

**Activity: ASME Section XI Repair and Replacement**

1.0 Purpose: To provide a method of assuring that Section XI Repair and Replacement activities are in compliance with applicable standards, regulations and procedures in effect at a nuclear power plant.

2.0 Scope: This guideline applies to repairs and replacements of components which are covered by Section XI of the ASME B&PV Code, includes Class 1, 2 and 3 pressure-retaining components and their supports.

3.0 References:

3.1 ASME B&PV Code, Section XI, Article IWA-4000

3.2 ANSI N18.7

3.3 10CFR50.55(a)

3.4 Regulatory Guide (NRC) 1.43

3.5 Regulatory Guide (NRC) 1.50

3.6 ANSI N45.2.1

4.0 Guidelines:

4.1 In preparation for and during the conduct of this surveillance:

- E Obtain and review implementing procedures, instructions and drawings governing this activity.
- E Prepare a guide or checklist using the selected items from this guideline.
- E Review past surveys, audits, surveillances and other evaluations/assessments.
- E Ensure that checklists include, where applicable, actual observations of performance, general plant conditions, radiological work practices, housekeeping, work document controls and use, and safety practices.

**NOTE:** Refer to Guideline A.1, "General Quality Surveillance Guidance," for specific details on the attributes listed above.

**NOTE:** The following checklist contains examples of items which should be considered during a surveillance. The edition of the Code used for this list was the 1980 edition up to and including the Winter 1981 addenda. Some plants may be committed to other editions of the Code.

- 4.2 Is the correct edition of the ASME Code referenced in the procedures?
- 4.3 Are repairs performed in accordance with the Owner's Design Specification and Construction Code or later editions of the Construction Code or of Section III, either in the entirety or portions thereof? (IWA-4120)
- 4.4 Are repair operations performed in accordance with a program delineating essential requirements of the complete repair cycle including:
- A. The Nondestructive Examination (NDE) method which revealed the flaw and a description of the flaw.
  - B. The method for removing the flaw, method for measuring the cavity created by removing the flaw and dimensional requirements for reference points during and after the repair.

- C. Weld procedure Post Weld Heat Treatment (PWHT), if applicable, and the NDE Program to be used after the repair? (IWA-4130)
- 4.5 Has the owner conducted an evaluation of the suitability of the welding procedure used to make the repair prior to authorizing the repairs? (IWA-4130)
- 4.6 Have the services of an Authorized Inspection Agency (AIA) been used when making a repair? (IWA-4140)
- 4.7 Has the AIA been notified prior to starting the repair? (IWA-4140)
- 4.8 Has the AIA been kept informed of the progress of the repair so that the necessary inspections may be performed? (IWA-4140)
- 4.9 Does material conform to the requirements of either the original Design Specifications or Section III? (IWA-4200)
- 4.10 Has welding been performed in accordance with a Welding Process Specification (WPS) which has been qualified by the owner or repair organization in accordance with the requirements of Section IX and the additional requirements of Sections III and XI? (IWA-4300)

- 4.11 Have welders been qualified by the repair organization in accordance with the requirements of Section IX and the additional requirements of Sections III and XI? (IWA-4300)
- 4.12 If welders are not employed directly by the repair organization are their activities controlled by the QA program of the repair organization? (IWA-4300)
- 4.13 Does the QA program of the repair organization include:
- A. Requirements for complete and exclusive administration and technical supervision of all welders by the repair organization.
  - B. Requirements for contractual control which provides the necessary authority to assign and remove welders at the discretion of the repair organization.
  - C. Evidence that the Quality Assurance Program is acceptable to the Owner's Authorized Nuclear Inservice Inspector (ANII)?
- 4.14 After repairs by welding on the pressure retaining boundary, has a system pressure test been performed in accordance with IWA-5000? (IWA-4400)

(Note: The following may be exempted from the system hydrostatic pressure tests:

- A. cladding repairs
- B. heat exchanger tube plugging
- C. piping, pump, and valve repairs that do not penetrate through the pressure boundary
- D. pressure vessel repairs where the repaired cavity does not exceed 10% of the minimum design wall thickness
- E. component connections, piping, and associated valves that are 1 inch nominal pipe size and smaller.

Repairs made in accordance with a procedure which allows exception from postweld heat treatment shall not be exempted.)

- 4.15 Have the repaired areas been reexamined to establish a new preservice record? (IWA-4500) (Note: If the repair includes the complete removal or isolation of the item bearing the flaw, such as heat exchanger tube plugging, above shall not apply.)

- 4.16 Have the above examinations included the NDE method that detected the flaw? (IWA-4500)
- 4.17 Have the records required by IWA-6000 been completed for all repairs? (IWA-4700)
- 4.18 Replacements:
- A. Have replacements met the requirements of the edition of the Construction Code to which the original component or part was constructed unless the alternative of (c) below is adopted. Replacements for parts or components originally constructed without Code requirements shall be in accordance with the original design, fabrication, and inspection requirements for the part or component being replaced unless the alternative of (c) below is adopted.
  - B. Replacements ordered as spares for future use at an unspecified time shall meet the requirements of the Construction Code edition used for the original part or component that is intended to be replaced.
  - C. Alternatively, replacements may meet all or portions of the requirements of later editions of the Construction Code, provided that the following requirements are

met.

- 1) The requirements affecting the design, fabrication, and examination of the replacement are reconciled with the Owner's Specification.
  
- 2) Mechanical interfac1, "General Quality Surveillance Guidance"

5.2 J Series, "ISI Program"

5.3 P.8, "Post Maintenance Testing"

5.4 V.2, "Welding"

5.5 V.3, "Nondestructive Examination"