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U.S. Department of Energy

Prepared for
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Washington, D. C. 20555
Under Interagency Agreement EY-76-C-02-0016
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INTERIM REPORT

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INFORMAL REPORT

RECOMMENDATIONS TO THE NRC FOR THE SAFETY EVALUATION REPORT OF KEWAUNEE NUCLEAR POWER PLANT INSERVICE TESTING PROGRAM

A. COPPOLA, V. LETTIERI, AND R.E. HALL

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DEPARTMENT OF NUCLEAR ENERGY BROOKHAVEN NATIONAL LABORATORY
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NOTICE

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Recommendations to the NRC for the Safety Evaluation Report of Kewaunee Nuclear Power Plant Inservice Testing Program

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Brookhaven National Laboratory
Recommendations to the NRC for the
Safety Evaluation Report of
Kewaunee Nuclear Power Plant
Wisconsin Public Service Corporation
Inservice Testing Program
(Docket No. 50-305)

(Submittal dated July 14, 1977 and February 9, 1979)

Executive Summary

Under contract to the Nuclear Regulatory Commission (NRC), the Reactor Engineering Analysis Group of Brookhaven National Laboratory (BNL) has conducted a review of the Inservice Testing portion (IST, pumps and valves) of the Kewaunee Nuclear Power Plant, Docket No. 50-305, Inservice Inspection and Test program (ISI/IST). This evaluation is based on the submittals of proposed ammendments to the technical specifications dated July 14, 1977 revised February 9, 1979, and a meeting held with representatives of the licensee, the NRC staff and BNL on July 10 and 11, 1978. The ISI portion of the submittal was reviewed by the NRC staff and is not commented on herein.

Based on that meeting, the proposed technical specification change was resubmitted on February 9, 1979 and this document has been formally reviewed for this report. Most of the open items discussed at the meeting were corrected by the resubmittal. The recommendations made in this report are based on evaluations which considered: Practicality within limitations of equipment design and geometry, requirements of Section XI of the 1974 Edition thru Summer of 1975 of the ASME Boiler and Pressure Vessel Code, 10 CFR 50.55a(g), NRC Staff Guidance Letters (November 1976 and January 1978), and topics of numerous NRC Staff/BNL briefings.

The review covers two major areas and is summarized as follows:

1. Inservice Testing of Pumps - Seven relief requests were reviewed and all are recommended to be granted. The complexities of older plants not designed to the 1974 ASME code are apparent. In most cases, flow measurement and bearing temperature are not available measurements. The proposed tests in lieu of the ASME requirements are acceptable.

2. Inservice Testing of Valves - This area involves the greatest number of relief requests and is divided into three main categories. The first category (2.1) is a group of general commentaries developed for all plants by the NRC staff. The second category (2.2 - 2.12 inclusive) contains 27 relief requests particular to Kewaunee. Twenty four of these are recommended for approval. The last category (Section 3.0) is a review of valves which cannot be tested quarterly but will be exercised at cold shutdown. All of these are recommended for approval. Section 4.0 is a program summary of the recommendations for valve testing.

In summary, it has been found that the program, as reviewed and modified by this analysis is in compliance to the extent possible with the requirements set forth in Section XI of the 1974 Edition and Addenda through the Summer 1975 of the ASME Boiler and Pressure Vessel Code as required by 10 CFR 50.55a(g).

BNL has evaluated requests and recommended relief from specific requirements which were determined to be impractical for this facility, for the pump and valve portion of the ISI/IST program only. The ISI portion of this review was done by the NRC staff.

This report includes the relief request specific evaluations that are recommended to be included in the NRC's Safety Evaluation Report on the subject of ISI/IST for the Kewaunee Nuclear Power Plant. These recommendations are a result of the above described review and do not constitute a completeness evaluation of the program.

1.0 PUMPS, INSERVICE TESTING PROGRAM

1.1 HPSI Pumps

1.1.1 Relief Request: The vibration amplitude and the bearing temperature of pumps APSI-1A and APSI-1B will be measured at refueling outages in lieu of Section XI requirements.

Code Requirement: An inservice test shall be run on each pump, nominally each month during normal plant operation. Each inservice test shall include measurement and observation of all quantities in Table IWP-3100-1 except bearing temperatures which shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: (a) The monthly performance test of these pumps is run under recirculation "miniflow" conditions. With high head, low flow operating conditions, these pumps vibrate considerably more than under normal flow conditions. Vibration measurements will be taken when the pumps are run under a reference flow condition during each refueling outage. (b) The bearing oil cooling system for these pumps 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.

Evaluation: The measuring of bearing temperatures at refueling outages meets the intent of the Code (yearly measurements). The NRC staff agrees that vibration measurements during miniflow tests are not very meaningful and it is therefore recommended that this relief request be granted.

1.2 Residual Heat Removal Pumps

1.2.1 Relief Request: The vibration amplitude, bearing temperature and the lubricant level of APRHI-1A and APRHI-1B will be measured at refueling outages in lieu of Section XI requirements.

Code Requirement: See Code Requirement, Item 1.1.1.

Licensee Basis for Relief Request: (a) The monthly performance test of these pumps 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 these pumps are run under a reference flow condition during each refueling outage. (b) Bearing temperatures are recorded at refueling since that situation provides reference conditions in which the bearing temperatures have had adequate time to stabilize. (c) Monthly recording of Lubricant Level or Pressure requires entry into the RHR pump pit which is normally inaccesible at power. No remote indication exists.

Evaluation: The licensee states that pumps APRHI-1A and APRHI-1B are tested under "miniflow" conditions. With high head, low flow conditions, these pumps vibrate considerably more than under normal flow conditions. Based on the fact that the vibration test under "miniflow" conditions is not representative of the pump's condition, therefore, it is recommended to grant relief to measure vibration amplitude at refueling outages in lieu of the Code requirement.

These pumps are tested monthly under "miniflow" conditions. Under these conditions, the pumps are run for as short a time as possible to prevent pump damage, and consequently the bearing temperature is constantly rising. Based on the above, it is recommended that relief be granted to measure bearing temperatures at refueling outages when these pumps are tested at full flow and are run long enough for test parameters to stabilize. In the event that the time period between refueling outages exceeds one year, this item is a relief request, otherwise, the indicated frequency meets the intent of the Code. As the licensee has stated, recording of lubricant level requires entry into the RHR pump pit which is normally inaccessible at power. Based on the impracticality of monthly recording of lubricant level due to plant design, relief is recommended to record this level at refueling outages.

1.3 Auxiliary Feedwater System Pumps

1.3.1 Relief Request: Flow rate will not be measured for pumps 1A and 1B. In addition, vibration amplitude and bearing temperature of these pumps will be measured at refueling outages in lieu of Section XI requirements.

Code Requirement: See Code Requirement, Item 1.1.1.

Licensee Basis for Relief Request: 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. The monthly performance test of these pumps is run under recirculation "miniflow" conditions. With high head, low flow operating conditions, these pumps vibrate considerably more than under normal flow conditions. Vibration measurements will be taken when these pumps are run under a reference flow condition during each refueling outage. Bearing temperatures are recorded at refueling since that situation provides reference conditions in which the bearing temperatures have had adequate time to stabilize.

Evaluation: Since pumps 1A and 1B will be tested with fixed resistance, as per footnote 1 of Table IWP-3100-1, flow rate will not be measured. This is not a relief request.

The licensee states that pumps 1A and 1B are tested under "miniflow" conditions. With high head, low flow conditions, these pumps vibrate considerably more than under normal flow conditions. Based

on the fact that the vibration test under "miniflow" conditions is not representative of the pump's condition, therefore it is recommended to grant relief to measure vibration amplitude at refueling outages in lieu of Code requirement.

These pumps are tested monthly under "miniflow" conditions. Under these conditions, the pumps are run for as short a time as possible to prevent pump damage, and consequently the bearing temperature is constantly rising. Based on the above, it is recommended that relief be granted to measure bearing temperature at refueling outages when these pumps are tested at full flow and are run long enough for test parameters to stabilize. In the event that the time period between refueling outages exceeds one year, this item is a relief request, otherwise, the indicated frequency meets the intent of the Code.

1.3.2 Relief Request: Flow rate for turbine driven pump 1C will not be measured. In addition, vibration amplitude and bearing temperature will be measured at refueling outages in lieu of Section XI requirements.

Code Requirements: See Code Requirements, Item 1.1.1.

Licensee Basis for Relief Request: Under the operating mode in which this pump 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. 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. Bearing temperature is recorded at refueling since that situation provides reference conditions in which the bearing temperature has had adequate time to stabilize.

Evaluation: Since pump 1C will be tested with fixed resistance, as per footnote 1 of the Table IWP-3100-1, flow rate will not be measured. This is not a relief request.

The licensee states that pump 1C is tested under "miniflow" conditions. With high head, low flow conditions, this pump vibrates considerably more than under normal flow conditions. Based on the fact that the vibration test under "miniflow" conditions is not representative of the pump's condition, therefore, it is recommended to grant relief to measure vibration amplitude at refueling outages in lieu of Code requirement.

This pump is tested monthly under "miniflow" conditions. Under these conditions, the pump is run for as short a time as possible to prevent pump damage, and consequently the bearing temperature is constantly rising. Based on the above, it is recommended that

relief be granted to measure bearing temperature at refueling outages when the pump is tested at full flow and is run long enough for test parameters to stabilize.

In the event that the time period between refueling outages exceeds one year, this item is a relief request, otherwise, the indicated frequency meets the intent of the Code.

1.4 Service Water System Pumps

1.4.1 Relief Request: Inlet pressure, outlet pressure, differential pressure, flow rate, bearing temperature and lubricant level will not be measured in accordance with code requirements for pumps 1A1, 1A2, 1B1, 1B2.

Code Requirement: See Code Requirement, Item 1.1.1.

Licensee Basis for Relief Request: 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.

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 common 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. There is no instrumentation to monitor flow rate in the plant system as designed and constructed. As indicated 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.

The service water pumps are open line shaft pumps that depend primarily on 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.

Evaluation: Service Water pumps 1A1, 1A2, 1B1, 1B2 are vertical design with no means of direct inlet pressure measurement. Inlet pressure to these pumps is established by reference to the level of water above the pump suction. Due to the impracticality of direct measuremert of inlet pressure due to plant design, it is recommended that relief be granted from meeting pressure tap construction and location requirements of IWP-4211 and IWP-4212, and to allow inlet pressure to be determined by tank level.

The system outlet pressure measurement can be used as an individual outlet pressure measurement, and will satisfy the intent of the code, if some means of measuring flow, either individually or in groups can be devised. It is apparent that flow rate measurements for individual pumps for this system do not exist, and that total flow rate depends not only on pump condition, but on system demand. This situation is not tenable under the ASME Code, since, at low system demands, the fact that one of the groups of pumps is degrading in hydraulic performance, can go undetected for long periods of time. Unless it is shown by the licensee that instrumentation cannot be installed, or other means for measuring flow (such as motor current, or heat exchanger temperature) are inaccurate and therefore unacceptable, it is recommended that this relief request be denied.

These pumps are open shaft pumps which are lubricated/cooled by water. Satisfactory pump operation is indicative of suficient bearing lubrication, therefore, it is recommended that relief from measuring and recording lubricant level be granted. The bearing lubricating water is allowed to leak off into the sump and is not piped back. Based on the impracticality of measuring bearing temperature due to plant design, it is recommended that relief from measuring this test parameter be granted.

1.5 Component Cooling System Pumps

1.5.1 Relief Request: The bearing temperature of pumps APCC1-1A and APCC2-1B will not be measured.

Code Requirements: Bearing temperature shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: There is no installed instrumentation to monitor this parameter. The design of the pump is such that article IWP-3500 cannot be met.

Evaluation: Component Cooling pumps APCC1-1A and APCC2-1B have no provisions for measuring bearing temperature. Based on this, we conclude that it is not practical to obtain bearing temperatures as required by the Code. In addition, other pump parameters including vibration are measured as required by the Code, indicating pump performance and bearing condition. Therefore, we recommend that relief be granted not to measure bearing temperature of these pumps.

1.6 Containment Spray System Pumps

1.6.1 Relief Request: The flow rate and bearing temperature of pumps 1A and 1B will not be measured. Vibration amplitude will be measured under a reference recirculation condition.

Code Requirement: See Code Requirement, Item 1.1.1.

Licensee Basis for Relief Request: 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.

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.

Evaluation: Since pumps 1A and 1B will be tested with fixed resistance, as per footnote 1 of Table IWP-3100-1, flow rate will not be measured. This is not a relief request.

The Containment Spray pumps have no provisions for measuring bearing temperature and measurements would not be meaningful since these pumps cannot be run long enough to stabilize conditions for testing. Based on the above statements, we conclude that it is not practical to obtain bearing temperatures as required by the Code. Therefore, we recommend that relief be granted not to measure bearing temperature of these Containment Spray pumps.

These pumps are tested under "miniflow" conditions. Vibration measurements will be taken under a reference condition, although it is expected that vibration will be higher under these conditions. We conclude that this is the most practical means of meeting the intent of the Code requirements and, therefore, it is recommended that relief be granted as requested.

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2.0 VALVES, INSERVICE TESTING PROGRAM

2.1 General

2.1.1 The scope of this review is limited to those valves which perform a safety-related function. Safety-related valves, for the purpose of IST, have been defined as those valves that are necessary to function to safely shutdown the plant and/or mitigate the consequences of an accident. As a minimum, all valves that receive a containment isolation signal or a safety injection signal shall be included in the IST program.

2.1.2 Leak Testing of Valves which Perform a Pressure Isolation Function

There are several safety systems connected to the reactor coolant pressure boundary that have design pressures that are below the reactor coolant system operating pressure. It is required that there be redundant isolation valves forming the interface between these high and low pressure systems to prevent the low pressure systems from being subjected to pressures which exceed their design limits. In this role, the valves are performing a pressure isolation function.

The redundant isolation provided by these valves regarding their pressure isolation function is important. It is considered necessary to provide assurance that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. For this reason it is believed that some method, such as a leak testing, should be used to assure the condition is sufficient to maintain this pressure isolation function.

In the event that leak testing is selected as the appropriate procedure for reaching this objective, the staff believes that the following valves should be categorized as A or AC and leak tested in accordance with IWV-3420 of Section XI of the applicable edition of the ASME Code. These valves are:

Valve	Valve
SI-22A	SI-16B
SI-22B	SI-303A
SI-21A	SI-303B
SI-21B	SI-304A
SI-13A	SI-304B
SI-13B	RHR 1A
SI-12A	RHR 1B
SI-12B	RHR 2A
SI-16A	RHR 2B

We have discussed this matter and identified the valves listed above to the licensee. In the resubmittal of February 9, 1979, the licensee has not reviewed this request. It is again requested that the licensee respond to the possible recategorization of the indicated valves.

2.1.3 Containment Isolation Valves

The Appendix J review for this plant is a completely separate review from this IST program review. However, the determinations made by that review are directly applicable to the IST program. The present IST submittal should be acceptable until the Appendix J review is completed. At that time, the licensee will be required to amend this IST program to reflect the conclusions of the Appendix J review.

2.1.4 Category A Valve Leak Check Requirements for Containment Isolation Valves (CIV)

All CIVs shall be classified as Category A valves. The Category A valve leak rate test requirements of IWV-3420 (a-e) have been superceded by Appendix ' requirements for CIVs. The staff has concluded that the applicable leak test procedures and requirements for CIVs are determined by 10 CFR 50 Appendix J. Relief from paragraph IWV-3420 (a-e) for CIVs presents no safety problem since the intent of IWV-3420 (a-e) is met by the Appendix J requirements.

Sections f and g of IWV-3420 must be met by the licensee otherwise relief mu t be requested from these paragraphs. It should be noted that these paragraphs are only applicable where a type C Appendix J leak test is performed.

The safet, nction of CIVs and thus passive CIVs is to perform leak limiti.. barriers. These a.e valves, which are normally closed, thus in their safety position, and are not required to open to mitigate the consequences of an accident or to safely shutdown the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function for which they perform. It is thus concluded that the quarterly stroke and stroke time measurement are meaningless for passive CIVs.

2.1.5 Stroke Requirements for Passive Valves

These valves are normally closed and thus in their safety-related position, and are not required to change position, that is to open or close to mitigate the consequences of an accident or to safely shutdown the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function for which they perform. It is thus concluded that the quarterly stroke and stroke time measurement are meaningless for passive valves.

2.1.6 Valves to be Tested at Cold Shutdowns

Valve testing should commence not later than 48 hours after shutdown, and continue until complete or plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during subsequent cold shutdowns to meet the Code specified testing frequency.

In the case of valves exercised less frequently than cold shutdown (i.e., refueling), relief from the Code requirement must be requested. These cases are treated as such in this review.

2.1.7 Valve Exercising Requirements

ASME Code, Section XI, Subsection IWV-3410(a) requires that Code Category A and B valves be exercised once every 3 months, with the exceptions as defined in IWV-3410(b-1), (e), and (f). IWV-3520(a) requires that Code Category C valves be exercised once every 3 months, with the exceptions as defined in IWV-3420(b). IWV-3700 requires no regular testing for Code Category E valves. Operational checks, with appropriate record entries, shall record the position of these valves before operations are performed and after operations are completed and shall verify that each valve is locked, or sealed. The limiting value of full stroke time for each power operated valve shall be identified by the owner and tested in accordance with IWV-3410(c). In the above exceptions, the code permits the valves to be tested at cold shutdown where:

a. It is not practical to exercise the valves to the position requireed to fulfill their function or to the partial position during plant operation.

b. It is not practical to observe the operation of the valves (with fail-safe actuators) upon loss of actuator power.

2.1.8 Changes to the Technical Specifications

In a November 1976 letter to the Wisconsin Public Service Corporation the NRC provided an attachment entitled "NRC Staff Guidelines for Excluding Exercising (Cycling) Tests of Certain Valves During Plant Operation." The attachment stated that when one train of a redundant system such as in the ECCS in inoperable, nonredundant valves in the remaining train should not be cycled since their failure would cause a loss of total system function. For example, during power operation in some plants, there are stated minimum requirements for systems which make up the ECCS which allow certain limiting conditions for operation to exist at any one time and if the system is not restored to meet the requirements within the time period specified in a plant's Technical Specification the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For such plants this situation would be contrary to the NRC guideline as stated in the document mentioned above.

The Kewaunee Plant's Technical Specifications may have requirements that are contrary to the above mentioned guidelines. We have discussed this situation with the licensee and the licensee has agreed to review the Technical Specifications and to consider the need to propose Technical Specification (TS) changes which would have the effect of preluding such testing.

If, after making this consideration, the licensee determines that the TS should not be changed because the guidelines are not applicable or if that the guidelines cannot be followed, the licensee shall submit to the NRC the reasons that led to their determination for each potentially affected valve. In the licensee submittal, the potentially affected sections of the TS, in addition to the valves, should be identified.

2.1.9 Containment Isolation Valves

In our review, we have found deviations from the containment isolation criteria set forth in General Design Criteria (G.D.C.) and the requirements of Appendix J, particularly, the type C test. We have determined that it is not in the scope of the IST program to evaluate the licensee's Appendix J program or the containment isolation criteria set forth in G.D.C. The Appendix J review is a completely separate review, however, the determinations made by that review are directly applicable to the IST program. The present IST submittal is acceptable, until the Appendix J review is completed, at that time, we will require the licensee to amend his IST program to reflect the conclusions of the Appendix J review for this plant.

In particular, the following valves are recommended for review and possible classification as containment isolation valves:

Valve	System
NG-304	Reactor Coolant System
MU-1011	Reactor Coolant System
SW-903A	Service Water System
SW-903B	Service Water System
SW-903C	Service Water System
SW-903D	Service Water System
SW-901A	Service Water System
SW-901B	Service Water System
SW-901C	Service Water System
SW-901D	Service Water System
MS-1A	Main, Auxiliary Steam and Steam Pump System
MS-1B	Main, Auxiliary Steam and Steam Pump System

2.2 Safety Injection System (28-M)

2.2.1 Code Relief: Category A Valves

2.2.1.1 Relief Request: Valves SI-204, SI-201A, SI-201B, SI-202A, and SI-202B will not be exercised as required by Section XI of the ASME B&PV Code.

Code Requirement: Category A valves shall be exercised at least once every 3 months with the exceptions as shown in the following paragraph. They shall be leak-tested at the same (or greater) frequency as scheduled refueling outages but not less than once every two years.

Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the valve shall be part stroke exercised during plant operation and full stroked during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months. Valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: This valve provides no safety function except as a containment pressure boundary in case of line rupture. It is normally closed to perform this function, thus requires no exercise testing.

Evaluation: Valves SI-204, SI-201A, SI-201B, SI-202A, and SI-202B are passive valves. Therefore, it is recommended, per item 2.1.4 that relief be granted from the stroke requirements of the Code.

2.2.1.2 Relief Request: The stroke time of air-operated valve NG-107 will not be measured.

Code Requirements: IWV-3410(c) (2) - The stroke time of all power operated valves shall be measured to the nearest second or 10% of the maximum allowable stroke time, whichever is less, whenever such a valve is full stroke tested.

Licensee Basis for Relief Request: The stroke time of this air operated valve varies depending on the air pressure at the valves and is a meaningless valve. The only meaningful measurement is the closure time for air operated isolation valves such as this one.

Alternate Testing: Acceptance criteria will be established and valve closure time will be measured to ensure acceptable operation.

Evaluation: The measurement of "Closure" time is an acceptable alternative to the code required "stroke" time. It is recommended that this relief request be granted.

2.2.2 Code Relief: Category C Valves

2.2.2.1 Relief Request: Valves SI-22A, SI-22B, SI-21A, and SI-21B will be exercised at refueling outages rather than quarterly.

Code Requirement: Check valves shall be exercised at least once every 3 months, with the exceptions as shown in the following paragraph.

Check valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the check valve shall be part stroke exercised during plant operation and full stroked during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months. Check valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: 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 identified 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°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 overpressurizing 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.

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

Evaluation: The test proposed is an acceptable proof of operability and since it can only be done when a substantial flow and level change in a task (i.e., at refueling) it is recommended that relief be granted to test these valves for operability at refueling outages.

2.2.2.2 Relief Request: Valves SI-12A, SI-12B, SI-13A, SI-13B, SI-16A, SI-16B, SI-303A, SI-303B, SI-304A, and SI-304B will be full-stroke exercised at refueling outages, in lieu of code requirements.

Code Requirements: See Code Requirements, Item 2.2.2.1.

Licensee Basis for Relief Request: None of these check valves should be exercised during normal plant operation. They can only be tested at refueling outages by isolating portions of the safety injection system (making that portion unavailable in case of an accident) and creating upstream pressures higher than the Reactor Cooling System. This would introduce unconditioned water into the reactor coolant system which is unacceptable.

Evaluation: The staff agrees with the licensee's basis and it is recommended that relief be granted to full-stroke exercise these valves at refueling outages.

2.2.2.3 Relief Request: Valves SI-6A and SI-6B will be full-stroke exercised at refueling outages, in lieu of code requirements.

Code Requirement: See Code Requirement, Item 2.2.2.1.

Licensee Basis for Relief Request: Full-stroke exercising of these valves quarterly is not practical during normal plant operation.

Evaluation: Check Valves SI-6A and SI-6B are on the HPSI discharge. The HPSI pumps are tested on miniflow. Full flow through these valves requires reactor shutdown. Therefore, based on the impracticality of exercising these valves during normal plant operation, relief is recommended to full-stroke exercise them at refueling outages.

2.2.2.4 Relief Request: Valves SI-301A and SI-301B will be full-stroke exercised at refueling outages, in lieu of Code requirements.

Code Requirements: See Code Requirements, Item 2.2.2.1.

Licensee Basis for Relief Request: Full-stroke exercising of these valves quarterly is not practical during normal plant operations.

Evaluation: Check valves SI-301A and SI-301B are on the line from the RWST to the RHR pumps. These pumps are tested on miniflow. Full flow through these valves from the RWST is possible only at reactor shutdowns. Therefore, based on the impracticality of exercising these valves during normal plant operation, relief is recommended to full-stroke exercise them at refueling outages.

2.3 Residual Heat Removal System (18L)

2.3.1 Code Relief: Category B Valves.

2.3.1.1 Relief Request: Valves RHR-300A and RHR-300B will be full-stroke exercised at refueling outages, in lieu of code requriements.

Code Requirement: Category B valves shall be exercised at least once every 3 months with the exceptions as shown in the following paragraph.

Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the valve shall be part stroke exercised during plant operation and full stroked during each cold shut; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months. Valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: 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.

Evaluation: The staff agrees with the Licensees basis and it is recommended that relief be granted as requested.

2.3.2 Code Relief: Category C Valves

2.3.2.1 Relief Request: Valves RHR-401A and RHR-401B will be stroked at refueling outages in lieu of Code requirements.

Code Requirements: See Code Requirements, Item 2.2.2.1.

Licensee Basis for Relief Request: It is impractical to exercise these valves quarterly as per code requirement.

Evaluation: Check valves RHR-401A and RHR-401B are located on the RHR supply line to the ICS pumps. They cannot be stroked during normal operation because containment spray would be activated. Based on the impracticality of exercising these valves during normal plant operation, it is recommended that relief be granted to stroke these valves at refueling outages. Stroking will be accomplished by flow testing of lines. Failure of flow test will also indicate failure of valves to operate unless further tests are accomplished.

2.4 Reactor Coolant System (10-N):

2.4.1 Code Relief: Category A Valves

2.4.1.1 Relief Request: Valves NG-304 and MU-1011 will not be exercised in accordance with the code requirements.

Code Requirement: See Code Requirement, Item 2.3.1.1.

Licensee Basis for Relief Request: These valves provide no safety function except as a containment pressure boundary in case of line rupture. They are normally closed and stay closed to perform this function, thus they require no exercise testing.

Evaluation: Check valves NG-304 and MU-1011 of the Reactor Cooling System are passive valves. Therefore, it is recommended, per item 2.1.4, that relief be granted from the stroking requirements of the Code.

2.4.1.2 Relief Request: The stroke time of air-operated valves MG-(R)-512, MR-(R)-513, NR-302 and MU-1010-1 will not be measured.

Code Requirements: See Code Requirements, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the Code required "stroke" time. It is recommended that this relief request be granted.

2.5 Waste Disposal System (131FF)

2.5.1 Code Relief: Category A Valves

2.5.1.1 Relief Request: The stroke time of air-operated valves MG-(R)-503, MG-(R)-504, MG-(R)-509, MG-(R)-510, RC-507, RC-508, MO-(R)-134, MO-(R)-135 will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code required "stroke" time. It is recommended that this relief request be granted.

2.6 Sampling System (44-G)

2.6.1 Code Relief: Category A Valves

2.6.1.1 Relief Request: The stroke time of air-operated RC-402, RC-403, RC-412, RC-413, RC-422, and RC-423 valves will not be measured.

Code Requirements: See Code Requirements, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code required "stroke" time. It is recommended that this relief request be granted.

2.7 Chemical and Volume Control System (CVCS)

2.7.1 Code Relief: Category A Valves

2.7.1.1 Relief Request: The stroke time of air-operated valves LD-4A, LD-4B, LD-4C will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code specified "stroke" time. It is recommended that this relief request be granted.

2.7.1.2 Relief Request: Valve LD will be full stroke exercised at refueling outages. Valve stroke time of this valve will not be measured.

Code Requirement: See Code Requirements, Item 2.2.1.1. See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: This CVCS valve must remain open as long as the Reactor Coolant pumps are running. The stroke time of this air operated valve is variable depending on the air pressure at the valves and is a meaningless valve. The only meaningful measurement is the closure time for air operated isolation valves such as this one.

Alternate Testing: Acceptance criteria will be established and valve closure time will be measured to ensure acceptable operation.

Evaluation: Valve LD-6 is on the line to the letdown heat exchanger, and as such, it should not be closed during normal plant operation. If this valve were to fail closed, it could cause reactor shutdown. Due to the impracticality of exercising this valve quarterly, it is recommended relief be granted to permit full-stroke exercising at refueling outages. The stroke time of this air operated valve is variable depending on the air pressure at the valves and is a meaningless valve. The only meaningful measurement is the closure time for air operated isolation valves such as this one.

Alternate Testing: Acceptance criteria will be established and valve closure time will be measured to ensure acceptable operation.

2.7.1.3.1 Relief Request: Valves CVC-211 and CVC-212 will be full stroke exercised at refueling outages.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: These CVCS valves must remain open as long as the Reactor Coolant pumps are running.

Evaluation: Valves CVC-211 and CVC-212 are motor operated valves of the CVCS. A cessation of flow caused by stroking these valves affects the seal water to the Reactor Coolant pumps. A change in seal water flow could damage these pumps, therefore, partial stroking or full stroking at quarterly intervals is not practical. Based on the above, it is recommended that relief be granted to full stroke exercise these valves at refueling outages.

2.7.1.3.2 Relief Request: Valve stroke time of valve CVC-211 and CVC-212 will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.?.

Licensee Basis for Relief Request: The stroke time of these valves is only a few seconds. When timing these valves, reaction time for the person timing the valves is a major error.

Evaluation: These valves are 3" motor operated valves. The licensee states that stroking time is low enough such that reaction time for the timer significantly affects stroking time. However, the licensee fails to give actual data to justify his claim. Therefore, until such time that additional justification from the licensee is received, reviewed and acted upon, it is recommended that relief for timing be denied.

2.7.1.4 Relief Request: Valves CVC-205A and CVC-205B will not be exercised, but they will be leak tested at refueling outages.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: These check valves remain in an open position during all phases of plant operation and remain open to fulfill their function following an incident.

Alternate Testing: (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.

Evaluation: Check valves CVC-205A and CVC-205B of the Chemical and Control Volume System are passive valves. Therefore, it is recommended, per Item 2.1.4, that relief be granted from the stroking requirements of the Code.

Due to the fact that these valves cannot be pressurized on one side to leak check, it is recommended that the licensee's proposal for leak checking be accepted.

2.7.1.5 Relief Request: Valve LD-60 will not be leak tested in accordance with Code requirements.

Code Requirements: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: This CVCS valve must remain open as long as the Reactor Coolant pumps are running.

Leak Testing: 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. Leakage shall be determined by visual inspection.

Evaluation: The leak testing that the licensee describes for valve LD-60 does not adequately insure that this valve is leak tight and it is recommended that relief for leak testing be deined and that this valve be tested to code requirements.

2.8 Service Water System (202-QQ)

2.8.1 Code Relief: Category A Valves

2.8.1.1. Relief Request: Valve SW-6010 will not be exercised, but it will be leak tested at refueling outages.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: This valve provides no safety function except as a containment isolation pressure boundary in case of time rupture. It is normally closed and stays closed to perform this function, this requires no exercise testing.

Evaluation: Valve SW-6010 of the Service Water System is a passive valve. Therefore, it is recommended, per item 2.1.4, that relief be granted from the stroking requirements of the Code.

2.8.1.2.1 Relief Request: Valves SW-901A, SW-901B, SW-901C, and SW-901D will not be full stroke exercised quarterly as per code requirements.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: These check valves remain in an open position during all phases of plant operations and remain open to fulfill their function following an incident.

Evaluation: Check valves SW-901A, SW-901B,. SW-901C, and SW-901D are passive valves. Therefore, it is recommended, per item 2.1.4 that relief be granted from the stroking requirements of the Code.

2.8.1.2.2 Relief Request: Valves SW-901A, SW-901B, SW-901C and SW-901D will not be leak checked in accordance with code requirements.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: These check valves remain in an open position during all phases of plant operations and remain open to fulfill their function following an incident.

Alternate Testing: 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.

Evaluation: The leak testing that the licensee describes does not adequately assure that these valves are leak-tight. Therefore, it is recommended that relief for leak testing valves SW-901A, SW-901B, SW-901C, and SW-901D be denied at tnis time and that these valves be tested to Code requirements.

2.8.2 Code Relief: Category B Valves

2.8.2.1 Relief Request: Valves SW-1300A and SW-1300B will be full-stroke exercised at refueling outages, in lieu of Code requirements.

Code Requirement: See Code Requirement, Item 2.3.1.1.

Licensee Basis for Relief Request: 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.

Evaluation: These valves are normally closed and should not be opened during normal operation since this would reduce temperatures in the heat exchangers and cause shock as described by the Licensee. It is recommended that this relief request be granted.

2.9 Reactor and Shield Building Ventilation (M602-Q)

2.9.1 Code Relief: Category A Valves

2.9.1.1 Relief Request: Valve stroke time for valves AS-1, AS-2, and AS-32 will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code specified "stroke" time. It is recommended that this relief request be granted.

2.9.1.2 Relief Request: Valve stroke time for valves RBV-1, RBV-2, RBV-3, RBV-4, VB-10A, and VB-10B will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code specified "stroke" time. It is recommended that this relief request be granted.

2.10 Secondary Sampling Systems (M219-N)

2.10.1 Code Relief: Category B Valves

2.10.1.1 Relief Request: Valve stroke time for valves BT-31B, BT-32B, BT-31A, and BT-32A will not be measured.

Code Requirement: See Code Requirement, Item 2.2.1.2.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request, Item 2.2.1.2.

Evaluation: The measurement of "closure" time is an acceptable alternative to the code specified "stroke" time. It is recommended that this relief request be granted.

2.11 Instrument Air System

2.11.1 Code Relief: Category A Valves

2.11.1.1 Relief Request: Valves IA-102 and IA-103 will not be tested other than Appendix J leak testing at refueling outages.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis for Relief Request: 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 be open.

Evaluation: Leak checking valves IA-102 and IA-103 at refueling outages also includes exercising them to the position required for safety. These valves must remain open at all times. Based on the impracticality of exercising these valves quarterly, it is recommended that relief be granted as requested.

2.12 Internal Containment Spray System (M217-T)

2.12.1 Code Relief: Category C Valves

2.12.1.1 Relief Request: Valves ICS-4A, ICS-4B, ICS-3A, and ICS-3B will be part-stroked quarterly.

Code Requirement: See Code Requirement, Item 2.2.2.1.

Licensee Basis for Relief Request: 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.

Evaluation: Check valves ICS-3A and ICS-3B are Containment Spray Pump Suction valves and must be part-stroke exercised monthly during performance testing of the ICS pumps. These valves and check valves ICS-4A and ICS-4B cannot be full-stroke exercised due to the fact that water would be sprayed into containment. Since these valves exist, with similar stroke problems, in other plants it is recommended that the staff review the system unavailability of only part stroking these valves. To this end, it is recommended that this item remain open until further study is completed.

2.12.1.2 Relief Request: Valves ICS-8A and ICS-8B will not be full stroke exercised as per Code requirements.

Code Requirements: See Code Requirements, Item 2.2.2.1.

Licensee Basis for Relief Request: Check valves ICS-8A and ICS-8B are on the ICS discharge line to the spray header. These valves are the final valves before entering containment. They cannot be even partially stroked otherwise water would be sprayed into 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.

Alternate Testing: These check valves will be physically inspected to observe freedom of disc movement every five years.

Evaluation: The staff agrees that testing these valves by flowing through them is impractical. The alternate proposed should be acceptable, as being better than no test at all. (Licensee first proposal). The adequacy of the test interval is unknown at this time. Too frequent a test interval will carry with it a higher possibility of incorrect re-assembly of the valves. It is recommended that the staff review this interval with the PAS branch before granting approval for a five year cycle.

3.0 COLD SHUTDOWN TESTING OF VALVES

3.1 General:

3.1.1 Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation, the valve shall be part-stroke exercised during plant operation and full-stroke exercised during cold shutdowns. Valves that cannot be exercised during plant operation shall be full-stroke exercised during cold shutdowns. Full-stroke exercising during cold shutdowns for valves not full-stroke exercised during plant operation shall be on a frequency determined by the intervals between shutdowns as follows: for intervals of 3 months or longer, exercise during each shutdown; for intervals of less than 3 months, full-stroke exercise is not required unless 3 months have passed since last shutdown exercise.

The intent of this section is to satisfy the requirements of the NRC letter dated January 13, 1978, i.e., "NRC Staff Guidance For Preparing Pump and Valve Testing Program Descriptions and Associated Relief Requests Pursuant to 10 CFR 50.55 a(g)," specifically section 5, page 7.

3.2 Residual Heat Removal System (18-L)

3.2.1 Category B Valves

3.2.1.1 Valves: RHR-1A, RHR-1B, RHR-2A, and RHR-2B.

Code Requirement: See Code Requirement, Item 2.3.1.1.

Licensee Basis: The RHR system operating pressure limits prohibit operation of these valves above 400 psig.

Evaluation: Valves RHR-1A, RHR-1B, RHR-2A and RHR-2B of the RHR system cannot be partial or fully stroked during normal operations due to the fact they serve as pressure isolation valves and cannot be opened at system pressures which are above 400 psig. Since it is not practical to test these valves during normal operation, it is recommended, per NRC guidelines, to allow full-stroke exercising of these valves at cold shutdowns.

3.2.2 Category C Valves

3.2.2.1 Valves: RHR-3A, RHR-3B, RHR-5A, and RHR-5B.

Code Requirement: See Code Requirement, Item 2.2.2.1.

Licensee Basis: The RHR system operating pressure limits prohibit operation of these valves above 400 psig.

Evaluation: Valves RHR-3A, RHR-3B, RHR-5A, and RHR-5B of the RHR system cannot be partial or fully stroked during normal operations due to the fact they serve as pressure isolation valves and cannot be opened at system pressures which are above 400 psig. Since it is not practical to test these valves during normal operation, it is recommended, per NRC guidelines, to allow full-stroke exercising of these valves at cold shtudowns.

3.3 Chemical and Volume Control System (35-J)

3.3.1 Category A Valves

3.3.1.1 Valve: LD-60

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis: This CVCS system valve must remain open as long as the Reactor Coolant pumps are running.

Evaluation: Valve LD-60 is on the line from the Residual Heat Removal Heat exchangers, and as such, it should not be closed during normal plant operation. If this valve were to fail closed, it could cause reactor shutdown. Since it is not practical to test this valve during normal operation, it is recommended, per NRC guidelines, to allow full-stroke exercising at cold shutdowns.

3.4 Service Water System (202-QQ)

3.4.1 Category C Valves

3.4.1.1 Valves: SW-501A and SW-501B

Code Requirement: See Code Requirement, Item 2.2.2.1.

Licensee Basis: These valves cannot be exercised during normal operation.

Evaluation: Valves SW-501A and SW-501B allow service water to flow to the auxiliary feedwater pumps. These valves should not be exercised unless the auxiliary feedwater pumps are operating. These pumps are for emergencies only and should not be operated during normal plant operation. Based on the impracticality of exercising these valves during normal plant operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.5 Reactor and Shield Building Ventilation (M602-Q)

3.5.1 Category A Valves

3.5.1.1 Valves: RBV-1, RBV-2, RBV-3, RBV-4, VB-10A, and VB-10B.

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis: These valves cannot be stroked quarterly due to the fact that upon opening these valves, containment is vented to the atmosphere.

Evaluation: Valves RBV-1, RBV-2, RBV-3, RBV-4, VB-10A, and BV-10B cannot be full stroke exercised quarterly since opening these valves would allow containment atmosphere to leak into the atmosphere which is undesireable. Based on the above, it is recommended, per NRC guidelines, to allow full stroke exercising these valves at cold shutdowns.

3.6 Main, Auxiliary Steam and Steam Dump System (M203-Z-1)

3.6.1 Category A Valves:

3.6.1.1 Valves: MS-1A and MS-1B

Code Requirement: See Code Requirement, Item 2.2.1.1.

Licensee Basis: These main steam valves occasionally require valve stem packing adjustment. These adjustments are performed during plant operation and do not allow full-stroke testing.

Evaluation: These valves are on the main steam line whose flow should never be interrupted during normal plant operation, due to the possiblity of causing reactor trip. It is recommended, per NRC guidelines, to allow full stroke exercising at cold shutdowns.

3.7 Feedwater System (M205-X)

3.7.1 Category B Valves

3.7.1.1 Valves: FW-12A and FW-12B

Code Requirement: See Code Requirement, Item 2.3.1.1.

Licensee Basis: These feedwater isolation valves occasionally require valve stem adjustments. These adjustments are performed during plant operation and do not allow full-stroke testing.

Evaluation: Valves FW-12A and FW-12B are on the line to the steam generators. It is not desirable to interrupt flow to these steam generators. Based on the possibility of reactor trip, it is recommended, per NRC guidelines, to allow full-stroke exercising at cold shutdowns.

3.7.2 Category C Valves

3.7.2.1 Valves: AFW-4A, AFW-4B, AFW-1A, AFW-1B, and AFW-1C.

Code Requirement: See Code Requirement, Item 2.2.2.1.

Licensee Basis: 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.

Evaluation: Valves AFW-4A and AFW-4B allow auxiliary feedwater to go to steam generators. Valves AFW-1A, AFW-1B and AFW-1C are located at the auxiliary feedwater pump discharge. It is not desirable to operate the auxiliary feedwater system during normal plant operation. Based on the impracticality of operating these valves during normal plant operation, it is recommended, per NRC guidelines, to allow full-stroke exercising these valves at cold shutdowns.

4.0 PROGRAM BREAKDOWN

4.1 Safety Injection System (-28M, -29E)

4.1.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
SI-20A	E	SI-3	E
SI-20B	E	SI-300A	B
SI-11A	E	SI-300B	B
SI-11B	E	SI-350A	A
SI-15A	B	SI-350B	A
SI-15B	B	SI-351A	A
SI-106A	C	SI-351B	A
SI-106B	C	SI-106A	C
SI-312	C	SI-106B	C
SI-9A	E	SI-201A	A
SI-4A	B	SI-201B	A
SI-4B	B	SI-202A	A
SI-2A	B	SI-202B	A
SI-2B	B		

4.1.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category	Valve	Category
SI-106A	C	SI-201B	A
SI-106B	C	SI-202A	A
SI-201A	A	SI-202B	A

4.1.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as beng non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
SI-9B	SI-302A
SI-5A	SI-302B
SI-5B	

4.1.4 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
$SI-22A	C	$SI-304B	C
$SI-22B	C	SI-201A	A

$See Item 2.1.2

Valve	Category	Valve	Category
$SI-21A	C	SI-201B	A
$SI-21B	C	SI-202A	A
$SI-13A	C	SI-202B	A
$SI-13B	C	NG-107	A
$SI-12A	C	SI-6A	C
$SI-12B	C	SI-6B	C
$SI-16A	C	SI-301A	C
$SI-16B	C	SI-301B	C
$SI-303A	C	SI-204	A
$SI-303B	C	$SI-304A	C

4.2 Residual Heat Removal System (-18L)

4.2.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
RHR-33	C	RHR-11	AE
RHR-400A	B	RHR-401A	C
RHR-400B	B	RHR-401B	C

4.2.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category	Valve	Category
RHR-401A	C	RHR-401B	C

4.2.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
RHR-8A	RHR-101
RHR-8B	RC over-pressure relief

4.2.4 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI.

Valve	Category	Valve	Category
RHR-1A	B	RHR-3A	C
RHR-1B	B	RHR-3B	C
RHR-2A	B	RHR-5A	C
RHR-2B	B	RHR-5B	C

$See Item 2.1.2.

4.2.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
RHR-300A	B	RHR-401A	C
RHR-300B	B	RHR-401B	C

4.3 Reactor Coolant System (10-N)

4.3.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
PR-3A	C	PR-3B	C

4.3.2 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
NG-304	C	MG-(R)-513	A
MU-1011	C	NG-302	A
MG-(R)-512	A	MU-1010-1	A

4.4 Waste Disposal System (-131FF)

4.4.1 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
MG-(R)-503	A	RC-507	A
MG-(R)-504	A	RC-508	A
MG-(R)-509	A	MD-R-134	A
MG-(R)-510	A	MD-R-135	A

4.5 Sampling System (44-G)

4.5.1 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
RC-402	A	RC-413	A
RC-403	A	RC-422	A
RC-412	A	RC-423	A

4.6 Chemical and Volume Control System (35-J)

4.6.1 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI.

Valve	Category
LD-60	A

4.6.2 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
LD-6	A	LD-4A	A
CVC-212	A	LD-4B	A
CVC-211	A	LD-4C	A
CVC-205A	AC	LD-60	A
CVC-205B	AC		

4.7 Auxiliary Cooling System (19-G1)

4.7.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category
CC-400A	B
CC-400B	B

4.7.2 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
CC-601A	CC-612B
CC-601B	CC-612C
CC-601C	CC-612D
CC-601D	CC-653
CC-612A	CC-651

4.8 Service Water System (-202-QQ)

4.8.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
SW-903A	B	SW-301A	B
SW-903B	B	SW-301B	B
SW-903C	B	SW-901A	C
SW-903D	B	SW-901B	C
SW-601A	B	SW-901C	C
SW-601B	B	SW-901D	C
SW-502	B	SW-301A	B
SW-4A	B	SW-301B	B
SW-4B	B		

4.8.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category	Valve	Category
SW-901A	C	SW-901D	C
SW-901B	C	SW-301A	B
SW-901C	C	SW-301B	B

4.8.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
SW-900A	SW-900C
SW-900B	SW-900D

4.8.4 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercised every 3 months.

Valve	Category
SW-501A	C
SW-501B	C

4.8.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
SW-6010	A	SW-901D	AC
SW-901A	AC	SW-1300A	B
SW-901B	AC	SW-1300B	B
SW-901C	AC		

4.9 Reactor Building Vent System (M403-D)

4.9.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
RBV-14-1	A	LOCA-3A	A
RBV-14-2	A	LOCA-3B	A
LOCA-2A	A	LOCA-10A	A
LOCA-2B	A	LOCA-10B	A

4.10 Reactor and Shield Building Ventilation (M602-Q)

4.10.1 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI.

Valve	Category	Valve	Category
RBV-1	A	RBV-4	A
RBV-2	A	BV-10A	A
RBV-3	A	BV-10B	A

4.10.2 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
AS-1	A	RBV-3	A
AS-2	A	RBV-4	A
AS-32	A	VB-10A	A
RBV-1	A	VB-10B	A
RBV-2	A		

4.11 Main, Auxiliary Steam and Steam Dump System (M203-Z-1)

4.11.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
BT-2A	A	SD-1A2	C
BT-2B	A	SD-1A3	C
BT-3A	A	SD-1A4	C
BT-3B	A	SD-1A5	C
MS-100A	B	SD-1B1	C
MS-100B	B	SD-1B2	C
MS-102	B	SD-1B3	C
MS-101A	B	SD-1B4	C
MS-101B	B	SD-1B5	C
SD-1A1	C		

4.11.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category
MS-102	A
MS-101A	B
MS-101B	B

4.11.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
MS-2A	MS-2B

4.11.4 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI.

Valve	Category
MS-1A	B
MS-1B	B

4.12 Secondary Sampling System (M219-N)

4.12.1 The following are valves in the Ist submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
BT-31A	B	BT-32A	B
BT-31B	B	BT-32B	B

4.13 Feedwater System (M205-X)

4.13.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category
AFW-10A	B
AFW-10B	B

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4.13.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category	Valve	Category
AFW-1A	C	AFW-10A	B
AFW-1B	C	AFW-10B	B
AFW-1C	C		

4.13.3 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI.

Valve	Category	Valve	Category
FW-12A	B	AFW-1A	C
FW-12B	B	AFW-1B	C
AFW-4A	C	AFW-1C	C
AFW-4B	C		

4.14 Instrument Air System

4.14.1 The following valve was listed in the IST submittal and was deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve
IA-101

4.14.2 The following are valves in the IST submittal that cannot meet the reuirements of Section XI and relief has been requested.

Valve	Category
IA-102	AC
IA-103	AC

4.15 Internal Containment Spray System (M217-T)

4.15.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
ICS-5A	B	ICS-6A	B
ICS-5B	B	ICS-6B	B

4.15.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore have been added to the resubmittal as shown.

Valve	Category
ICS-4A	C
ICS-4B	C

4.15.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve
CI-1003
CI-1001A
CI-1001B

4.15.4 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
ICS-3A	C	ICS-4B	C
ICS-3B	C	ICS-8A	C
ICS-4A	C	ICS-8B	C

4.16 Service Air System

4.16.1 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-saety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
SA-471	SA-472

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Conclusion

The Inservice Testing Program submitted by the Wisconsin Public Service Corporation for the Kewaunee Nuclear Power Plant, and modified by this evaluation report is in general compliance with the requirements of Section XI of the 1974 Edition and Addenda through the Summer of 1975 of the ASME Boiler and Pressure Vessel Code as required by 10 CFR 50.55 a(g), and NRC Staff guidance letters and briefings. Those items not found to be in compliance with the above require further evaluation.

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