on providing employees with the appropriate skill or task training required to properly perform job position assignments.

**b.** The repair station should have procedures to determine the applicable scope and depth of initial and/or recurrent training based on each job assignment and each employee's experience and capability established by the needs assessment (see paragraph 401). The needs assessment is the basis for determining an individual's initial and recurrent training requirements.

**c.** When developing the initial or recurrent training courses, the repair station may want to take into account that individuals will not have the same training, experience, and skill level. For example, when developing its initial course of study for technicians, a repair station may want to have separate programs for:

- (1) Individuals that hold an A&P certificate.
- (2) Individuals with experience performing similar tasks at another repair station.
- (3) Individuals with applicable military aviation maintenance experience.
- (4) Individuals with no skills, experience, or knowledge.

**d.** A repair station may have more than one training course for its employees. For example, initial training for new repair station technicians with limited repair station experience may include the following in-depth courses:

- (1) Maintenance human factors.
- (2) Tools.
- (3) Test equipment, including ground support equipment.
- (4) Materials and parts.
- (5) Records and recordkeeping.
- (6) Specific Hazardous Material, OSHA, and EPA requirements.
- (7) Shop safety.
- (8) Specific-job or task training.

e. In contrast, initial training for new technicians with prior repair station experience may include a general review of the same subjects as necessary and detailed technical training only for specific job or task assignments. In all events, an individual's specific training requirements should be established based on a needs assessment.

f. Additionally, whenever new information is introduced on the topics, the initial training requirements for new employees should be updated and existing employees should be provided abbreviated initial training on the new information. Alternatively, the additional information may be imparted to existing employees through the recurrent training requirements.

g. The time devoted to initial or recurrent training can vary depending on the level of experience of the individual and skills and knowledge associated with the assigned job or tasks. However, the repair station should establish a basic minimum standard for all employees in a specific job position, whether through training given by the repair station or knowledge acquired through other sources. For example, the repair station could establish minimum time requirements for training or alternatively could assess the need for training based upon skills and knowledge testing. In either event, the repair station training program must ensure that the employee is capable of properly performing assigned tasks.

### **303. RECURRENT TRAINING.**

a. Recurrent maintenance training commonly includes training known as refresher training, to ensure that a repair station employee remains capable of properly performing the assigned job. The repair station's program should define the terms initial and recurrent and identify the areas of study and/or courses/lessons that will be provided under the two definitions. The definitions should be associated with either the person receiving the training, the training course, or the information being offered. The repair station should have procedures to determine the recurrent training requirements for each job assignment or employee. Not all job assignments will have the same recurrent training requirements. The repair station may also wish to provide a procedure for determining when training is not required to ensure an employee is capable of performing assigned tasks.

b. The repair station should have procedures to determine the type and frequency of recurrent training for each of its employees through the needs assessment. The repair station may define recurrent training that will be provided on a regular basis to address any subject provided in initial training. Alternatively, the repair station may provide new information on initial training requirements to existing employees under the recurrent training system. Its program procedures should set forth the two different types of recurrent training:

- (1) That which updates the initial training requirements on a one-time basis.
- (2) That conducted on a regular basis (refresher training).



c. Each repair station's recurrent training program should differ since it should be based on the repair station's needs assessment, which will take into account its size, employees, customers, and complexity of ratings and operations.

**304. SPECIALIZED TRAINING.** The repair station should have procedures to identify job assignments that will require special skills or have complexity that would require the development of specialized training to ensure capabilities. Some areas that may require specialized training include flame and/or plasma spray operations, special inspection or test techniques, special machining operations, complex welding operations, aircraft inspection techniques, or complex assembly operations. Individuals who attend specialized training and develop competency in a particular job assignment or task should be able to convey the information to other employees. The repair station's training program should address the initial and recurrent training requirements for any task or assignment that it determines requires specialized training.

**305. REMEDIAL TRAINING.**

a. A repair station should have procedures to determine an individual's training requirements, including when an employee will be provided remedial training. The repair station should use remedial training procedures to rectify an employee's demonstrated lack of knowledge or skill by providing information as soon as possible. In some instances, remedial training may consist of an appropriately knowledgeable person reviewing procedures with an employee through on-the-job training (OJT). Remedial training should be designed to fix an immediate knowledge or skill deficiency and may focus on one individual.

b. Successful remedial training should show an individual what happened, why it happened, and in a positive manner, how to prevent it from happening again. Remedial training may be included in the repair station's definitions of initial or recurrent training requirements.



## CHAPTER 4. TRAINING PROGRAM BASIC COMPONENTS

### 400. GENERAL.

a. An effective training program should contain the following elements.

**(1) Needs Assessments.** The repair station should have defined processes for objectively identifying its training requirements and assessing each individual's capabilities.

**(2) Area of Study and Course Definition.** The training program should include the procedures used to design each area of study, and/or individual classes or lessons. This includes defining the specific purpose and objectives of a given area, any prerequisites, any required lessons, any time requirements, and the desired outcome—gained technical skill or knowledge. The individual courses associated with a particular area of study should include a detailed description of the technical information or skill that will be taught, along with the referenced material, tools, equipment, or procedures that will be used, the methods and sources of training available, instructor qualifications, and method of recording employee accomplishment.

**(3) Identification of Training Sources and Methods.** The repair station should have a method to identify and select the sources and methods of training that will meet the regulations and its training objectives.

**(4) Measurement of Effectiveness.** To avoid the potential of assigning an unqualified person to maintenance or alteration tasks, the training program may include a process to continually measure the effectiveness of the overall training program and individual training courses.

**(5) Training Documentation.** The repair station must have procedures to document each individual's training to ensure compliance with part 145, section 145.163. This includes defining the extent of training records and establishing a system for creating, accessing, and retaining training records for 2 years after the training is provided.

**(6) Interfaces.** The repair station should include a description of how its training program interacts with other repair station functions, particularly how the capabilities of employees are assessed prior to being assigned maintenance (including inspection), preventive maintenance, and alteration tasks.

b. Each repair station's procedures addressing the suggested elements will vary in terms of complexity and scope to fit the repair station's requirements. Ultimately, the training program must ensure each employee performing maintenance (including inspection), preventive maintenance, or alteration duties is capable of performing assigned tasks.

**401. NEEDS ASSESSMENTS.** The repair station's needs-assessment procedures enable the repair station to identify its training requirements based on job positions, duties, and tasks. It also establishes an objective method for determining training standards, assessing the capability of its employees, and establishing training programs for its employees to fill the gap between

position/duty/skill/task requirements and employee capabilities. Procedures associated with the repair station's needs assessment will be based on its size, employee hiring, assignment and training practices, customer base, and the complexity of its ratings and scope of operations. The repair station should establish the basic standard that identifies the individual employee's training needs by assessing the job function and duties against the employee's specific skills and knowledge. Training areas, programs, and lessons can then be assigned to fill any gaps between the skills and knowledge needed for the job tasks and the employee's capabilities.

**a. Repair Station Needs Assessment.**

(1) The program description should include the processes the repair station will use to identify its training requirements for ensuring each individual assigned to perform maintenance (including inspection), preventive maintenance, and alterations tasks is capable of performing the job properly. If you are a single employee repair station, you must evaluate your capabilities and determine that your current training is adequate or if additional training is necessary to perform the task for which you are rated. The training needs assessment is a method of analyzing the job tasks associated with repair station's maintenance and alteration positions. This entails identifying the knowledge and skills required to successfully fill positions that perform maintenance and alteration tasks. In addition, when determining its training requirements, a repair station should analyze the nature of its business structure and its customers.

(2) When identifying overall training needs, the repair station should consider:

- (a) The tasks associated with each position responsible for performing maintenance, preventive maintenance, or alteration.
- (b) The skills, experience, and training of new and current employees.
- (c) How assessments will be made of employees being assigned new tasks.
- (d) The return of an employee to tasks after an extended period.
- (e) The introduction of new regulations, procedures, equipment, or recordkeeping requirements.
- (f) Preparing for a change in the nature of basic repair station capability.

(3) The needs assessment reviews the repair station's training requirements in the context of its existing staff's capability and tasks associated with specific work assignments. Based on the outcome of its training needs assessment, the repair station can develop and revise its areas of study and/or courses. The training needs assessment should identify the requirements for initial and recurrent training. Based on its needs assessment, the repair station will determine the type and extent of training needs for the company and for individual employees.

**b. Employee Needs Assessment.**

(1) The repair station's procedure should evaluate the current capability of its employees, technical and non-technical. Only those performing maintenance, preventive maintenance, or alteration tasks must be trained under 14 CFR part 145; however, the repair station may wish to include employees that support or manage technical personnel. The training program should differentiate between those employees required to be trained under the program and those that will be trained in accordance with the procedures at the repair station's discretion. Once a technical employee's capabilities have been assessed, employee specific training needs will be identified. If you are a single employee repair station, you must evaluate your capabilities and determine that your current training is adequate or if additional training is necessary to perform the task for which you are rated. Your training accomplishments or certifications should be contained in a training record. The basis of your program would show how you intend to remain current and how you will receive initial and recurrent training in accordance with section 145.163(a). These procedures should be documented and form the basis of your specific training program. The FAA recognizes that training programs may vary depending on the size of the repair station, its capabilities, and the experience of its employee(s). A portion or all of the training requirements of section 145.163 may be met by attending trade or technical society seminars and through on-the-job training. Some of the methods available to evaluate employee capability are listed in the following table.

**TABLE 1. CAPABILITIES EVALUATION**

<b>Method for Evaluation Capability</b>	<b>Usefulness of Method</b>
Formal examination	This may include development of formal written test procedures with pass/fail criteria. While it is an effective method for assessing knowledge, it does not necessarily determine whether an individual can apply the knowledge to the assigned tasks.
Certificate	Possessing a certificate may be a prerequisite for some specialized positions, the certification of qualifications or education from a credible source can measure an individual's knowledge. However, it does not necessarily assess the individual's ability to apply that knowledge to assigned tasks.
Completion of a training course	A review of the documentation or instruction provided can be used to establish an individual's knowledge of a subject. Completion of training courses is most useful when there is some verification, through testing or demonstration, that the individual absorbed the course objectives. However, successful completion of a training course does not necessarily translate into the ability to accomplish a task.
Practical evaluation	A practical evaluation permits the employee to demonstrate skills in a controlled environment that is similar to a situation, or part of a situation, encountered in real life. Such an evaluation might, for example, allow the reviewer to focus on the critical steps in a time-consuming process without actually going through the entire

Method for Evaluation Capability	Usefulness of Method
	process. This can be an effective way to determine an individual's capability; however, the assessment can depend on the skills of the individual designing the practical evaluation mechanism.
Group exercise	A properly designed group exercise can help demonstrate the understanding of a group that must work together on a project. Where an employee's understanding of his or her role in a larger scheme is important, a group exercise that tests that knowledge in an appropriate context can illuminate who within the group needs assistance and can illuminate human factors elements of the training issue that might be otherwise misunderstood by the students. It can also do so in a manner that lends itself well to immediate remedial training as well as reinforcement of the training given the other members of the group, where properly administered.
On-the-job assessment	These types of assessments should be objectively based and judged by successful accomplishment of specified tasks. This is an effective way to determine an individual's capability; however, the assessment can depend on the skills of the individual accomplishing the assessment unless objective criteria are established.
Oral examination in the working environment	These types of assessments should be objectively based and judged by the proper response to a consistent set of questions. This is an effective way to assess an individual's knowledge and ability to apply that knowledge. It is also a valid method of determining whether an inspector or supervisor is capable of reading, writing, and understanding the English language. However, it can depend on the skills of the individual conducting the examination unless objective criteria are established.

**NOTE: This is a sample list of tools for assessing training success and should not be considered exhaustive. Unique instructional and teaching methods, for example, often give rise to unique evaluation mechanisms. The FAA encourages the use of novel techniques for conducting effective evaluations.**

(2) When carrying out any assessment of an individual's capabilities, the repair station's process should be as objective as possible and structured to produce consistent results. The repair station should establish the basic skill level and qualifications for assigned tasks under the job function or position, and then establish objective methods for comparing an individual's capability to those established skill standards. It may be necessary for the repair station to use more than one method to adequately assess an individual's capability. The repair station should also have procedures to accept prior experience, training, or education to establish an individual's capability. For example, a repair station may accept graduation certificates from a part 147 school and/or an A&P certification as acceptable evidence of a basic knowledge and skill level in a particular area. A repair station could also have procedures for accepting

certificates from previous training by manufacturers or associations, or documented by military records. The repair station should have procedures to:

- Ensure the assessments are objectively based and consistent
- Ensure the assessment is documented in the individual's training records
- Ensure the individual conducting the assessment is qualified to evaluate the results of the assessment
- Monitor the individual to ensure capability of performing the tasks consistently at an acceptable level and assigning recurrent or remedial training as necessary

**402. AREA OF STUDY AND COURSE DEFINITION.** Once the repair station identifies its training requirements, including the type of training each individual needs, it can define the areas of study it needs, what subjects should be included in each area or what individual course/lesson it is going to make available, and what level of treatment is appropriate, such as introductory or advanced, initial, or recurrent for each course. The development will take into account the needs assessment of the job tasks and the level of experience of the individuals to be trained.

**a.** The repair station can develop its own areas of study or provide acceptable courses or lessons to its employees. If the repair station chooses to develop areas of study, each area should include objectives, desired outcome and a list of available courses/lessons.

**b.** Each course or lesson under an area of study should include, as appropriate, the following:

(1) The prerequisites or minimum student qualifications prescribed by the regulations or required by the repair station for enrollment in the course, for example, the type of airman certificate, aircraft, product and/or article qualifications, previous training, experience with other operators, and recency of experience requirements.

(2) Instructional aids and course materials such as manuals, tooling, and equipment.

(3) The training methods, sources, and qualified instructors.

(4) A course outline. The outline should identify any individual lesson or modules.

(5) Anticipated time of instruction for completion, and/or the knowledge or skill requirements that must be demonstrated to obtain credit for the course/lesson.

(6) Training forms and records to be used for recording student progress and/or completion.

(7) Supporting information such as courseware, lesson plans, and instructor guides.

### 403. IDENTIFYING THE TRAINING METHOD.

a. Once the repair station defines its areas of study and individual courses/lessons, it can identify the methods available to deliver the training. There are many methods available to repair stations for the development and delivery of training. Most repair station training requirements may be accomplished through existing courses conducted in-house, offered by local schools and colleges, or provided by manufacturers or other organizations. To control costs, repair stations could share the costs of in-house training with other similarly situated repair stations. These repair stations may also want to function as a training entity or work with an aviation maintenance technician school (AMTS) to develop courses. AMTS and repair stations may enter into reciprocal agreements.

b. The following is a brief overview of the different training delivery methods currently available:

**(1) Formal Classroom Instruction.** Training can be provided as a formal course delivered by an instructor in a classroom setting. To ensure the effectiveness of this method of training, the courses should include: an objective; a course outline defining the subjects, topics, and expected outcome; a list of reference and/or course material used; the qualifications of the instructor; and a summary of the knowledge or skill that is to be obtained and the method used to ensure it was absorbed by the employee. The interaction of employees with their instructor is important for the information to be successfully transferred.

**(2) On the Job Training (OJT).** OJT is knowledge obtained while participating in accomplishing the task under the direction of a qualified person or watching another demonstrate a task or activity and then accomplishing the same action under supervision until satisfactory results are obtained. It is an effective method of training for subject matter and tasks that are difficult to understand if described or for which demonstration of capability is essential to correct completion. Practical skills may also be taught using OJT. To make this method of training most effective, the process for providing the information should be standardized by using, for a particular task, the approved data from the article's maintenance manual, and the referenced tools and/or equipment. The process should document that the employee demonstrated the ability to accomplish the skill or task properly on the requisite OJT record. The same process can then be used to train other employees to the same task, activity, or skill. Even with a very capable instructor, the repair station should ensure any OJT is well structured by establishing that the same key elements are included each time.

**(3) Computer-Based Training (CBT).** Interactive CBT courses can be used to impart knowledge and teach practical skills at the correct pace for each employee. CBT can be accomplished at any location at times that are convenient for each employee. To ensure the effectiveness of this type of training, the repair station should evaluate the information provided against its particular needs.

**(4) Distance Learning.** Distance learning applies to situations where the instructor and the employees are not in the same location. It can take the form of mail-based correspondence courses using written, videotaped, or CBT materials; videoconferencing;



teleconferencing or a combination of both—sometimes called “virtual” classrooms; or Internet- or intranet-based instruction that allows employees to interact with an instructor or with courseware similar to CBT. The advantage of this training method is that the courses can be tailored to a specific repair station’s need and an instructor can respond to individual questions. The disadvantages are that the communications can be misinterpreted because of technical difficulties, and the interaction of an employee may be inhibited.

**(5) Embedded Training.** Some equipment, particularly that which uses software for testing or to perform a maintenance function, has training embedded into the process. Incorporating a tutorial or “help” menu are simple examples of how a software program can provide instruction as the user performs a specific task. Embedded training is most useful when:

- The employee already knows the underlying technical information related to the basic task and needs only to learn the details of the procedure
- The procedure is straightforward and can be easily understood with a written explanation
- The media and method in which training is embedded are part of the task or equipment to be learned
- There is a method to assess the employee’s performance and to record that training has taken place

**(6) Other Methods Include Self-Study, Case Study, and Seminars.** These methods of training or acquiring knowledge can be accepted by the repair station provided the information gained applies to the job function and skills required to perform the work capably. The repair station’s training program should ensure any processes used to impart information could be established by objective standards and requirements. Any class, course, or lesson should have a written objective, identified course material or tools/equipment, and an assessment of whether the knowledge was absorbed by the employee.

c. A repair station should pick the delivery method based on its assessment of the training needs. The repair station also should have a method to verify the training delivery technique it chooses is effective for the employee.

#### **404. TRAINING SOURCES.**

a. There are a number of different sources for training, and the repair station should have a process for selecting a source that will satisfy its training requirements.

b. Some common training sources are:

**(1) Original Equipment Manufacturers (OEM).** OEMs may deliver technical information regarding maintenance or alteration on its articles by formal classroom instruction, OJT, distance learning, embedded technology, or CBT material. OEM instructors may come to a repair station to conduct training on-site or deliver the information during seminars, sessions, or extended study at other locations. OEM training on-site gives the repair station the opportunity to share the costs of the training with other local repair stations. If the repair station selects an

OEM course, the repair station should ensure its employees have the prerequisite training and/or experience for the course to be most effective. Also, the repair station should verify that the area of study, course objective, material, and any instructors assigned by the OEM meet the repair station's standards.

(2) **AMTS.** An AMTS approved under part 147 can be an effective source of training for repair stations, particularly for basic knowledge and skills. The training may need to be supplemented by information unique to the repair station's tasks and equipment.

(3) **Operators or Other Repair Stations.** Operators and other repair stations may have training programs they are willing to provide to others by contract. Operators may provide specified repair station employees required inspection items and operator's program training. The operator may also provide other general training, such as regulatory requirements.

(4) **Government Agencies.** Government agencies provide training on OSHA, EPA, and hazardous materials recognition and handling. They may also be a source of training related to maintenance human factors and general safety subjects.

(5) **Trade Associations.** Entities that represent certain segments of the aviation or business community offer training classes on technical and regulatory subjects. Again, the repair station must ensure the individual attending the training completed the course and acquired the requisite knowledge required by the particular repair station's requirements.

(6) **Other Sources.** There are a variety of other training sources, which include, but are not limited to, independent seminars, product demonstrations, computer-based instructions, videos, and equipment manufacturers. All sources of information should be viewed as potential training sources. The repair station's training program should have a method of incorporating training opportunities to ensure each employee is capable of performing its assigned task.

c. Regardless of the source of the training, the repair station remains responsible for the administration, adequacy, and currency of its training program and for the maintenance of training records.

**405. QUALIFYING INSTRUCTORS.** The repair station may set basic standards for any instructor, whether a repair station employee, someone hired temporarily, or an instructor providing an outside training course/lesson. The repair station may have a procedure for evaluating and qualifying instructors. The following should be considered in verifying whether an instructor is appropriate:

- Appropriate background for subject area (such as formal training and/or experience)
- Teaching ability—the ability to impart information on the particular subject matter

#### **406. MEASURING TRAINING EFFECTIVENESS.**

a. To validate that a repair station's employees are capable of performing assigned tasks, the training program should have a method to evaluate whether the training has been effective.

This measurement has two parts. The first is a measure taken immediately after completion of the training to see if the training objectives have been met and the essential knowledge and skills have been transferred. The second is a measure of effectiveness in the application to the actual tasks. The repair station should measure this by evaluating the work and determining that the associated final products produced the learned capability in the actual work environment. The repair station may accomplish these objectives through testing upon completion of an area of study or course, or it may require a demonstration of capability by employees during the performance of the task.

**b.** The repair station's process to measure the effectiveness of training should be linked to the process for defining and updating training requirements.

**c.** The following sources may be used as a tool by the repair station to measure training effectiveness:

**(1)** Review investigations into problems with the repair station's work, as evidenced by complaints of customers and findings of inspectors when a product is to be approved for return to service, or other incidents.

**(2)** Voluntary disclosures with root causes of improper training or a lack of training.

**(3)** Audits that point to weaknesses in an employee's capabilities that can be remedied by the training program.

**(4)** Complaints or suggestions from employees related to accomplishing work assignments or lack of training.

**d.** When it is determined that a training area, class, or lesson must be adjusted, the repair station should have a method of instituting the update and providing the additional information to its employees.

#### **407. TRAINING DOCUMENTATION.**

**a.** The repair station must document the required individual employee training in a format acceptable to the FAA. The capability of each employee depends on training, knowledge, and experience. Consequently, the determination by the repair station that an employee is able to perform the maintenance, preventive maintenance, or alteration assignment requires an analysis of the factors that contribute to the employee's capability. The data to accomplish this analysis should be found in the employee's training records if the principles of this AC are followed when the training program is developed.

**b.** The repair station may retain its training records electronically or in hard copy. In either case, the repair station should standardize the format and content for the training records based on individual job assignments. Each employee's records should contain at least:

**(1)** The employee's name and job position.

(2) Training requirements as determined by the needs assessment, including requirements for indoctrination (initial and recurrent), and other training required by areas and course titles.

(3) FAA certificates applicable to the qualifications (i.e., supervisors, RII personnel, and persons approving articles for return to service must be certificated under 14 CFR part 65).

(4) Other certifications, diplomas, and degrees.

(5) Authorizations and qualifications (if not covered by 14 CFR part 65 certificates).

(6) Proof of training course completion, if determined applicable to capabilities.

(7) List of accomplished training, to include enough information to determine whether it is applicable to the employee's capability to perform assigned tasks:

- Course title or description
- Course objective
- Date completed
- Test results
- Total hours of training
- Location of training
- Name of instructor and/or instructor qualifications
- Signature of employee

(8) Other documentation relevant to determining capability to perform tasks associated with assigned duties, such as past employment, written, oral and practical tests results, etc.

c. All records that are required by the training program to determine whether an employee is capable of performing assigned tasks, as well as those that document training conducted by the repair station, should be considered those required by 14 CFR section 145.163. Therefore, these records should be detailed in the training program and retained for a minimum of 2 years. The repair station is encouraged to have procedures to regularly review all training records to ensure they comply with the requirements set forth in the training program manual.

**408. INTERFACES WITH THE TRAINING PROGRAM.** Section 145.163(b) requires that the repair station ensure that all of its employees performing maintenance (including inspection), preventive maintenance, or alteration tasks are capable of properly accomplishing that work. One of the measures for determining capability is the training an employee receives. When supervisors or managers assign tasks, they should have a procedure to verify the individual assigned has demonstrated the knowledge and skills necessary to properly accomplish the work. Consequently, the repair station should clearly define the interfaces between the employee's individual capabilities, the training records, and the maintenance planning process in its description of the training program.

**409. SPECIAL CONSIDERATIONS FOR REPAIR STATIONS LOCATED OUTSIDE THE UNITED STATES.**

**a.** A repair station located outside the United States is not required to have its personnel certificated under 14 CFR part 65. However, the technical knowledge, skills, and abilities should be no different for any individual performing maintenance (including inspection), preventive maintenance, or alteration tasks, regardless of where the repair station is located. Consequently, the FAA expects all repair stations to have training programs that include the basic elements set forth in this AC, including a comprehensive needs assessment requirement.

**b.** When conducting the training needs assessment, the repair station should place special emphasis on inspection and supervisory personnel's ability to read, write, and understand the English language.

**c.** Repair stations located outside the United States that hold an approval under another national aviation authority, may have a training program that satisfies the requirements of 14 CFR part 145. Different or additional requirements will not interfere with an FAA approval of the training program as long as the program meets all of the 14 CFR part 145 requirements. Consequently, a repair station located outside the United States does not have to maintain multiple programs. However, the training program must be submitted to the FAA for approval as set forth in 14 CFR part 145, or in accordance with the procedures of an International agreement.



**CHAPTER 5. ADMINISTRATIVE INFORMATION****500. HOW TO OBTAIN COPIES OF PUBLICATIONS REFERRED TO THIS AC.**

**a.** The CFRs and those ACs for which a fee is charged may be obtained from the Superintendent of Documents at the following address. A listing of the CFRs and current prices is located in AC 00-44, Status of Federal Aviation Regulations, and a listing of all ACs is located in AC 00-2, Advisory Circular Checklist:

Superintendent of Documents  
P.O. Box 371954  
Pittsburgh, PA 15250-7954

**b.** To order free ACs, contact:

U.S. Department of Transportation  
Subsequent Distribution Office  
M-30  
Ardmore East Business Center  
3341 Q 75th Avenue  
Landover, MD 20785

**c.** The FAA public Web site is located at <http://www.faa.gov/>.

**501. REQUESTS FOR INFORMATION.** For information concerning this AC, contact the General Aviation and Repair Station Branch, AFS-340, at (202) 267-3546. Submit direct comments regarding this AC to:

U.S. Department of Transportation  
Federal Aviation Administration  
Aircraft Maintenance Division, AFS-300  
800 Independence Avenue, SW.  
Washington, DC 20591





## **APPENDIX 1. SAMPLE TRAINING PROGRAM LARGE/MEDIUM REPAIR STATION**

### **INTRODUCTION**

This appendix provides a sample repair station training program for a large/medium size repair station performing work for air carriers or commercial operators under parts 121, 125, 129, or 135. This example is consistent with the guidance provided in this AC. This appendix also provides a sample training plan. The Federal Aviation Administration (FAA) must approve each training program. A repair station is not required to follow this sample to have its training program approved. Individual repair station training programs may require different or additional information. Each program should be tailored to fit the size and complexity of the repair station. A large, complex repair station may have considerably more detail in its program description. This sample program emphasizes the process, procedures, and standards that a repair station should use to ensure compliance with the regulations. It does not set minimum limits or describe the details of the areas of study, courses, course outlines, or instructor qualifications.

In addition, the AC provides some information to help the repair station develop its training program that may not be included in the repair station's written training program manual. The following sample training program contains notes for areas in which repair stations should provide further information.

## SAMPLE TRAINING PROGRAM MANUAL

**NOTE: The following example is for a large/medium size repair station doing business as ABC. ABC has a training department and director of training who reports directly to the accountable manager.**

### INTRODUCTION TO THE TRAINING PROGRAM

This training program manual contains the policies and procedures ABC uses to determine its training requirements and to develop its training program. The training program ensures each repair station employee has the knowledge and skills to capably perform assigned maintenance, preventive maintenance, and alteration tasks. The training program contents in this manual ensures ABC can respond to its employees' changing training needs.

This manual sets forth the procedures for ABC to identify its training needs in a systematic manner, develop training and/or identify appropriate existing training, select the training methods, provide training, record training accomplishment, and measure the effectiveness of its training program.

ABC controls this document in accordance with the procedures for document control described in its Repair Station Manual (RSM). A copy of this document and all revisions are provided to ABC's certificate-holding district office (CHDO). The procedures for revising this document and submitting revisions to the FAA for approval are described in this document and in the ABC RSM.

ABC uses a closed loop system to ensure that the training requirements for the company and employees are identified, training standards are established, training is provided, and the training program is revised as necessary. ABC's training program consists of the following basic components:

- A training needs assessment to identify ABC's overall training needs and individual employee training needs
- The method for defining areas of study and/or courses/lessons made available to employees
- The method for identifying training sources and methods available to employees for the areas of study, courses, and/or lessons
- The method of documenting employee qualifications and training
- The methods used to measure the effectiveness of the training program and to make changes as necessary

The director of training is responsible for ensuring ABC complies with all of the components of its training program.

The accountable manager (general manager) has the overall authority for ABC's training program. Any changes to the training program will be coordinated with the accountable manager.

## SECTION 1. BACKGROUND

Persons performing maintenance (including inspections), preventive maintenance, and alteration must be assessed and trained in accordance with the Federal Aviation Administration (FAA)-approved procedures set forth in this manual. All other employees may be trained in accordance with the approved procedures of this manual at management discretion.

ABC has an established training program that includes indoctrination (initial, recurrent), specialized, and remedial training areas of study for all of its employees. ABC has separate areas of study for the following staffing categories:

- Technicians and other individuals performing maintenance, preventive maintenance, or alteration tasks such as:
  - inspectors
  - supervisors
  - managers
- Support staff

ABC further breaks down the training requirements for each staffing category based on job function requirements and experience levels. ABC has established minimum training standards for its job positions and methods to assess an individual's skill level for each job function to determine training requirements.

The procedures in this manual enable ABC to revise its existing training program to ensure it continues to meet ABC's needs and produce training consistent with all regulatory requirements.

## SECTION 2. TRAINING NEEDS ASSESSMENT

ABC's needs assessment is a two-part process that determines ABC's overall training requirements, as well as individual employee training requirements.

### 1. Overall Repair Station Needs.

To determine its overall training requirements, the Director of Training and the managers of each technical area must review ABC's operations specifications (OpSpecs); capability list; job position duties and responsibilities listed in the repair station quality manual; technical job functions and tasks; customer requirements; past, current, and expected scope of work; employment procedures for hiring; and current employee experience levels.

This needs-assessment will result in a description of the knowledge and skill standards for each defined job position or function.

Employees will then be assessed against the standard established for the position and tasks assigned. If it is determined that an employee does not possess the capability to perform a

maintenance (including inspection), preventive maintenance, or alteration task, appropriate training will be administered.

The areas of study, individual courses/lessons, and instructors are developed or qualified in accordance with section 3.

ABC continuously evaluates its overall repair station training needs. However, ABC will specifically revise the training program when:

- It identifies additional training needs
- Changes to its ratings, facilities, equipment, or work scope require additional training areas, classes, or lessons

**a. Identification of Training Needs.**

ABC may identify additional training needs through:

- The needs assessment outlined in this manual
- FAA or other external agency oversight findings
- Investigations that lead to voluntary disclosures
- Routine or special quality assurance audits
- Findings from the ABC Internal Evaluation Program
- Feedback from employees
- The results from audits related to maintenance human factors

The Director of Training ensures the Training Department regularly reviews the results and reports for additional training needs.

**NOTE: The repair station should set forth its method for accomplishing the review and for identifying potential training needs.**

**b. Changes to Repair Station Work Scope.**

Whenever ABC is planning to change its facilities, equipment, or scope of work as reflected in its OpSpecs or capability list, it will conduct a review of its current training program. The need for additional training will be based on an analysis of the new work to be performed, the capability of employees, and the availability of in-house training.

Appropriate changes will be made to initial, recurrent, and specialized training areas of study, including existing courses or the addition of new courses, positions, and individuals requiring the training, and when the new training needs to be implemented and completed.

**c. Annual Training Program Review.**

An annual review of the training program will verify if ABC has made any changes that might affect training and will analyze the measures of training effectiveness.

As a part of this annual review, ABC will analyze its job position duty and task assignments, its employee experience levels, and the method of delivery for various courses, new training techniques, or commercially available courses. It will make any changes that are required to ensure employees are capable of performing assigned tasks in accordance with the procedures set forth in their manual.

**NOTE: The repair station should set forth its method of documenting the annual review and for ensuring any changes to the training program are accomplished.**

## **2. Individual Needs Assessment.**

ABC has established skill levels and qualifications for each job position based upon technical functions and tasks. In addition, ABC has developed methods to evaluate an individual to determine what knowledge, experience, or training establishes capability to properly perform the work.

Whenever ABC hires a new employee or transfers an employee to a new job position, the employee's new supervisor will assess the individual's skill level and qualifications against the requirements for the assigned functions or tasks. The supervisor and the Training Department determine what training is necessary and ensure the individual's training record is updated to reflect the assessment and training requirements. The supervisor will also work with the Training Department to ensure the individual receives the necessary training in the appropriate timeframe.

## **SECTION 3. COURSE DEFINITION**

The Training Department will develop and revise areas of study, courses, and/or lessons based on the results of a training needs assessment.

**1.** An Area of Study will be developed to identify the entire scope of training available for a broad area of knowledge and skill requirements. It will include the appropriate number and level of courses or lessons to accomplish the defined objective. The areas of study will define the initial and recurrent requirements for the associated courses and lessons.

Initial training will be provided to an employee for the first time.

Recurrent training will be information that supports, expands, or refreshes initial training areas of study, courses/lessons, or other requirements.

Remedial training will be assigned to ensure an employee who lacks demonstrated knowledge and has been provided the information necessary to accomplish assigned maintenance or alteration tasks properly.

- a.** Total required course of study hours or performance outcome.

- b. Staffing category.
- c. Job function.

2. All Courses/Lessons shall be recorded by developing the following information as necessary to capture the required knowledge or skill.

- Course/Lesson Title
- Objectives
- Prerequisites
- Course outline
- Required hours or performance outcome for each topic or lesson
- Training material including handouts, regulations, manuals, tools, or equipment used
- Training source(s)
- Training method(s)
- Instructor(s)
- Instructor qualifications
- Method(s) of evaluation
- Other supporting information, as available such as instructor guides and courseware

The information required by this Section shall be developed for all areas of study and/or courses/lessons made available to employees. This includes training provided by the on-the-job methodology.

The information on courses and lessons from outside sources will be evaluated to ensure the availability of enough information to determine its capability to impart the information required by the repair station's needs assessment for the company or for the particular employee.

#### **SECTION 4. SELECTION OF TRAINING METHODS AND SOURCES**

Using the information developed during the course definition phase, ABC will evaluate training method(s), source(s), and instructor(s) to determine whether the appropriate and necessary knowledge or skill will be transferred to employees.

##### **1. Training Methods.**

The material to be presented, the level of personnel receiving the training, and alternatives available will be used to establish training methods for areas of study and/or courses/lessons. ABC uses various methods to train its employees including:

- Formal classroom training
- On-the-job training (OJT)
- Self study

- Case study
- Computer-based training (CBT)
- Distance learning
- Embedded training
- External classes and courses

The company will use all available resources to provide the appropriate training. Many areas of study, courses, and lessons will be provided by more than one method. All methods will have a documented method of determining the amount of information that must be exchanged. Generally, this will be accomplished by completing the information required by Section 3 of this training manual. However, the validity of any particular method can be established by an evaluation of the employee's capabilities.

## **2. Training Sources.**

Sources available for training will be continually monitored to ensure ABC is aware of its alternatives. When a new or revised training need is identified, the available options will be reviewed. This process may include consultation with the FAA PI, other repair stations, manufacturers, and local colleges for available training.

If the training will be conducted by an outside vendor, an audit will be conducted to ensure it provides appropriate information. The audit may include an observation of training, a review of course outlines and materials, contact with previous training customers, and a review of instructor qualifications and experience. The extent of the audit will be based on an informal risk assessment related to the criticality of the training and the ability of the repair station to assess the information imparted.

**NOTE: The repair station should set forth its method of tracking audits.**

## **3. Training Instructors.**

Instructors shall be qualified based upon subject matter knowledge and teaching ability. Subject matter expertise may be established by experience, demonstrated knowledge, and/or certification. The ability to impart information can be determined by observation, demonstration, or experience. The evaluation of in-house instructors shall be documented in the course description.

## **SECTION 5. TRAINING DOCUMENTATION**

The director of training is responsible for establishing the standards for the creation and retention of training records for all ABC employees that perform maintenance (including inspection), preventive maintenance, and alteration tasks. The company maintains an electronic summary of all training provided. Each electronic report includes the employee's name and job function, the needs assessment findings, a list of FAA certifications, other applicable certifications and degrees, ABC qualifications and authorizations (such as required inspection items (RII) for a

given customer), and for each course completed, the total time credited, the date provided, the instructor, the location, and the results of any associated examination. ABC will make the training records of employees performing maintenance (including inspection), preventive maintenance, and alteration tasks available to the FAA for review upon request.

The company maintains the individual training records for as long as an employee is employed at ABC and for two years thereafter.

## **SECTION 6. MEASUREMENT OF TRAINING EFFECTIVENESS**

The training department will regularly evaluate each course for its content, time, quality of the training materials (courseware), training facilities, and instructor. This is accomplished through observation, examination results, and feedback.

The director of training will coordinate with the quality department to ensure ABC audits outside training vendors and in-house training courses. The quality manager will ensure the director of training is provided the results of these evaluations. The director of training will work with the quality manager to resolve any discrepancies.

The director of training will ensure the training program is reviewed on an annual basis as described in section 2, paragraph 1c.

During the course design, ABC developed a method to evaluate each employee's performance. This could include written or oral examinations or manipulative skill tests. The training department will analyze the results of all course examinations to determine if any changes are required to establish a basis for determining whether the course met its objectives and provided the information necessary to ensure the employee was capable of performing assigned tasks.

## **SECTION 7. REVISION PROCESS**

The process for submitting changes is described in ABC's RSM.

**NOTE: Alternatively if the repair station wishes this training program to stand on its own, it may describe the method for changing this approved program in this section.**

## **SECTION 8. WORK PERFORMED FOR PART 121, 125, 129, AND PART 135 OPERATORS**

ABC performs work for 14 CFR parts 121, 125, 129, and 135 operators. Individual operator training requirements (initial, recurrent, or specialized) are identified for each job function. The director of training will work with each operator to schedule ABC employees for operator training, as determined during the individual's needs assessment.



**SECTION 9. WORK PERFORMED BY INTERIM MAINTENANCE EMPLOYEES**

During periods of heavy workload, ABC may supplement its workforce with interim maintenance employees. Before these individuals begin work for ABC, they must undergo a needs assessment. The training department must coordinate with the manager of the area where the individuals will work to conduct the needs assessment and ensure all individuals are provided training appropriate to the particular assignment before they are required to begin work.

The training department must make and retain training records for all individuals performing maintenance (including inspection), preventive maintenance, and alteration tasks.



## **APPENDIX 2. SAMPLE TRAINING PROGRAM SMALL REPAIR STATION (UNDER 10 EMPLOYEES) THAT PERFORMS WORK SOLELY FOR PART 91 OWNER/OPERATORS**

### **INTRODUCTION**

This appendix provides an example of a repair station training program for a small repair station (under 10 employees performing maintenance (including inspection), preventive maintenance, or alteration tasks) that performs maintenance for general aviation or business operations under 14 CFR part 91. It anticipates that the repair station will have low employee turnover and that the work being performed is consistent with the experience of the current employees. Each training program, such as the example shown in this appendix, must be approved by the Federal Aviation Administration (FAA) in accordance with 14 CFR part 145, section 145.163.

A repair station is not required to follow this sample for FAA approval. Individual training programs may require additional information. Each program should be tailored to fit the size and complexity of the repair station. This sample program emphasizes the process, procedures, and standards that any repair station could use, and illustrates how all of these processes can be compatible with even a very small repair station. The following sample training program contains notes for areas in which repair stations should provide further information.

### **SAMPLE TRAINING PROGRAM MANUAL**

**NOTE: The following example is for a very small repair station doing business as “ABC.” ABC has a manager who also serves as the chief inspector and the accountable manager. He also accomplishes basic maintenance work as necessary. In addition, there are two technicians and one support person.**

### **INTRODUCTION TO THE TRAINING PROGRAM**

This training program document contains the policies and procedures ABC uses to determine its training requirements and develop its FAA approved training program. ABC is responsible for ensuring each repair station employee performing maintenance (including inspection), preventive maintenance, and alteration is capable of performing assigned tasks. This plan identifies the procedures for ABC to identify an employee’s training needs in a systematic manner, develop training and/or identify appropriate existing training, select the training methods, provide training, and record the training accomplished.

ABC controls this document in accordance with the procedures for document and revision control described in its RSM. A copy of this document and all revisions are provided to ABC’s certificate-holding district office (CHDO).

ABC’s training program consists of the following basic components:

- Assessment of training needs, to identify overall training needs and individual employee training needs

- Course definition to define specific courses of study and individual courses
- Identification of training sources and methods to identify options and select how ABC will provide the training
- Documentation of training to ensure all employees' training is documented, and records are retained

## **SECTION 1. BACKGROUND**

ABC has an established training program that includes indoctrination (initial and recurrent), specialized, and remedial training for employees performing maintenance (including inspection), preventive maintenance, and alteration tasks. The procedures in this manual enable ABC to revise its existing training program to ensure it meets ABC's needs and produces training consistent with all regulatory requirements.

All of the information pertaining to the current training records is available for review by the principal maintenance inspector (PI) at ABC's facilities.

## **SECTION 2. TRAINING NEEDS ASSESSMENT**

ABC's needs assessment is a two-part process that includes determining the overall training requirements as well as individual employee training requirements.

### **1. Overall Repair Station Needs Assessment.**

To determine its overall training requirements, ABC will review the types of work being performed and planned, and identify and update the types of knowledge and skills that the repair station needs. This will include reviewing such items as the ABC operations specifications (OpSpecs); capability list; customer requirements; expected scope of work; and the relevant experience of each technician that will be assigned to perform maintenance, preventive maintenance, or alteration tasks.

This general needs assessment will result in a description of the knowledge and skill an employee must have to properly perform the tasks associated with the work assignment.

The results are recorded in a brief summary report establishing the type and level of training required for an indoctrination to company procedures if there is a new employee, initial training for a new type of equipment ABC will maintain or alter, and an appropriate level of recurrent training for the different responsibilities of the technical and support personnel. These basic training goals are documented in the training program files, but do not require FAA approval.

ABC reviews overall training requirements and the requirements of specific individuals in relation to specific tasks to be performed. ABC will provide training to employees:

- When individual employee knowledge or skill deficiencies are identified; or

- When significant changes are made to its work scope, or such changes are planned such that the knowledge, skills, or experience render the employee unable to perform work properly such as—
  - New regulatory requirements are introduced
  - New tools, equipment, or skills are required to perform the work properly
  - Work is going to be performed for an air carrier or commercial operator under parts 121, 125, 129, or 135

#### **a. Identification of Capability Deficiencies.**

ABC may identify individual capability deficiencies through:

- FAA or other external agency oversight findings
- Investigations that lead to voluntary disclosures

The accountable manager ensures the above programs are regularly reviewed to determine if any training deficiencies exist. The accountable manager will decide on the appropriate training after consulting with all of the technical staff. The accountable manager will also be responsible for ensuring that the work performed by the individual requiring additional training will not affect the quality of ABC's work until the required training is successfully completed. This can be accomplished through additional supervision or by changing work assignment.

#### **b. Changes to Repair Station Work Scope.**

Whenever ABC is planning to change its facilities, equipment, or scope of work as reflected in its OpSpecs or capability list, the accountable manager must ensure the employees are capable of performing the maintenance (including inspection), preventive maintenance, or alteration tasks or that training needs have been identified and met. For changes to ABC's capability list, the accountable manager will review the results of the self-evaluation (required by 14 CFR part 145, sections 145.209 and 145.215) and identify if changes in training needs are required.

## **2. Individual Needs Assessment.**

Whenever ABC hires a new employee or transfers an employee to a new task assignment, an assessment of the individual's skill level and qualifications will be documented. ABC may accept previous employer training records or certifications, use a formal written examination, an on-the-job assessment, or other appropriate means to determine if any training is required to perform the assigned tasks.

### **SECTION 3. COURSE DEFINITION**

The accountable manager (or technical staff delegated by the accountable manager) will outline training requirements for the company and/or for the individual, based on the results of a training needs assessment.

While defining the course or lesson, the following information should be documented, as appropriate:

- Objectives and/or required performance outcome—define the knowledge or skill obtained or to be obtained from the course or lesson
- Prerequisites—define any knowledge, skill, course, or lesson that needs to be known before the course or lesson can be given
- Training sources—define any and all training sources available to the repair station for the course or lesson
- Training methods—define any and all training methods that can be, will be, or were used to impart the information
- Instructor qualifications—define the knowledge or skill level of the in-house instructor or the qualifications of the instructor that provided the information (if known)
- Other supporting information, such as instructor guides, course material, tools, equipment, or any other aid or information provided during the instruction

Documentation associated with any training accepted or given by the repair station shall be retained in the training program files or in the file of the individual employee assigned to perform maintenance (including inspection), preventive maintenance, or alterations under the repair station's 14 CFR part 145 repair station certificate. Training will be provided on an initial and recurrent basis as required to ensure all employees performing maintenance (including inspection), preventive maintenance, and alteration tasks are capable of performing assignments.

### **SECTION 4. TRAINING METHODS AND SOURCES**

ABC company will use all training sources and methods available to provide employees with the information necessary for them to perform assigned maintenance (including inspection), preventive maintenance, and alterations tasks correctly.

The majority of the training provided by this repair station will use on-the-job (OJT) methodology. The information required by section 3 will be developed for each lesson to ensure consistency among training providers.

### **SECTION 5. TRAINING DOCUMENTATION**

The accountable manager will ensure training records are generated and maintained for all ABC employees that establish each individual is capable of performing the maintenance (including inspection), preventive maintenance, and alteration tasks assigned. The records include FAA

certifications, other applicable certifications and degrees, ABC or customer qualifications and authorizations, and for each course completed, the total time credited, the date, the instructor, the location, and the results of any associated examination.

All documents showing proof of any of the aforementioned training are maintained for as long as an individual is an ABC employee and for two years thereafter.

Any employee may review their training records to verify that they are complete and current. If an employee notes a discrepancy in the training record documentation, that employee will inform the accountable manager of the discrepancy. Any change necessary to update an employee's training record must be approved by the accountable manager.

## **SECTION 6. REVISION PROCESS**

The process for submitting changes to the training program for FAA approval is described in ABC's RSM.

**NOTE: Alternatively if the repair station wishes this training program to stand on its own, it may describe the method for changing this approved program in this section.**

## **SECTION 7. WORK PERFORMED FOR PARTS 121, 125, 129, AND PART 135 OPERATORS**

ABC does not perform work for air carriers or commercial operators under 14 CFR parts 121, 125, 129, or 135.

Before ABC would perform maintenance (including inspection), preventive maintenance, or alteration under its 14 CFR part 145 certificate for an air carrier or commercial operator it would conduct a training needs assessment in accordance with section 2, paragraph 1, to determine if additional capabilities were needed for its employees.

## **SECTION 8. WORK PERFORMED BY INTERIM MAINTENANCE EMPLOYEES**

During periods of heavy workload, ABC may supplement its workforce with interim maintenance employees. Before these individuals begin work for ABC, they must undergo a needs assessment. The accountable manager must determine where the individuals will work to conduct the needs assessment and ensure all individuals are provided training appropriate to the particular assignment before they are required to begin work.





**APPENDIX 3. RELATED CORRESPONDENCE****FAA Documents**

1. AC-00-46, Aviation Safety Reporting Program.
2. AC-00-58, Voluntary Disclosure Reporting Program.
3. AC 120-59, Air Carrier Internal Evaluation Programs.
4. AC 120-66, Aviation Safety Action Programs (ASAP).
5. AC 120-72, Maintenance Resource Management Training.
6. AC 120-79, Developing and Implementing a Continuing Analysis and Surveillance System. FAA Order 8300.10, Airworthiness Inspector's Handbook.

**Information on the World Wide Web**

1. Human Factors Guide for Aviation Maintenance (February 1998) <http://hfskyway.faa.gov>).
2. CAP 716 Aviation Maintenance Human Factors ([www.caa.co.uk](http://www.caa.co.uk)).
3. CAP 712 Aviation Maintenance Human Factors ([www.caa.co.uk](http://www.caa.co.uk)).
4. Human Factors Training (2003) ([www.LTTHF.com](http://www.LTTHF.com)).

**Other Related Documents**

1. UKCAA CAP 712, Safety Management System for Commercial Air Transport Operations.
2. ICAO Document 9824/AN450 Human Factors Guidelines-First Addition 2003.
3. Managing the Risks of Organizational Accidents (1997), by James Reason. Ashgate Publishing Limited.
4. Risk Management and Error Reduction in Aviation Maintenance (2004) by Manoj S. Patankar and James C. Taylor. Ashgate Publishing.
5. Applied Human Factors in Aviation Maintenance (2004) by Manoj S. Patankar and James C. Taylor. Ashgate Publishing.