

# NRC INSPECTION MANUAL

EMCB

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## INSPECTION PROCEDURE 57050

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### VISUAL TESTING EXAMINATION

PROGRAM APPLICABILITY: 2515, 2700

#### 57050-01 INSPECTION OBJECTIVES

01.01 To determine whether the visual testing (VT) examination procedures used by the licensee and contractor meet applicable American Welding Society (AWS)/American Society of Mechanical Engineers (ASME) Code, regulatory, specification and contract requirements.

01.02 To determine through direct examination whether the VT examination is being conducted by properly qualified personnel, in accordance with procedures and the licensee's or contractor's approved Quality Assurance (QA) program.

01.03 To review a sample of records to determine whether they are prepared, evaluated, and maintained in accordance with applicable commitments and requirements.

#### 57050-02 INSPECTION REQUIREMENTS

##### 02.01 Procedure Review

- a. Review the active VT examination procedure(s) and ascertain whether it has (they have) been issued and qualified in accordance with the licensee's or contractor's QA program or both.
- b. Review each special test procedure that deviates from the technique prescribed in the ASME Code or exceeds the range of examination parameters specified in the ASME Code to determine that they have been qualified in accordance with the Code requirements and have been approved by the licensee's authorized inspection agency or that NRC has granted relief in accordance with 10 CFR 50.55a.
- c. Determine whether the VT examination procedure contains information or references a general inspection procedure or supplementary instructions sufficient to assure that all

parameters are specified and controlled within the limits permitted by the applicable Code and other additional specification requirements. For each VT examination procedure, ascertain whether essential examination variables are defined and whether these variables are controlled within the limits specified by the applicable Code and other specification/contract requirements. Perform the following evaluations:

1. Method: direct visual, remote visual, or translucent visual.
2. Application: hydrostatic testing, fabrication procedure, visual examination of welds, leak testing, inservice inspection, etc.
3. How visual examination is to be performed.
4. Type of surface condition available.
5. Method or tool for surface preparation, if any.
6. Whether direct or remote viewing is used.
7. Special illumination, instruments, or equipment to be used, if any.
8. Sequence of performing examination, when applicable.
9. Data to be tabulated, if any.
10. Acceptance criteria are specified consistent with the applicable Code section and specific contract requirements. The procedure shall contain or reference a report of what was used to demonstrate that the examination procedure was adequate. In general, a fine line (1/32 inch (0.8 mm) or less in width), or some other artificial flaw located on the surface or on a similar surface to that to be examined, may be considered a test method for this demonstration. The line or artificial flaw should be in the least discernible location on the area examined, to prove the procedure.
11. Report form or general statement to be completed.

#### 02.02 Work Observation

Observe the performance of the VT examination for the selected application and conduct the following reviews:

- a. Determine whether the applicable drawing, instructions, or travelers clearly specify the test procedure to be used and that a copy of the procedure is available in the area in which the work is being performed.

- b. Identify for subsequent record review the personnel performing the examination and ascertain whether they are qualified to perform the assigned task.
- c. Determine whether the required tools and examination aids (as specified in the examination procedures) are available at the work location.
- d. Determine whether the specific areas, locations, and extent of examination are clearly defined.
- e. Determine whether the test attributes are as specified in the applicable test procedure and consistent with the limits or ranges given in paragraph 02.01b above.
- f. Ascertain whether the defects are evaluated in accordance with the procedure requirements using correct acceptance criteria, and whether the inspection results are reported in a prescribed manner.
- g. Verify that the licensee has a nondestructive examination (NDE) indication evaluation process that contains a provision for adequate corrective action or analysis of the indication before plant system startup.

02.03      Record Review

- a. Review a random sampling of visual inspection personnel qualification records and ascertain whether these qualification records properly reflect the following:
  - 1. Employer's name.
  - 2. Person certified.
  - 3. Activity qualified to perform.
  - 4. Effective period of certification.
  - 5. Signature of employer's designated representative.
  - 6. Basis used for certification.
  - 7. Annual examination of visual acuity and color vision and periodic recertification.
- b. Review a random sampling of VT inspection records and independently verify the inspection results using the licensee's/contractor's procedure for conducting the inspection.
- c. Review a random sampling of VT inspection records for compliance with procedure requirements, for recording of examination, for evaluation of data, and for results.

## General Guidance

- a. Applicable portions of the Safety Analysis Report (SAR) should be reviewed to determine licensee commitments relative to NDE of components and equipment. The applicable Code editions and special requirements will generally be indicated in specifications, drawings, and/or QA manuals. The inspector is responsible for determining the acceptance criteria for each individual application.
- b. Inspection of VT examination as outlined in this procedure can be described as a three-phase, progressive review: First, a general audit is made of the applicable VT examination procedure to verify that it is properly prepared, approved, and qualified in accordance with the applicable Code and contract requirements. Secondly, the use of the procedure is observed to verify that the work is planned, scheduled, and accomplished in accordance with the licensee's or contractor's QA program and that personnel performing the examination are properly qualified. Finally, records are reviewed to verify that they are complete, accurate, and retrievable. It is preferable to complete all phases of the inspection during a single inspection. However, this may not always be possible since there may be no VT examination in progress during a particular inspection. Under such circumstances, completion of a specific phase of the procedure may be deferred and resumed during a subsequent inspection.

The first inspection should concentrate on reviewing the licensee's program and procedures with enough work observation and record review to determine that the VT inspection personnel know and understand the program. The second inspection should only include changes to previously reviewed programs and procedures and should concentrate heavily on work observation, record review, and independent verification.

- c. The type of VT examination to be inspected should be selected by the inspector. The selected application scheduled for observation should be adequate to permit an effective evaluation of the inspected VT examination activities.
- d. The VT examination method described in Sections III, V, or XI of the ASME Code is applicable to most conditions encountered during fabrication and inservice inspection. However, the Code recognizes that special conditions may be encountered that require modification of these techniques. If modified procedures are used, they must be equivalent or superior to the Code techniques. Such special procedures must also be proven by demonstration to be capable of detecting discontinuities to at least the same extent as the applicable Code technique under normal conditions. This applies to all NDE examination procedures used to meet Code acceptance criteria.
- e. Qualification of NDE personnel involved in the performance, evaluation, or supervision of NDE examination should meet the qualification requirements stated in the applicable Code and standards referenced in the licensee's SAR.

Qualification certificates, visual acuity examination, color vision examination, and periodic recertification should be included in the licensee's or contractor's procedures.

- f. Findings from this inspection activity should address each element as being satisfactory, being unresolved and requiring resolution, or being in violation and requiring correction. When significant inadequacies are identified indicating possible generic deficiencies, the issue should be addressed at the appropriate level of licensee management

#### Specific Guidance

There is no specific guidance provided.

#### 57050-04 REFERENCES

10 CFR Part 50, Appendix B, Criterion IX

ASME Boiler and Pressure Vessel Code Sections III, V, and XI

Society for Nondestructive Testing, Recommended Practice No. SNT-TC-1A and Supplements

ANSI/ASNT CP-89, Standard for Qualification and Certification of Nondestructive Testing Personnel

Regulatory Guide 1.88, Collection, Storage and Maintenance of Nuclear Power Plant QA Records

Regulatory Guide 1.58, Qualification of Nuclear Power Plant Inspection, Examination, and Testing Personnel

ANSI N45.2.9, Requirements for Collection, Storage and Maintenance of QA Records for Nuclear Power Plants

ANSI N45.2.6, Qualification of Inspection, Examination and Testing Personnel.

AWS D1.1, Structural Welding Code.

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