



Standard Practice for Agencies Performing Nondestructive Testing¹

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This specification has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice covers minimum requirements for agencies performing nondestructive testing (NDT).

1.2 When using this practice to assess the capability of, or to accredit NDT agencies, Guide E 1359 shall be used as a basis for the survey. It can be supplemented as necessary with more detail in order to meet the auditor's specific needs.

1.3 This practice can be used as a basis to evaluate testing or inspection agencies, or both, and is intended for use for the qualifying or accrediting, or both, of testing or inspection agencies, public or private.

1.4 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 94 Guide for Radiographic Testing²

E 114 Practice for Ultrasonic Pulse-Echo Straight-Beam Examination by the Contact Method²

E 125 Reference Photographs for Magnetic Particle Indications on Ferrous Castings²

E 127 Practice for Fabricating and Checking Aluminum Alloy Ultrasonic Standard Reference Blocks²

E 142 Method for Controlling Quality of Radiographic Testing²

E 164 Practice for Ultrasonic Contact Examination of Weldments²

E 165 Test Method for Liquid Penetrant Examination²

E 213 Practice for Ultrasonic Examination of Metal Pipe and Tubing²

E 214 Practice for Immersed Ultrasonic Examination by the Reflection Method Using Pulsed Longitudinal Waves²

E 215 Practice for Standardizing Equipment for Electro-

magnetic Examination of Seamless Aluminum-Alloy Tube²

E 243 Practice for Electromagnetic (Eddy-Current) Examination of Copper and Copper-Alloy Tubes²

E 273 Practice for Ultrasonic Examination of Longitudinal Welded Pipe and Tubing²

E 309 Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation²

E 317 Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Testing Systems Without the Use of Electronic Measurement Instruments²

E 376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods²

E 426 Practice for Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products, Austenitic Stainless Steel, and Similar Alloys²

E 427 Practice for Testing for Leaks Using the Halogen Leak Detector (Alkali-Ion Diode)²

E 428 Practice for Fabrication and Control of Steel Reference Blocks Used in Ultrasonic Inspection²

E 431 Guide to Interpretation of Radiographs of Semiconductors and Related Devices²

E 432 Guide for Selection of a Leak Testing Method²

E 433 Reference Photographs for Liquid Penetrant Inspection²

E 479 Guide for Preparation of a Leak Testing Specification²

E 493 Test Methods for Leaks Using the Mass Spectrometer Leak Detector in the Inside-Out Testing Mode²

E 498 Test Methods for Leaks Using the Mass Spectrometer Leak Detector or Residual Gas Analyzer in the Tracer Probe Mode²

E 499 Test Methods for Leaks Using the Mass Spectrometer Leak Detector in the Detector Probe Mode²

E 515 Test Method for Leaks Using Bubble Emission Techniques²

E 545 Method for Determining Image Quality in Direct Thermal Neutron Radiographic Examination²

E 566 Practice for Electromagnetic (Eddy-Current) Sorting of Ferrous Metals²

¹ This practice is under the jurisdiction of ASTM Committee E-7 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.09 on Nondestructive Testing Agencies.

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² Annual Book of ASTM Standards, Vol 03.03.

E 569 Practice for Acoustic Emission Monitoring of Structures During Controlled Stimulation²

E 570 Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products²

E 571 Practice for Electromagnetic (Eddy-Current) Examination of Nickel and Nickel Alloy Tubular Products²

E 587 Practice for Ultrasonic Angle-Beam Examination by the Contact Method²

E 588 Practice for Detection of Large Inclusions in Bearing Quality Steel by the Ultrasonic Method²

E 592 Guide to Obtainable ASTM Equivalent Penetrameter Sensitivity for Radiography of Steel Plates ¼ to 2 in. (6 to 51 mm) Thick with X Rays and 1 to 6 in. (25 to 152 mm) Thick with Cobalt-60²

E 650 Guide for Mounting Piezoelectric Acoustic Emission Sensors²

E 664 Practice for Measurement of the Apparent Attenuation of Longitudinal Ultrasonic Waves by Immersion Method²

E 690 Practice for In Situ Electromagnetic (Eddy-Current) Examination of Nonmagnetic Heat Exchanger Tubes²

E 703 Practice for Electromagnetic (Eddy-Current) Sorting of Nonferrous Metals²

E 709 Guide for Magnetic Particle Examination²

E 746 Test Method for Determining Relative Image Quality Response of Industrial Radiographic Film²

E 747 Practice for Design, Manufacture, and Material Grouping Classification of Wire Image Quality Indicators (IQI) Used for Radiology²

E 748 Practices for Thermal Neutron Radiography of Materials²

E 749 Practice for Acoustic Emission Monitoring During Continuous Welding²

E 750 Practice for Characterizing Acoustic Emission Instrumentation²

E 751 Practice for Acoustic Emission Monitoring During Resistance Spot-Welding²

E 797 Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method²

E 801 Practice for Controlling Quality of Radiological Examination of Electronic Devices²

E 803 Method for Determining the *L/D* Ratio of Neutron Radiography Beams²

E 908 Practice for Calibrating Gaseous Reference Leaks²

E 999 Guide for Controlling the Quality of Industrial Radiographic Film Processing²

E 1001 Practice for Detection and Evaluation of Discontinuities by the Immersed Pulse-Echo Ultrasonic Method Using Longitudinal Waves²

E 1004 Test Method for Electromagnetic (Eddy-Current) Measurements of Electrical Conductivity²

E 1025 Practice for Design, Manufacture, and Material Grouping Classification of Hole-Type Image Quality Indicators (IQI) Used for Radiology²

E 1030 Test Method for Radiographic Examination of Metallic Castings²

E 1032 Method for Radiographic Examination of Weldments²

E 1212 Practice for Establishment and Maintenance of Quality Control Systems for Nondestructive Testing Agencies²

E 1254 Guide for Storage of Radiographs and Unexposed Industrial Radiographic Films²

E 1316 Terminology for Nondestructive Examinations²

E 1359 Guide for Surveying Nondestructive Testing Agencies²

E 1417 Practice for Liquid Penetrant Examination²

E 1444 Practice for Magnetic Particle Examination²

E 1742 Practice for Radiographic Examination²

2.2 Other Documents:

SNT-TC-1A Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing³

ANSI/ASNT-CP-189 ASNT Standard for Qualification and Certification in Nondestructive Testing Personnel³

NAS-410 Certification and Qualification of Nondestructive Personnel (Quality Assurance Committee)⁴

2.3 Military Standard:

MIL-STD-410 Nondestructive Testing Personnel Qualification and Certification⁵

3. Terminology

3.1 *Definitions*—Additional definitions are contained in the specific specification or in Terminology E 1316.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *agency*—the public, independent, or in-house nondestructive testing organization selected by the authority to perform the examination(s) required by the purchase order or specification.

3.2.2 *authority*—the owner, prime contractor, engineer, architect, or purchasing agent in responsible charge of the work, or duly recognized or designated representative.

3.2.2.1 *Discussion*—The agency and the authority may be the same in some cases.

4. Significance and Use

4.1 This practice is applicable where the systematic assessment of the competence of a nondestructive testing agency by a user or other party is desired.

4.2 It is intended that the requirements specified in this practice apply to independent, public, or in-house agencies to the extent required by the purchase order or specification. This practice does not apply to in-house equipment, methods, and examinations used for the exclusive purpose of internal process control. It is intended that this practice apply to all examination(s) used for the final acceptance examination(s) if such examination(s) are required by the purchase order or specification.

4.3 Criteria are provided for evaluating the capability of an agency to properly perform designated examinations and establishes essential characteristics pertaining to the organization, personnel, facilities, and quality systems of the agency.

³ Available from American Society for Nondestructive Testing, 1711 Arlinggate Plaza, P.O. Box 28518, Columbus, OH 43228-0518.

⁴ Available from Aerospace Industries Association of America, Inc., 1250 Eye Street, N.W., Washington, DC 20005.

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

This practice may be supplemented by more specific criteria and requirements for particular projects.

5. Organization of the Agency

5.1 The following information concerning the organization of the agency shall be provided by documentation:

5.1.1 A description of the organization including:

5.1.1.1 The complete legal name and address of the main office,

5.1.1.2 The names and positions of the principal officers and directors,

5.1.1.3 The agency's ownership, managerial structure, and principal members,

5.1.1.4 The functional description of the agency's organization structure, operational departments, and support departments and services. This may be demonstrated in the form of charts that depict all the divisions, departments, sections and units, and their relationships,

5.1.1.5 All relevant organizational affiliates of the agency and the principal officers of affiliates and directors of the affiliates where applicable,

5.1.1.6 External organizations and organizational components and their functions that are utilized for significant technical support services, and

5.1.1.7 A brief history of the agency including its relationship with its organizational component affiliations and other supporting information.

5.1.2 A general description of the type of users of the agency's services.

5.1.3 A listing of the relevant technical services offered.

5.1.4 A list giving applicable dates of the qualifications, accreditations, and recognition of the agency by others.

6. Responsibilities and Duties

6.1 A nondestructive testing agency's capabilities should include, but not be limited to, one or more of the following methods: magnetic particle, penetrant, radiographic/fluoroscopic, ultrasonic, eddy current, and leak testing.

NOTE 1—A comparison of selected NDE Methods is provided as Appendix X1.

6.2 It is the responsibility of the agency to ensure that:

6.2.1 It performs only examinations for which it is adequately equipped and staffed.

6.2.2 Its employees perform only examinations for which they are adequately qualified.

6.2.3 Its equipment is calibrated and personnel are certified in accordance with applicable specifications.

6.2.4 All equipment is properly maintained.

6.2.5 It informs the authority of any discrepancy or limitation imposed on the testing accuracy by such factors as surface finish, form, shape, or procedure.

6.3 The following duties are those usually performed by the agency:

6.3.1 To perform all examinations in accordance with specified standards or quality-control criteria, or both. (The necessary documents shall be furnished by the authority, or the agency, or both, as specified in the applicable purchase agreements.) The agency should call to the attention of the

authority at once any irregularity or deficiency noted in the documents.

6.3.2 To submit promptly to the authority formal reports of all examinations that indicate compliance or noncompliance of the material with 6.3.1. The agency should be prepared to substantiate examination results when required.

6.4 The agency may, in accordance with an agreement with the authority, report only compliance or noncompliance with the applicable specifications or control documents. The authority reserves the right for disposition of noncomplying material.

6.5 The authority may, at its discretion, inspect the procedures, equipment, and personnel program of the agency.

7. Human Resources of the Agency

7.1 The agency shall document the following:

7.1.1 Written outline or chart defining operational personnel positions and their lines of responsibility and authority.

7.1.2 Summary job description for each professional, scientific, supervisory, and technical position category, documenting the required education, training, or experience, or a combination thereof.

7.1.3 Records or resumes that document the qualifications, work experience, and training history of each person in a position described in 7.1.2.

7.2 The agency shall make available a description of its means of ensuring the continued competence of its personnel to perform NDT, including the maintenance of written records to document the results.

8. Personnel Qualification

8.1 Nondestructive testing (NDT) personnel shall be qualified in accordance with a nationally recognized NDT personnel qualifications practice or standards such as ANSI/ASNT-CP-189, SNT-TC-1A, MIL STD 410, NAS-410, or a similar document. The practice or standard used and the applicable revision shall be specified in the contractual agreement between parties.

PROCEDURE MANUAL

9. Minimum Requirements

9.1 Each agency shall have prepared a written Procedures Manual for the type of work for which the agency is contracted. The manual shall be prepared in accordance with the requirements of Practice E 1212. Additional requirements or clarifications are contained in 9.2 through 9.6. The manual shall be of sufficient detail to provide complete guidance for their use by the agency's personnel.

9.1.1 The agency management shall designate a person or persons within the agency who has responsibility for maintaining the agency's quality system. This person(s) shall have direct access to top management. This person shall conduct and document an internal audit at least once every year to verify that the quality system is functioning properly.

9.2 *Process Control (Operational Procedures)*—This section shall contain the information necessary to control the various activities necessary for the examination of materials. Items covered shall include receiving and preparing material, identification and marking, test procedures and specifications to use, reports, and return of material.