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SUBJECT: Forwards proposed Amend 25B to Tech Specs revising specs for Inservice Insp to delete redundant functional testing requirements for certain equipment.

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WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

February 9, 1979

Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention Mr. A. Schwencer, Chief
Operating Reactors Branch #1

Gentlemen:

Docket 50-305
Operating License DPR-43
Proposed Technical Specification Amendment No. 25B
In Service Inspection Program

Enclosed please find forty (40) copies of proposed Amendment No. 25B to the Kewaunee Nuclear Power Plant Technical Specifications. This proposed amendment revises and supersedes previously submitted proposed Amendment No. 25A transmitted July 18, 1977.

The enclosed revision to the In-Service Inspection (ISI) Technical Specifications incorporates the comments and suggestions made by the NRC staff during discussions held in meetings on July 10 and 11, 1978, and several subsequent phone conversations.

Adoption of the proposed In-Service Inspection Program would create redundant Technical Specification functional test requirements for certain equipment. The revised proposed amendment includes a request for deletion of these redundant requirements. Submitted for deletion are current specifications requiring functional testing of Containment Isolation Valve; Fan Coil Service Water Isolation Valves; SI, RHR and ICS Pumps; certain SI System Valves; Main Steam Isolation Valves; Auxiliary Feedwater Pumps and Valves; Pressurizer Safety Valves; Main Steam Safety Valves and Hydrostatic Testing of the RHR System, which are all included in the revised ISI program submittal.

The enclosed proposed Technical Specification Amendment No. 25B requested by the NRC staff is a revision to previously submitted Proposed Amendment No. 25A submitted July 18, 1977. Since this proposed amendment is of the

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same technical issue which has been submitted prior to the March 23, 1978, enactment of 10 CFR 170.22, "Schedule of Fees for Facility License Amendments," this amendment is exempt from the fee associated with the processing of this Technical Specification change.

Very truly yours,

E. W. James
Senior Vice President
Power Supply & Engineering

snf

Enc.

Subscribed and Sworn to
Before Me This 9th Day
of February 1979

Notary Public, State of Wisconsin

My Commission Expires 2-6-83

## 4.2 REACTOR COOLANT SYSTEM IN-SERVICE INSPECTION

### Applicability

Applies to in-service structural surveillance of the reactor coolant system boundary and functional testing of safety related pumps and valves associated with the reactor coolant system.

### Objective

To assure the continued integrity of the reactor coolant system boundary and performance of safety related mechanical equipment associated with the reactor coolant system.

### Specification

4.2.1 Inservice inspection of ASME Code Class 1, Class 2 and Class 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10CFR50, Section 50.55a(g), except where such inspections are documented as being impractical and specific relief has been requested of the NRC pursuant to 10CFR50 Section 50.55a(g)(6)(i), Following formal response by the NRC to the relief request the inspection shall be in accordance with the relief as granted. Tables TS 4.2-1 through TS 4.2-3 specify the tests applicable to the Kewaunee Plant and the Code relief which has been granted.

4.2.2 Inservice testing of ASME Code Class 1, Class 2 and Class 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10CFR50 Section 50.55a(g), except where nuclear safety would be compromised by such tests, specific Technical Specification requirements address performance testing of such equipment, or specific exemption has been requested of the NRC pursuant to 10CFR50 Section 50.55a(g)(6)(i), Following formal response by the NRC to the relief request the testing shall be in accordance with the relief as granted. Tables TS 4.2-4 through 4.2-5 specify the tests applicable to the Kewaunee Plant and Code relief which has been granted.

Basis

The inspection program will be in accordance with the requirements of Section XI of ASME Code and applicable Addenda per the requirements of 10CFR50 Section 50.55a(g). The Examination requirements will be met to the extent practical through limitations on component configuration, accessibility and material composition.

The plant was not specifically designed to meet all the requirements of Section XI of the code; therefore, 100 percent compliance may not be feasible or practical. However, access for in-service inspection was considered during the design, and modifications have been made where practical to make provision for maximum access within the limits of the current plant design.

The Reactor Coolant System was initially free of gross defects, and the system has been designed such that gross faults or defects should not occur throughout the plant lifetime. The ten-year surveillance program will reveal possible fault areas before any leak develops, should such problems actually occur.

The inservice testing requirements of Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda were developed following commercial operation of the Kewaunee Plant. The Technical Specifications address specific testing requirements for safety related equipment including pumps and valves, which were evaluated to be adequate by the NRC in granting the Operating License. The ASME Code does not take precedence over these established surveillance requirements of the Specifications and the methodology of those Technical Specification required tests.

Additional tests of equipment required to be listed by Section XI and applicable Addenda and not addressed in the Technical Specification shall not compromise nuclear safety. Specific exemption will be provided by the NRC for those component tests which are impractical, compromise safety, or whose performance would require modification of the facility which degrades overall safety or is not cost-effective in light of 10CFR50 Section 50.109(g) considerations.

Tables TS 4.2-1 through TS 4.2-5 identify the specific tests which are applicable to the Kewaunee Plant. The tables clarify the requirements of the inservice inspection program and tabulate the exceptions to Section XI of the ASME Boiler and Pressure Vessel Code. Each component to be inspected is addressed in the tables where the applicable safety class Code specification and examination method is addressed. Where specific relief from the Code requirement is necessary, the justification for relief and alternate inspection methods are included.

The following provide further clarification concerning the Class 1, 2, and 3 system inspection programs.

(a) Articles IWC-3000 and IWD-3000 entitled, "Evaluation of Examination Results" are in the course of preparation by the Code Committee and, as yet, are not avialable for use. The rules of IWA-3000 will be utilized where applicable. The evaluation of any indications detected during any inservice examinations will be made using the acceptance standards for materials and welds specified in the code under which the specific component was constructed for those components not constructed in accordance with the rules of Section III.

(b) Articles IWC-4000 and IWD-4000 entitled, "Repair Procedures" state that the rules of IWB-4000 shall apply. It is considered that the repair procedures outlined in IWB-4000 are inappropriate for the Class 2 and 3 components in this program and the rules of IWA-4000 will be applied.

(c) Requirements for the visual examination of Class 1 systems and components for evidence of leakage during the performance of a system pressure test following each refueling are identified by IWB-5200. Exception is taken to the implementation of these requirements on those portions of Class 1 systems which are contained between two check valves or where pressure applied to the reactor coolant system will be retained at the first valve in the line. The portions of systems affected by this limitation are:

(i) Cold leg injection from accumulators between check valves 8840A and B and 8841A and B and test line to valves 8824A and 8825B and RHR return line valve 8703.



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(ii) Cold leg high head injection between check valves 8842A and B and SI 118-1 and 118-3.

(iii) Reactor Vessel injection between check valves 8844A and B and 8843A and B and SI 118-2 and 118-4.

(d) Subsections IWB and IWC contain differing requirements for the hydrostatic testing of Class 1 and Class 2 systems and components. The implementation of these requirements is impractical when the only means of pressurizing the Class 2 system is through the Class 1 system or when the boundary between the two systems is a check valve arranged for flow from Class 2 to the Class 1 system. Exception is taken to the performance of the hydrostatic test requirements as required by Article IWC-2412 (a) on those portions of the Class 2 systems identified below. Visual examination for evidence of leakage will be conducted on these portions of the systems at the system nominal operating pressure in accordance with the requirements of IWB-5221 for the adjoining Class 1 system.

(i) R. C. pump seal bypass line from the orifice to AOV 8145.

(ii) R. C. pump seal leak off line to manually operated valves 8148 A and B.

(iii) R. C. pump seal injection line from check valve CS 100-1 and 2 to manually operated valves CS 7-1 and 2.

(iv) Charging line control valve by-pass line from check valve CS 102-5 to manually operated valve CS 101-24.

(v) Letdown line from valve LCV 428 to orifice outlet valves 8140 A and B and 8141.

(vi) Pressurizer steam space sampling line from valve 9999A to SS13-5, pressurizer liquid space sampling line from valve 9999B to SS13-6 and loop sampling line from valve 9999C. to valve SS13-7.

The potential for inadvertent overpressurization of the reactor coolant system causes additional concerns on the advisability of pressurizing Class 2 systems to considerably higher pressures than the adjacent Class 1 system and relief is requested from implementing the hydrostatic test requirements of IWC-2412(a) on the CVCS system where such potential exists. The chemical and volume control charging, seal injection and letdown systems are in continuous operation during normal plant operation and are continuously monitored to ensure continued integrity and performance.

(e) The examination requirements for Class 3 systems and components included in Table TS 4.2-3 are in accordance with IWD-2410(c) which specifies that 100 percent of the components be examined as required by IWA-5240 and IWD-2600 either during normal operation or during system inservice testing. An additional requirement of IWD-2410(b) is for the examination of Class 3 systems and components for evidence of leakage during the performance of a system pressure test in accordance with IWD-5000. The code does not stipulate that certain amounts of these examination requirements be completed within each 40-month period such that the system pressure test requirements may be deferred until the end of the ten year inspection interval. However, it should be noted, that these system pressure tests when required are impractical in those systems, such as component cooling, service water, spent fuel pit cooling, and boric acid transfer and recirculation, which are in continuous operation during all modes of plant operation. The continuous functional operation serves to demonstrate the structural and leak-tight integrity of these systems. Visual examinations of these systems will be performed at normal operation pressures to verify leak-tightness.

Tables TS 4.2-4 and TS 4.2-5 provide a listing of the ASME Code Class 1, 2, and 3 pumps and valves subject to the testing requirements of Subsections IWP and IWV of the ASME Boiler and Pressure Vessel Code, 1974 Edition, and Addenda through Summer, 1975.

The tabulation of pumps identifies the pumps to be tested, pump code classes, parameters to be measured and test intervals.

Similarly the tabulation of valves identifies the valves to be tested, Valve code classes, Section XI Category as defined by IWV-2000, and test frequencies. In both tabulations, relief from the testing requirements of Section XI is requested in cases where these requirements have been determined to be impractical. Where relief is requested, specific information is provided which identifies the applicable code requirement, justification for the relief request, and testing method to be used as an alternative. The pump and valve testing programs have been reviewed to ensure that testing the component at the specified interval will not place the plant in an unsafe condition.

The requirements for pump performance as currently specified in other sections of the technical specification is that they reach the required developed head at miniflow. Relief is requested from pump performance parameters of head and flow from having to meet the allowable ranges of test quantities as defined in Table IWP-3100-2 with the substitution of the tolerances of being no less than 10 percent of the performance curve as allowed by IWP-3210.

The Kewaunee plant systems as designed and installed do not contain provisions for the measurement of seat leakage as required by IWV-3420(d) during the performance of the valve leak rate test. Relief is requested from meeting this requirement. Integrated leakage of the containment isolation systems will be measured, as required by 4.4a of the technical specification.

Where valve actuation or leak rate tests are currently covered and documented by existing requirements of the plant technical specifications, relief is requested from maintaining separate additional records to meet the requirements of IWV-6000.

Included in the tabulation of valves are normally closed check valves for which operation will be verified at each refueling outage. Operation will be verified by establishing flow in each individual line. Flow will be verified as allowed by IWV-3520(b)(2), either by observation of installed flow instrumentation or by observing that flow is established into the reactor coolant system when opened up for refueling.

Normally closed category A and B valves and normally closed check valves which cannot be exercised at three month intervals are identified as being operated at each refueling outage in accordance with the requirements of IWV-3410(b)(1) and IWV-3520(b).

Manual valves or power operated valves that fail as is on loss of power and do not have to change position to perform their intended safety function are excluded from testing by IWV-1300 and are not included in Table 4.2-5. These valves are assured in their proper safeguard position by procedures, checklists, and/or periodic verification.

The inservice inspection and testing programs outlined in the attached tabulations have been developed as a result of a design review. Should certain ASME Section XI Code requirements be discovered to be impractical due to unforeseen reasons during the process of performing inspections or tests, relief will be requested from the specific Section XI Code requirement at that time.

Radiation levels in certain areas or of certain components may be found to prohibit the access for operators or inspectors to perform the inspections or tests described in this program. If source strengths cannot be reduced such that the personnel dose per weld inspected is less than 0.25 Man Rem for Class 2 and 3 inspections, the inspection will not be performed. Additional relief will be requested from the specific Section XI Code requirements be proposed if radiation doses are determined to be excessive.

Table TS 4.2-1
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 1 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B1.1 | B-A | Reactor Vessel | III-A | Upper to Intermediate Shell Course Circumferential Weld | Volumetric | No |
| B1.1 | B-A | | | Intermediate to Lower Shell Course Circumferential Weld | Volumetric | No |
| B1.1 | B-A | | | Lower Head to Shell Circumferential Weld | Volumetric | No |
| B1.2 | B-B | | | Lower head ring to disc circumferential weld | Volumetric | No |
| B1.3 | B-C | | | Flange to Vessel Weld | Volumetric | No |
| B1.3 | B-C | | | Closure Head to Flange Weld | Volumetric | No |
| B1.4 | B-D | | | Outlet Nozzle to Shell Welds (2) | Volumetric | No |
| B1.4 | B-D | | | Inlet Nozzle to Shell Welds (2) | Volumetric | No |
| B1.5 | B-E | | | CRDM, Vent and In-Core Instrumentation penetrations and CRDM seal welds | Visual | No |
| B1.6 | B-F | | | Primary Nozzle to Safe-End Welds | Volumetric & Surface | No |
| B1.7 | B-G-1 | | | Closure Studs (In Place) | NA | No - Note 1 |
| B1.8 | B-G-1 | | | Closure Studs and Nuts and Surface | Volumetric | No |

Table TS 4.2-1
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| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B1.9 | B-G-1 | | | Vessel Flange Ligaments | Volumetric | No |
| B1.10 | B-G-1 | | | Closure Washers | Visual | No |
| B1.11 | B-G-2 | | | Conoseal Bolting | Visual | No |
| B1.12 | B-H | | | Integrally Welded Supports | Volumetric | No - Note 2 |
| B1.13 | B-J-1 | | | Closure Head Cladding | Volumetric | No - Note 3 |
| B.1.14 | B-J-1 | | | Vessel Cladding | Visual | No |
| B1.15 | B-N-1 | | | Vessel Interior Surfaces and Internals | Visual | No |
| B1.16 | B-N-2 | | | Interior Attachments and Core Support Structures | NA | No - Note 4 |
| B1.17 | B-N-3 | | | Core Support Structures | Visual | No |
| B1.18 | B-O | | | Control Rod Drive Housings | Volumetric | No |
| B1.19 | B-P | | | Exempted Components | Visual | No |
| B2.1 | B-B | Pressurizer | III-A | Circumferential Shell Welds (3) | Volumetric | No |
| B2.1 | B-B | | | Longitudinal Shell Welds (2) | Volumetric | No |
| B2.2 | B-D | | | Nozzle to Vessel Welds (6) | NA | No - Note 5 |
| B2.3 | B-E | | | Heater Penetrations | Visual | No |

Table TS 4.2-1
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 1 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B2.4 | B-F | | | Nozzle to Safe-End Welds (6) | Surface and Volumetric | No |
| B2.5 | B-G-1 | | | Pressure Retaining Bolting (In place) | NA | No - Note 6 |
| B2.6 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B2.7 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B2.8 | B-H | | | Integrally Welded Support | Volumetric | No |
| B2.9 | B-I-2 | | | Vessel Cladding | Visual | No |
| B2.10 | B-P | | | Exempted Components | Visual | No |
| B2.11 | B-G-2 | | | Manway Bolting | Visual | No |
| B3.1 | B-B | Steam Generators (2) Primary Side | III-A | Channel Head to Tubesheet Weld (2) | Volumetric | No |
| B3.2 | B-D | | | Nozzle to Vessel Welds | NA | No - Note 7 |
| B3.3 | B-F | | | Nozzle to Safe End Welds (4) | Volumetric & Surface | Yes - Note 8 |
| B3.4 | B-G-1 | | | Pressure Retaining Bolting (In Place) | NA | No - Note 6 |
| B3.5 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |

Table TS 4.2-1
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 1 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B3.6 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B3.7 | B-H | | | Integrally Welded Supports | NA | No - Note 6 |
| B3.8 | B-I-2 | | | Vessel Cladding | Visual | No |
| B3.9 | B-P | | | Exempted Components | Visual | No |
| B3.10 | B-G-2 | | | Manway Bolting | Visual | No |
| B4.1 | B-F | Piping Pressure Boundary | | Safe End to Pipe Welds | Volumetric and Surface | Yes - Note 8 |
| B4.2 | B-G-1 | | | Pressure Retaining Bolting (In Place) | NA | No - Note 6 |
| B4.3 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B4.4 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B4.5 | B-J | | | Circumferential and Longitudinal Pipe Welds | Volumetric | Yes - Notes 9 and 10 |
| B4.6 | B-J | | | Branch Pipe Connection Welds exceeding 6-inch diameter | Volumetric | Yes - Note 11 |
| B4.7 | B-J | | | Branch Pipe Connection Welds 6-inch diameter and smaller | Surface | No |
| B4.8 | B-J | | | Socket Welds | Surface | No |
| B4.9 | B-K-1 | | | Integrally Welded Supports | Volumetric | Yes - Note 12 |

Table TS 4.2-1
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 1 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B4.10 | B-K-2 | | | Support Components | Visual | No |
| B4.11 | B-P | | | Exempted Components | Visual | No |
| B4.12 | B-G-2 | | | Pressure Retaining Bolting | Visual | No |
| B5.1 | B-G-1 | Reactor Coolant Pumps | | Main Flange Bolting | Volumetric | No |
| B5.1<br>B5.2 | B-G-1<br>B-G-1 | | | Seal Housing Bolting<br>Main Flange and Seal Housing Bolting | Volumetric<br>Volumetric and Surface | Yes - Note 13<br>No - Note 14 |
| B5.3 | B-G-1 | | | Pressure Retaining Bolting | Visual | No |
| B5.4 | B-K-1 | | | Integrally Welded Supports | NA | No - Note 6 |
| B5.5 | B-K-2 | | | Support Components | Visual | No |
| B5.6 | B-L-1 | | | Pump Casing Welds | Volumetric | No - Note 15 |
| B5.7 | B-L-2 | | | Pump Casings | Visual | No |
| B5.8 | B-P | | | Exempted Components | Visual | No |
| B5.9 | B-G-2 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B6.1 | B-G-1 | Valve Pressure Boundary | | Pressure Retaining Bolting (In Place) | NA | No - Note 6 |
| B6.2 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |
| B6.3 | B-G-1 | | | Pressure Retaining Bolting | NA | No - Note 6 |

Table TS 4.2-1
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 1 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| B6.4 | B-K-1 | | | Integrally Welded Supports | NA | No - Note 6 |
| B6.5 | B-K-2 | | | Support Components | Visual | No |
| B6.6 | B-M-1 | | | Valve Body Welds | NA | No - Note 6 |
| B6.7 | B-M-2 | | | Valve Bodies | Visual | No |
| B6.8 | B-P | | | Exempted Components | Visual | No |
| B6.9 | B-G-2 | | | Pressure Retaining Bolting | Visual | No |

## ASME CODE CLASS 1 COMPONENTS

### NOTES

1. The reactor vessel closure studs are removed during each refueling and there will be no need for examination in place as required by IWB-2600.

2. The reactor vessel has six supports, four of which are pads integral with the four primary nozzles and are excluded from examination requirements of IWB-2500 by Category B-H. The attachment welds and the vessel wall base metal beneath the two bracket supports will be examined from inside the vessel when the core barrel is removed at the end of the ten year interval.

3. Radiation levels beneath the closure head are 15 to 30 R/hr at 6 inches from the clad surface. The time required for access, cleaning and both visual and surface examination of two 36 square inch cladding patches could take a total of 15 minutes such that the examiner (or examiners) could be subjected to a total accumulated dose of up to 7.5 man Rem. The presence of the cladding material is not considered when performing the stress analyses of the vessel such that failure of the cladding would not effect the integrity of the vessel. The closure head cladding will be volumetrically examined concurrent with the examinations performed on the closure head to flange weld.

4. This requirement of IWB-2600 is applicable only to Boiling Water type reactors.

5. The pressurizer nozzles are integrally cast with the vessel heads and there are no welds requiring examination in accordance with the requirement of IWB-2600.

6. There are no items in this category on this component in the Kewaunee plant Class 1 systems.

7. The steam generator nozzles are integrally cast with the channel head and there are no welds in this category.

8. Examination of the steam generator primary nozzle to safe-end and safe-end to pipe weld is limited both by the nozzle geometry and surface condition and the limited surface preparation on the pipe side of the weld. The surface on the pipe side of the weld, which is a cast elbow, is machined for a distance of approximately 3 inches from the edge of the weld. Ultrasonic examination is limited to this distance from the edge of the weld. Examinations can be performed on the surface of the weld but are severely limited from the nozzle side by the rough, as cast surface. Surface examinations can be performed on 100 percent of the weld and the base metal on the pipe side.

9. Limitations may occur for the examination of piping system circumferential butt welds (Category B-J) when the welds occur at geometric discontinuities such as pipe to vessel welds, pipe to fitting welds or fitting to fitting welds. For pipe to fitting or pipe to vessel nozzle welds, examinations can be performed to the extent required by T-532 of Section V from the weld and pipe surfaces. Examination from the fitting side would be dependent upon the geometric configuration. Where elbows or tees are concerned, examination can be performed from the fitting side except where the intrados of the fitting prevents adequate ultrasonic coupling. No examinations can be performed from the fitting side when it is a valve or a flange. In all cases 100 percent of the weld material can be examined. In instances where welds occur at fitting to fitting, access restrictions as outlined above occur on both sides of the weld. In instances where ultrasonic examinations cannot be performed on 100 percent of the volume of the weld and heat affected zone, surface examinations will be performed to supplement the limited volumetric examination.

Welds in the Kewaunee Plant, Class 1 systems which due to limitations, would require surface examination are:

(a) Loop A Accumulator Discharge Line; Weld #5.
(b) Loop A RHR Take-off Line; Weld #11.
(c) Loop A High Head SIS Line; Weld #3.
(d) Loop A Pressurizer Spray Line; Weld #5.
(e) Loop A RTD Return Line; Weld #3.

(f) Loop B Accumulator Discharge Line; Weld #4.

(g) Loop B RHR Take-off Line; Weld #9.

(h) Loop B High Head SIS Line; Weld #3.

(i) Loop B Pressurizer Spray Line; Weld #5.

(j) Loop B RTD Return Line; Weld #2.

(k) Pressurizer Safety Valve (8010A) Line; Welds #4, 7 & 8.

(l) Pressurizer Safety Valve (8010B) Line; Welds #5, 8 & 9.

(m) Pressurizer Relief Line, Welds *9 & 13.

In instances where the locations of pipe supports or hangers restrict the access available for the examination of pipe welds as required by IWB-2600, examinations will be performed to the extent practical unless removal of the support is permissible without unduly stressing the system. Welds in the Kewaunee Plant, Class 1 systems which due to the location of supports, would require surface examination are:

(a) Loop A Accumulator Discharge Line; Weld #6

(b) Loop A RHR Take-off Line; Weld #8

(c) Loop A Pressurizer Spray Line; Weld #9.

(d) Loop B RHR Take off Line; Weld #7.

(e) Loop B Accumulator Discharge Line; Weld #12.

(f) Loop B RHR Return Line, Welds #6 & 7.

(g) Pressurizer Relief Line, Weld #12.

10. The 90 degree elbows in the crossover leg of the reactor coolant system are fabricated in two halves from austenitic stainless steel castings welded together by the electroslag process.

The structure and nature of the electroslag weld in the cast austenitic 90 degree elbows is such that the material is opaque to ultrasonic transmissions utilizing currently available techniques. Radiography is the only other available technique for volumetric examination. It is not possible to obtain code acceptable radiographs with double wall "shots" on these components which are approximately 38 inches diameter, 3 1/2 inches wall thickness, containing a 2 inch thick splitter plate and having radiation levels of up to 300 mr/hour on contact. Surface examination could be performed on these welds.

11. The configuration of the reactor coolant branch nozzle connection welds is such that ultrasonic examinations cannot be performed on the surface of the weld. Examinations will be performed to the extent practical from the pipe and nozzle surfaces adjacent to the weld. Surface examination of the weld will be performed to supplement the volumetric examination.

12. The piping system integrally welded supports are attached to the pipe by fillet welds. The configurations of such welds is such that examinations cannot be performed to the extent required by IWB-2600 and only the base material of the pipe wall can be examined by ultrasonic techniques. Surface examination will be performed on the integrally welded attachments to supplement the limited volumetric examination.

13. The reactor coolant pump seal housing bolts are of the socket head type and the configuration is such that ultrasonic examinations as required by IWB-2600 cannot be performed when the bolting is in place. Examinations will be performed to the extent required by IWB-2600 when the seal housing is disassembled for maintenance.

14. The reactor coolant pump main flange bolting is ultrasonically examined in place in accordance with the requirements of IWB-2600, Item B5.1. Both main flange and seal housing bolting will be examined as required by IWB-2600, Item B5.2 whenever a pump is disassembled for maintenance or at the end of the ten year interval when a pump will be disassembled for the performance of examinations required by Category B-L-1.

15. One of the reactor coolant pump casings in the Kewaunee plant is fabricated from two heavy wall austenitic steel casting joined together by a weld formed by the electroslag process. The structure and nature of this material is such that is opaque to ultrasonic transmission.

Volumetric examinations as required by IWB-2600 will be attempted utilizing radiographic techniques. The success of these examinations will be dependent upon the availability of high energy gamma sources and the level of background radiation. Internal fittings in the pump may also provide restriction to the extent of examination that can be performed.

Table TS 4.2-2
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 2 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| C1.1 | C-A | Letdown Heat Exchanger (Tube Side) | III-C | Head to Shell Weld | Volumetric | No |
| C1.1 | C-A | | | Shell to Flange Weld | Volumetric | No |
| C1.2 | C-B | | | Nozzle to Vessel Weld | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Tubesheet Flange Bolting | NA | No - Note 1 |
| C1.1 | C-A | Regenerative Heat Exchngr | III-C | Head to Shell Welds (6) | Volumetric | Yes - Note 2 |
| C1.1 | C-A | | | Shell to Tubesheet Welds (6) | Volumetric | Yes - Note 2 |
| C1.2 | C-B | | | Nozzle to Vessel Welds (12) | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | NA | No - Note 1 |
| C1.4 | C-D | | | Pressure Retaining Bolting | NA | No - Note 1 |
| C1.1 | C-A | Residual Heat Exchngr (2) (Tube Side) | III-C | Head to Shell Welds | Volumetric | No |
| C1.1 | C-A | | | Shell to Flange Welds | Volumetric | No |
| C1.2 | C-B | | | Nozzle to Vessel Welds | Volumetric | Yes - Note 3 |

Table TS 4.2-2
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 2 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Tubesheet Flange Bolting | Visual and Volumetric | No |
| C1.1 | C-A | Seal Water Return Filter | III-C | Cover Weldment to Shell Weld | Volumetric | Yes - Note 4 |
| C1.1 | C-A | | | Head to Shell Weld | Volumetric | Yes - Note 4 |
| C1.2 | C-B | | | Nozzle to Vessel Weld | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Pressure Retaining Bolting | NA | No - Note 1 |
| C1.1 | C-A | Volume Control Tank | III-C | Upper Head to Shell Weld | Volumetric | No |
| C1.1 | C-A | | | Lower Head to Shell Weld | Volumetric | No |
| C1.2 | C-B | | | Nozzle to Vessel Weld | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Manway Bolting | Visual and Volumetric | No |
| C1.1 | | Charging Pump Surge Vessel | VIII Div.I | Head to Shell Welds (2) | Volumetric | No |

Table TS 4.2-2
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 2 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| C1.2 | | | | Nozzle to Vessel Welds | NA | No - Note 1 |
| C1.3 | | | | Integrally Welded Supports | NA | No - Note 1 |
| C1.4 | | | | Pressure Retaining Bolting | NA | No - Note 1 |
| C1.1 | C-A | Seal Water Injection Filter (2) | III-C | Shell to Flange Weld | Volumetric | No |
| | | | | Head to Shell Weld | Volumetric | No |
| C1.2 | C-B | | | Nozzle to Vessel Welds | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Tubesheet Flange Bolting | Visual and Volumetric | No |
| C1.1 | C-A | Steam Generators (2) (Shell Side) | III-A | Upper Head to Shell Weld | Volumetric | No |
| C1.1 | C-A | | | Upper Shell to Transition Weld | Volumetric | No |
| C1.1 | C-A | | | Transition to Lower Shell Weld | Volumetric | No |
| C1.1 | C-A | | | Lower Shell to Stub Barrel Weld | Volumetric | No |
| C1.1 | C-A | | | Stub Barrel to Tubesheet Weld | Volumetric | No |
| C1.2 | C-B | | | Steam Outlet Nozzle to Shell Weld | Volumetric | No |

Table TS 4.2-2
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 2 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| C1.2 | C-B | | | Feedwater Inlet Nozzle to Shell Weld | Volumetric | No |
| C1.3 | C-C | | | Integrally Welded Supports | NA | No - Note 1 |
| C1.4 | C-D | | | Manway Bolting | Visual and Volumetric | No |
| C1.1 | C-A | Reactor Coolant Filter | III-C | Cover Weldment to Shell Weld | Volumetric | Yes - Note 4 |
| C1.1 | C-A | | | Head to Shell Weld | Volumetric | Yes - Note 4 |
| C1.2 | C-B | | | Nozzle to Vessel Weld | NA | No - Note 1 |
| C1.3 | C-C | | | Integrally Welded Supports | Surface | No |
| C1.4 | C-D | | | Pressure Retaining Bolting | NA | No - Note 1 |
| C2.1 | C-F; C-G | Piping Systems | | Circumferential Butt Welds | Volumetric | Yes - Note 5 |
| C2.2 | C-F; C-G | | | Longitudinal Weld Joints in Fittings | Volumetric | No |
| C2.3 | C-F; C-G | | | Branch Pipe to Pipe Welds | Volumetric | Yes - Note 6 |
| C2.4 | C-D | | | Pressure Retaining Bolting | Visual and Volumetric | No |
| C2.5 | C-E-1 | | | Integrally Welded Supports | Surface | No |

Table TS 4.2-2
KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 2 COMPONENTS

| TABLE IWB-2600 ITEM NO. | TABLE IWB-2500 EXAMINATION CATEGORY | SYSTEM OR COMPONENT | CODE APPLICABLE TO CONSTRUCTION | AREA TO BE EXAMINED | EXAMINATION REQUIREMENT | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| C2.6 | C-E-2 | | | Support Components | Visual | No |
| C3.1 | C-F | Residual Heat Removal Pumps (2) | | Pump Casing Welds | NA | No - Note 1 |
| C3.2 | C-D | | | Pressure Retaining Bolting | Visual and Volumetric | No |
| C3.3 | C-E-1 | | | Integrally Welded Supports | NA | No - Note 1 |
| C3.4 | C-E-2 | | | Support Components | Visual | No |
| C3.1 | C-F | Charging Pumps (3) | | Pump Casing Welds | NA | No - Note 1 |
| C3.2 | C-D | | | Pressure Retaining Bolting | Visual and Volumetric | No |
| C3.3 | C-E-1 | Charging Pumps (3) | | Integrally Welded Supports | NA | No - Note 1 |
| C3.4 | C-E-2 | | | Support Components | Visual | No |
| C4.1 | C-F; C-G | Valves | | Valve Body Welds | NA | No - Note 1 |
| C4.2 | C-D | | | Pressure Retaining Bolting | Visual and Volumetric | No |
| C4.3 | C-E-1 | | | Integrally Welded Supports | NA | No - Note 1 |
| C4.4 | C-E-2 | | | Support Components | Visual | No |



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ASME CODE CLASS 2 COMPONENTS

NOTES

1. There are either no items in this category or items are excluded from Examination requirements of IWC-2600 by application of criteria given in IWC-1220. The specific details of exclusions are:
   (a) Letdown heat exchanger inlet and outlet nozzles are 2 inch diameter, tubesheet flange bolting is 7/8 inch diameter.
   (b) Regenerative heat exchanger inlet and outlet nozzles are 2 inch diameter, there are no integrally welded supports or pressure retaining bolting on this vessel.
   (c) Seal water return filter inlet and outlet nozzles are 2 inch diameter, cover flange bolting is 3/4 inch diameter.
   (d) Volume control tank inlet and outlet nozzles are 4, 3 and 2 inch diameter.
   (e) Charging pump surge vessel inlet nozzle is 3 inch diameter, there are no integrally welded supports or pressure retaining bolting on this vessel.
   (f) Seal water injection filter inlet and outlet nozzles are 2 inch diameter.
   (g) There are no integrally welded supports on the steam generators.
   (h) Reactor coolant filter inlet and outlet nozzles are 2 inch diameter and cover flange bolting is 3/4 inch diameter.
   (i) Residual heat removal pump casings have no pressure containing welds or integrally welded supports.
   (j) Charging pump casinsg have no pressure continaing welds or integrally welded supports.
   (k) There are no Class 2 valves with pressure containing welds or integrally welded supports.

   Portions of Class 2 systems and components that are exempt from the examination requirements of IWC-2520 by IWC-1220 are as follows:
   (a) CVCS Piping equal to or less than 4-inch nominal diameter is exempted by IWC-1220 (d).

(b) During plant operation, the contents of the SIS accumulators are normally sampled on a regular basis and this component and associated piping would be exempted by IWC-1220(c).

(c) The high head SIS piping is all equal to or less than 4-inch nominal diameter and exempted by IWC-1220(d).

(d) During plant operation, the high head SIS injection pumps are run on a periodic basis to recirculate flow to and from the RWST. Samples taken on a regular basis from the RWST would verify the chemistry of the system fluid and the pump and associated suction piping would be exempt from examination by IWC-1220(c).

(e) The containment spray system does not function during normal reactor operation and is exempted by IWC-1220(b).

2. The regenerative heat exchanger is a three pass vessel, having a total of six head to shell welds and six shell to tubesheet welds. Radiation levels adjacent to this heat exchanger are between 6 and 7 R/hr. The total time required for erection of scaffolding, removal of insulation, cleaning, performing examinations and restoration insulation could take a total of 3 to 4 hours for the examination of an 1/2 inch long portion of each of 12 welds in this category, such that personnel involved could be subjected to a total accumulated dose of up to 56 man Rem. It is felt that the potential personnel exposure to complete these examinations is excessive particularly when the examination is to establish the continued integrity of a vessel in system in which all the piping welds are exempt from examination by IWC-1220(d). Examination of this vessel for evidence of leakage during the performance of pressure tests will provide the same assurance of continued integrity as for the piping system with which it is associated.

3. The nozzle to vessel welds of the residual heat exchangers are covered by 12 inch diameter, one inch thick reinforcement pad. The weld is not accessible for examination by volumetric or surface methods. The area will be subject to visual examination for evidence of leakage during system pressure tests.

4. The thickness of the materials utilized for the construction of this component (0.165 to 0.185 inches) is such that meaningful results could not be expected with ultrasonic examination as required by IWC-2600. Surface and visual examination of these welds will be performed as an alternative method.

5. Examination of Class 2 piping system welds is limited to those occuring at geometric discontinuities such that some limitations may be expected at all locations. For pipe to fitting or pipe to vessel nozzle welds, examinations can be performed to the extent required by T-532 of Section V from the weld and pipe surfaces. Examination from the fitting side would be dependent upon the geometric configuration. Where elbows or tees are concerned, examination can be performed from the fitting side except where the intrados of the fitting prevents adequate ultrasonic coupling. No examinations can be performed from the fitting side when it is a valve or a flange. In all cases 100 percent of the weld material can be examined. In instances where welds occur at fitting to fitting, access restrictions as outlined above occur on both sides of the weld. In instances where ultrasonic examinations cannot be performed on 100 percent of the volume of the weld and heat affected zone, surface examinations will be performed to supplement the limited volumetric examination.

Preservice examinations were not conducted on the welds in Class 2 systems in the Kewaunee Plant and the following listing of welds are those where it is expected that supplemental surface examinations would be required.

(a) Loop A Feedwater, ISO WPS2-2101 Weld #19.
(b) Loop B Feedwater, ISO WPS2-2201 Welds #18 & 19.
(c) RHR System, ISO WPS2-2520, Welds #2, 22, 28, 29, 56, 57 and 58
(d) RHR System, ISO WPS2-2521, Welds #2, 5 and 11.
(e) RHR/Low head SIS System, ISO WPS2-2522, Weld #23.
(f) RHR System, ISO WPS2-2530, Welds #3, 20 & 32.
(g) RHR System, ISO WPS2-2531, Welds #3, 19, 34, 35, 42 and 48.
(h) Low Head SIS System, ISO WPS2-2540, Weld #12.
(i) Low Head SIS System, ISO WPS2-2541, Weld #16.
(j) Low Head SIS System, ISO WPS2-2542, Weld #31.

Additionally sections of the Loop B mainsteam and feedwater systems are encapsulated for pipe whip restraint and welds contained in these sections are inaccessible for examination. Specific welds are:

(a) Loop B Mainsteam, Welds #8 and 9.

(b) Loop B Feedwater, Welds #1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13 and 14.

The code does not require that all welds in multiple streams be examined and consequently not all the welds listed above will be included in the inspection program during the life of the plant.

6. Where ultrasonic examinations cannot be performed on the surface of branch pipe to pipe welds, examinations will be performed to the extent practical from the pipe and nozzle surfaces adjacent to the weld. Surface examination of the weld will be performed to supplement the volumetric examination.

Table TS 4.2-3

KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 3 COMPONENTS

| SYSTEM | COMPONENT DESCRIPTION/IDENTIFICATION | | CODE APPLICABLE TO CONSTRUCTION | METHOD OF EXAMINATION | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|
| Component Cooling | Pumps | APCC1 1A<br>APCC2 1B | | Visual/Operating Pressure | No |
| | Heat Exchangers (Shell Side) | AHCC1 1A<br>AHCC2 1B | VIII | Visual/Operating Pressure | No |
| | Seal Water Heat Exchanger (Shell Side) | AHSW | VIII | Visual/Operating Pressure | No |
| | Letdown Heat Exchanger (Shell Side) | AHNR | VIII | Visual/Operating Pressure | No |
| | RHR Heat Exchangers (Shell Side) | AHRS1 (1A)<br>AHRS2 (1B) | VIII | Visual/Operating Pressure | No |
| | Surge Tank | ATCS 1 | VIII | Visual/Operating Pressure | No |
| | Excess Letdown Heat Exchangers (Shell Side) | AHEL 1A<br>AHEL 1B | VIII | Visual/Operating Pressure | No |
| | R. C. Pump Oil Coolers | PCPC 1A<br>PCPC 1B | | Visual/Operating Pressure | No |
| | Containment Spray Pump Gland Coolers | 1A<br>1B | | Visual/Operating Pressure | No |
| | Safety Injection Pump Coolers | APSI 1A<br>APSI 1B | | Visual/Operating Pressure | No |



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Table TS 4.2-3

KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 3 COMPONENTS

| SYSTEM | COMPONENT DESCRIPTION/IDENTIFICATION | CODE APPLICABLE TO CONSTRUCTION | METHOD OF EXAMINATION | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|
| Component Cooling | RHR Pump Shaft Seal Heat Exchangers / APRH1 1A, APRH2 1B | | Visual/Operating Pressure | No |
| | Piping | B31.1 | Visual/Operating Pressure | No |
| | Hangers and Supports | | Visual | No |
| Service Water | Pumps / 1A1, 1A2, 1B1, 1B2 | | Visual/Operating Pressure | No |
| | Strainers / 1A1, 1A2, 1B1, 1B2 | | Visual/Operating Pressure | No |
| | Diesel Generator Heat Exchangers / 1A, 1B | | Visual/Operating Pressure | No |
| | Component Cooling Heat Exchangers (Tube Side) / 1A, 1B | | Visual/Operating Pressure | No |
| | Spent Fuel Pool Heat Exchanger (Shell Side) | VIII | Visual/Operating Pressure | No |
| | Safety Injection Pump Coolers / APSI 1A, APSI 1B | | Visual/Operating Pressure | No |

Table TS 4.2-3

KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 3 COMPONENTS

| SYSTEM | COMPONENT DESCRIPTION/IDENTIFICATION | | CODE APPLI-CABLE TO CONSTRUCTION | METHOD OF EXAMINATION | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|
| Service Water | Containment Fan Coil Units | 1A<br>1B<br>1C<br>1D | | Visual/Operating Pressure | No |
| | Piping | | | Visual/Operating Pressure | No |
| | Hangers and Supports | | | Visual | No |
| Auxiliary Feed Water | Motor Driven Pumps | 1A<br>1B | | Visual/Operating Pressure | No |
| | Turbine Driven Pump | 1C | | Visual/Operating Pressure | No |
| | Supports | | | Visual | No |
| Spent Fuel Pool Cooling | Pumps | 1A<br>1B | | Visual/Operating Pressure | No |
| | Heat Exchanger (Tube Side) | | III C | Visual/Operating Pressure | No |
| | Piping | | B31.1 | Visual/Operating Pressure | No |

Table TS 4.2-3

KEWAUNEE NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
ASME CODE CLASS 3 COMPONENTS

| SYSTEM | COMPONENT DESCRIPTION/IDENTIFICATION | | CODE APPLICABLE TO CONSTRUCTION | METHOD OF EXAMINATION | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|
| Spent Fuel Pool Cooling | Hangers and Supports | | | Visual | No |
| Chemical and Volume Control | Boric Acid Tanks | ATBA 1A<br>ATBA 1B | | Visual/Operating Pressure | No |
| | Boric Acid Filter | FLBA | III C | Visual/Operating Pressure | No |
| | Boric Acid Transfer Pumps | APBA 1A<br>APBA 1B | | Visual/Operating Pressure | No |
| | Component Supports | | | Visual | No |
| Auxiliary Steam | Piping | | B31.1 | Visual/Operating Pressure | No |

Table TS 4.2-4
KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 PUMPS

| PUMP IDENTIFICATION | | PUMP DESCRIPTION | ASME CODE CLASS | MEASURED PARAMETERS | TEST INTERVAL | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| APSI | 1A | High Head Safety | 2 | 1. Speed (if variable) | NA | No |
| APSI | 1B | Injection Pumps | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | | 5. Flow Rate | NA | No - Note 1 |
| | | | | 6. Vibration Amplitude | Refueling* | Yes - Note 2 |
| | | | | 7. Bearing Temperature | Refueling* | Yes - Note 3 |
| | | | | 8. Lubricant Level or Pressure | Monthly | No |
| APRHI | 1A | Residual Heat | 2 | 1. Speed (if variable) | NA | No |
| APRHI | 1B | | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | | 5. Flow Rate | NA | No - Note 1 |
| | | | | 6. Vibration Amplitude | Refueling* | Yes - Note 2 |
| | | | | 7. Bearing Temperature | Refueling* | Yes - Note 4 |
| | | | | 8. Lubricant Level or Pressure | Refueling* | Yes - Note 5 |
| | 1A | Auxiliary Feed | 3 | 1. Speed (if variable) | NA | No |
| | 1B | Water (Motor Driven) | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | | 5. Flow Rate | NA | No - Note 1 |

* Once Per Refueling Cycle

Table TS 4.2-4

KEWAUNEE NUCLEAR PLANT

INSERVICE TEST PROGRAM

ASME CODE CLASS 1, 2 AND 3 PUMPS

| PUMP IDENTIFICATION | | PUMP DESCRIPTION | ASME CODE CLASS | MEASURED PARAMETERS | TEST INTERVAL | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|
| | 1A | Auxiliary Feed | 3 | 6. Vibration Amplitude | Refueling* | Yes - Note 2 |
| | 1B | Water (Motor Driven) | | 7. Bearing Temperature | Refueling* | Yes - Note 4 |
| | | | | 8. Lubricant Level or Pressure | Monthly | No |
| | 1A1 | Service Water | 3 | 1. Speed (if variable) | NA | No |
| | 1A2 | | | 2. Inlet Pressure (Pi) | Note 6 | Yes |
| | 1B1 | | | 3. Outlet Pressure (Po) | Note 7 | Yes |
| | 1B2 | | | 4. Differential Pressure (Pi-Po) | Note 7 | Yes |
| | | | | 5. Flow Rate | Note 8 | Yes |
| | | | | 6. Vibration Amplitude | Monthly | No |
| | | | | 7. Bearing Temperature | NA | Yes - Note 9 |
| | | | | 8. Lubricant Level or Pressure | NA | Yes - Note 9 |
| APCC1 | 1A | Component Cooling | 3 | 1. Speed (if variable) | NA | No |
| APCC2 | 1B | | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | | 5. Flow Rate | Monthly | No |
| | | | | 6. Vibration Amplitude | Monthly | No |
| | | | | 7. Bearing Temperature | NA | Yes - Note 10 |
| | | | | 8. Lubricant Level or Pressure | Monthly | No |

* Once Per Refueling Cycle

KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 PUMPS

| PUMP IDENTIFICATION | PUMP DESCRIPTION | ASME CODE CLASS | MEASURED PARAMETERS | TEST INTERVAL | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|
| 1A | Containment Spray | | 1. Speed (if variable) | NA | No |
| 1B | | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | 5. Flow Rate | NA | No - Note 1 |
| | | | 6. Vibration Amplitude | Refueling* | Yes - Note 11 |
| | | | 7. Bearing Temperature | Note 11 | Yes |
| | | | 8. Lubricant Level or Pressure | Monthly | No |
| 1C | Auxiliary Feedwater (Turbine Driven) | | 1. Speed (if variable) | Monthly | No |
| | | | 2. Inlet Pressure (Pi) | Monthly | No |
| | | | 3. Outlet Pressure (Po) | Monthly | No |
| | | | 4. Differential Pressure (Pi-Po) | Monthly | No |
| | | | 5. Flow Rate | NA | No - Note 1 |
| | | | 6. Vibration Amplitude | Refueling* | Yes - Note 2 |
| | | | 7. Bearing Temperature | Refueling* | Yes - Note 4 |
| | | | 8. Lubricant Level or Pressure | Monthly | No |

* Once Per Refueling Cycle

INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 & 3 PUMPS

NOTES

1. Under the operating mode in which these pumps will be tested the system will have fixed resistance. As allowed by footnote 1 of Table IWP-3100-1, this parameter will not be recorded.

2. The monthly performance test of this pump is run under recirculation "miniflow" conditions. With high head, low flow operating conditions, this pump vibrates considerably more than under normal flow conditions. Vibration measurements will be taken when the pump is run under a reference flow condition during each refueling outage.

3. The bearing oil cooling system for this pump is cooled by the Service Water System. The system is not temperature stabilized, therefore meaningful results from the recording of this temperature cannot be expected.

4. Bearing temperatures are recorded at refueling since that situation provides reference conditions in which the bearing temperatures have had adequate time stabilized.

5. Monthly recording of Lubricant Level or Pressure requires entry into the RHR pump pit which is normally inaccesible at power. No remote indication exists.

6. The service water pumps are vertical design with no means of direct inlet pressure measurement as required by IWP-4200. Inlet pressure to these pumps will be established by reference to the level of water above the pump suction. As the measurement of the level of water above suction is to be used to determine the inlet pressure, relief is required from meeting pressure tap construction and location requirements of IWP-4211 and IWP-4212.

7. The outlet pressure of the individual Service Water pumps cannot be recorded and consequently differential pressure cannot be established. Instrumentation is available to monitor system pressure at the com-

mon outlet header of the four service water pumps and this parameter can be recorded. It must be recognized that the design heat load is such that multiple pumps must be in operation at all times. There is no plant operating conditions when a single pump could be run to determine performance parameters as required by IWP-3400(a). Additionally, the heat load is constantly varying dependent on plant power levels; lake water temperatures and ambient conditions such that performance parameters are not readily repeatable.

8. There is no instrumentation to monitor this operating parameter in the plant system as designed and constructed. As indicated in Note 7 above, the system heat load is such that multiple pumps must be in operation at all times and operating parameters will vary with plant power levels, etc.

9. The service water pumps are open line shaft pumps that depend primarily of the liquid being pumped for the lubrication of the pump and lineshaft bearings. The bearing lubricating water flow can be verified by sight glass but pressure cannot be monitored. All pump bearings are submerged and lubricant is allowed to leak off into the sump and is not piped back, such that temperatures cannot be monitored.

10. There is no installed instrumentation to monitor this parameter. The design of the pump is such that article IWP-3500 cannot be met.

11. The containment spray pumps are performance tested by running the pump under recirculation "miniflow" conditions. Vibration measurements will be taken under a reference recirculation condition, however, it is expected that vibration will be higher under these conditions. No remote bearing temperature instruments exist and measurements would not be meaningful since these pumps cannot be run under these conditions long enough to stabilize.

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| SI-22A<br>SI-22B<br>SI-21A<br>SI-21B | 8840 A<br>8840 B<br>8841 A<br>8841 B | C | 1 | 12-inch, Check,<br>Accumulator discharge to Cold legs | Each Refueling | N/A | Notes 1, 1a |
| SI-20A<br>SI-20B | 8800 A<br>8800 B | E | 2 | 12-inch, MOV, norm. open<br>Accumulator Discharge Stop Valves | N/A | N/A | |
| SI-13A<br>SI-13B | 8842 A<br>8842 B | C | 1 | 6-inch, Check,<br>HPSI to Cold Legs | Each Refueling | N/A | Note 1 |
| SI-12A<br>SI-12B | SI-118-1<br>SI-118-3 | C | 1 | 2-inch, Check,<br>HPSI to Cold Legs | Each Refueling | N/A<br>N/A | Note 1 |
| SI-11A<br>SI-11B | 8801 A<br>8801 B | E | 2 | 2-inch, MOV, norm. open<br>HPSI to Cold Legs | N/A | N/A | |
| SI-16A<br>SI-16B | SI-118-2<br>SI-118-4 | C | 1 | 2-inch, check,<br>HPSI to Reactor Vessel Core Flood | Each Refueling | N/A | Note 1 |
| SI-15A<br>SI-15B | 8802 A<br>8802 B | B | 2 | 2-inch, MOV, norm. closed<br>HPSI to Reactor Vessel Core Flood | Every 3 Months | N/A | |
| SI-303A<br>SI-303B | 8843 A<br>8843 B | C | 1 | 6-inch, check,<br>LPSI to Reactor Vessel | Each Refueling | N/A | Note 1 |
| SI-106A<br>SI-106B | SI-113-1<br>SI-113-2 | C | 2 | 1-inch, Safety Valve<br>Accumulator Safety Valve | Note 3 | N/A | |



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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| SI-304A<br>SI-304B | 8844 A<br>8844 B | C | 1 | 6-inch, Check,<br>HPSI and LPSI to Reactor Vessel | Each Refueling | N/A | Note 1 |
| SI-312 | 8831 | C | 2 | 3/4-inch, safety valve<br>LPSI relief to PRT | Note 3 | N/A | |
| SI-201A<br>SI-201B<br>SI-202A<br>SI-202B | 8824 A<br>8825 B<br>8825 A<br>8824 B | A | 2 | 3/4-inch, AOV, norm. closed<br>SI test line | N/A | Each Refueling | Note 2 |
| SI-204 | SI 1-7 | A | 2 | 3/4-inch manual valve, norm closed<br>Safety Injection Test Line | N/A | Each Refueling | Note 2 |
| SI-9A | 8806 A | E | 2 | 3-inch, MOV, norm. open<br>HPSI line to Cold Leg Injection | N/A | N/A | |
| SI-6A<br>SI-6B | 8812 A<br>8812 B | C | 2 | 4-inch, Check,<br>HPSI pump discharge | Each Refueling | N/A | Note 1 |
| NG-107 | 8820 | A | 2 | 1-inch, AOV, norm. open<br>$N_2$ Supply to Accumulators | Every 3 Months | Each Refueling | Note 4 |
| SI-4A<br>SI-4B | 8808 A<br>8808 B | B | 2 | 12-inch, MOV, norm. closed<br>RWST Supply to HPSI | Every 3 Months | N/A | |
| SI-2A<br>SI-2B | 8809 A<br>8809 B | B | 2 | 8-inch, MOV, norm. closed<br>BAT Supply to HPSI | Every 3 Months | N/A | |
| SI-3 | 8809 C | E | 2 | 8-inch, MOV, norm. open<br>BAT Supply to HPSI | N/A | N/A | |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| SI-351A<br>SI-351B | 8804 A<br>8804 B | A | 2 | 12-inch, MOV, norm. closed<br>Containment Sump Recirc to RHR | Every 3 Months | Each Refueling | Note 6, 6A |
| SI-350A<br>SI-350B | 8805 A<br>8805 B | A | 2 | 12-inch, MOV, norm. closed<br>Containment Sump Recirc to RHR | Every 3 Months | Each Refueling | Note 6, 6A |
| RHR-300A<br>RHR-300B | 8816 A<br>8816 B | B | 2 | 6-inch, MOV, norm. closed<br>HPSI Pump Suction from RHR | Each Refueling | N/A | Note 7 |
| SI-300A<br>SI-300B | 8810 A<br>8810 B | B | 2 | 10-inch, MOV, norm. closed<br>RWST supply to RHR pumps | Every 3 Months | N/A | |
| SI-301A<br>SI-301B | 8811 A<br>8811 B | C | 2 | 10-inch, Check,<br>RWST supply to RHR Pumps | Each Refueling | N/A | Note 1 |
| RHR-1A<br>RHR-1B | 8702 A<br>8702 B | B | 1 | 8-inch, MOV, norm. closed<br>RHR Take-off from Hot Legs | Cold Shutdown | N/A | Note 8,8A |
| RHR-2A<br>RHR-2B | 8701 A<br>8701 B | B | 1 | 8-inch, MOV, norm. closed<br>RHR Take-off from Hot Legs | Cold Shutdown | N/A | Note 8, 8A |
| RHR-3A<br>RHR-3B | 8710 A<br>8710 B | C | 2 | 8-inch, Check,<br>RHR pump suction from Hot Legs | Cold Shutdown | N/A | Note 8, 8A |
| RHR-5A<br>RHR-5B | 8712 A<br>8712 B | C | 2 | 8-inch, Check,<br>RHR pump discharge | Cold Shutdown | N/A | Note 8, 8A |
| RHR-33 | 8705 | C | 2 | 2-inch, Relief Valve<br>RHR Suction relief valve | Note 3 | N/A | |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| RHR-400A<br>RHR-400B | ICS 6-5<br>ICS 6-6 | B | 2 | 6-inch, MOV, norm. closed<br>RHR Supply to ICS pumps | Every 3 Months | N/A | |
| RHR-401A<br>RHR-401B | ICS 4-1<br>ICS 4-2 | C | 2 | 6-inch, Check<br>RHR supply to ICS pumps | Each Refueling | N/A | Note 15 |
| RHR-11 | 8703 | E/A | 1 | 10-inch, MOV, norm. closed<br>RHR return to Cold Leg | N/A | Each Refueling | Notes 5 & 6a |
| PR-3A<br>PR-3B | 8010 A<br>8010 B | C | 1 | 6-inch, Safety Valve,<br>PZR Safety Relief to PRT | Note 3 | N/A | |
| MG-(R)-513<br>MG-(R)-512 | 8025<br>8026 | A | 2 | 3/8-inch, AOV, norm. closed<br>PRT vent to gas | Every 3 Months | Each Refueling | Note 4 |
| NG-302 | 8028 | A | 2 | 3/4-inch, AOV, norm. open<br>N-2 supply to PRT | Every 3 Months | Each Refueling | Note 4 |
| NG-304 | RC 1-1 | C | 2 | 3/4-inch, Check<br>N-2 supply to PRT | N/A | Each Refueling | Note 2 |
| MU-1010-1 | 8029 | A | 2 | 2-inch, AOV, norm. open<br>Make-up $H_2O$ to PRT | Every 3 Months | Each Refueling | Note 4 |
| MU-1011 | RC 2-1 | C | 2 | 2-inch, Check,<br>Make-up $H_2O$ to PRT | N/A | Each Refueling | Note 2 |
| MG-(R)-503<br>MG-(R)-504 | 9159 A<br>9159 B | A | 2 | 3/8-inch, AOV, norm. closed<br>RCDT Vent to Gas Analyzer | Every 3 Months | Each Refueling | Note 4 |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| MG-(R)-509<br>MG-(R)-510 | 9160 A<br>9160 B | A | 2 | 1-inch, AOV, norm. open<br>RCDT to Vent Header | Every 3 Months | Each Refueling | Note 4 |
| RC-507<br>RC-508 | 9170 A<br>9170 B | A | 2 | 3-inch, AOV, norm. open<br>RCDT pump discharge | Every 3 Months | Each Refueling | Note 4 |
| MD-(R)-134<br>MD-(R)-135 | 9182 A<br>9182 B | A | 2 | 3-inch, AOV, norm. closed<br>Containment Sump Pump Discharge | Every 3 Months | Each Refueling | Note 4 |
| RC-402<br>RC-403 | SS13-1<br>SS13-5 | A | 1 | 3/8-inch, AOV, norm. open<br>PZR Steam Space Sample | Every 3 Months | Each Refueling | Note 4 |
| RC-412<br>RC-413 | SS13-2<br>SS13-6 | A | 1 | 3/8-inch, AOV, norm open<br>PZR Liquid Space Sample | Every 3 Months | Each Refueling | Note 4 |
| RC-422<br>RC-423 | SS13-3<br>SS13-7 | A | 1 | 3/8-inch, AOV, norm. open<br>RC Hot Leg Sample | Every 3 Months | Each Refueling | Note 4 |
| LD-60 | 8102 | A | 2 | 2-inch, MOV, norm. closed<br>Letdown from RHR | Cold Shutdown | Each Refueling | Note 8, 8A |
| LD-4A<br>LD-4B<br>LD-4C | 8140 A<br>8140 B<br>8141 | A | 2 | 2-inch, AOV, norm. open<br>Outlet from Letdown Orifices | Every 3 Months | Each Refueling | Note 4 |
| LD-6 | 8147 | A | 2 | 2-inch, AOV, norm. open<br>Letdown to heat exchanger | Each Refueling | Each Refueling | Notes 4, 8 |
| CVC-212<br>CVC-211 | 8100 A<br>8100 B | A | 2 | 3-inch, MOV, norm. open<br>RC pump Seal Return | Each Refueling | Each Refueling | Notes 8, 8B |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| CVC-205B<br>CVC-205A | CS100-1<br>CS100-2 | C | 2 | 2-inch, Check,<br>RC pump seal injection | N/A | Each Refueling | |
| CC-400A<br>CC-400B | 9411 A<br>9411 B | B | 3 | 10-inch, MOV, norm. closed<br>CC water to RHR heat exchangers | Every 3 Months | N/A | |
| SW-903A<br>SW-903B<br>SW-903C<br>SW-903D | SW10-1<br>SW10-2<br>SW10-3<br>SW10-4 | B | 2 | 8-inch, MOV, norm. open<br>Service Water return from RCFC units | Every 3 Months | N/A | |
| SW-6010 | SW66-1 | A | 2 | 2-inch, manual, norm. closed<br>Service water to Containment Hose Stations | N/A | Each Refueling | Note 2 |
| SW-601A<br>SW-601B<br>SW-502 | SW54-1<br>SW54-2<br>SW54-3 | B | 3 | 3-inch, MOV, norm. closed<br>SW to Aux. Feed Pumps | Every 3 Months | N/A | |
| SW-901A<br>SW-901B<br>SW-901C<br>SW-901D | SW7-1<br>SW7-2<br>SW7-3<br>SW7-4 | C | 3 | 8-inch, check,<br>SW to RCFC units | N/A | Each Refueling | Notes 11,6, & |
| SW-501A<br>SW-501B | SW50-2<br>SW50-1 | C | 3 | 3-inch, Check<br>SW to Aux. Feed Pumps | At Cold Shutdown | N/A | Note 1a |
| SW-1300A<br>SW-1300B | SW4-1<br>SW4-2 | B | 3 | 10-inch, MOV, norm. closed<br>SW to CC heat Exchangers | Refueling | N/A | Note 17 |
| SW-301A<br>SW-301B | SW48-2<br>SW48-2 | B | 3 | 4-inch, AOV, norm. closed<br>SW return from D/G coolers | Note 16 | N/A | |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| SW-4A<br>SW-4B | SW16-1<br>SW16-2 | B | 3 | 16-inch, MOV, norm. open<br>SW supply to Turbine Building | Every 3 Months | N/A | |
| RBV 14-1<br>RBV 14-2 | RBV 14-1<br>RBV 14-2 | A | 2 | 2-inch, MOV, norm. closed<br>Air supply to containment | Every 3 Months | Each Refueling | |
| LOCA-2A<br>LOCA-2B | RBV 14-3<br>RBV 14-4 | A | 2 | 2-inch, MOV, norm. closed<br>$H_2$ control post LOCA sample | Every 3 Months | Each Refueling | |
| LOCA-3A<br>LOCA-3B | RBV 15-1<br>RBV 15-2 | A | 2 | 1-inch, AOV, norm. closed<br>$H_2$ Control post LOCA Containment Air Sample | Every 3 Months | Each Refueling | |
| LOCA-10A<br>LOCA-10B | RBV 16-1<br>RBV 16-2 | A | 2 | 1-inch, AOV, norm. closed<br>$H_2$ Control post LOCA air sample to gas analyzer | Every 3 Months | Each Refueling | |
| RBV-1<br>RBV-2 | RBV 4-3<br>RBV 4-4 | A | 2 | 36-inch, AOV, norm. closed<br>Containment Purge Supply | At Cold Shutdown | Each Refueling | Note 4 & 8 |
| RBV-4<br>RBV-3 | RBV 4-1<br>RBV 4-2 | A | 2 | 36-inch, AOV, norm. closed<br>Containment Purge Exhaust | At Cold Shutdown | Each Refueling | Note 4 & 8 |
| VB-10A<br>VB-10B | RBV 2-1<br>RBV 2-2 | A | 2 | 18-inch, AOV, norm. closed<br>Containment Vacuum Breaker | At Cold Shutdown | Each Refueling | Note 4 & 8 |
| AS-1<br>AS-2 | RBV 20-1<br>RBV 20-2 | A | 2 | 1-inch, AOV, norm. open<br>Containment air sample to radiation monitors | Every 3 Months | Each Refueling | Note 4 |
| AS-32 | RBV 20-3 | A | 2 | 1-inch, AOV, norm. open<br>Containment air sample return | Every 3 Months | Each Refueling | Note 4 |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| BT-2A<br>BT-3A<br>BT-2B<br>BT-3B | SD 27-1<br>SD 27-2<br>SD 27-3<br>SD 27-4 | A | 2 | 2-inch, MOV, norm. open Steam Generator Blowdown isolation valves | Every 3 Months | Each Refueling | |
| MS-1A<br>MS-1B | SD 24-1<br>SD 24-2 | B | 2 | 30-inch, AOV, norm. open Main Steam Isolation Valve | At Cold Shutdown | N/A | Notes 8, & 8C |
| MS-100A<br>MS-100B | SD 26-1<br>SD 26-2 | B | 2 | 3-inch, MOV, norm. open MS to turbine dirven AFW pump | Every 3 Months | N/A | |
| MS-102 | SD 26-3 | B | 3 | 3-inch, MOV, norm. closed MS to turbine driven AFW pump | Every 3 Months | N/A | |
| MS-101 A<br>MS-101 B | SD 28-1<br>SD 28-2 | C | 3 | 3-inch, Check MS to turbine driven AFW pump | Every 3 Months | N/A | |
| SD-1A1<br>SD-1A2<br>SD-1A3<br>SD-1A4<br>SD-1A5<br>SD-1B1<br>SD-1B2<br>SD-1B3<br>SD-1B4<br>SD-1B5 | SD 23-1<br>SD 23-2<br>SD 23-3<br>SD 23-4<br>SD 23-5<br>SD 23-6<br>SD 23-7<br>SD 23-8<br>SD 23-9<br>SD 23-10 | C | 2 | 6-inch, Safety relief Mainsteam Lines | Note 3 | N/A | |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| BT-31 B<br>BT-32 B<br>BT-31 A<br>BT-32 A | SS 14-1<br>SS 14-2<br>SS 14-3<br>SS 14-4 | B | 2 | 3/8-inch, AOV, norm. closed<br>S/G Blowdown Sample | Every 3 Months | N/A | Note 4 |
| FW-12A<br>FW-12B | F 7-1<br>F 7-2 | B | 2 | 16-inch, MOV, norm. open<br>Main FW to S/G isolation valves | At Cold Shutdown | N/A | Notes 8 & 8C |
| AFW-4A<br>AFW-4B | F 15-1<br>F 15-2 | C | 2 | 4-inch, Check,<br>AFW to Steam Generators | At Cold Shutdown | N/A | Note 10 |
| AFW-1A<br>AFW-1B<br>AFW-1C | F 16-3<br>F 16-6<br>F 16-1 | C | 3 | 3-inch, Check<br>AFW pumps discharge | At Cold Shutdown | N/A | Note 10 |
| AFW 10A<br>AFW 10B | F 33-1<br>F 33-2 | B | 3 | 3-inch, MOV, norm. open<br>Turbine driven AFW pump discharge | Every 3 Months | N/A | |
| IA 102<br>IA 103 | SA 31-1<br>SA 31-2 | C | 2 | 1-inch, check,<br>Instrument air containment supply | N/A | Each Refueling | Note 12 |
| ICS-3A<br>ICS-3B | ICS 3-1<br>ICS 3-2 | C | 2 | 6-inch, Check,<br>Containment Spray Pump Suction | Every 3 Months | N/A | Note 13 |
| ICS-4A<br>ICS-4B | ICS 4-3<br>ICS 4-4 | C | 2 | 6-inch, Check<br>Containment Spray Pump discharge | Every 3 Months | N/A | Note 13 |

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KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2 AND 3 VALVES

| VALVE IDENTIFICATION | | SECTION XI CATEGORY PER IWV-2000 | ASME CODE CLASS | VALVE DESCRIPTION/FUNCTION | TEST FREQUENCY | | SECTION XI CODE RELIEF REQUESTED |
|---|---|---|---|---|---|---|---|
| OPS NO. | FSAR NO. | | | | EXERCISE | LEAKAGE | |
| ICS-5A<br>ICS-6A<br>ICS-5B<br>ICS-6B | ICS 6-1<br>ICS 6-2<br>ICS 6-3<br>ICS 6-4 | B | 2 | 6-inch, MOV, norm. closed<br>Containment Spray Pump discharge | Every 3 Months | N/A | |
| ICS-8A<br>ICS-8B | ICS 4-5<br>ICS 4-6 | C | 2 | 6-inch, Check<br>ICS discharge line to spray header | Note 14 | N/A | Notes 14 & 6C |

KEWAUNEE NUCLEAR PLANT
INSERVICE TEST PROGRAM NOTES
ASME CODE CLASS 1, 2 AND 3 VALVES

1. Operation of these normally closed check valves will be verified each refueling outage. Operation will be verified by establishing and observing flow through the individual line. Establishing flow through these check valves would introduce safety injection flow into the reactor coolant system.

   IWV-3410(b) states that normally closed valves that cannot be operated during normal plant operation shall be specifically idnetified by the owner and exercised during each cold shutdown. The term "cold shutdown" covers a wide variety of plant conditions which can exist with the reactor coolant temperature equal to, or less than, $200^{o}$F. Under cold shutdown conditions, the system may be "solid" such that introducing flow into the system to exercise check valves would have a high probability of overpressurinzing the system. These tests can only be performed when the reactor coolant system is vented to the containment atmosphere and partially drained such as for a refueling. Similarly, under cold shut down conditions reactor coolant pumps may be in operation and closing normally open valves in systems serving these components would jeopardize their safe operation.

   A. Full open or full stroke position cannot be identified on certain check valves. Operability will be verified by flow measurements or by observing a tank level change, as in the case of the Accumulator discharge check valves.

2. This valve provides no safety function except as a containment pressure boundary in case of line rupture. It is normally closed and stays closed to perform this function, thus requires no exercise testing.

3. Testing of safety relief valves will be in accordance with the requirements of IWV-3500.

4. An exception is taken to the requirement to determine and measure the stroke time of air operated valves. This time is variable depending on the air pressure at the valves and is a meaningless value. The only meaningful measurement is the closure time for air operated isolation valves such as these. Acceptance criteria will be established and valve closure time will be measured to ensure acceptable operation.

5. This valve provides no safety function except to prevent backflow of Accumulator discharge into RHR system. This valve is normally closed and remains closed to provide this function.

6. Valves associated with safeguard systems which will be operated during and following an accident are required to open or remain open for the systems to fulfill the safeguard function. These systems will be used to cool the containment and the reactor core post accident. These systems are designed to remain intact post accident and in effect are an extension of the containment. The following surveillance will assure leak tightness of these systems.

A. Residual Heat Removal

(i) Those protions of the Residual Heat Removal System external to the isolation valves at the Reactor Coolant System shall be hydrostatically tested in excess of 350 psig at each major refueling outage, or they shall be tested during their use in normal operation at least once between successive major refueling outages.

(ii) The total leakage from either train's piping shall not exceed two gallons per hour. Leakage shall be determined by visual inspection. Visible leakage that cannot be stopped at test conditions shall be suitably measured to demonstrate compliance with this Specification.

(iii) Any repairs necessary to meet the specified leak rate shall be accomplished within seven days of resumption of power operation.

B. Safety Injection System (High Head)

(i) Those portions of the Safety Injection System in-service accident shall be hydrostatically tested by closure of the motor operated valves nearest the Reactor Coolant System and operation of the pumps on the minimum flow test line to refueling water storage tank. This test shall be performed during each major refueling outage.

(ii) The total leakage from the system piping shall not exceed one gallon per hour. Leakage shall be determined by visual inspection. Visible leakage that cannot be stopped at test conditions shall be suitably measured to demonstrate compliance with this Specification.

(iii) Any repairs necessary to meet the specified leak rate shall be accomplished prior to resumption of power operation.

C. Internal Containment Spray System

(i) Those portions of the Internal Containment Spray System in service post accident shall be hydrostatically tested by closure of the manual isolation valves nearest the spray ring assembly and operation of the pumps on the 2" test line to the refueling water storage tank. This test shall be performed during each major refueling outage.

(ii) The total leakage from the system piping shall not exceed one gallon per hour. Leakage shall be determined by visual inspection. Visible leakage that cannot be stopped at test conditions shall be suitably measured to demonstrate compliance with this Specification.

(iii) Any repairs necessary to meet the specified leak rate shall be accomplished prior to resumption of power operation.

D. Chemical and Volume Control Charging System

(i) The Chemical and Volume Control Charging System piping from the charging pump discharge to the Reactor Coolant System shall be inspected for leakage during the startup following each major refueling outage when the charging system is in service and the Reactor Coolant System is at normal temperature and pressure.

(ii) The total leakage from the system piping shall not exceed one gallon per hour. Leakage shall be determined by visual inspection. Visible leakage that cannot be stopped at test conditions shall be suitably measured to demonstrate compliance with this Specification.

(iii) Any repairs necessary to meet this specified leak rate shall be accomplished prior to resumption of power operation.

E. Component Cooling System

(i) The Component Cooling System piping shall be inspected for leakage at each major refueling outage.

(ii) The total leakage from the system piping shall not exceed one gallon per hour. Leakage shall be determined by visual inspection. Conformance to the leakage limit shall be demonstrated by suitable measurement.

(iii) Any repair necessary to meet the specified leak rate shall be accomplished prior to resumption of power operation.

F. Service Water - Fan Coil Cooling System

(i) The Service Water System piping for the fan coil coolers which are located within containment shall be inspected for leakage during each major refueling outage. The inspections shall be performed by closure of the fan coil cooler outlet isolation valve during normal operation of the service water supply system and visually inspecting the piping within containment.

(ii) The total leakage from the system piping within containment shall not exceed one gallon per hour.

(iii) Any repairs necessary to meet this specified leak rate shall be accomplished prior to resumption of power operation.

7. Failure of either of these valves in an open position during operational testing would provide an open connection between the RHR system and the suction side of the SI pumps. The operating pressure of the RHR system under normal conditions is in excess of the design pressure of the SI system suction piping and an open cross connection would prevent operation of the RHR system for it's function of normal cool down of the reactor system.

8. These valves will be tested in accordance with the exception to category A and B valves allowed by IWV-3410(b)(1).

A. RHR system operating pressure limits prohibit operation of these valves above 400 psig.

B. These CVCS system valves must remain open as long as the Reactor Coolant pumps are running.

C. The main steam and feedwater isolation valves occasionally require valve stem packing adjustments. These adjustments are performed during plant operation and do not allow full stroke testing.

9. These normally open control valves remain open to perform their safeguard function. Exercise testing during normal plant operations is not necessary to ensure performance of their safeguard function.

10. Operation of these normally closed check valves will be verified by establishing and observing flow through the individual line prior to startup of the plant.

11. These check valves remain in an open position during all phases of plant operation and remain open to fulfill their function following an incident. Exception is taken to the performance of exercising tests as required by IWV-3520.

12. The only safeguard function required for these check valves is to provide containment isolation. Operability tests are not performed during plant operation or shutdown since these lines are required to operate.

13. The operation of these check valves will be partially verified during performance testing of the pumps. These valves are of a split disc design and the low flow at pump test conditions will only require limited actuation of the valves.

14. Introducing flow through these valves would result in the fluid being sprayed into the containment. Due to the split disc design of these valves, utilizing a compressible gas would provide assurance of only minimal movement of the valve discs. These check valves will be physically inspected to observe freedom of disc movement every five years.

15. The operation of these check valves will be partially verified during refueling by flow testing of these lines. Normal plant operation prohibits testing of these lines.

16. Proper operation of these control valves is verified on the monthly 4-hour surveillance tests of the Diesel Generators.

17. Cooling of the CC heat exchangers is normally accomplished by 4-inch bypass valves. Opening of these 10 inch valves could cause thermal shock to the heat exchangers and thereby the Reactor Coolant Pumps.

from the integrated leak rate test result, yield a leak rate value not greater than the periodic leak rate $L_{tm}$.

If the leak rate determined by any test exceeds the maximum allowable leak rate, the test schedule applicable to subsequent integrated leak tests shall be subject to review and approval by the Commission. If the leak rate determined by two consecutive periodic tests exceeds the maximum allowable leak rate, subsequent tests shall be performed at each major refueling outage until two consecutive tests have been performed for which the leak rate does not exceed the maximum allowable. The initial retest schedule specified above shall then be resumed on the basis of starting a new ten-year service period.

b. Isolation Valves and Local Leak Rate Tests

1. Deleted 25I

2. The following containment penetrations shall periodically be leak-tested at a pressure not less than 46 psig, using pressure decay, soap bubble, halogen detection, or equivalent methods.

   A. Containment penetrations which rely on resilient seals, gaskets, or sealing compounds.

   B. The personnel air locks.

   C. The equipment hatch.

   D. The flange of the fuel transfer tube.

   E. Other components which develop leaks and require repairs to meet allowable integrated leakage limits.

to this value.

c. Deleted

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d. Shield Building Ventilation System

1. At least once per operating cycle, or once every 18 months whichever occurs first, the following conditions shall be demonstrated:

   A. Pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 10 inches of water and the pressure drop across any HEPA filter bank is less than 4 inches of water at the 12 system design flow rate (±10%).

   B. Automatic initiation of each train of the system.

   C. Operability of heaters at rating and the absence of defects by visual inspection.

2. A. The tests and analysis of Specification 3.6.b.3 shall be performed at least once per operating cycle or once every 18 months, whichever occurs first, or after every 720 hours of system operation or following painting, fire, or chemical release (during system operation) in any ventilation zone serviced by the ventilation system. Tests and analysis of Specification 3.6.b.3 shall also be performed

that for a leak rate, have been investigated thoroughly. A summary of the items of conservatism involved in the reference calculation and the magnitude of their effect upon off-site dose demonstrates the collective effect of conservatism in these assumptions. (Refer to Appendix H, FSAR)

The reference initial leak rate in this analysis is 0.5 weight percent of air per 24 hours at the peak pressure of the Design Basis Accident. The resulting two-hour doses at the nearest site boundary are significantly less than the guidelines presented in 10 CFR 100.

The pre-operational integrated leak rate tests are specified at both full design pressure and at reduced pressure, with later periodic tests performed only at reduced pressure, as suggested in the relevant AEC guide [3], and at the frequency indicated in the guide for the design and leak rate test pressures. The operational limit on leak rate $L_{tm} = 0.75\ L_t$, provides a 25 percent allowance for possible leakage deterioration between integrated leak rate tests. The six-month allowance on test schedule provides flexibility necessary to permit tests to be performed at times of scheduled or unscheduled plant outage.

The frequent leak-testing of isolation valves and other penetrations, (areas which may reasonably be expected to be responsible for any excess leakage, rather than the containment shell itself) will provide reassurance, approximately annually, that the allowable leak rate limit is met. These tests will also indicate specific areas of deterioration that may warrant repair before their leakage is excessive.

Containment Isolation valves will be tested for operability in accordance with the In-Service-Inspection program provided in Section 4.2.

The operability of the Residual Heat Removal System shall be 25B functionally tested in accordance with the In-Service-Inspection program provided in Section 12. 25B

The Shield Building Ventilation System consists of two independent systems that have only a discharge point in common, the Containment System Vent. Both systems are normally activated and one alone must be capable of accomplishing the design function of the system. The periodic tests will demonstrate the capability of both the separate and combined systems.

Reliable simulation of the transient effects of accident-related heat flow from the Reactor Containment Vessel to the annulus appears to be difficult as well as inconvenient, and the necessary differences between any test conditions and predicted accident conditions would still require supporting analysis. Only the heat input to the annulus could be test-simulated, and not the heat transfer which determines the heat input. However, analysis supported by the results of actual tests without heat addition will provide reliable means of determining system performance with heat addition. The major uncertainties in system performance relate to such "as-built" considerations as Shield Building in-leakage, actual system losses, and overall transient response. These areas can be directly refined in the analysis model from the results of the tests specified. The effects of heat addition are readily incorporated, in a conservative manner where necessary, by considering extreme variations of heat transfer coefficients and transient containment temperature conditions. Such analysis performed during final design has demonstrated, for example, that a slight increase in the capacity of the fans was sufficient to accomodate more severe assumptions regarding heat transfer through the shell. It is expected that nearly any deviation in system behavior discovered during initial testing can be similarly offset by increases in the capacity of these fans, which have minimal power requirements (12 hp and 1 hp for the recirculation and discharge fans, respectively).

2. Containment Vessel Internal Spray System

A. System tests shall be performed during each major refueling outage. The test shall be performed with the isolation valves in the supply lines at the containment blocked closed. Operation of the system is initiated by tripping the normal actuation instrumentation.

B. The spray nozzles shall be checked for proper functioning at least every five years using either air with telltales or smoke tests to determine that all nozzles are clear.

C. The test will be considered satisfactory if control board indications or visual observations indicate all components have operated satisfactorily.

3. Deleted

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b. Component Tests

1. Pumps

A. The safety injection pumps, residual heat removal pumps, and containment spray pumps shall be started and operated on recirculation flow at intervals not greater than once every month of power operation.

B. Deleted

25B

2. Valves

A. Deleted

B. Deleted

C. Deleted

D. Spray additive tank valves shall be tested during each major refueling outage.

E. Closing of the boric acid tank isolation valves and concurrent opening of refueling water storage tank valves upon receipt of simulated Lo Lo boric acid tank level signal shall be tested at intervals not to exceed once every month during power operation.

F. Residual Heat Removal System valve interlocks shall be tested during each major refueling outage.

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Basis

The Safety Injection System and the Containment Vessel Internal Spray System are principal plant safety systems that are normally inoperative during reactor operation. Complete systems tests cannot be performed when the reactor is operating because a safety injection signal causes containment isolation and a Containment Vessel Internal Spray System test requires the system to be temporarily disabled. The method of assuring operability of these systems is therefore to combine system tests to be performed during refueling shutdowns with more frequent component tests, which can be performed during reactor operation.

The systems tests demonstrate proper automatic operation of the Safety Injection and Containment Vessel Internal Spray Systems. With the pumps blocked from starting, a test signal is applied to initiate automatic action and verification is made that the components receive the safety injection signal in the proper sequence. The test demonstrates the operation of the valves, pump circuit breakers, and automatic circuitry.[1]

During reactor operation, the instrumentation which is depended upon to initiate safety injection and containment spray is checked daily and the initiating and logic circuits are tested monthly (in accordance with Specification 4.1). In addition, the active components (pumps and valves) are tested to 25B
check the operation of the starting circuits and to verify that the pumps are in satisfactory running order. Test intervals are established in accordance with the In-Service-Inspection program provided by Section 4.2. 25B

Testing of the closure of the boric acid tank isolation valves with concurrent opening of the refueling water storage tank valves upon receipt of simulated lo-lo boric acid tank level signal is performed to verify proper operation to prevent inadvertent spillage of refueling water storage tank water through the boric acid tank should the isolation valves fail to close.

Other systems that are also important to the emergency cooling function are the accumulators, the Component Cooling System, the Service Water System, and the containment fan-coil units. The accumulators are a passive safety feature. In accordance with Specification 4.1, the water volume and pressure in the accumulators are checked each shift. The other systems mentioned operate when the reactor is in operation and by these means are continuously monitored for satisfactory performance.

Reference: (1) FSAR Section 6.2

4.7 Deleted

4.8 Deleted



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Deleted

TABLE 4.1-3

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

| | Equipment Tests*** | Test | Frequency | Maximum Time Between Tests (Days) |
|---|---|---|---|---|
| 1. | Control Rods | Rod drop times of all full length rods | Each refueling outage | N.A. |
| | | Partial movement of all rods | Every 2 weeks | 17 |
| 1a. | Reactor Trip Breakers | Open trip | Monthly | 37 |
| 1b. | Reactor Coolant Pump Breakers-Open-Reactor Trip | Operability | Each refueling outage | N.A. |
| 2. | Deleted | | | |
| 3. | Deleted | | | |
| 4. | Containment Isolation Trip | Operability | Each refueling outage | N.A. |
| 5. | Refueling System Interlocks | Operability | Prior to each refueling outage | N.A. |
| 6. | Ventilation System<br>a. Shield Building<br>b. Auxiliary Building SV Zone<br>c. Spent Fuel Pool | Halide, DOP and Methyl Iodide Pressure Drop Test Visual Inspection | During each refueling outage except as specified in Note** | N.A. |
| 7. | Fire Protection Pump and Power Supply | *Operability | Monthly | 37 |
| 8. | Containment Leak Detect | Operability | Weekly | 8 |
| 9. | Diesel Fuel Supply | *Fuel inventory | Weekly | 8 |
| 10. | Turbine Stop and Governor Valves | Operability | Monthly (1) | 37(1) |
| 11. | Fuel Assemblies | Visual Inspection | Each refueling outage | N.A. |
| 12. | Guard Pipes | Visual Inspection | Each refueling outage | N.A. |

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Notes

* See Specification 4.1.d

** Tests and frequency shall be in accordance with Specifications 4.4.d and 4.12.

*** Following maintenance on the above equipment that could affect the operation of the equipment tests should be performed to verify operability.

(1) Temporary extension granted from February 1, 1975 to April 1, 1975 (59 days).