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**Federal Aviation
Administration**

Advisory Circular

AC 145-RSTP
DATE:

Repair Station Training Program



Initiated by: AFS-300

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CHAPTER 1. INTRODUCTION

100. Purpose of this advisory circular (AC).

a. This AC provides information on—

(1) Developing repair station employee training programs required under Title 14 of the Code of Federal Regulations (14CFR) part 145.163.

(2) Categories of training;

(3) Training program components;

(4) Sample training programs.

b. This AC provides an acceptable means, but not the only means, for developing a repair station employee training program for repair stations certificated under part 145. A repair station does not have to follow either of the sample programs in this AC, which are described in appendixes 1 and 2. The sample programs only represent a possible way to structure a training program that meets the requirements of the regulations. The hours indicated in the sample do not represent minimum hour requirements. Each repair station should develop its own program tailored to its individual operations. Because this AC contains only guidance on developing a training program, the word “should” used herein applies only to a repair station that chooses to follow a particular suggestion without deviation.

101. Who should use this AC.

Each repair station certificated under part 145, whether located within or outside the United States, should use this AC to develop its training program required by §145.163.

CHAPTER 2. BACKGROUND ON REPAIR STATION TRAINING

200. General.

a. Under 14 CFR part 145, certificated repair stations located within and outside the United States that perform maintenance, preventive maintenance, and alterations on United States-registered aircraft, airframes, engines, propellers, appliances, and component parts must have an approved FAA training program.

b. Aircraft maintenance has changed a great deal since the repair station regulations were recodified in 1967 into the Code of Federal Regulations, these regulations have not changed substantively since that time. Before the August 2001 rule change in amendment 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 requirement for a repair station personnel training program. Title 14 CFR part 121.375 or part 135.433 requires, however, that any person performing maintenance or preventive maintenance functions for a certificated-holder 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. Therefore, if the repair station personnel are performing work for a part 121 or part 135 operator, they may be required to obtain carrier specific training.

NOTE: The information contained within this AC provides a means to develop a repair station's existing training program into a formal document that will require FAA approval.

c. Today, many air carriers have emerged that do not perform their own heavy maintenance. As a result, several large repair stations have emerged, or existing repair stations have grown to accommodate the increased work from these air carriers. In addition, there has been a trend for established air carriers to contract out work to repair stations for heavy maintenance work in excess of what they can handle in house, for specific aircraft types of which few are in operation, or for a number of specific major repairs and alterations.

d. Most mechanics today acquire their initial skill through formal training, such as 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 can the type or level of training. If repair stations do not have proper initial and recurrent training, the maintenance performed and, consequently, safety could be affected.

e. There are several categories of personnel employed by part 145 repair stations to perform contract work in their facilities. The majority of repair station personnel are specialists, with slightly more than half of them holding A&P certifications. There also is a large pool of maintenance personnel who work for temporary placement organizations, sometimes called fourth-party maintenance providers. These organizations supply mechanics that permit repair stations to meet peak workload demands. These employees must meet the training requirements of the repair station.

f. Hiring practices also vary widely among repair stations. While a majority of employees have directly relevant experience, certification, and training, others do not. It can be difficult for repair stations to obtain previous individual training documents and organize them into an efficient system.

g. Under new §145.163 promulgated in August 2001 under amendment No. 145-27, each repair station certificated under part 145 must establish a training program for its employees who perform work under its ratings and classes. This training program will enhance aviation safety by ensuring each employee who works for a repair station is fully capable of performing that work. It also would ensure a level of safety equivalent to that of maintenance performed under parts 121 and 135. The FAA understands that repair stations vary in size, therefore, they expect each repair station to have a training program appropriate to its organization and the work it performs.

h. The FAA notes that certain approved repair stations also have repair station certifications from other countries or international organizations that, in some cases, require different programs. Among these promulgating requirements are the International Civil Aviation Organization (ICAO), European Aviation Safety Agency (EASA), and Transport Canada. Specifically:

(1) The ICAO Continuing Airworthiness Manual recommends that policies for initial and refresher training be considered by the airworthiness authority when assessing an organization for approval. The manual further states that the repair station should consider the needs of mechanics, quality control (QC) and quality assurance (QA) personnel, and individuals releasing aircraft for service. Each civil aviation authority (CAA) has guidance to judge the adequacy of maintenance training programs of its applicant Approved Maintenance Organizations (AMO).

(2) EASA part 145 contains licensing and training requirements for AMOs that perform maintenance on aircraft. These EASA part 145 requirements can affect FAA part 145-approved repair stations that have EASA approvals; EASA Part 145 also requires maintenance human factors training.

(3) Transport Canada's regulations state that AMOs must implement a training program that includes initial, recurrent, and other necessary training to ensure continued qualifications appropriate to the function to be performed or supervised. The Canadian regulations also mandate human factors training.

201. Regulatory requirements.

Part 145 requires an FAA-certificated repair station to have an employee training program approved by the FAA that includes initial and recurrent training. It also requires that the training program ensure each employee assigned to a task is capable of performing the work. If a repair station accomplishes work for a part 121 or part 135 operator, its employees must be trained in accordance with the operator's requirements. (See §§145.163, 145.51(a)(7), 145.209(e), 121.375, and 135.433.)

202. Compliance schedule.

To provide adequate time for the FAA to develop guidance, and for repair stations to develop and submit a training program for FAA approval, the training program requirements are effective on April 6, 2005, 24 months after the effective date of the final rule. The FAA has developed a staggered compliance schedule to ensure all training programs are not submitted to the FAA on the same day. A repair station may submit its training program to the FAA earlier than required.

TABLE 1. TRAINING PROGRAM SUBMITTAL DATES

If you are—	Then you must submit your training program to the FAA—
A repair station certificated before April 6, 2005,	by the last day of the month in which your original certificate was issued .
An applicant applying for a repair station certificate on or after April 6, 2005,	with your application for a repair station certificate.

TABLE 2. COMPLIANCE DATES

If—	Then you must submit your training program to the FAA—
Your certificate was issued May 12, 1995,	by May 31, 2005.
Your certificate was issued January 12, 2002,	by January 31, 2006.
Your application was submitted January 5, 2005, with an expected certification date of June 15, 2005,	with your application.

203. Repair station manual requirements.

a. Section 145.209(e) requires the repair station to include in its manual procedures for revising its training program. This manual should include the procedures for submitting any revisions to the certificate-holding district office (CHDO).

b. The training program itself may be documented in the repair station manual or it may be a separate document. An advantage to having the training program in a separate document is that it provides separation for the training program approval requirement from the non-approved repair station and quality control manuals.

204. Required program scope and complexity.

- a. The purpose of the repair station's training program is to—
- (1) Provide compliance with §145.163;
 - (2) Provide, through initial and recurring training, a continuing education program enabling repair station employees to perform their job functions efficiently, safely, and correctly; and
 - (3) Familiarize repair station employees with the repair station manual, quality control manual, and their procedures.

b. Each repair station's training program will be based on its individual operation and needs. When developing its training program, each repair station should consider its size, location, ratings, the type of employees it uses, and its employees' experience and skill levels.

c. Each individual employed by a repair station should have training based on the person's job function. Therefore, each repair station should develop procedures for determining which employees require what training. All repair station employees usually do not require the same level of training. To facilitate the development of the training requirements and courses of study, each repair station should develop procedures to separate its staff into categories. The following table shows two examples of types of categories a repair station might use—

TABLE 3. EXAMPLES REPAIR STATION CATEGORIES

Type of Repair Station	Example of Staffing Categories
Small to medium	<ul style="list-style-type: none"> (1) Technicians. (2) Inspectors. (3) Managers and supervisors. (4) Support staff.
Larger	<ul style="list-style-type: none"> (1) Technical personnel conducting maintenance or overhauls with authority for approval for return to service. (2) Technical personnel conducting maintenance or overhauls without authority for approval for return to service. (3) Inspection personnel. (4) Management and supervisor personnel. (5) Technical support staff such as planners, production controllers, records personnel, and purchasing, supply, and stores personnel. (6) Other staff.

d. Each repair station's training program should address at least the following training courses of study for the different categories of employees:

(1) Indoctrination training for new employees covering the repair station's operations (see paragraph 301);

(2) Initial technical training to provide new and existing employees taking on new job functions with the appropriate technical skills (see paragraph 302);

(3) Recurrent technical training to ensure all employees remain current (see paragraph 303);

(4) Specialized technical training or advanced training for specific tasks or functions (see paragraph 304); and

(5) Remedial technical training for certain employees to correct training deficiencies (see paragraph 305).

e. Each repair station's training program will vary in the number of different courses of study, course content, hour requirements, training devices, and training sources. One repair station may have three indoctrination courses of study (one for technicians and inspectors, one for managers and supervisors, and one for support staff). Another repair station may have four indoctrination courses of study by breaking the technicians and inspectors into separate courses

of study, and yet another may need only one indoctrination course that is appropriate for all of its employees.

f. The FAA does not require a minimum number of hours for each type of training course of study or a list of courses that should be offered. Consistent with its evolving systems safety certification and surveillance process, the FAA may ask the following questions:

(1) Is there clear responsibility and authority? Did the repairs station clearly identify the individual or individuals by job title who are responsible for the different aspects of the training program and have authority to make changes to the training program?

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

(3) Is there a measurement of effectiveness? Does the repair station have a procedure for management to measure the effectiveness of the training program?

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

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

(6) Are there written procedures for maintaining personnel training records?

(7) Is the manual identified with company name, address, certificate number, and other contact information appropriate to this manual (phone, fax, email, 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 and retaining records for a 2-year minimum?

(11) Does the training program have provisions for initial and recurrent training?

(12) Does the training program adequately identify each person or position performing maintenance or inspection functions?

(13) Does the training program adequately ensure that each person or position performing a maintenance or inspection function is capable of performing the assigned task?

(14) 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 break its initial and recurrent training into the following courses of study for each category of employee:

- a. Indoctrination,
- b. Initial,
- c. Recurrent,
- d. Specialized, and
- e. Remedial.

301. Indoctrination training.

a. This type of training serves as core training for all repair station personnel. The scope and depth of indoctrination training may vary based on the individual's assigned job function. However, indoctrination training should be similar for all employees to establish a common company core of knowledge. The repair station should determine the level of indoctrination training course of study required for each job function, through its training needs assessment process, described in paragraph 401.

b. The following subjects should be a part of any repair station's indoctrination program, regardless of its size or capabilities:

- (1) Title 14 CFR and other regulatory requirements,
- (2) Company manuals, policies, procedures, and practices,
- (3) General Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA),
- (4) Maintenance human factors,
- (5) Computer systems and software, as applicable to the repair station's systems,
- (6) Facility security,
- (7) Repair station maintenance functions and authority as reflected on the certificate and operations specifications, and
- (8) Quality control process.

NOTE: Some of the subjects listed above do not fall under the direct purview of the FAA or the Flight Standards Service.

302. Initial training.

a. The repair station's initial courses of study for each category of employee may be separate and distinct from indoctrination training. Initial training should focus on providing employees with the appropriate technical training required to perform their jobs. This includes new employees or existing repair station employees taking on new job functions.

b. The repair station should have procedures to determine the applicable scope and depth of initial training based on each job function and each employee's previous experience and capability established by the needs assessment (see paragraph 401). The needs assessment is a critical part of determining an individual's initial training requirements.

c. When developing the initial training courses of study, the repair station may want to take into account that all individuals may not have the same training, background, 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 prior experience at another repair station;
- (3) Individuals with military aviation maintenance experience; and
- (4) Individuals with no prior experience.

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

- (1) Maintenance human factors,
- (2) Ground support equipment,
- (3) Tools,
- (4) Test equipment,
- (5) Materials and parts,
- (6) Records and recordkeeping,
- (7) Relevant OSHA and EPA requirements,
- (8) Hazardous materials,
- (9) Shop safety, and
- (10) Specific-job function training.

In contrast, the initial training course of study for new technicians with prior repair station experience may include a general review of the majority of the above subjects as necessary and detailed technical training only for their job function. An individual's specific initial training requirements should be established based on a needs assessment.

e. The number of hours of initial training varies depending on the level of experience of the individual and job function. However, the repair station should establish a basic minimum that all employees in a specific job function meet, whether through training given by the repair station or training acquired before working at the repair station. For example, the repair station could establish that all technicians have 22 hours of initial training. One new technician may have 11 hours credited based on prior repair station experience and training determined during the needs assessment and only have to take 11 hours of initial training given by the repair station. Another technician with no prior experience may have to take all 22 hours of initial training, again, determined during the needs assessment.

303. Recurrent training.

a. Recurrent maintenance training commonly includes training known as refresher training, and training on new policies, procedures, or practices to ensure that a repair station employee remains current for the assigned job function. The repair station should have procedures to determine the recurrent training requirements for each job function. Not all job functions may have the same recurrent training requirements.

b. The repair station should have procedures to determine the type and frequency of recurrent training for each of its employees. The repair station should have procedures to address the two different types of recurrent training: that conducted on a one-time basis as necessary to introduce new policies, procedures, and practices, and that conducted on a regular basis (refresher training).

c. For example, the repair station could have procedures to develop one-time recurrent training courses of study when there are—

- (1) Changes in the regulations;
- (2) New inspection procedures and maintenance techniques;
- (3) New customer recordkeeping and procedure requirements; and
- (4) New equipment.

d. In addition, the repair station should have standard recurrent training courses of study provided on a regular basis to address:

- (1) Maintenance procedures,
- (2) Repair station and customer forms, procedures, and records,
- (3) Required inspection item procedures,
- (4) Practical skills,
- (5) Maintenance human factors, and
- (6) Regulatory review.

e. Each repair station's recurrent training program may differ and based on the repair station size, situation, employees, customers, and complexity of operations.

304. Specialized training.

The repair station should have procedures to develop specialized training courses of study as necessary. The individuals who attend specialized training may be tasked to convey the information to other employees upon completion of the training.

305. Remedial training.

a. A repair station should have procedures to determine when individuals require remedial training, and to develop appropriate remedial training programs. The repair station should have procedures to rectify any training deficiencies as soon as possible. In some instances, remedial training may consist of an appropriate person reviewing procedures with another individual through on-the-job training (OJT). Remedial training should be designed to fix an immediate problem and may focus on one individual.

b. Successful remedial training courses of study should show an individual what happened, why it happened, and how to prevent it from happening again in a positive manner. Remedial training should not be punitive.

NOTE: A repair station's training program may incorporate training that may be specialized or remedial in nature into its initial or recurrent courses of study.

CHAPTER 4. TRAINING PROGRAM BASIC COMPONENTS

400. General.

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

(1) **Needs assessment.** The repair station should have well-defined processes for identifying its overall training requirements and assessing each individual's capabilities. The procedures should include the following:

- Determination of who needs training and what type of training,
- Reassessment when changes occur at the repair station,
- Ongoing review to ensure that training meets all the repair station's needs,
- Evaluation of all new employees to determine their initial capability and training requirements,
- Assessment of current repair station employees when they are assigned new job functions to determine their training requirements, and
- Analysis of data from voluntary reporting systems, internal evaluations, or repair station rework after deliveries.

(2) **Course definition.** The training program should include procedures the repair station will use to design each course of study, and individual courses. This includes defining the specific purpose and objectives of a given course of study, the prerequisites, the required courses, the hour requirements, and the desired outcome. The course definition should include a detailed description of what technical information or skill is obtained by the course.

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

(4) **Measurement of effectiveness.** The training program should include a process to continually measure the effectiveness of the overall training program and individual training courses. This is an essential process if the continual review of training needs is to be useful.

(5) **Training documentation.** The repair station should have procedures to document each individual's training. This includes a system for creating, accessing, and retaining training records.

(6) **Interfaces.** The repair station should include a description of how its training program affects other repair station functions.

b. Each repair station's procedures addressing the above elements will vary in terms of complexity and scope and should fit the repair station's capabilities. Therefore, training programs may range from relatively small and simple programs to large and complex programs.

401. Needs assessment.

The repair station's needs assessment procedures should ensure the repair station can identify all of its training requirements and the capability of its employees. Each repair station's procedures to conduct its needs assessment will be based on its size, complexity, and scope of operations.

The repair station should have a basic standard that establishes employee training needs by the employee's type of responsibility and job function and employee's specific needs.

a. Needs assessment for overall training requirements.

(1) The program description should include the processes the repair station will use to continually identify its training requirements to ensure each individual assigned to perform maintenance, preventive maintenance, alterations, or inspection functions is capable of performing the job function. The training needs assessment normally is based on an analysis of the repair station's positions and job functions as detailed in position descriptions, followed by identification of what knowledge and skills are required to successfully fill that position. In addition, when determining its training requirements, a repair station should analyze the nature of its business structure and its customers. The following table will affect how the repair station complies with the regulations and structures its training:

TABLE 1. WORK SCOPE AND REQUIREMENTS

Type of Work	Special Requirements
Work accomplished for a customer operating under part 121 and part 135 operators with a Continuous Airworthiness Maintenance Program (CAMP)	There are a number of special requirements that must be included in the repair station training program to meet the regulatory requirements for this type of work. These special requirements relate to understanding the air carrier's maintenance and inspection programs, including the proper technical data and the appropriate records to be kept. Repair station procedures should describe the process for ensuring that the training needs that are identified are complete and that all the required training is completed and recorded before the repair station accomplishes work for the air carrier. Although the content of this type of training is the responsibility of the operator, the repair station and the operator are responsible for ensuring that the individuals doing the work received the training and that the training records are accurate and complete.
Work accomplished for a customer operating under part 125	The repair station must do all work of this type in accordance with the operator's FAA-approved inspection program. Understanding those requirements and providing the needed training to personnel accomplishing such work is a critical repair station responsibility.
Work accomplished for a foreign air carrier or foreign person operating a U.S.-registered aircraft under part 129.14	These part 129.14 operators must have an FAA-approved maintenance program, and the repair station must follow that program including all procedures described in the operator's manual and all recordkeeping requirements.
Work accomplished through fourth-party maintenance providers	If the repair station uses temporary individuals during periods of heavy workload, it should have procedures to ensure these individuals receive the appropriate repair station and/or operator training before beginning work. The repair station should include a way to validate the individual's certifications and prior training and evaluate each individual's capability and training needs. The procedures also should include an assessment of the individual's work. The repair station should document each individual's capability and training in its system.

(2) When identifying overall training needs, the repair station may want to consider—

(a) The experience and previous training of new employees;

- (b) The transfer or promotion of employees who will be assigned new tasks;
- (c) The return of an employee to a certain task assignment when that employee has not performed that task for an extended period;
- (d) The assignment of an employee to use new equipment or accomplish a new type of work; and
- (e) 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 specific work. Based on the outcome of its training needs assessment, the repair station will develop and revise its individual courses of study and/or courses. The training needs assessment should identify the requirements for initial and recurrent training. Additionally, if specialized or remedial training are necessary, the repair station may develop courses of study for incorporation into its initial and recurrent training requirements. Based on its needs assessment, the repair station will determine the training needs of its employees.

b. Employee needs assessment.

(1) It is essential that the repair station have a procedure to evaluate the current capability of its repair station employees, technical and nontechnical. Once an employee's capabilities have been assessed, employee specific training needs may be identified. Some of the methods available to evaluate employee capability are listed in the following table.

TABLE 2. CAPABILITIES EVALUATION

Method for Evaluation Capability	Usefulness of Method
Formal examination	This is an effective method for assessing knowledge, but not necessarily an individual's ability to apply knowledge to a typical working situation.
Certificate	A certification of qualifications from a credible source, if the qualification is directly applicable, can be a measure of an individual's knowledge. This method does not assess the individual's ability to apply that knowledge.
Completion of a training course	This may be of limited value unless there is some verification through testing or demonstration that the course objectives were realized with a given individual. Also, successful completion of a training course does not necessarily translate into the ability to apply knowledge or skills.
On-the-job assessment	This is an effective way to determine an individual's capability; however, the assessment depends heavily on the skills of the individual accomplishing the assessment.
Oral examination in the working environment	This is an effective way to assess an individual's knowledge and ability to apply that knowledge. However, it depends quite heavily on the skills of the individual conducting the examination.

(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 skill level and qualifications for each job function and assigned task, and then establish methods to compare an individual's capability to those requirements. 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. In the alternative, a repair station could accept certificates from previous training by manufacturers, associations, or military records. The repair station should have procedures to—

- Ensure this assessment is documented in the individual's training records;
- Ensure the individual conducting the assessment is trained and qualified to conduct the assessment; and
- Monitor the individual to ensure capability of performing the tasks consistently at an acceptable level.

NOTE: EASA and many repair stations located outside the United States use the term competency. The FAA uses the term capability. These terms should be considered synonymous for the training program and as used in this AC.

402. Course of study definition.

Once the repair station identifies its training requirements, including the individuals who need the training and the type of training required, a repair station should define the courses of study it needs, what subjects should be included in a course of study or individual course, and what level of treatment is appropriate, such as introductory or advanced. The processes to accomplish this should take into account the job tasks to be performed and the level of experience of the individuals to be trained. The course of study and individual course definition should define the course of study, course objectives, and expected capability level at completion. This is where the repair station should begin developing each individual course of study and determining what it should cover.

403. Identifying the training method.

a. Once the repair station defines its required courses of study and individual courses, it should identify the methods available to deliver the training, such as classroom or computer-based training (CBT). At this time the repair station also should identify the best method to administer 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. The repair station can also send individuals to industry seminars and conferences to obtain training related to information about new techniques or equipment. To control costs, repair stations could share the costs of in-house training with other similarly situated repair stations. A repair station may also want to work with an aviation maintenance technician school to develop courses. AMTS and repair stations may enter into reciprocal agreements.

b. The following is a brief overview of the different training methods commonly used for maintenance training:

(1) **Formal classroom instruction.** Training can be structured as a formal course delivered by an instructor in a classroom setting. The value of this delivery method depends on the objectives and subject matter of the training. Developing or improving knowledge usually is best suited for the classroom environment. The interaction of students with their instructor is very important for certain types of information to be transferred. Consequently, a classroom type of discussion is important. A classroom course can also involve demonstration devices, video, and graphics.

(2) **On the job training (OJT).** At the other end of the spectrum from a classroom training session is OJT. OJT is a process of learning while watching another demonstrate a task and then accomplishing the same task under that individual's supervision. It is a very effective method of training for subject matter and tasks that are difficult to understand if described, but relatively easy to understand while observing the task being performed. Practical skills are best taught using OJT. The drawback of OJT is that it is difficult to standardize the training process and results because OJT depends heavily on the capability of the instructor. Even with a very capable instructor, the repair station should ensure any OJT is well-structured to ensure all the key elements of the training are included and treated the same way from one instructional period to another.

OJT is usually the most appropriate training method when—

- The trainees already have prerequisite knowledge and skills and do not need detailed explanations or lengthy discussions;
- The target skill or knowledge can only be taught or are best learned in an actual work environment;
- The work environment cannot be reasonably simulated or replicated in the classroom or with CBT devices;
- The training process very closely matches the actual tasks that would be performed;
- OJT best matches the needs and constraints of the repair station in terms of scheduling, costs, and human resources;
- There are documented course outlines, measures of effectiveness, and training records;
- There are qualified instructors readily available. Having well-qualified OJT instructors is essential for OJT to be effective. The instructors should be thoroughly familiar with the knowledge, skills, and objectives of the training and also should be capable instructors. It is not enough for an instructor to be technically qualified; an instructor also should be able to impart that knowledge and/or skill to another. The repair station should have a process to verify that its OJT instructors are qualified and the quality of the OJT instruction is acceptable. The FAA normally will not mandate the repair station's OJT instructor qualifications; however, the FAA expects the repair station to have a logical process for selecting and monitoring its instructors.

(3) **CBT.** Interactive CBT courses are typically used by repair stations to impart knowledge and teach practical skills because such courses facilitate progress at the correct pace

for each trainee. CBT can be accomplished at any location at times that are convenient for each student. Some questions can be anticipated and responses made available; however, many questions will not have available answers.

(4) Distance learning. Distance learning is a general term that applies to a situation where the instructor and the students 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 students to interact with an instructor or with courseware similar to CBT.

The advantage of distance learning courses 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 interrupted because of technical difficulties, and the interaction of students tends to be inhibited. Distance learning, like all training delivery options, is effective for some types of courses and not as good for others.

(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 appropriate when—

- The trainee 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 trainee’s performance and to record that training has taken place.

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. Once the repair station designs its course and chooses its delivery methods, it may want to validate the design, delivery method, and source before conducting the first class. The repair station also may validate its course when it is first taught.

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 usually provide training for customers and make it available for those that perform maintenance on their equipment. OEMs may have formal classroom instruction or CBT material for individual review in-house. In some cases, an OEM instructor might be willing to come to a repair station to conduct training on-site. 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 the trainees have the prerequisite training and/or experience for the course to be effective. Also, the repair station should verify that 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 should be supplemented by information unique to the repair station's tasks and equipment.

(3) **Operators or other repair stations.** Operators and other repair stations, particularly the larger ones, generally will have training programs and may be willing to provide training to others under a contract. For operators who are repair station customers, some of the training, for example required inspection items, must cover the operator's program and would best be taught by the operator. Other general training, such as basic regulatory requirements, may also be provided by the operator. Repair stations that have a training department and a well-structured program may be another source of training for a smaller repair station. However, the smaller repair station remains responsible for ensuring the training meets its needs.

(4) **Government agencies.** Government agencies can 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.** There are a variety of other training sources including seminars, product demonstrations, computer based instructions, videos, and equipment manufacturers, etc.

c. No matter what the source of the training, the repair station remains responsible for the administration adequacy and currency of its training program and the maintenance of training records. The repair station also is responsible for ensuring any changes to the training program procedures receive FAA approval.

405. Selecting instructors.

All instructors for any type of repair station training given by any source should be qualified by the repair station to instruct. The repair station should set basic criteria that would apply to any instructor, whether a repair station employee, someone hired temporarily, or an instructor provided by an outside training source. The repair station should have a specific procedure in place for selecting and evaluating its instructors. When developing the criteria for its instructors, the repair station should use the following:

- Appropriate aviation background such as formal training and experience,
- Relevant certifications,
- Subject matter knowledge, and
- Demonstrated teaching ability.

406. Measuring training effectiveness.

a. It is essential that the training program 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.

b. The repair station process to measure the effectiveness of training should be linked to the process for defining and updating training requirements. The FAA may accomplish spot checks of training in progress and review course of study material.

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 that have as their root cause improper training or a lack of training;

(3) Outside audits by the Department of Defense, the FAA, customers, or others that point to weaknesses in the training;

(4) Complaints or suggestions from employees related to training; and

(5) Internal quality assurance audits, or audits as part of an internal evaluation program.

407. Training documentation.

a. The repair station must document, in a format acceptable to the FAA, the individual employee training required under part 145.163(a). The capability of each employee depends on recent training, historical training, certifications, and experience. Consequently, the determination by the repair station that an employee assignment meets the intent of this regulation requires an analysis of all the factors that contribute to employee capability. The data to accomplish this analysis should be found in the employee's personnel records, part of which are training records.

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 functions. However, each training record should contain at least copies of:

(1) The employee's name and job function,

(2) Needs assessment findings, including total hours of indoctrination, initial, and other training required and course titles,

(3) FAA certificates,

(4) Other certifications, diplomas, and degrees,

(5) Authorizations and qualifications,

(6) Proof of training course completion, if provided,

(7) List of accomplished training, to include:

- Course title
- Date completed
- Test results
- Total hours of training, this course
- Location of training
- Name and signature of instructor
- Signature of employee

(8) Other relevant documentation.

c. The FAA will approve the process the repair station uses to determine training needs, and as part of that approval the FAA may review what information is available to the repair station in support of that process. As part of its surveillance, FAA inspectors may review samples of personnel records relevant to the training program. All records that are the basis of determining training requirements as well as those that document accomplishment of training conducted by the repair station should be retained for a minimum of two years. The repair station should have procedures to regularly review all training records. The repair station also should allow its employees to regularly review their own training records.

408. Interfaces with the training program.

a. Section 145.163(b) requires that the repair station ensure that any employee assigned to a task is qualified to accomplish that task. One of the measures of qualification is the training an employee receives. When supervisors or managers assign a task, they should have a procedure to verify the training and experience of the individual assigned. Consequently, the repair station should clearly define the interfaces between the training records and the maintenance planning process in its description of the training program.

b. The training records and other personnel records that are indicators of capability to perform specific tasks are also an essential source of information for the training needs assessment process, a basic element of the training program. The interface between that needs assessment process and the capability records (including training records) should be defined in the training program documentation.

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 any personnel who hold a certificate issued under 14 CFR part 65. However, the standards of capability for individuals approving an article for return to service are otherwise the same. Also, the technical knowledge, skills, and abilities of those performing maintenance should be no different for mechanics, inspectors, supervisors, or managers, regardless of where the repair station is located. Consequently, the FAA expects these repair stations to have training programs that include the same basic elements as for repair stations located within the United States, including a comprehensive needs assessment.

b. When conducting the training needs assessment, the repair station should place special emphasis on an individual's ability to read, write, and understand the English language. All documents and records related to employee training must be in English.

c. Repair stations located outside the United States that hold an approval under EASA, or other form of approval or certificate from a civil aviation authority, may already have a formal training program that satisfies the requirements of part 145. In some cases, these programs might exceed U.S. requirements. For example, there are certain countries and/or authorities that require knowledge of human factors. Such additional requirements will not interfere with an FAA approval of the training program as long as the program also meets all of the U.S. requirements. Consequently, a repair station located outside the United States does not have to maintain multiple programs. However, the training program must be FAA-approved.

410. Content of course of study.

a. Each individual repair station should develop courses of study for each category of employee. Each course of study should include a list of courses for that course of study, including the total number of hours of instruction, objectives, and desired outcome for that course of study. Each course under a course of study should include additional details such as the following items, as appropriate:

(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) The course objectives and desired outcome,

(3) The training source,

(4) The training method,

(5) A course outline. The outline should identify any individual course modules,

(6) Required hours of instruction for completion of the course,

(7) The method to measure the capability of the individual to determine successful course completion,

(8) Copies of training forms and records to be used for recording student progress and the completion of training, and

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

b. The FAA will not approve the courses of study, course outlines, hours of instruction, or the material taught in each course.

CHAPTER 5. ADMINISTRATIVE INFORMATION

500. How to obtain this and other FAA publications.

a. AC 00.2-14, *Advisory Circular Checklist and Status of Other FAA Publications*, contains a listing of all ACs. AC 00-44, *Status of Federal Aviation Regulations*, contains a listing of the 14 CFR and current prices. You can also obtain a copy of current regulations online at <http://www.faa.gov/regulations/index.cfm>. You can obtain the 14 CFR and ACs for which there is a fee from the following address:

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

b. To be placed on our mailing list of free ACs, contact:

U.S. Department of Transportation
Subsequent Distribution Office
SVC-121.23
Ardmore East Business Center
3341Q 75th Avenue
Landover, MD 20785

c. Our Web site is located at www.faa.gov.

501. Requests for information.

For further information on this AC, contact Herbert E. Daniel, AFS-340 General Aviation Repair Station Branch, Aircraft Maintenance Division, 202-267-3109, Herbert.E.Daniel@faa.gov.

James J. Ballough
Director, Flight Standards Service

APPENDIX 1. SAMPLE TRAINING PROGRAM LARGE/MEDIUM SIZE REPAIR STATION

INTRODUCTION

This appendix provides a sample repair station training program for a large/medium size repair station. This example is consistent with the guidance provided in this advisory circular (AC). This appendix also provides a sample training plan. Each training program, must be approved by the Federal Aviation Administration (FAA). A repair station does not have to follow this sample to have its training program approved. Individual repair station training programs may require additional information not included here. 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 than is presented here. This sample program emphasizes the process, procedures, and standards that a repair station should use. It does not set minimum limits or prescribe what the end results of any planning or analysis would be. For example, it does not describe the details of the courses 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 will not be included in the repair station's written training program document. For example, the AC states that the repair station should establish methods to assess an individual's skill level for each job function. This process is not included in the training program. Once the process is established, the training program document will simply describe the execution of that process.

The following sample training program contains notes for areas in which repair stations should provide further information. These notes are identified by brackets and italics in the text.

SAMPLE TRAINING PROGRAM DOCUMENT

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 document contains the policies and procedures ABC uses to determine its training requirements and develop its training program. ABC is responsible for ensuring each of its repair station employees is properly trained to perform individual job functions, ensuring ABC can respond to its changing training needs. This plan identifies the procedures for ABC to identify its training needs in a systematic manner, develop training and/or identify appropriate existing training, select the best training methods, provide training, record training accomplishment, and measure the effectiveness of that training.

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 all training requirements are identified, 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,
- 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, and
- Measurement of effectiveness to continually review the training program and 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 to make fundamental changes to how ABC designs and carries out its training program. However, changes to the training program will be FAA-approved in accordance with previously identified procedures.

SECTION 1. BACKGROUND

ABC has an established training program that includes indoctrination, initial, recurrent, specialized, and remedial training courses of study for all of its employees. ABC has separate courses of study for the following staffing categories: technicians, inspectors, managers and supervisors, and 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 requirements for all of its job functions and methods to assess an individual's skill level for each job function to determine training requirements.

The procedures in this plan 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.

The Director of Training maintains ABC's training program database.

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.

200. Overall Repair Station Needs Assessment.

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 functions; customer requirements; past, current, and expected scope of work; and prior employee experience levels. The procedures in ABC's document and the guidance in AC 145-RSTP, Repair Station Training Program, help to determine the indoctrination, initial, recurrent, and specialized training requirements for each job function. These training requirements are met through a course of study to determine that each individual is able to perform the job function. This needs-assessment will not result in a list of course requirements, but in a description of the knowledge and skill each employee must have for a job function. The courses of study and individual courses are developed in accordance with section 3.

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

- It identifies training deficiencies;
- It makes significant changes to its work scope or has plans to make such changes;
- The annual training program review indicates changes are needed.

a. Identification of Training Deficiencies.

ABC may identify training deficiencies through—

- 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 or supervisors; or
- The results from audits related to maintenance human factors.

The Director of Training ensures the Training Department regularly reviews the results and reports of the above programs and translates them into potential training deficiencies. The Director of Training maintains the training program database and assigns an analyst to review any deficiencies in the training program database. The training program analyst categorizes the deficiency based on individual assessment, and determines what action should be taken. This could include changes to existing courses of study, or the development of new recurrent or remedial training courses. The training program analyst provides the results of the analysis to the Director of Training. The Director of Training reviews the results of the analysis with the manager of the technical areas affected and determines the appropriate action, such as development of remedial training or revision to existing training. If the Director of Training and the manager of the affected area determine that immediate action must be taken to correct the deficiency, the Director of Training notifies the Accountable Manager for approval to take such action. If immediate action is not necessary, the Director of Training will ensure the appropriate action is taken to revise the training program in a timely manner.

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 Director of Training must ensure the Training Department conducts a review of ABC's training needs before any changes are implemented. The Training Department will identify any requirements for new training based on an analysis of the work to be performed and through interviews with the managers of the affected areas. The Director of Training will ensure the Training Department identifies any required revisions to existing initial, recurrent, and specialized training courses of study, including revisions to existing courses or the addition of new courses, the desired outcome of the training, who requires the training, and when the new training requirements need to be implemented and completed. The Director of Training will coordinate all training requirements based on changes to the repair station's scope of work with the Accountable Manager. The Director of Training will ensure the results of this analysis are entered into the training program database for tracking.

For changes to ABC's capability list, the Director of Training will review the results of the self-evaluation (required by ABC's RMS) that apply to training requirements and identify changes in training needs.

c. Annual Training Program Review.

The Director of Training annually will review ABC's training needs. To conduct this review, the Director of Training will review the current training program courses of study, verify if ABC has made any changes to its work that might affect training, and analyze the measures of training effectiveness. The primary sources of those measures are listed above as sources of training deficiencies. The Director of Training will work with the managers of affected areas when reviewing the training requirements.

As a part of this annual review, the Training Department staff will analyze the method of delivery for various courses, identify possible new training techniques or commercially available courses, and make recommendations for changes to the content or training methods to improve ABC's training program. The Director of Training will document the annual training needs assessment in the Annual Training Requirements Report, which is provided to the Accountable Manager, the Managers of the affected areas, and ABC's FAA principal inspector (PI).

201. Individual Needs Assessment.

ABC has established skill levels and qualifications for each of its employee's job functions. In addition, ABC has developed methods to test an individual's skill level for each job function and has determined what previous training may be accepted to establish qualifications and skill level. Depending on the job function and skill requirements, ABC may accept previous employer training certifications or use a formal written examination, an on-the-job assessment, or other appropriate means.

Whenever ABC hires a new employee or transfers an employee to a new job function, the employee's new supervisor is responsible for assessing the individual's skill level and qualifications. Each supervisor will work with the Training Department as necessary to establish the individual's skill level. 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 also will 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 new courses of study, revise existing courses of study, or revise individual courses based on the results of a training needs assessment. To accomplish this, a training program analyst will work with supervisors and managers in the various technical areas to further refine any training requirements. During this time, these individuals will identify specific training courses of study, individual courses, goals, objectives, and the individuals who require the training. They also will identify what technical skill and knowledge the course is intended to teach beginning, intermediate, or advanced material, and how ABC will test for the desired outcome. They will establish the prerequisites for the course, such as previous training, experience, and certifications, and establish objective measures to determine whether an individual meets that skill level. They will determine when the training should take place, for example, if the training will be recurrent, or if it will be completed before a certain date.

During this phase, the training program analyst, supervisors, and managers also will develop a course of study or course description, and appropriate course outline. The course outlines will include the individual subject matter to be taught and an estimate of the time required to teach that subject matter. The course outline may break the course into individual modules, if necessary. They also will tentatively identify instructor qualifications such as relevant experience, background, and certifications.

While defining the course of study or individual course, the training program analyst will create or update the course of study file and/or individual course files and include at least the following information for each course of study and course, as appropriate:

Course of Study:

- a. Total required course of study hours or performance outcome,
- b. Staffing category,
- c. Job function.

(1) **Course Title to include:**

- Objectives,
- Required hours or performance outcome,
- Prerequisites,
- Training source,
- Training method,
- Instructor,
- Instructor qualifications,
- Method of evaluation,
- Course outline, and
- Other supporting information, as available such as instructor guides and courseware.

(2) **Course Title to include:**

- Objectives,
- Required hours or performance outcome,
- Prerequisites,
- Training source,
- Training method,
- Instructor,
- Instructor qualifications,
- Method of evaluation,
- Course outline, and
- Other supporting information, as available such as instructor guides and courseware.

SECTION 4. SELECTION OF TRAINING METHODS AND SOURCES

Using the information developed during the course definition phase, the training program analyst will determine the appropriate training method, source, and instructor.

400. Training Methods.

When determining the appropriate training method, the training program analyst will take into account the type of course and material to be presented, who will receive the training, and how best to present the material. ABC uses the following methods to train its employees, appropriate to the material to be presented:

- Formal classroom training.
- On-the-job training (OJT).
- Computer-based training (CBT).
- Embedded training.

The training program analyst will work with supervisors and managers, as necessary, to determine the appropriate method to present the material. In many instances, the training program analyst will determine what source to be used concurrently with determining the training method. The training program analyst will update the course file as appropriate when selecting the training method.

401. Training Sources.

The Training Department will continually monitor the sources available for training to ensure ABC is using new training techniques and delivery sources. When a new or revised training need is identified, the training program analyst will review the available options. This process may also include consultation with the FAA PI, other repair stations, manufacturers, and local colleges for available training. In most instances, the selection of a training source is tied to the selection of a training method.

If the training will be conducted by an outside vendor, the Training Department, in coordination with the Quality Department, will conduct an audit of the training source. 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 Manager of Training will work with the Quality Manager to determine what type of audit the Training Department will conduct based on an informal risk assessment related to the criticality of the training, experience, and reputation of the provider. The Director of Training will provide audit results to the Quality Manager. The Quality Manager will ensure ABC audits the training vendor on a regular basis in accordance with the audit procedures in the RSM. The Quality Manager also will ensure all subsequent audit results for all training vendors are provided to the Manager of Training for review.

For training ABC will conduct in-house, the training program analyst will work with the supervisors and manager of the technical areas to review the course outline and identify qualified, available instructors. When selecting instructors, the training program analyst will review the instructor qualifications and determine the proposed instructor's subject matter knowledge and demonstrated teaching ability. The instructor's teaching ability is critical if the training will be conducted as OJT. Any potential instructor deficiencies will be discussed with the supervisor or manager of the technical area where the training is needed. All deficiencies must be corrected before the start of training.

Once the training source is selected, the training program analyst will update the course file.

SECTION 5. TRAINING DOCUMENTATION

The Director of Training is responsible for ensuring complete training records are generated and maintained by the Training Department for all ABC employees. The Training Department maintains an electronic summary of all training provided. The electronic reports 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 hours, the date it was given, the instructor, the location, and any grade achieved on an associated examination. All hard copies of documents showing proof of any of the above are maintained by the human resources department in the employee's personnel file. The Training Department does not maintain any hard copy training records. ABC will make all employee training records available to the FAA for review upon request.

For training conducted by outside vendors, the Training Department reviews the vendor's training records and audits them against the training contract. The Training Department updates an individual's electronic training summary and forwards any hard copies to the human resources department for filing. The human resources department maintains the individual training records for as long as an employee is employed at ABC and for two years thereafter.

The Training Department audits its electronic training summary on an annual basis. To conduct this audit, the Training Department will provide each employee with a hard copy printout of the individual's electronic summary report to review. Each employee is responsible for reviewing the summary, noting any inaccuracies on the summary, signing and dating it, and returning it to the Training Department by the appropriate date. The Training Department will investigate all inaccuracies noted by employees and update the training summary as necessary. The training program analyst reviewing the report and updating the summary will document the review by signing and dating the hard copy printout and, after all discrepancies are resolved, forward the hard copy printout to the human resources department. They will file the hard copy report with the individual's personnel records and maintain it for at least two years. The Training Department also will annually audit a sample of electronic summaries against the hard copy files and correct any deficiencies. The Training Department will document this review in the individual's summary report.

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 from students and the FAA.

600. Course Evaluation.

At the completion of each course, including OJT, each student will complete a course evaluation to assess the training, including the course content and materials, length of course, method and source of instruction, and instructor.

The evaluation will be returned to the Training Department, where a training program analyst will review each evaluation and analyze the course feedback as a whole to provide the Director of Training with information on each course. The Director of Training will review the course feedback and take appropriate action to remedy any problems. The evaluation forms and analysis will be maintained with the course file for at least two years.

601. Course Observation.

The Director of Training will ensure the Training Department observes and evaluates all courses, including OJT, and instructors on a regular basis. The Training Department evaluator will use a standardized evaluation form to evaluate the course and instructor and provide feedback to the Director of Training, who will ensure appropriate action is taken in a timely manner to rectify any problems.

The Director of Training also will ensure the FAA is provided access to observe any training course upon request.

602. Audits and Evaluations.

The Director of Training will coordinate with the Quality Department to ensure ABC audits all outside training vendors and in-house training courses on a regular basis. 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 also will coordinate with ABC's Internal Evaluation Program (IEP) office to ensure the Training Department receives regular IEP evaluations. The Director of Training will work with the IEP office to take any corrective action.

603. Annual Review.

The Director of Training will ensure the training program is reviewed on an annual basis as described in paragraph 200c.

604. Student Examinations.

During the course design, ABC developed a method to evaluate each student's performance for that course. This could include written or oral examinations or manipulative skill tests. On an annual basis, the Training Department will review the results of all course examinations and analyze them to determine if any changes are required. The Director of Training will ensure any necessary changes to examinations are made.

SECTION 7. REVISION PROCESS

The process for submitting changes is described in ABCs RSM.

SECTION 8. WORK PERFORMED FOR PART 121 AND PART 135 OPERATORS

ABC performs work for certain Title 14 of the Code of Federal Regulations (14 CFR) part 121 and part 135 operators. Each operator provides training to ABC employees on specific procedures unique to the operator. 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. Training Department personnel are responsible for recording all operator training in the individual's training records as described in section 5.

Before ABC begins work for a new part 121 or part 135 operator, the Director of Training must ensure ABC conducts a training needs assessment in accordance with paragraph 200 to determine additional training requirements.

SECTION 9. WORK PERFORMED BY FOURTH PARTY MAINTENANCE PROVIDERS

During periods of heavy workload, ABC may supplement its workforce with fourth party maintenance providers. Before these individuals begin work for ABC, they must undergo a needs assessment. Training requirements are determined in accordance with section 2. 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 scheduled for and complete training before they are required to begin work. Individuals must receive all training for the job function they will be performing.

The Training Department must keep training records for all individuals and record their training in accordance with the procedures in section 5. The Training Department must retain these records for at least two years.

SECTION 10. SAMPLE TRAINING PLAN

The repair station determines and revises its specific training requirements using the procedures in its FAA approved training program. The sample information presented below is developed using the procedures in the training program and is considered the outcome. This section illustrates the possible outcome of a needs assessment.

NOTE: The staffing categories, experience levels, courses, and hourly requirements used below are for sample purposes only. Each repair station will divide its employees into categories appropriate for its operation. In addition, the table MUST NOT be interpreted as providing minimum hourly requirements or course requirements. Each repair station's training requirements will be different and will be based on its size and complexity. For example, a small repair station's training program requirements may be significantly less than a large repair station's.

The table below is an example of minimum required training hours for a mechanic to learn to perform a specific job function. The repair station has performed an employee needs assessment

and established the training hours required for each course of study. Column A describes the repair station's minimum training requirement for new hire personnel with no prior or only minimum aviation/repair station experience or training. Column B describes the training requirements of a new hire or current employee with previous aviation/repair station experience or training. A repair station may have similar tables for each job function based on skill, training and experience, not all job functions will have the same training requirements.

TABLE 1. REPAIR STATION MECHANIC - JOB FUNCTION

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
Indoctrination Training		
Company organization	4	4
Policies, procedures, manuals, computer system	4	2
Repair station maintenance functions including OpSpecs and capability list	4	2
Regulatory requirements	4	2
Quality control (QC) process	2	2
Safety	2	2
Facility security	1	1
Maintenance Human Factors	4	2
Insert operator specific courses		
TOTAL	25	17
Initial Training		
Ground support equipment	4	2
Tools and test equipment	2	2
Materials and parts	2	2
Records and recordkeeping requirements	4	4
Special customer Requirements (e.g., RII)	4	2
OSHA and EPA requirements	2	2

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
Hazardous materials	2	2
Shop safety	2	2
Maintenance Human Factors	4	2
Insert specific job function training courses, including operator specific training		
TOTAL	26	20
Recurrent Training		
RSM and QCM changes	2	2
Regulatory changes	2	2
Inspection Procedures	2	2
New procedures or technology	2	2
New customer requirements	2	2
Maintenance Human Factors	2	2
Insert specific job function refresher training, including operator-specific courses		
TOTAL	12	12
Specialized Training		
Management techniques	4	1
Non-destructive Inspection (NDI)	4	4
Composite repairs	8	4
Corrosion control	4	2
Major/minor repairs	4	2
Insert specific job function specialized training, including operator-specific courses		

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
	24	13
Remedial Training (as needed)		
Insert remedial training course as necessary		

APPENDIX 2. SAMPLE TRAINING PROGRAM SMALL SIZE REPAIR STATION

INTRODUCTION

This appendix provides an example of a repair station training program for a small repair station (three technical and one support person) that is consistent with the guidance provided in this advisory circular (AC). Each training program, such as the example shown in this appendix, must be approved by the Federal Aviation Administration (FAA) in accordance with Title 14 of the Code of Federal Regulations (14 CFR) part 145.163.

A repair station does not have to follow this sample for FAA approval. Individual training programs may require additional information not included here. 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 should 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. These notes are identified by brackets and italics in the text.

SAMPLE TRAINING PLAN

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 training program. ABC is responsible for ensuring each of its repair station employees is properly trained to perform individual job functions, ensuring ABC can respond to its changing training needs. This plan identifies the procedures for ABC to identify its training needs in a systematic manner, develop training and/or identify appropriate existing training, select the best training methods, provide training, record training accomplishment, and measure the effectiveness of that training.

ABC controls this document in accordance with the procedures for document and revision 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).

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, and
- Measurement of effectiveness to continually review the training program, and make changes as necessary.

SECTION 1. BACKGROUND

ABC has an established training program that includes indoctrination, initial, recurrent, specialized, and remedial training courses of study for all of its employees. The procedures in this plan enable ABC to revise its existing training program to ensure it meets ABC's needs, and produces training consistent with all regulatory requirements.

The Accountable Manager is responsible for ensuring a training program information system is maintained. The Assistant to the Manager maintains the system in paper form as a series of file folders stored in a fire-resistant filing cabinet. It contains files for recording training analysis results, administrative decisions, records of meetings related to training, and individual personnel training records.

All of the information in this file 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.

200. Overall Repair Station Needs Assessment.

To determine its overall training requirements, the Accountable Manager and all technicians meet bi-annually to review the types of work being performed and planned, and to 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; past, current, and expected scope of work; and prior relevant experience of each technician.

This general needs assessment will not result in a list of course requirements, but only in a description of the knowledge and skill each employee must have for their job function in relation to the planned repair station work.

The results of that meeting are recorded in a brief summary report, and filed in the training program file. The most recent meeting report and the two previous such reports are maintained in the file. One result of this meeting will be to establish and revise, as necessary, 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 individual in relation to specific tasks to be performed, based on input from any employee. In addition there are three events that trigger a specific review and analysis of training needs. ABC will specifically revise its training program when—

- Training deficiencies are identified;
- Significant changes are made to its work scope, or such changes are planned; or
- The annual training program review indicates changes are needed.

a. Identification of Training Deficiencies.

ABC may identify training deficiencies through—

- 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 or supervisors; or
- The results from audits related to maintenance human factors.

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, until the required training is successfully completed, the work performed by the individual requiring additional training will not affect the quality of ABC's work. This will be accomplished through additional supervision or by 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 training needs have been identified and met before any changes are implemented. For changes to ABC's capability list, the Accountable Manager will review the results of the self-audit (required by ABC's RSM) that apply to training requirements and identify changes in training needs.

c. Annual Training Program Review.

The Accountable Manager annually will review ABC's training needs. This review will examine the current training program courses of study, verify if ABC has made any changes to its work that might effect training, and analyze the measures of training effectiveness. The Accountable Manager will work with the entire repair station staff when reviewing the training requirements. The Accountable Manager will document the annual training needs assessment in a report that is filed with the training program records, as described above.

201. Individual Needs Assessment.

Whenever ABC hires a new employee or transfers an employee to a new job function, the Accountable Manager is responsible for assessing an individual's skill level and qualifications. Depending on the job function and skill requirements, ABC may accept previous employer training certifications, use a formal written examination, an on-the-job assessment, or other appropriate means to determine if any additional training is required to perform the anticipated assigned tasks.

SECTION 3. COURSE DEFINITION

The Accountable Manager (or technical staff delegated by the Accountable Manager) will define any new courses of study and/or identify how existing courses of study need to be revised, based on the results of a training needs assessment. The Accountable Manager will consider the prerequisites for the course, such as previous training, experience, and certifications, and establish objective measures that will allow future determination of whether an individual meets the required knowledge and skill level. The Accountable Manager will then determine when the training should take place, for example, if the training will be recurrent, or if it will be completed before a particular date.

While defining the course of study or individual course, the following information for each course of study and course should be considered, as appropriate:

Course of Study:

- a. Total required course of study hours or performance outcome.
- b. Staffing category.
- c. Job function.

(1) Course Title to include:

- Objectives,
- Required hours or performance outcome,
- Prerequisites,
- Training source,
- Training method,
- Instructor,
- Instructor qualifications,
- Method of evaluation, and
- Course outline.
- Other supporting information, as available such as instructor guides and courseware.

(2) Course Title to include

- Objectives,
- Required hours or performance outcome,
- Prerequisites,
- Training source,

- Training method,
- Instructor,
- Instructor qualifications,
- Method of evaluation,
- Course outline, and
- Other supporting information, as available such as instructor guides and courseware.

The results of this analysis are documented in the training program files.

SECTION 4. SELECTION OF TRAINING METHODS AND SOURCES

Using the information developed during the course definition phase, the individual assigned to conduct the above analysis will examine the training options considering the appropriate training method, source, and instructor.

400. Training Methods.

When determining the appropriate training method, ABC considers the following methods to train its employees, as appropriate to the presented material:

- Formal classroom training;
- On-the-job training (OJT);
- Computer-based training (CBT); and
- Embedded training.

The individual examining the options will make recommendations to the Accountable Manager, who will select the method and source of the necessary training.

401. Training Sources.

All members of the ABC staff will continuously monitor sources available for training to ensure ABC is making good use of new training techniques and delivery sources. This will be accomplished through review of trade publications, contacts with colleagues in other repair or manufacturing facilities, and participation in industry activity. This process may also include consultation with the FAA PI and local colleges for available training. In most instances, the selection of a training source is tied to the selection of a training method.

If the training is to be conducted by an outside vendor, the Accountable Manager will be responsible for ensuring one member of the staff conducts an audit of the training source. 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. In most cases, the audit will be based on contacts with previous customers of the training provider. Results of the audit will be documented in a brief memorandum filed in the administrative folder in the training program file.

For ABC training that will be conducted in-house, through OJT or classroom training session, a syllabus will be developed and a formal record of the training created. Both will be filed in the training program files.

SECTION 5. TRAINING DOCUMENTATION

The Accountable Manager will delegate to a technician the responsibility for ensuring complete training records are generated and maintained for all ABC employees. The records include a list of FAA certifications, other applicable certifications and degrees, ABC qualifications and authorizations (such as required inspection items for a given customer), and for each course completed, the total hours, the date it was given, the instructor, the location, and any grade achieved on an associated examination.

All hard copies of documents showing proof of any of the above are maintained, as well as training summary sheets will be maintained for as long an individual is an ABC employee and for two years thereafter.

Each year, all employees will review their training records to verify that they are complete and current. Any needed corrections will be the responsibility of the employee, and must be approved by the Accountable Manager.

SECTION 6. MEASUREMENT OF TRAINING EFFECTIVENESS

The Accountable Manager is responsible for ensuring all training is effective.

600. Course Evaluation.

Upon the completion of each course, including OJT, each student will complete a course evaluation memo to assess the training, including the course content and materials, length of course, method and source of instruction, and instructor. The evaluation will be returned to the Accountable Manager and filed in the training program administrative file. The evaluation forms and analysis will be maintained with the course file for at least two years.

601. Audits and Evaluations.

The Accountable Manager will ensure ABC audits all outside training vendors on a regular basis. This may be accomplished through discussions with ABC employees who have received the training, and with other trainees or supervisors with whom ABC has regular contact. The Accountable Manager will be responsible for resolving any problems identified during this process.

602. Annual Review.

The Accountable Manager will ensure the training program is reviewed on an annual basis as described in paragraph 200c.

SECTION 7. REVISION PROCESS

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

SECTION 8. WORK PERFORMED FOR PART 121 AND PART 135 OPERATORS

ABC performs work for certain part 121 and part 135 operators. Each operator provides training to ABC employees on specific procedures unique to the operator. Individual operator training requirements (initial, recurrent, or specialized) are identified for each job function. The Accountable Manager will work with each operator to schedule ABC employees for operator training, as determined during the individual's needs assessment. Training Department personnel are responsible for recording all operator training in the individual's training records as described in section 5.

Before ABC begins work for a new part 121 or part 135 operator, the Accountable Manager must ensure ABC conducts a training needs assessment in accordance with paragraph 200 to determine additional training requirements.

SAMPLE TRAINING PLAN AND NEEDS ASSESSMENT OUTCOME FOR A SMALL REPAIR STATION

The repair station determines and revises its specific training requirements using the procedures in its repair station's FAA approved training program document. The sample information presented below is developed using the procedures in the training program, and illustrates the results of a needs assessment. It is not part of the training program that must be approved by the FAA.

NOTE: The staffing categories, experience levels, courses, and hourly requirements used below are for sample purposes only. The table MUST NOT be interpreted as providing minimum hourly requirements or course requirements. Each repair station's training requirements will be different and will be based on its size and complexity.

The table below is an example of minimum required training hours for a mechanic to learn to perform a specific job function. The repair station has performed an employee needs assessment and established the training hours required for each course of study. Column A describes the repair station's minimum training requirement for new hire personnel with no prior or only minimum aviation/repair station experience or training. Column B describes the training requirements of a new hire or current employee with previous aviation/repair station experience or training. A repair station may have similar table for each job function based on skill, training and experience, not all job functions will have the same training requirements.

TABLE 1. REPAIR STATION MECHANIC - JOB FUNCTION

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
Indoctrination Training		
Company organization	4	4
Policies, procedures, manuals, computer system	4	2
Repair station maintenance functions including OpSpecs and capability list	4	2
Regulatory requirements	4	2
Quality Control process	2	2
Safety	2	2
Facility security	1	1

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
Maintenance Human Factors	4	2
Insert operator specific courses		
TOTAL	25	17
Initial Training		
Ground support equipment	4	2
Tools and test equipment	2	2
Materials and parts	2	2
Records and recordkeeping requirements	4	4
Special customer Requirements (e.g., RII)	4	2
OSHA and EPA requirements	2	2
Hazardous materials	2	2
Shop safety	2	2
Maintenance Human Factors	4	2
Insert specific job function training courses, including operator specific training		
TOTAL	26	20
Recurrent Training		
Repair station manual (RSM) and QCM changes	2	2
Regulatory changes	2	2
Inspection Procedures	2	2
New procedures or technology	2	2
New customer requirements	2	2
Maintenance Human Factors	2	2
Insert specific job function refresher		

Course of Study	Minimum Hourly Training Requirements based on Skill Level, Previous Training, and Experience	
	Repair Station Minimum Column A	Employee Requirements Minimum Column B
training, including operator-specific courses		
TOTAL	12	12
Specialized Training		
Management techniques	4	1
NDI	4	4
Composite repairs	8	4
Corrosion control	4	2
Major/minor repairs	4	2
Insert specific job function specialized training, including operator-specific courses		
	24	13
Remedial Training (as needed)		
Insert remedial training course as necessary		

APPENDIX 3. RELATED CORRESPONDENCE

FAA Documents

AC-00-46, Aviation Safety Reporting Program.

AC-0058, Voluntary Disclosure Reporting Program.

AC 120-59, Air Carrier Internal Evaluation Programs.

AC 120-66, Aviation Safety Action Programs (ASAP).

AC 120-72, Maintenance Resource Management Training.

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

Human Factors Guide for Aviation Maintenance (February 1998) <http://hfskyway.faa.gov>).

CAP 716 Aviation Maintenance Human Factors (www.caa.co.uk).

CAP 712 Aviation Maintenance Human Factors (www.caa.co.uk).

Human Factors Training (2003) (www.LTTHF.com).

Other Related Documents

UKCAA CAP 712, Safety Management System for Commercial Air Transport Operations.

ICAO Document 9824/AN450 Human Factors Guidelines-First Addition 2003.

Managing the Risks of Organizational Accidents (1997), by James Reason. Ashgate Publishing Limited.

Risk Management and Error Reduction in Aviation Maintenance (2004) by Manoj S. Patankar and James C. Taylor. Ashgate Publishing.

Applied Human Factors in Aviation Maintenance (2004) by Manoj S. Patankar and James C. Taylor. Ashgate Publishing.