



Designation: F2974 – 22

Standard Practice for Auditing Amusement Rides and Devices¹

This standard is issued under the fixed designation F2974; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice establishes minimum requirements for auditing conformance to ASTM Committee F24 Standards during an audit of an amusement ride or device within a defined scope.

1.2 Defined scope of audit shall include but not be limited to the following:

1.2.1 Auditors sufficient relevant education, training, technical knowledge, certifications as appropriate, and experience to properly audit an amusement ride or device in accordance with subsection 5.1 of this standard.

1.2.2 Visual acuity requirements (if applicable) in accordance with subsection 5.1.3 of this standard.

1.2.3 Reference standards including published year.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[F747 Terminology Relating to Amusement Rides and Devices](#)

[F770 Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices](#)

[F1193 Practice for Quality, Manufacture, and Construction](#)

¹ This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.30 on Maintenance and Inspection.

Current edition approved June 1, 2022. Published June 2022. Originally approved in 2013. Last previous edition approved in 2020 as F2974 – 20. DOI: 10.1520/F2974-22.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[of Amusement Rides and Devices](#)

[F2291 Practice for Design of Amusement Rides and Devices](#)

2.2 *ASNT Document:*³

[ASNT-SNT-TC-1A Recommended Practice Personnel Qualification and Certification in Nondestructive Testing](#)

2.3 *AWS Standard:*⁴

[AWS B5.1 Specification for the Qualification of Welding Inspectors](#)

2.4 *ISO Standard:*⁵

[ISO 9712 Non-destructive testing – Qualification and certification of personnel](#)

3. Terminology

3.1 For definitions of terms used in this practice, refer to Terminology [F747](#).

4. Significance and Use

4.1 The purpose of this practice is to provide the minimum auditing requirements for audits of amusement rides and devices.

4.2 An audit can include inspections, evaluations, or examinations during the design, manufacturing, installation, commissioning, operation, or major modification of an amusement ride or device.

4.3 When audits are performed, they shall occur during the relevant stages of an amusement ride or device's design, manufacture, installation, commissioning or major modification. This practice does not require recurring design, manufacturing, installation, commissioning, or major modification audits.

5. General

5.1 Auditor(s) shall have sufficient relevant education, training, technical knowledge, certifications as appropriate, and experience to properly audit an amusement ride or device as defined within the scope of the audit.

³ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.

⁴ Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.

⁵ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

5.1.1 Evidence of auditor(s) relevant education, training, technical knowledge, certifications as appropriate, and experience shall be made available to the party(ies) requesting the audit upon request.

5.1.2 Auditor(s) shall read and become familiar with contents of the applicable referenced documents.

5.1.3 When visual inspections are required by the defined scope of work, the auditor(s) shall have:

5.1.3.1 Visual acuity in conformance with one of the following; AWS B5.1 (Section 6), ASNT SNT-TC-1A (Section 8), ISO 9712 (Section 7), or other equivalent standard(s).

5.1.3.2 Sufficient lighting available (natural or artificial) to perform the visual inspection.

5.1.3.3 The necessary eye correction, lenses, tools or visual enhancements (if any) to comply with 5.1.3.1.

5.2 The auditor must prepare for and comply with all personal health and safety requirements as they pertain to the scope of the audit.

5.3 Inspection tools, test equipment, gauges, or other devices shall be in proper working order and, where applicable, calibrated. Calibration shall be established by a record of calibration showing calibration traceable to accepted standards specific to the equipment used (for example, AISC, ASME, ANSI, etc.).

5.4 Audit recording formats shall be mutually agreed upon by auditor and auditee before the audit is initiated.

5.4.1 Actual findings or statements, or other information that is related to the audit(s) shall be included in the audit record(s). Audit record(s) may include but not limited to, written documentation, photo(s), video(s), spreadsheet(s), and list(s).

5.4.2 The auditor's name(s) and date(s) of the audit(s) performed shall be included in the auditing record(s).

6. Design Audit Program

6.1 When performing an audit of a new design of an amusement ride or device, the auditor shall review conformance to Practice F2291 or the applicable F24 standard in effect at the time of the design.

7. Manufacturing Audit Program

7.1 When performing an audit of the manufacturing of an amusement ride or device, the auditor(s) shall review conformance to Practice F1193.

8. Installation and Commissioning Audit Program

8.1 When performing an audit of the installation and commissioning of an amusement ride or device, the auditor(s) shall:

8.1.1 Perform an inspection of equipment condition per the Certification, Installation and Commissioning, Operation and Maintenance Documentation, and Information Plate sections of Practice F1193.

8.1.2 Review conformance to Practice F770.

9. Major Modification Audit Program

9.1 When performing an audit of the design of an amusement ride or device, the auditor shall review conformance that the design specific to the major modification meets Practice F2291 or the applicable F24 standard.

9.2 When performing an audit of a major modification to an amusement ride or device as defined in Terminology F747, the auditor(s) shall perform the following where applicable:

9.2.1 Review conformance to Practice F770.

9.2.2 Owner/operator's conformance to manufacturer's maintenance and inspection requirements.

9.2.3 Review conformance to manufacturer's requirements and documentation per Practice F1193.

9.2.4 Evaluate all documentation that is available for the modification and that this information reflects the in-field installation.

9.2.5 Confirm that all documentation pertaining to the modifications was included in the supporting documentation needed to properly train, inspect, maintain, and operate the ride or device per the design requirements.

9.2.6 Review conformance of the operational functionality as it complies with the operational specifications provided by the engineer, designer, or manufacture as per Practice F1193.

10. Operation Audit Program

10.1 When performing an operation audit, the auditor(s) shall:

10.1.1 Review conformance to Practice F770 and Practice F1193.

10.1.2 Review conformance of documentation and that it reflects the current configuration of the ride and device in operation.

10.1.3 Review conformance as to the operational functionality per the operational specifications as provided in the section on Operation and Maintenance Documentation of Practice F1193.

11. Nondestructive (NDT) Audit Program

11.1 When performing an Audit of a Non-Destructive Testing program, the auditor(s) shall:

11.1.1 Review written practices or procedures, or both.

11.1.2 Review technician(s) training records and experience logs as applicable.

11.1.3 Review technician(s) qualification record(s).

11.1.4 Review technician(s) visual acuity record(s), where applicable.

11.1.5 Review equipment calibration records.

11.1.6 Review consumable certification(s) and expiration.

11.1.7 Review exemplary inspection reports.

12. Keywords

12.1 inspection; inspector

APPENDIX
(Nonmandatory Information)
X1. INDEPENDENT CLASSES OF INSPECTORS/AUDITORS
X1.1 General

X1.1.1 Every individual executing any form of inspection/audit on an Amusement Ride or Device has some sort of relationship with the other stakeholders of this Amusement Ride or Device.

X1.1.2 These stakeholders are:

- (A) Designer/Manufacturer
- (B) Owner/Operator
- (C) Inspection Body
- (D) Insurance Company
- (E) Authority Having Jurisdiction

X1.2 Class A – Designer/Manufacturer

X1.2.1 A Class A Inspector/Auditor is an individual employed by the Designer/Manufacturer of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer.

X1.2.2 Class A Inspector/Auditors are separated into the following sub-classes:

- (1) Class A1 – same department
- (2) Class A2 – different department, same business unit
- (3) Class A3 – different business unit

X1.2.2.1 *Class A1 Definition*—A Class A1 Inspector/Auditor is an individual employed by the Designer/Manufacturer of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working within the same department having design/manufacturing responsibility for the inspected/audited Amusement Ride or Device.

X1.2.2.2 *Class A2 Definition*—A Class A2 Inspector/Auditor is an individual employed by the Designer/Manufacturer of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working within the same business unit but different department having design/manufacturing responsibility for the inspected/audited Amusement Ride or Device.

X1.2.2.3 *Class A3 Definition*—A Class A3 Inspector/Auditor is an individual employed by the Designer/Manufacturer of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working in a different business unit than the business unit having design/manufacturing responsibility for the inspected/audited Amusement Ride or Device.

X1.3 Class B – Owner/Operator

X1.3.1 A Class B Inspector/Auditor is an individual employed by the Owner/Operator of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer.

X1.3.2 Class B Inspector/Auditors are separated into the following sub-classes:

- (1) Class B1 – same department
- (2) Class B2 – different department, same business unit
- (3) Class B3 – different business unit

X1.3.2.1 *Class B1 Definition*—A Class B1 Inspector/Auditor is an individual employed by the Owner/Operator of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working within the same department having operating/maintenance responsibility for the inspected/audited Amusement Ride or Device.

X1.3.2.2 *Class B2 Definition*—A Class B2 Inspector/Auditor is an individual employed by the Owner/Operator of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working within the same business unit but different department having operating/maintenance responsibility for the inspected/audited Amusement Ride or Device.

X1.3.2.3 *Class B3 Definition*—A Class B3 Inspector/Auditor is an individual employed by the Owner/Operator of an Amusement Ride or Device executing inspection/auditing tasks on behalf of his employer and who is working in a different business unit than the business unit having operating/maintenance responsibility for the inspected/audited Amusement Ride or Device.

X1.4 Class C – Inspection Body

X1.4.1 A Class C Inspector/Auditor is an individual executing inspection/auditing tasks on an Amusement Ride or Device and being employed by the Inspection Body which is neither the Designer/Manufacturer nor the Owner/Operator of the inspected/audited Amusement Ride or Device.

X1.4.2 Class C Inspector/Auditors are separated into the following sub-classes:

- (1) Class C1 – contracted by Designer/Manufacturer
- (2) Class C2 – contracted by Owner/Operator
- (3) Class C3 – contracted by Insurance Company
- (4) Class C4 – contracted by AHJ
- (5) Class C5 – contracted by Association

X1.4.2.1 *Class C1 Definition*—A Class C1 Inspector/Auditor is an individual executing inspection/auditing tasks on behalf of his employer where the employer is the Inspection Body being contracted by the Designer/Manufacturer of the inspected /audited Amusement Ride or Device.

X1.4.2.2 *Class C2 Definition*—A Class C2 Inspector/Auditor is an individual executing inspection/auditing tasks on behalf of his employer where the employer is the Inspection Body being contracted by the Owner/Operator of the inspected/audited Amusement Ride or Device.

X1.4.2.3 *Class C3 Definition*—A Class C3 Inspector/Auditor is an individual executing inspection/auditing tasks on behalf of his employer where the employer is the Inspection Body being contracted by the Insurance company of the inspected/audited Amusement Ride or Device.