Section 9 Safety Assurance System: Inspect a Part 145 Repair Station’s Tools and Equipment

6-1795 REPORTING SYSTEM(S). Use Safety Assurance System (SAS) automation and the associated Data Collection Tools (DCT).

6-1796 OBJECTIVE. This section guides the aviation safety inspector (ASI) when inspecting a repair station’s tools and equipment and system procedures to confirm compliance with the Repair Station Manual (RSM) or Quality Control Manual (QCM) and Title 14 of the Code of Federal Regulations (14 CFR) part 145, § 145.109.

6-1797 GENERAL. The repair station must provide and maintain the tools and equipment necessary to perform the maintenance, preventive maintenance, or alteration under its certificate and operations specifications (OpSpecs).

NOTE: In the remainder of this section, the ASI should refer to precision tools and test equipment which repair station personnel use to make airworthiness determinations as measuring tools and equipment (MTE).

6-1798 COORDINATION REQUIREMENTS. If the repair station has an assigned principal maintenance inspector (PMI) and a principal avionics inspector (PAI), both inspectors should coordinate this inspection.

6-1799 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 43 and 145.
- Volume 1, Chapter 3, Section 1, Safety Assurance System: Responsibilities of Aviation Safety Inspectors.
- Volume 2, Chapter 11, Certification of a Title 14 CFR Part 145 Repair Station.
- Volume 3, Chapter 15, Evaluate Avionics Test Equipment.
- Volume 6, Chapter 11, Section 17, Safety Assurance System: Inspect Avionics Test Equipment.
- Volume 10, Safety Assurance System Policy and Procedures.
- Volume 14, Chapter 1, Section 2, Flight Standards Service Compliance Action Decision Procedure.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.
B. **Forms.** None.

C. **Job Aids.** The following are available in the Flight Standards Information Management System (FSIMS):

- Nondestructive Inspection for Aviation Safety Inspectors.
- On-Line Job Aid for Evaluating a Repair Facility Conducting Composite Repairs.

**6-1800 PROCEDURES.**

A. **Review Applicable Information.** Prior to inspecting, the ASI, or the principal inspector (PI), should carefully review:

1) Parts 43 and 145.

2) The RSM or QCM.

3) Applicable OpSpecs.


5) The certificate-holding district office (CHDO) file.

B. **Review Calibration/Record.** Review the part of the RSM or QCM describing the system and the procedures used for calibrating measuring tools and equipment (MTE).

1) The ASI should verify:

   a) The repair station is calibrating MTE per intervals, procedures, and the system described in the RSM or QCM.

   b) All MTE are calibrated and traceable to a standard acceptable to the Federal Aviation Administration (FAA), to include those recommended by the manufacturer, and the National Institute of Standards and Technology (NIST) or other national authority. This requires an unbroken chain of documentation from the MTE through each intermediate standard used to the acceptable standard.

NOTE: The part 145 rule states that tooling used to make airworthiness determinations must be calibrated to a standard acceptable to the FAA. Those standards may be derived from the NIST, a standard provided by the equipment manufacturer, or other recognized standards. The International Bureau of Weights and Measures (BIPM) is a recognized authority that maintains a global list of National Metrology Institutes (NMI). The BIPM website lists the NMI signatory countries that participate in the International Committee for Weights and Measures (CIPM). The CIPM Mutual Recognition Arrangement (MRA) signatories are acceptable to the FAA and can be found at www.bipm.org.
NOTE: There are many accreditation bodies that provide third-party laboratory accreditation. The International Laboratory Accreditation Cooperation (ILAC) establishes a global network for accreditation of laboratory and testing facilities. Signatories to the ILAC MRA are in full conformance with the standards of International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17011. ILAC MRA signatories are acceptable to the FAA and can be found at www.ilac.org. Accredited laboratories have already established traceability through the assessment and accreditation process under ISO/IEC 17025. No further documentation is required once traceability is confirmed to a recognized accredited laboratory. Additionally, for foreign equipment, the standard of the country of manufacture may be used if acceptable to the Administrator.

2) The PI should consider:

a) Whether the repair station determines calibration status of new MTE before using the new tools.

b) How and when the repair station recalls MTE for calibration.

c) If the calibration and tracking system includes employee-owned MTE.

d) How the repair station establishes calibration intervals.

e) Whether the repair station maintains a list of all calibrated equipment by name, model or part number, serial number, date of calibration, and next calibration due date.

f) If the repair station keeps calibration records for at least 2 years.

g) If the repair station identifies MTE to prevent using noncalibrated equipment in the maintenance process.

h) Whether the repair station identification includes the serial number or other identification, date of last calibration, date calibration is due, and the name or initials of the person who performed the calibration.

i) Whether MTE that is not used to make airworthiness determinations is properly identified (e.g., “reference only”).

j) How the repair station performs in-house calibration of its MTE.

NOTE: The repair station must not perform maintenance with the same tools or test equipment which is used as the standard for performing calibrations.

k) During initial certification, all tools and equipment must be in place at the time of certification or rating approval for inspection by the FAA. Refer to § 145.51(b).
NOTE: A contract available for review may be acceptable to ensure that tools and equipment will be made available upon the repair station’s request, if special equipment and tools are obtained as needed per §§ 145.51(b) and 145.109.

C. Verify Use of Manufacturer’s Requirements or Equivalency. Review the part of the RSM or QCM describing the system and procedures that confirm the equipment and tools recommended by the article’s manufacturer or an equivalent acceptable to the FAA.

1) A repair station may substitute a manufacturer’s tooling with one that is its equivalent. If the repair station uses equivalent tooling, it is responsible for the determination of equivalency. The repair station must provide a means to the FAA that will demonstrate that the tool meets the manufacturer’s standards and specifications with all respects regarding tolerances and accuracy.

2) Verify that the repair station’s RSM or QCM provides procedures for ensuring the equipment and tools used in the performance of maintenance are those recommended by the article’s manufacturer or an equivalent acceptable to the FAA.

NOTE: This section does not include industry standard tools and equipment, such as wrenches or sockets, manufactured to a recognized industry standard.

3) Test and measuring equipment manufactured by a repair station as an equivalent must meet or exceed the calibration standards recommended by the manufacturer of the article being measured or tested. The special equipment or test apparatus must be capable of performing all normal tests and checking all parameters of the equipment (article) under test. The level of accuracy should be equal or better than that recommended by the manufacturer.

4) The equivalency can be made based upon an evaluation of a technical data file. The repair station will establish a technical data file for each piece of equivalent tooling. The file will contain, but is not limited to, data, drawings, specifications, instructions, photographs, templates, certificates, and reports.

5) In the case of calibration equipment, the technical data file should also include data sheets attesting to the accuracy when calibration standards are necessary, as well as any special manufacturing processes that are used, including gauges and recording equipment in the controlling process.

   a) A demonstration of the functionality of the special equipment or test apparatus may be necessary to determine its equivalency.

   b) Designated Engineering Representatives (DER) may not approve or determine equivalency of tooling and test equipment. Neither the FAA nor a DER may approve equipment or test apparatus. The FAA and DERs may only make a finding that the functional equivalency for special equipment or test apparatus is acceptable. It is important to emphasize that the repair station, not the FAA, bears the burden of demonstrating equivalency.
6) If the repair station uses a manufacturer’s test and measuring equipment as an equivalent for equipment recommended by an article’s manufacturer, verify that the equipment meets the article’s calibration standards in all respects regarding tolerances, repeatability, and accuracy. This type of calibration must be traceable to a standard acceptable to the FAA.

a) The basis of equivalency is the requirement that the article meet the manufacturer’s standards and specifications in all respects regarding tolerances, repeatability, and accuracy.

b) If calibration equipment is involved, adequacy of that calibration system shall be established with documented procedures to evaluate the adequacy of that calibration equipment and its traceability to one of the previously listed standards.

D. Inspect Control, Maintenance, and Storage. Review the RSM parts or QCM describing the system and procedures for MTE control, maintenance, use, and storage that maintains articles.

1) Verify:

a) That the repair station is following its system and procedures in the RSM or QCM for MTE control, maintenance, use, and storage that maintains articles.

b) The repair station has the MTE to perform maintenance, preventive maintenance, or alterations under its repair station certificate.

c) MTE are located on the premises and under the repair station’s control when the repair station is performing work.

2) Also consider:

a) Does the repair station have the maintenance and service manuals for all MTE the repair station uses to perform the maintenance, preventive maintenance, or alterations under its repair station certificate?

b) Does the repair station fulfill the MTE manufacturer’s requirements for control, maintenance, use, and storage?

3) If the repair station does not own the equipment or does not keep the equipment at the facility, determine:

a) How the repair station obtains the equipment, such as a lease agreement or rental.

b) How the repair station ensures the equipment is on the premises and under the repair station’s control when repair station personnel are performing work.

c) That the repair station identifies the department responsible for calibrating leased MTE.
E. **Inspect Test Cells.** Review the RSM or QCM section describing systems and procedures for test cell correlation, operation, design, and modification. Verify that:

1) The repair station is following the systems and procedures in the RSM or QCM for MTE control, maintenance, use, and storage to maintain articles.

2) The test cell conforms to the description in the RSM or QCM, to include:
   - An accurate description of systems and procedures to ensure test cell correlation, operation, design, and modification; and
   - A description of test cell design, operation, configuration, and construction and test hardware operation and performance.

3) The correlated test cell ensures articles meet minimum test requirements.

4) The repair station calibrates test cell instrumentation to a standard acceptable to the FAA.

5) When the repair station repairs makes structural modifications to an existing test cell, and the repairs or modifications significantly affect performance, the repair station performs a test cell correlation or re-correlation.

### 6-1801 TASK OUTCOMES.

A. **Complete the Task.** Follow Volume 10, Chapter 5 guidance for Module 4, Data Collection and Data Reporting; PIs follow Volume 10, Chapter 6 for Module 5, Analysis, Assessment, and Action procedures.

B. **Conduct Debriefing.** Brief the certificate holder on the inspection results. Discuss any deficiencies and possible corrective actions. The ASI can find detailed instructions for conducting this briefing in Volume 1, Chapter 3, Section 1.

C. **Document the Task.** Place all supporting paperwork in the certificate holder’s office file. Update the Vitals tab in the SAS Configuration Module, as required.

D. **Compliance Action.** Follow the process contained in Volume 14, Chapter 1, Section 2 to identify the root cause that led to any deviations from rules, standards, or procedures; resolve them, and return the repair station to full compliance.

### 6-1802 FUTURE ACTIVITIES.** Follow Volume 10 to plan future risk-based surveillance in SAS.

**RESERVED.** Paragraphs 6-1803 through 6-1816.