TECHNICAL EVALUATION REPORT

Pump and Valve Inservice Testing Program
Revision 21
Oconee Nuclear Station
Units 1, 2, and 3
Duke Power Company

Docket Numbers: 50-269, 270, 287
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ABSTRACT

This report presents the results of Brookhaven National Laboratory's evaluation of the revised and new relief requests submitted in Revision 21 of the Oconee Nuclear Station's ASME Section XI Pump and Valve Inservice Testing Program.

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Oconee Nuclear Station
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1.0 INTRODUCTION

Contained herein is a technical evaluation of new and revised relief requests contained in Revision 21 of the ASME Section XI pump and valve inservice testing (IST) program submitted by Duke Power Company for its Oconee Nuclear Station (ONS), Units 1, 2, and 3 on December 6, 1993 and revised on January 11, 1994. The Oconee Nuclear Stations are Babcock and Wilcox Pressurized Water Reactors (PWR) that began commercial operation in 1973 (Units 1 and 2) and 1974 (Unit 3). This program was developed utilizing the 1986 Edition of the ASME Section XI Code and supersedes all previous submittals. The third ten year interval extends from July 1, 1992 to July 1, 2002.

Duke Power Company submitted Revision 20, dated December 1992, of the Inservice Testing Program, Third Inspection Interval on January 4, 1993. The NRC reviewed this program and issued a Safety Evaluation (SE), dated July 23, 1993. In response to the Safety Evaluation, Duke Power revised their program and submitted Revision 21 on December 6, 1993 and January 11, 1994. This TER contains the evaluation of the revised and new relief requests contained in this revision and the evaluation of the licensee's actions taken in response to action items identified in the June 11, 1993 TER, attached to the July 23, 1993 Safety Evaluation (SE). Table 1.1 provides a summary of the previous required action items and the licensee's action. The licensee did not provide a discussion of each of the open items and these are also summarized in Table 1.1.

Section 2 of this report presents the two new relief requests and Brookhaven National Laboratory's (BNL) evaluation. Similar information is presented in Section 3 for the ten revised relief requests that require NRC review. Relief requests that were revised to incorporate the required action items discussed in the July 23, 1993 Safety Evaluation were reviewed, and noted as acceptable in Table 1.1.

Section 4 summarizes the actions required of the licensee resulting from the relief request evaluations. BNL recommends that the licensee resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

2.0 NEW RELIEF REQUESTS

2.1 Generic Valve Relief Request Number GNR-VLV-10, All Pressure Relief Devices

Relief Request: The licensee has requested relief from the additional testing requirements of ANSI/ASME OM-1981 Part 1, ¶ 1.3.3.1.5(a) and 1.3.4.1.5(a) for all pressure relief devices.

Licensee's Basis for Requesting Relief: The licensee states: "Relief Device application should also be taken into account when doing additional testing in order to detect any common mode failure of the type and manufacturer of the valve, i.e., raw water corrosive service, vibration, etc."

Proposed Alternate Testing: The licensee proposes: "Valves Not Meeting Acceptance Criteria. For valves which fail the test . . . , additional valves shall be set pressure tested on the basis of two additional valves to be tested for each valve failure up to the total number of valves of the same type, manufacture and APPLICATION if the cause of the failure is directly related to the application."

Evaluation: ANSI/ASME OM-1-1981 ¶1.3.3.1.5(a) and 1.3.4.1.5(a), Valves Not Meeting Acceptance Criteria, states that:

> For valves which fail the test..., additional valves shall be set pressure tested on the basis of two additional valves to be tested for each valve failure up to the total number of valves of the same type and manufacture.

The licensee is proposing that valve application also be considered when determining how many additional valves are to be selected in the event a valve fails to meet the set pressure acceptance criteria. Application would only be considered when it is directly related to the failure. The NRC has always encouraged licensees to consider the possibility of common mode failures and so has looked favorably upon those actions taken by licensees to consider the effects of failures of one component on identical components in the same or similar systems. In addition, ASME has recently approved a Code change (1994 Addenda) to Appendix I of the OM Code which limits additional testing to valves of the same group (i.e., same manufacturer, type, system application, and same media). The licensee's proposal meets the intent of both the NRC guidance to consider component application and the revisions to the OM Code.

In cases where the failure is directly related to the application, limiting the additional testing to similar valves with the same application should identify any similar valves which may be in the same degraded condition. By not considering valve application, degraded valves may be missed in the additional testing. However, additional testing should also be considered for valves of different type and manufacturer, when the common mode of valve failure related to the application can apply to dissimilar valves.

Since the licensee's proposed alternative provides an acceptable level of quality and safety, it is recommended that relief be granted pursuant to §50.55a(a)(3)(i). In cases where the common mode of failure is directly related to the application, and can apply to dissimilar valves, the licensee should assess testing additional valves of different type and manufacturer.

2.2 Generic Valve Relief Request GNR-VLV-11, All Pressure Relief Devices

Relief Request: The licensee has requested relief from the alternative test media requirements of ANSI/ASME OM-1981 Part 1, ¶ 8.3, for all pressure relief devices.

Licensee's Basis for Requesting Relief: The licensee states: "In many cases, relief valve manufacturer's supply charts and graphs that relate setpoints at ambient temperature conditions to setpoints at operating temperature conditions. This "cold differential setpressure" information is supplied on a model or type specific basis and has proven to be accurate over a number of years of experience. The manufacturer's recommendations, derived from a broader experience base, are more accurate than a single correlation test conducted on valves at Duke Power."

Proposed Alternate Testing: The licensee proposes: "For valves with manufacturer published "cold set pressures" (which allow setting the valve at ambient conditions as opposed to operating conditions), we will continue to use the manufacturer's data in lieu of performing the correlation required by paragraph 8.3."

Evaluation: The licensee requests relief for all pressure relief devices from ANSI/ASME OM-I-1981, ¶ 8.3, Alternative Test Media, which states that pressure relief devices may be subjected to set pressure tests and seat tightness tests using a test media (fluid and temperature) other than that for which they are designed, provided the testing complies with ¶ 8.3.1, 8.3.2, and 8.3.3.

The licensee is proposing to use, whenever available, the manufacturer's published "cold set pressures" which allow setting the relief valve at ambient conditions as opposed to operating conditions, instead of performing the certification of the correlation procedure required by OM-1981 Part 1, ¶ 8.3. The licensee's request to use the manufacturer's published data for "cold set pressures," in lieu of establishing the correlation, is acceptable provided that the licensee can provide documentation showing that the manufacturer has performed the appropriate certification of correlation to the licensee's operating conditions in accordance with ¶ 8.3.2 and 8.3.3.

As the Code allows the Owner to assign the preparation of the correlation procedure to a designee, relief is not required. If the licensee or his designee (i.e., the manufacturer) cannot comply with the requirements of ¶ 8.3.2 or 8.3.3, the licensee should revise the request accordingly, including identification of the specific paragraphs for which relief is required and including a discussion of the impracticality or burden of Code compliance.

3.0 REVISED RELIEF REQUESTS

3.1 Pump Relief Request RR-PMP-01 (Previously Pump Relief Request 10), Standby Shutdown Facility Reactor Coolant Makeup Pumps

Relief Request: The licensee has requested relief, for the Standby Shutdown Facility (SSF) Reactor Coolant (RC) Makeup Pumps, from ASME Section XI, ¶ IWP-4110, which requires the accuracy of vibration amplitude measurements to be +/- 5% of full scale, and ¶ IWP-4120, which requires the full-scale range of vibration instrumentation to be three times the reference value or less.

Licensee's Basis for Requesting Relief: "The SSF RC Makeup Pumps are located in each Unit's reactor building and, thus, inaccessible for local pump vibration monitoring during quarterly pump testing. An IRD vibration monitor panel is installed in the SSF control room with velometers on the pumps in the horizontal and vertical directions. The velometers that are installed have an accuracy of ± 10 %.

The interface panel is equipped with a 0-15 mil gauge that provides an overall vibration level. The baseline vibration (levels) for these pumps are typically 0.1 to 2 mils. To improve readability of the interface panel, the signal is being output to a CSI 2110 Digital Vibration Analyzer which has auto ranging capability. The CSI 2110 Digital Vibration Analyzer also provides the ability to perform spectral analysis to aid in the determination of the cause of vibrations. The analyzer has an accuracy of ± 3 % and an integration error of ± 3 %. The combined loop accuracy for the vibration monitoring system used is ± 10.86 % (root sum of the squares methodology) of reading. A station modification request has been issued to upgrade the existing instrumentation to improve the accuracy."

Proposed Alternate Testing: The Licensee proposes: "Continue to perform test as noted above until plant instrumentation is upgraded by approved modification ON-12913, 22913, and 32913 on Units 1, 2 and 3 respectively. These modifications will begin at the start of the next Unit 3 refueling outage, U3EOC14 and continue on a unit basis until all 3 units have been completed in 1994.

The replacement probes are Wilcoxon transducer model # 793R Accelerometers, rated for a 3 to 1000 Hertz with an accuracy of ± 5% frequency and sensitivity. These probes will be connected via existing coaxial cable to SSF Control Room. In the control room by (sic) a CSI 2110 Digital Vibration Analyzer hand held monitor (as described above), will be providing the readout during the quarterly testing. In addition, procedures have been permanently changed to take complete local vibration analysis at refueling outages or whenever maintenance has been done on the RCMUP.

The combined loop accuracy for the vibration monitoring system will be ± 7.37% (root sum of the squares methodology) of reading. This is an acceptable value to provide indication of pump degradation between refueling outages due to the low number (<7 hours) of run time. Per GNR-PMP-08, the hand held (sic) will be able to have an accuracy of ≤ ± 5% in the first quarter of 1994."

Evaluation: These pumps provide emergency reactor coolant pump seal cooling, reactor coolant inventory makeup and pressurizer level control in the event normal high pressure injection pumps are lost.

In the July 23, 1993 SE, it was noted that Section XI ¶ IWP-4110 requires that vibration amplitude instrumentation accuracy be ± 5% of full scale, while ¶ IWP-4120 requires the full-scale range of each instrument to be three times the reference value or less. The combination of these two requirements results in an effective reading accuracy requirement of ± 15% of the reference value. The licensee has stated that the loop accuracy for the current vibration monitoring system on the reactor coolant makeup pumps is ± 10.86%. This exceeds the ± 5% requirement, however, it is within the effective reading accuracy requirement of ± 15%.

Additionally, in the July 23, 1993 SE, relief was granted for one year or until the next refueling outage pursuant to 10 CFR 50 §50.55a ¶(f)(6)(i), to allow the licensee time to complete the vibration instrumentation upgrade to comply with the Code requirements. The licensee was requested to provide an implementation plan which includes the schedule for completion and information on the accuracy of the new instrumentation.

The licensee has responded to the request to describe the implementation plan and schedule for completion. With respect to the accuracy of the new instrumentation, the licensee refers to relief request GNR-PMP-08 for the accuracy of the "hand held" instrumentation. The licensee appears to be stating that the accuracy requirements of Section XI, ¶ IWP-4110 will be met by means of the hand held vibration instrumentation, which will be completely installed by the first quarter of 1994. However, there is no relief request GNR-PMP-08 included in the Revision 21 IST program. It appears that the correct reference is to generic pump relief request GNR-PMP-05.

It appears that the licensee will comply with code accuracy requirements for the quarterly tests within the allowed interim period discussed in the July 23, 1993 SE (i.e., in the first quarter of 1994). Therefore, relief will no longer be required.

3.2 Pump Relief Request Number RR-PMP-02 (Previously Pump Relief Request 3), Low Pressure Injection/ Decay Heat Removal Pumps

Relief Request: The licensee has requested relief from ASME Section XI for the Low Pressure Injection Pumps 1A, 2A, and 3A.

The licensee had determined that the following code requirements are impractical:

1. IWP-3100 Inservice Test Procedure (Table IWP-3100-1)

Which requires the licensee to measure pump inlet pressure before pump startup and during the tests.

2. IWP-3210 Allowable Ranges of Inservice Test Quantities

Which provides differential pressure and flow rate acceptance criteria in Table IWP-3100-2.

3. IWP-4110 Quality (Table IWP-4110-1) and IWP-4120 Range

Which specifies the required flow rate and vibration instrument accuracies in Table IWP-4110-1 and that the full-scale range of each instrument shall be three times the reference value or less.

Licensee's Basis for Requesting Relief: The licensee states:

1. "Relief is requested from the requirement to take inlet pressure readings prior to starting the pumps for the following reason. These pumps may be in service during plant outages at the same time that the test is required to be performed. Measuring inlet pressure prior to pump startup would require stopping and restarting the pump. This increases the duration and complexity of the test, adds wear and tear on the pump, and could result in additional radiation dose to test personnel. These disadvantages are not offset by a compensating increase in the level of safety or validity of test results."

2. "Relief is requested from Table IWP-3100-2 limits on ranges for flow rate and differential pressure because the high limits are more restrictive than the calibration limits on our flow instrumentation at the required reference flow rate. During normal plant operation, LPI pumps can be run only in recirculation mode to the BWST. The "A" pump can only be tested using a line-up which contains a 3 inch cross section of pipe this restricts flow to a range from 1150 to 1550 gpm. At this low flow, the installed flow instrumentation lacks the required accuracy. Consequently, the differential pressure readings fluctuate accordingly. Other flow alignments are physically possible, but prohibited by our Technical Specifications due to the necessity of having both trains of the system inoperable simultaneously."

3(a). Relief is requested from the flow instrument requirements on the following basis: "Flow alignment restrictions discussed above prohibit us from achieving the +/- 2% accuracy requirement for flow rate." "The existing flow gages, with 0-6000 gpm ranges, were selected for flow measurement in the normal system alignment, in which expected flow rate is 3000 gpm. In the restricted alignment discussed above, the gage is over-ranged. Plant modifications have been issued to install a second gage for each pump with a range of 0-2000 gpm. These are expected to be in place by the end of 1993."

(b). Relief is requested from the vibration instrument requirements on the following basis: "Vibration monitoring is performed with digital equipment which has a stated accuracy of 7.37% of reading. Full scale is not defined for digital instrumentation. The instrument is auto-ranging, and range is therefore variable. Consequently, the 5% of full scale requirement has no meaning for the equipment we use."

"We are currently performing enhanced vibration monitoring utilizing digital vibration instrumentation. Digital vibration instrumentation, however, has a variable range, and therefore no defined full scale. IWP does not provide adequate guidance for utilization of state-of-the-art digital vibration instrumentation."

Alternate Method of Testing: The licensee proposes:

1. Two sets of inlet pressure reference values will be defined for these pumps. One set will apply to the recirculation alignment test and another for the normal system alignment test performed at cold shutdown.

During normal operation the "A" LPI pumps will be tested in recirculation mode at a reduced flow. Suction pressure readings will be taken prior to starting the pumps. During cold shutdowns (or quarterly in the event of frequent shutdowns) the "A" pump suction pressure will be read with the pumps running.

2. Ranges for differential pressure will, at the licensee's discretion, be as follows:

Acceptable Range: 0.93 to 1.07 times reference value
Low Alert Range: 0.90 to 0.93 times reference value
High Alert Range: 1.07 to 1.10 times reference value
Low Required Action: < 0.90 times reference value
High Required Action: > 1.10 times reference value

Ranges for flow will, at the licensee's discretion be as follows:

Acceptable Range: 0.94 to 1.06 times reference value
Low Alert Range: 0.90 to 0.94 times reference value
High Alert Range: 1.06 to 1.10 times reference value
Low Required Action: < 0.90 times reference value
High Required Action: > 1.10 times reference value

3(a). "During normal operation the "A" LPI pumps will be tested in recirculation mode at a reduced flow. Flow gages meeting range requirements of IWP-4120 will be installed as soon as practicable. Accuracy of flow instrumentation will be per our existing calibration standards.

During cold shutdowns (or quarterly in the event of frequent shutdowns) the "A" pump will be tested at a higher flow such that existing flow gages will meet IWP range and accuracy requirements."

(b). "In lieu of the vibration instrument accuracy requirements of IWP-4110, the loop accuracy of vibration instruments will be +/- 6.56% of reading for velocity and +/- 7.37% of reading for displacement. This accuracy is the best that can be reasonably obtained from state-of-the-art instrumentation that must be used to perform the enhanced testing. (The requirements of IWP allow vibration inaccuracies of greater than +/- 15% of reading.)

In lieu of the range requirements imposed on vibration instrumentation by IWP-4120, there will be no vibration instrumentation range requirement (digital vibration instrumentation is auto-ranging). It is not necessary to have a range requirement because the accuracy stated above and the readability of a digital gage are not dependent upon instrument range.

In addition to the vibration requirements of IWP-4510, peak-to-peak displacement and peak velocity will be measured at multiple points as defined per the test procedure. Multiple point measurements provide enhanced evaluation of overall machine condition. Acceptance criteria will be based on displacement as defined in Table IWP-3100-2 with a 2.37% adjustment made to allow for the instrument inaccuracy. Velocity vibration data will have no acceptance criteria applied procedurally, but will be reviewed by the Accountable Systems Engineer during the final procedure review."

Evaluation: The LPI system consists of two independent trains, "A" and "B"; each with its own pump. A third pump "C" is also available and can be valved into either train. The LPI pumps can be tested by establishing flow through a recirculation line back to the Borated Water Storage Tank (BWST).

As part of the LPI System, the LPI "A" pumps perform several safety functions. These include emergency core cooling flow in the event of a large break LOCA, NPSH for the HPI pumps in piggyback alignment for small break LOCAs, and long term post-accident sump recirculation cooling. They are also used for normal system cooldown in the decay heat removal alignment. Lastly, they are used for filling and draining the Fuel Transfer Canal during refueling outages.

This relief request, as written, pertains only to the "A" pumps. Additionally, this relief request appears to contain in its entirety Generic Relief Request PMP-03, thereby making Generic Relief Request PMP-03 superfluous. Furthermore, the Pump IST List indicates that this relief request applies also to the "B" and "C" LPI pumps for Units 1, 2, and 3 (in the "Unit Status" column). The licensee should review the Pump IST List and revise the Program as appropriate to clarify the status of Generic Pump Relief Request PMP-03 and also of any relief requests which may pertain to the "B" and "C" LPI pumps.

1. The licensee has requested relief from the requirements of Section XI, Table IWP-3100-1, that pump inlet pressure be measured before pump startup and during pump testing. This request is addressed in Generic Relief Request (GNR-PMP-1), formerly Pump Request #1. The use of OM Part 6, which does not require the measurement of suction pressure was previously approved pursuant to §50.55a(f)(4)(iv) in the July 23, 1993 Safety Evaluation.

2. The licensee has requested relief from the requirements of Section XI Table IWP-3100-2 acceptance criteria for flow rate and differential pressure because the high limits are more restrictive than the calibration limits on the flow instrumentation at the required reference flow rate. During normal plant operation, LPI pumps can be run only in recirculation mode to the BWST. The "A" pump can only be tested using a line-up which contains a 3 inch cross section of pipe This restricts flow to a range from 1150 to 1550 gpm. At this low flow, the installed flow instrumentation lacks the required accuracy. Consequently, the differential pressure readings fluctuate accordingly.

During cold shutdown, the "A" pumps will be tested at a higher flow such that the existing 0-6000 GPM flow gages will meet the Section XI range and accuracy requirements. A review of the LPI system piping and instrumentation diagram (P&ID) verifies that the LPI pumps cannot be operated at full flow during normal reactor operation since this would require the pumps to inject directly into the reactor vessel. This is precluded by the fact that the LPI pumps' maximum outlet pressure (design pressure 505 psig) is below reactor operating pressure (over 2000 psig).

In the NRC's July 23, 1993 SE the licensee was requested to consider the feasibility of an alternate flowpath for testing of the "A" LPI pumps. As noted by the licensee in the current Rev. 21 IST Program, other flow alignments are physically possible, but prohibited by the Technical Specifications due to the fact that both trains of the system would be inoperable simultaneously. A review of the LPI system P&ID confirms that the alternative flow path described above would align flow from all three LPI pumps to the BWST, thereby disabling the entire LPI System solely for testing purposes.

The licensee states that two sets of reference values will be defined for these pumps. One set will apply for the recirculation alignment test and another for the normal system alignment test performed at cold shutdown. Generic relief from the Code flow and differential pressure acceptance criteria was requested in the previous IST Program submittal (Relief Request No. 7). This request was denied in the July 23, 1993 Safety Evaluation. This request was revised and resubmitted as GNR-PMP-4. Since the July 23, 1993 SE, draft NUREG-1482 was published. In Section 5.6, it discusses the use of expanded ranges in accordance with Section XI, ¶ IWV-3210. Section XI, ¶IWP-3210 allows alternate acceptance criteria to be used, provided that the range limits allow the pump to fulfil its safety function. Therefore, relief is not required. As discussed in draft NUREG-1482, the record of tests must include the expanded ranges and the basis for finding that the pump performance does not demonstrate degrading conditions.

3(a). The licensee has requested relief from the Code's flow instrument range and accuracy requirements. The existing flow gages, with 0-6000 GPM ranges, were selected for flow measurement in the normal system alignment, in which expected flow rate is 3000 GPM. In the restricted alignment in which LPI Pump "A" must be tested, i.e., 1150 to 1550 GPM through a 3 inch pipe, the gage is over-ranged so that the licensee cannot meet the ± 2% accuracy requirement of Table IWP-4110-1. The licensee initiated plant modifications to install a second gage for each "A" pump with a range of 0-2000 GPM. These gages were scheduled to be installed by the end of 1993. The licensee states that the gage accuracy "will be per our existing calibration standards." The request does not indicate whether the instrument accuracy meets the Code requirements. Additionally, during the full-flow tests conducted at cold shutdowns, the existing gages will meet the Code accuracy and range requirements.

Pump Generic Relief Request GNR-PMP-03 also addresses the flow instrumentation for the Low Pressure Injection Pump 1A . Although this request is labeled generic, it appears to apply only to the "A" LPI pumps. This request was evaluated in the July 23, 1993 Safety Evaluation and was considered an open item. The SE states:

> If the optional test path described above is not feasible and the instrumentation does not meet the Code requirements, the licensee should revise the request and provide information to substantiate that this option was considered and explain why it is not feasible. In addition, information should be provided specifying what the accuracy and range of the installed instrumentation are. Based on these outstanding issues, relief cannot be recommended. The licensee should continue testing in accordance with the proposed alternative while reviewing the optional flow path and instrumentation range and accuracy. It is recommended that this request be considered an open item, pending further action by the licensee.

As discussed in the evaluation for 2 above, the licensee has revised this request to address the feasibility of the optional flow path discussed in the July 23, 1993 SE. However, the revised request does not discuss the accuracy of the new 0-2000 GPM flow gages which were to have been installed by the end of 1993.

The licensee should address the concerns from the July 23, 1993 SE. Provided that the flow gages have been installed and they meet the Code accuracy and range requirements, no relief is required and this portion of RR-PMP-02 and GNR-PMP-03 should be deleted.

(b). The relief requested for vibration instrument accuracy and range requirements is identical to that requested in Generic Relief Request GNR-PMP-05. The alternative was authorized in the July 23, 1993 SE pursuant to §50.55a ¶(a)(3)(ii), with provisions.

3.3 Relief Request GNR-VLV-03 (Previously Generic Valve Relief Request c), Fail Safe Valves

Relief Request: The licensee has requested relief from the requirements of Section XI, ¶ IWV-3415, which requires fail-safe valves to be tested by observing the operation of the valves upon loss of actuator power.

Licensee's Basis for Requesting Relief: The licensee states: "Testing by loss of actuator power is not practical. First, loss of actuator power generally involves maintenance action to interrupt power, which must subsequently be restored and verified. This greatly increases the manpower requirements for testing and increases possibility for human error in returning component to service.

Second, by IWV-3200, a subsequent post-maintenance test is required to verify return to acceptable operation.

Third, some components, especially pneumatic valves, have two modes of "loss of actuator power": they can lose pneumatic power by loss of instrument air or they can lose electrical power to control solenoids.

Therefore, to test all modes of failure, at least three tests would be required on some valves. The net result is a significant increase in manpower and time to perform the tests, an increase in radiation exposure for valves in radiation areas, and an increase in the possibility of improper return to service."

Proposed Alternate Testing: The licensee proposes: "Fail-safe valves will be tested using normal controls. Where both normal controls and engineered safeguard (ESG) control switches exist, the ESG switches will be used. The action of the switch is the same as if the actuator power is removed. Fail/Safe valves installed have pneumatic or mechanical devices to fail the valve in the safe direction. Response to I.E. Notice 88-14 and recent analysis has shown all valves installed to fail in the safe direction and/or mechanical means have been provided and incorporated into procedures to reposition the valve."

Evaluation: In the July 23, 1993 SE, generic relief was denied pending an evaluation by the licensee of the testing for each valve to determine if the safety-related fail-safe function can be monitored by the proposed testing, i.e., that testing the valves using the normal or ESG control switches has the same effect as a loss of electric power supply or loss of air supply.

The licensee has revised this relief request with a statement that, for all fail-safe valves, "The action of the switch is the same as if actuator power is removed. Fail-Safe valves installed have pneumatic or mechanical devices to fail the valve in the safe direction." The licensee further states that the "response to I.E. Notice 88-14 and recent analysis has shown all valves installed to fail in the safe

direction and /or mechanical means have been provided and incorporated into procedures to reposition the valve." The licensee should ensure that this test method will verify the safety related function for each valve and failure mode.

Based on the impracticality of physically disconnecting the actuator power, which may result in an increased radiation exposure to the personnel performing the test, and that the proposed alternate testing adequately assures that the valve will return to the fail-safe position, it is recommended that the relief requested by the licensee be approved in accordance with 10 CFR 50.55a(f)(6)(i).

3.4 Generic Relief Request GNR-VLV-07 (Previously Generic Valve Relief Request g), Containment Isolation Valves

Relief Request: The licensee has requested relief from the Section XI, ¶ IWV-3200 requirements regarding post-maintenance leakage testing for containment isolation valves.

Licensee's Basis for Requesting Relief: The licensee states: "Adjusting a packing leak on a CIV in a pressurized system will have a minimal effect on total Reactor Building leakage. It is not practical to remove a pressurized safety system from service, depressurize, vent, drain, and a local leak rate test to verify that tightening the valve's packing has not increased its leak rate. For safety, ALARA, and cost considerations, CIV packing leaks will be reduced to a minimum level without performing a post maintenance leak rate test. Exercising the valve or stroke testing where code requires it, will demonstrate its operability."

Proposed Alternate Testing: The licensee proposes: "When valve packing is adjusted to reduce a leak the valve will be observed to verify the leak has been reduced and exercised (Partial or Full) tested prior to returning the valve to service. The leakage rate for type "C" valves will be determined by testing at the next refueling outage. Valve(s) which cannot by type "C" tested and are in penetrations which are challenged during a type "A" will be tested at the next scheduled type "A" test. No special type "A" will be performed."

Evaluation: The licensee revised the basis for this relief request to clarify that packing adjustments for containment isolation valves have a minimal effect on the Reactor Building total leakage, and to demonstrate the impracticality of leak testing.

In the July 23, 1993 SE, the staff concluded that relief to defer stroke and leak testing until the first available opportunity in which the plant enters an operating mode which allows testing could be recommended on a case-by-case basis. However, generic relief, as requested, could not be recommended until the licensee establishes a valve packing program which has designated limits, backed by testing data, that allow adjustments which do not affect the performance parameters of the particular valves in question.

Since the issuance of the July 23, 1993 SE, the NRC has issued Draft NUREG-1482. In Section 4.4.4 of that NUREG, the NRC staff clarified its position with respect to post-maintenance testing following stem packing adjustments. The NRC staff has stated that specific or general relief is not appropriate for this activity. If the licensee cannot justify that the packing adjustment does not adversely affect the performance parameters of the particular valves in question, such justification being established by the means described in Section 4.4.4, there would be no basis for relief and the Code requirements must be met.

Therefore, relief may not be granted. The licensee must consider this issue for each valve individually, as discussed in the draft NUREG. The licensee must establish appropriate procedures to ensure that any packing adjustments do not adversely affect the performance parameters of the particular valves in question. The licensee's evaluation and procedures are subject to NRC inspection.

3.5 Generic Valve Relief Request GNR-VLV-09 (Previously Generic Valve Relief Request i), Power-Operated Valves

Relief Request: The licensee has requested relief from Section XI, IWV-3417(a) which requires that stroke times for power operated valves be compared to previous stroke times.

Licensee's Basis for Requesting Relief: The licensee states: "As described in NRC Generic Letter No. 89-04, comparing stroke times to a reference value is an acceptable alternative to comparing with the previous stroke time. Comparing to a reference value will not allow stroke times to gradually increase without requiring corrective action."

Proposed Alternate Testing: The licensee proposes:

"Power-operated valve stroke times will be compared to reference stroke times. A reference stroke time will be established for each power-operated valve when it is known to be operating acceptably. This relief used the acceptance criteria of OM-10 (1988).

If the stroke time of a power-operated valve is not within the ranges specified below, its test will be immediately repeated; if within the restroke range limits or immediately declared inoperable if outside those limits, per the acceptance criteria of OMa-1988 Section 4.2.1.9 (sic). In either of the above cases an evaluation will be done prior to returning the valve to service.

a) For electric-motor-operated valves with a reference stroke time greater than 10 sec, the stroke time will be compared to a +/-15% change from the reference stroke time.

b) For other power-operated valves with a reference stroke time greater than 10 sec, the stroke time will be compared to a +/-25% change from the reference value.

c) For electric-motor-operated valves with a reference stroke time less than or equal to 10 sec, the stroke time will be compared to a +/-25% or +/-1 sec change from the reference value, which ever is greater.

d) For other power-operated valves with a reference stroke time less than or equal to 10 sec, the stroke time will be compared to a +/-50% change from the reference value."

Evaluation: In the July 23, 1993 SE, the NRC staff advised the licensee that in lieu of Section XI, pursuant to 10 CFR 50 § 50.55a ¶ (f)(4)(iv), the licensee could use OMa-1988 Part 10 ¶ 4.2.1.8 <u>and</u> related requirements, including ¶ 4.2.1.9. The licensee was instructed to revise the request accordingly.

The licensee has revised the relief request to state explicitly that the acceptance criteria for the allowable changes in stroke times are in accordance with those of OM-1988 Part 10, ¶ 4.2.1.9.

However, the second paragraph of the proposed alternate testing is not clear. The alternate testing description should be revised to reflect clearly OMa-1988 Part 10, ¶ 4.2.1.9. As stated in the July 23, 1993 SE, it is acceptable for the licensee to use Part 10 ¶ 4.2.1.9 in accordance with 10 CFR 50 § 50.55a ¶ (f)(4)(iv), if all related requirements are met. Such related requirements include paragraphs 1.3, 3.1 to 3.6, 4.2.1.1 to 4.2.1.9, 5, and 6.

Additionally, the "ONS ASME Valve and Pump Testing Directive," System Engineering Manual 4.7, Section 4.8 and Enclosure 13.8, Section 6, should be reviewed and revised to comply with Part 10 and be consistent with the relief request.

It should be noted that the licensee has requested only relief from IWV-3417(a) and that the requirements of IWV-3417(b), which require declaring the valve inoperable when the valve fails to exhibit the required change of position or exceeds its specified limiting stroke value of full-stroke time, must be met.

3.6 Valve Relief Request RR-VLV-10 (Previously Valve Relief Request 10), Core Flood Tank Outlet Check Valves

Relief Request: The licensee has requested relief from the ASME Code Section XI requirements for the Core Flood Tank "A" and "B" Outlet Check Valves 1CF-11, 13, 2CF-11, 13, and 3CF-11, 13. The code requirements which the licensee has determined to be impractical are as follows:

1. IWV-3200, "Valve Replacement, Repair, and Maintenance" - Relief is requested from the requirement for post-maintenance full-flow testing.

2. IWV-3521, "Test Frequency" - Relief is requested from exercise test frequency of 3 months or at cold shutdown.

3. IWV-3523, "Corrective Action" - Relief is requested from the requirement to perform a full-flow test prior to returning valve to service following corrective action.

4. IWV-3424, "Seat Leakage Measurement" - Relief is requested from the test methodology requirements.

5. IWV-3427, "Corrective Action" - Relief is requested from the requirements for double-frequency testing as stated in IWV-3427(b).

6. IWV-3522, "Exercising Procedure" - Relief is requested from exercising procedure requirement to pass full accident flow through the valve.

Note: The licensee has also asked for relief, in conjunction with 2 and 3 above, from ¶ IWV-3411 and IWV-3417. However, those paragraphs apply to power-operated valves only. The subject valves are check valves.

Licensee's Basis for Requesting Relief: The licensee states:

1. "Relief from IWV-3200 requirement for post maintenance testing is requested on the following basis. Any maintenance required on these valves would be scheduled after the full flow test because the valve cannot be removed from the system for maintenance until after the core flood tanks are drained (low-point maintenance). Full flow testing is concurrent with draining of the tanks, and therefore precedes valve removal. Revising the outage schedule to provide for valve maintenance prior to full-flow testing would create a significant hardship on outage management and would adversely affect shutdown risk as explained below.

The maintenance on the valve must be performed during the defueled maintenance window. To fill the CF Tanks after defueled maintenance window and perform the full flow test before fuel is reloaded would take roughly 30 hours of critical path outage time. Additionally, during that phase of the outage there is no available space to mix water for the CF Tank fill. There is also no piping system available to refill the tanks. Realignment of the piping necessary to refill the tanks would require extensive procedure revisions and many Block Tagout revisions.

Performing the test just prior to fuel movement as required by the above scenario would cloud the water in the vessel and limit the ability to properly verify fuel assembly locations. This increases the risk of a fuel handling error during the refueling process."

2. "Relief from IWV-3521 is requested because these valves cannot be exercised at power or cold shutdown. These valves cannot be subjected to greater than RCS pressure during power operation. They cannot be full-stroke exercised during cold shutdown due to the possibility of over pressurization and hydraulic shock to the reactor coolant system."

3. "Relief from the retest requirement following corrective action (IWV-3523) is requested on the same basis as stated above for IWV-3200. Corrective action as intended in this context would necessarily require disassembly for these valves. Such corrective action will be scheduled during the defueled maintenance window of each respective refueling outage."

4. "Relief from IWV-3424(a) is requested on the basis of contamination risk and exposure concern. This method has been employed in the past with poor results. We were not confident in the accuracy of the methodology, and we had incidents involving spills and personnel contamination. The alternate methodology described below has been in place for several years with acceptable results. The method is based upon a computer code which has been validated by hand calculation to assure that the results are reliable and conservative. Therefore, the methodology will provide an adequate level of safety. Conversion to new methodology will require resources to make procedure changes which are not justified by a compensatory increase in level of safety.

Relief from IWV-3424(b) is requested because alternate methodology currently in place (see alternative testing discussed below) will produce equivalent result with no reduction in level of safety. Existing test methodology has been in place for several years with acceptable results. Conversion to new methodology will require resources to acquire additional test apparatus and to take procedure changes which are not justified by a compensatory increase in level of safety."

5. "Relief from IWV-3427(b) requirement for double-frequency testing is requested on the following basis. Double-frequency testing of these valves would require testing at conditions other than cold shutdown or refueling outage. This would result in unnecessary risk to personnel due to exposure

to high-energy piping inside containment. Personnel exposure to high radiation would also result. Moreover, our current practice (described below) is more conservative than the code requirement, therefore, making this requirement inappropriate."

6. "Relief from IWV-3522 requirement for full flow testing is requested on the following basis. It is understood that full flow testing as described in Generic Letter 89-04 is taken to mean full accident flow rate. Compliance with this requirement would introduce the potential for personnel injury, contamination of personnel and equipment, and potential equipment damage due to water spray. The tanks discharge into the fuel transfer canal through an open, defueled vessel. Establishing full accident flow rate through these valves could create flow velocities sufficient to force water over the walls of the fuel transfer canal, which is unacceptable. No alternate flow path is available. Testing with the vessel head in place is not feasible because:

a) fuel assembly could be damaged if test was performed prior to defueling, and

b) replacement of vessel head after defueling would have an unacceptable impact on the outage schedule and require additional resources without a compensating increase in level of safety."

Proposed Alternate Testing: The licensee proposes:

1. and 3. As an alternative to post-maintenance retesting required by IWV-3200 and IWV-3523, all maintenance which can affect the performance of the valve will be performed during refueling. The valves will be exercised by hand following disassembly, prior to returning the valves to service. While not the preferred method, disassembly is recognized by Generic Letter 89-04 as an acceptable alternate to full flow testing. In some respects, disassembly can be the most effective method of advance detection of deterioration. For example, it can detect wear, corrosion, or other mechanical damage that flow testing may not detect. Therefore, this method will assure an acceptable level of safety. A partial stroke test will be performed during unit startup following disassembly.

2. In lieu of exercise test frequency required by IWV-3521, the valves will be exercised at each refueling outage. Partial stroke testing will be performed at cold shutdown.

4. As an alternative to seat leakage measurement methods prescribed by IWV-3424, we will apply pressure downstream of each valve and measure pressure-rise in a fixed volume upstream of the valves. Leakage rate will be determined by comparison of measured pressure rise versus time to a calculated pressure rise versus time based upon an assumed leakage rate. Calculated pressure rise is based upon a computer model which has been validated by hand calculation to assure accurate and conservative results. Therefore, use of this method will assure an acceptable level of safety.

5. Valves for which leakage rates exceed the criteria of IWV-3427 (b) will receive an evaluation by Engineering and Operations Departments prior to returning the valve to service. If this evaluation determines the leakage to be unacceptable, valves will be repaired or replaced prior to returning unit to service.

6. In lieu of exercise test procedure required by IWV-3522, testing will be performed at a lower than accident pressure and flow condition and the data analyzed to verify that the valves will pass the required flow under accident conditions. Test method utilizes nitrogen overpressure on the Core Flood Tanks, which are filled to normal Technical Specification level with outlet block valves closed. Outlet valves are opened while tank level and pressure data are recorded versus time. This data is used to

calculate flow rate through the check valves. Pressure drops in the system are also calculated and used to determine the flow coefficient (Cv) of the check valves. This Cv is then compared to the accident required Cv. A calculated Cv higher than the accident required Cv indicates that the valve was exercised to its accident required position. Qualification of methodology is provided by independent review of calculation in accordance with owners Quality Assurance Program.

Evaluation: These are 14 in. check valves which normally prevent backflow from RCS to core flood tanks. In an emergency they open to permit flow from the core flood tanks to the Reactor Coolant System.

1, 2 and 3. The relief requested under Items 1 and 2 was previously approved in the July 23, 1993 SE. The licensee has revised the basis to provide clarification of the statement that shutdown risk would be affected adversely by post-maintenance testing, as requested in the SE. The July 23, 1993 SE evaluation of Item 1 for post-maintenance testing is also applicable to Item 3, concerning testing following corrective action, and therefore the relief requested under Item 3 is also approved in accordance with Generic Letter 89-04, Position 2.

4. The relief requested under Item 4 is a new request. The licensee is requesting relief from the valve seat leakage measurement requirements of Section XI, ¶ IWV-3424, which states that valve seat leakage may be determined by either:

(a) draining the line, closing the valve, bringing one side to test pressure, and measuring leakage through a downstream telltale connection, or

(b) measuring the feed rate required to maintain pressure between two valves or between two seats of a gate valve, provided the total apparent leak rate is charged to the valve or gate valve seat being tested, and that the conditions required by IWV-3423 (for differential test pressure) are satisfied.

The valves in question are Category A valves which are other than containment isolation valves. The licensee's proposed alternative leak rate testing method is to apply pressure downstream of each valve and measure the pressure rise in a fixed volume upstream of the valve. The measured leakage rate will be compared to a calculated pressure rise for an assumed leakage rate. This method is opposite to, but essentially equivalent to, the method allowed by OMa-1988 Part 10, ¶ 4.2.2.3, which applies to valve seat leakage rate tests for other than containment isolation valves. Specifically, ¶ 4.2.2.3(c)(3) states that valve seat leakage rate may be determined by measuring pressure decay in a test volume, provided the total apparent leakage rate is charged to the valve or valve combination being tested, provided that the requirements for differential test pressure specified in ¶ 4.2.2.3(b) are satisfied.

Accordingly, it is recommended that the alternative proposed by the licensee be approved pursuant to § 50.55a ¶ (a)(3)(i) on the basis that the proposed alternative provides an equivalent level of safety to the OM Part 10 requirements.

5. The relief requested under Item 5 is a new request. The licensee is requesting relief from the requirements of Section XI, ¶ IWV-3427(b). The licensee states that valves for which leakage rates exceed the criteria of ¶ IWV-3427(b) will be evaluated to determine whether the leakage rate is unacceptable. If the leakage rate is determined to be unacceptable, the valves will be repaired or replaced prior to returning the unit to service.

As per Generic Letter 89-04, Position 10, the NRC staff stated that although ¶ IWV-3427(b) specifies additional requirements on increased test frequencies for valve sizes 6 in. and larger, and repairs or replacements over the requirements of ¶ IWV-3427(a), based on input from many utilities and staff review of testing data at some plants, the usefulness of ¶ IWV-3427(b) does not justify the burden of complying with this requirement.

The analogous ¶ IWV-3427 paragraph in OMa-1988 Part 10, i.e., ¶ 4.2.2.3(f), does not specify any increased frequency requirement. Therefore, the alternate requested by the licensee exceeds the requirements of OMa-1988 Part 10, ¶ 4.2.2.3.

In rulemaking to 10 CFR 50.55a effective September 8, 1992 (see Federal Register, Vol. 57, No. 152, page 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of § 50.55a. The 1989 Edition provides that the rules for inservice testing of valves are as specified in OMa-1988 Part 10. The NRC staff imposed no limitations to OMa-1988 Part 10 associated with corrective actions following valve leakage rate testing for valves other than containment isolation valves. Section 50.55a ¶ (f)(4)(iv) provides that inservice testing of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of §50.55a, subject to the limitations and modifications listed, and subject to NRC approval. Portions of editions and addenda may be used provided that all related requirements of the respective editions and addenda are met. Accordingly, the relief requested by the licensee is covered by the rulemaking, effective September 8, 1992, as described above, and relief is not required. It is recommended that the alternative proposed by the licensee be approved pursuant to § 50.55a ¶ (f)(4)(iv).

6. The licensee is requesting relief from the requirements of Section XI, ¶ IWV-3522 that check valves be exercised to the position required to fulfill their function. The licensee is proposing to perform the testing at a lower than accident pressure and flow condition and to analyze the data to verify that the valves will pass the required flow under accident conditions. The test data are used to calculate the flow coefficient (Cv) of the check valves. The calculated Cv is then compared to the accident required Cv. The licensee has revised the request to state that the qualification of the methodology is provided by independent review of the calculation in accordance with the licensee's Quality Assurance Program.

As discussed in the July 23, 1993 SE and in Draft NUREG-1482, Section 4.1.2 and also Appendix A, NRC Staff Position 1 concerning full flow testing of check valves, under Question Group 8, the NRC discusses alternative techniques to confirm that the check valve is exercised to the position required to perform its safety function. Non-intrusive methods are acceptable techniques to verify that the system conditions specified in the test procedures cause the valves to fully stroke. In general, the licensee should demonstrate that the alternate test is quantifiable and repeatable. Qualification should involve more than a review of a calculation, such as a physical verification that the test procedures cause the valves to fully stroke. This qualification of the alternate test should be documented by the licensee and available for review by NRC inspectors.

Therefore, since the intent of Generic Letter 89-04, Position 1 is to quantify a valve's full-stroke, relief can only be granted per Generic Letter 89-04, Position 1 provided the licensee ensures that the methodology is quantifiable and repeatable, particularly by addressing the issue of uncertainties in the calculation, and is qualified.

3.7 Valve Relief Requests RR-VLV-11 and RR-VLV-12, (Previously Valve Requests 11 and 12), "A" or "B" Reactor Building Spray Pump Suction and Discharge Check Valves

Relief Request: The licensee has requested relief from full-stroke exercising the "A" or "B" Reactor Building Spray (RBS) System pump suction check valves 1BS-5, 6, 2BS-5, 6, and 3BS-5, 6 and the pump discharge check valves 1BS-11, 16, 2BS-11, 16 and 3BS-11, 16 quarterly or during cold shutdowns in accordance with Section XI, ¶ IWV-3520 Tests for Check Valves.

Licensee's Basis for Requesting Relief: The licensee states: "These valves cannot be full-stroke exercised because the present piping size configuration prevents recirculation flow from equaling design spray flow. Normal recirculation flow is approximately 1250 gpm and full flow for this system is 1500 gpm."

Proposed Alternate Testing: The licensee proposes:

"These valves will be partial-stroked tested quarterly. These valves will also be disassembled at refueling. The positions on check valve disassembly in the NRC Generic Letter 89-04 will be followed. Disassembly will begin as the current check valves are replaced.

This will be completed on the following schedule:

For the pump suction check valves -

Unit 1 End of Cycle 16 (i.e., 12/23/95)
Unit 2 End of Cycle 15 (i.e., 05/18/96)
Unit 3 End of Cycle 15 (i.e., 07/24/95)

For the pump discharge check valves -

Unit 1 End of Cycle 15 (i.e., 06/22/94)
Unit 2 End of Cycle 14 (i.e., 11/16/94)
Unit 3 End of Cycle 14 (i.e., 03/23/94)

The present check valves will not be disassembled because this would require cutting the valve out of the line and rewelding in back in place (sic). The new valves will be flanged to facilitate removal and inspection."

Evaluation: These are the Reactor Building Spray Loop A and Loop B check valves on the pump discharge and suction lines from the Borated Water Storage Tank (BWST).

In the July 23, 1993 SE, the relief as requested was denied because the licensee had proposed only to perform a quarterly part-stroke flow test on these valves without a full stroke exercise.

In the current relief request, the licensee is proposing disassembly and inspection of the valves at refueling outages in accordance with Generic Letter 89-04 Position 2, once replacement valves are installed. No disassembly and inspection, or any full flow testing, will be conducted on the existing valves. The existing valves will be replaced, on a schedule extending out to the middle of 1996, to install flanged end valves which the licensee states will facilitate disassembly and inspection. While the licensee has responded to the issues raised in the July 23, 1993 SE by proposing to perform

disassembly and inspection of the replacement valves, it is not clear why disassembly and inspection can not be performed on the existing valves by leaving them in place and performing the disassembly and inspection by removing the cover flange which is the most likely construction feature of the valves.

The relief requested by the licensee is or will be granted in accordance with Generic Letter 89-04, Position 2 as the replacement valves are installed. However, the licensee should revise the relief request to indicate more clearly why disassembly and inspection cannot be performed on the existing valves until the replacement valves are installed. The licensee has not provided sufficient information in the relief request for interim relief to be recommended pending the installation of the replacement valves.

Additionally, the licensee should note the NRC staff position as described in Draft NUREG-1482, NRC Staff Position 1, Question Group 8, wherein it states that the Nuclear Industry Check Valve Group (NIC) is investigating the qualification of various testing techniques, such as ultrasonics and radiography for check valves. The results of those and other industry efforts might be of value to the individual licensee in providing for the use of alternatives to full flow testing (or to disassembly and inspection). The guidance established for Position 1 remains valid for inservice testing. However, with the progress made in developing and using nonintrusive testing techniques, the staff recommends that licensees investigate and employ these techniques where practical. The criteria listed in Position 1 could be applied to the nonintrusive techniques. Further guidance and requirements for the use of nonintrusive techniques are being incorporated into the ASME OM codes and standards by the OM-22 Working Group on Check Valves.

As discussed in the TER enclosed in the July 23, 1993 SE, Section 5.20, Generic Letter 89-04 provides that when exercising a valve using flowrate is impractical, disassembly and inspection is an acceptable alternative technique. However, the NRC considers disassembly and inspection a maintenance procedure and not a test equivalent to the exercising produced by fluid flow. This procedure has some risk, which makes its routine use as a substitute for testing undesirable when some other method of testing is practical. Check valve disassembly is a valuable maintenance tool that can provide much information about a valve's internal condition and, as such, should be performed under the maintenance program at a frequency commensurate with the valve type and service. The licensee should be aware of the risks associated with disassembly and investigate alternative methods to verify the valve's position, for example non-intrusive methods. Disassembly should only be used as an alternative when no other means of testing is practical.

Therefore, the licensee should revise and resubmit this request. The relief request should be revised to address why disassembly and inspection cannot be performed until the valves are replaced and also to discuss the licensee's position with respect to alternative techniques to disassembly and inspection, such as the use of non-intrusive testing techniques. Less than design flow may be sufficient to full-stroke the valves.

3.8 Valve Relief Request RR-VLV-17 (Previously Relief Request 17), Low Pressure Injection Inlet Header "A" and "B" Check Valves

Relief Request: The licensee has requested relief from Section XI for the low pressure injection (LPI) header "A" and "B" check valves 1CF-12. 14, 2CF-12, 14 and 3CF-12, 14.

The licensee has determined that the following code requirements are impractical:

1. IWV-3200, "Valve Replacement, Repair and Maintenance" - Relief is requested from requirement for post-maintenance full-flow testing.

2. IWV-3521, "Test Frequency" - Relief is requested from exercise test frequency of 3 months or at cold shutdown.

3. IWV-3523, "Corrective Action" - Relief is requested from requirement to full-flow test prior to returning valve to service following corrective action.

4. IWV-3424, "Seat Leakage Measurement" - Relief is requested from requirements of test methodology stipulated in IWV-3424(a) and IWV-3424(b).

5. IWV-3427, "Corrective Action" - Relief is requested from requirements of double-frequency testing as stated in IWV-3427(b).

6. IWV-3522, "Exercising Procedure" - Relief is requested from exercising procedure requirement to pass full accident flow through the valve.

Note: The licensee has also asked for relief, in conjunction with 2 and 3 above, from ¶ IWV-3411 and IWV-3417. However, those paragraphs apply to power-operated valves only. The subject valves are check valves.

Licensee's Basis for Requesting Relief: The licensee states:

1. "Relief from IWV-3200 requirement for post maintenance testing is requested on the following basis. These valves cannot be isolated from the RCS. Therefore, disassembly of these valves for maintenance must be performed when the reactor is defueled and the refueling canal drained. (This is called the "defueled maintenance window" or "low point maintenance window".) Operability testing of these valves is scheduled immediately following defueling and just prior to draining the canal for maintenance. Since the operability test requires draining of the core flood tanks, there will be no later source for testing after the completion of maintenance.

Revising the outage schedule to provide for valve maintenance prior to full-flow testing would require either

a) isolating the core flood tanks with CF-1 and CF-2 while draining the canal and performing maintenance, or

b) draining the core flood tanks prior to the defueled maintenance window.

Option a) is a safety risk to maintenance personnel, since the tanks would have only single isolation. Also, it does not allow for maintenance of CF1 and CF-2, if required.

Option b) creates an outage scheduling burden in that the core flood tanks would have to be refilled in order to perform the operability test. During that phase of the outage there is no available space to mix water for the CF Tank fill. There is also no piping system available to refill the tanks. Realignment of the piping necessary to refill the tanks would require extensive procedure revisions and

many Block Tagout revisions. Furthermore, any problems discovered during the operability test would require a second draining of the refueling canal for repairs. These hardships are not offset by a compensating increase in the level of safety.

In fact, both of the above options would adversely affect shutdown risk, as follows. The water in the canal will be clouded by the operability test. The sequences described above result in reduced time allowed for this cloudiness to clear up prior to refueling. This would make it harder to identify fuel assembly locations correctly, increasing the risk of a fuel handling accident."

2. "Relief from IWV-3521 is requested because these valves cannot be exercised at power or cold shutdown. These valves cannot be subjected to greater than RCS pressure during power operation. They cannot be full-stroke exercised (implying full accident flow rate) during cold shutdown due to the possibility of over pressurization and hydraulic shock to the reactor coolant system."

3. "Relief from the retest requirement following corrective action IWV-3523 is requested on the same basis as stated above for IWV-3200. Corrective action as intended in this context would necessarily require disassembly of the valves, as the condition of the valve internals would need to be ascertained. Such corrective action will be scheduled during the defueled maintenance window of each respective refueling outage."

4. "Relief from IWV-3424(a) is requested on the basis of contamination risk and exposure concern. This method has been employed in the past with poor results. We were not confident in the accuracy of the methodology, and we had incidents involving spills and personnel contamination. The alternate methodology described below has been in place for several years with acceptable results. The method is based upon a computer code which has been validated by hand calculation to assure that the results are reliable and conservative. Therefore, the methodology will provide an adequate level of safety. Conversion to new methodology will require resources to make procedure changes which are not justified by a compensatory increase in level of safety.

Relief from IWV-3424 (b) is requested because alternate methodology currently in place (see alternative testing discussed below) will produce equivalent results with no reduction in level of safety. Existing test methodology has been in place for several years with acceptable results. Conversion to new methodology will require resources to acquire additional test apparatus and to take procedure changes which are not justified by a compensatory increase in level of safety."

5. "Relief from IWV-3427(b) requirement for double-frequency testing is requested on the following basis. Double-frequency testing of these valves would require testing at conditions other than cold shutdown or refueling outage. This would result in unnecessary risk to personnel due to exposure to high-energy piping inside containment. Personnel exposure to high radiation would also result. Moreover, our current practice (described below) is more conservative than the code requirement, therefore, making this requirement inappropriate."

6. "Relief from IWV-3522 requirement for full flow testing is requested on the following basis. It is understood that full flow testing as described in Generic Letter 89-04 is taken to mean full accident flow rate. Compliance with this requirement would introduce the potential for personnel injury. Contamination of personnel and equipment and potential equipment damage due to water spray. The tanks discharge into the fuel transfer canal through an open defueled vessel. Establishing full accident

flow rate through these valves could create flow velocities sufficient to force water over the walls of the fuel transfer canal, which is unacceptable. No alternate flow path is available. Testing with the vessel head in place is not feasible because

a) fuel assemblies could be damaged if test has performed prior to defueling,

b) there is no reservoir of sufficient volume into which to drain the water other than the pressurizer, and there is no way to isolate the steam generators, and

c) replacement of vessel head after defueling would have an unacceptable impact on the outage schedule and require additional resources without a compensating increase in level of safety."

Alternative Testing: The licensee proposes:

1. and 3. As an alternative to post-maintenance retesting required by IWV-3200 and IWV-3523 all maintenance which can affect the performance of the valve will be performed during refueling. The valves will be exercised by hand following disassembly prior to returning the valves to service. While not the preferred method, disassembly is recognized by Generic Letter 89-04 as an acceptable alternate to full flow testing. In some respects, disassembly can be the most effective method of advance detection of deterioration. For example, it can detect wear, corrosion, or other mechanical damage that flow testing may not detect. Therefore, this method will assure an acceptable level of safety. A partial stroke test will be performed during unit startup following disassembly.

2. In lieu of exercise test frequency required by IWV-3521 the valves will be exercised at each refueling outage. Partial stroke testing will be performed at cold shutdown.

4. As an alternative to seat leakage measurement methods prescribed by IWV-3424, we will apply pressure downstream of each valve and measure pressure-rise in a fixed volume upstream of the valves. Leakage rate will be determined by comparison of measured pressure rise versus time to a calculated pressure rise versus time based upon an assumed leakage rate. Calculated pressure rise is based upon a computer model which has been validated by hand calculation to assure accurate and conservative results. Therefore, use of this method will assure an acceptable level of safety.

5. Valves for which leakage rates exceed the criteria of IWV-3427(b) will receive an evaluation by Engineering and Operations Departments prior to returning the valve to service. If this evaluation determines the leakage to be unacceptable, valves will be repaired or replaced prior to returning unit to service.

6. In lieu of exercise test procedure required by IWV-3522, testing will be performed at a lower than accident pressure and flow condition and the data analyzed to verify that the valves will pass the required flow under accident conditions. Test method utilizes nitrogen overpressure on the Core Flood Tanks, which are filled to normal Technical Specification level with outlet block valves closed. Outlet valves are opened while tank level and pressure data are recorded versus time. This data is used to calculate flow rate through the check valves. Pressure drops in the system are also calculated and used to determine the flow coefficient (Cv) of the check valves. This Cv is then compared to the accident required Cv. A calculated Cv higher than the accident required Cv indicates that the valve has exercised to its accident required position. Qualification of methodology is provided by independent review of calculation in accordance with owner's Quality Assurance Program.

Evaluation: These 14 in. normally closed check valves normally prevent backflow from the RCS to the LPI/CF Systems. In an emergency they open to permit flow from core flood tanks or the LPI to the Reactor Coolant System when the RCS pressure is less than 600 psig.

1 and 3. The relief requested under Items 1 and 3 was not included in the Revision 20 version of the licensee's program. However, in the July 23, 1993 SE, the NRC noted that the alternate testing proposed in Relief Request 17, the previous version of this relief request, was similar to the alternate testing proposed in Relief Request 10, (now VLV-RR-10, evaluated in Section 3.6 above), but that the licensee had not requested relief from the requirements of Section XI, ¶ IWV-3200 which requires testing valves following maintenance, when the maintenance could affect the valves' performance. It appeared that the Section XI requirements could not be met and the licensee was directed to request relief if required.

The relief now requested in this request is essentially identical to that requested in Valve Relief Request VLV-RR-10 and is therefore approved in accordance with Generic Letter 89-04, Position 2. See the Evaluation of VLV-RR-10 for Items 1 and 3.

2. The relief requested under Item 2 was previously approved in the July 23, 1993 SE.

4. The relief requested under Item 4 is a new request. The licensee is requesting relief from the valve seat leakage measurement requirements of Section XI, ¶ IWV-3424, which states that valve seat leakage may be determined by either:

(a) draining the line, closing the valve, bringing one side to test pressure, and measuring leakage through a downstream telltale connection, or

(b) measuring the feed rate required to maintain pressure between two valves or between two seats of a gate valve, provided the total apparent leak rate is charged to the valve or gate valve seat being tested, and that the conditions required by IWV-3423 (for differential test pressure) are satisfied.

The valves in question are Category A valves which are other than containment isolation valves. The licensee's proposed alternative leak rate testing method is to apply pressure downstream of each valve and measure the pressure rise in a fixed volume upstream of the valve. The measured leakage rate will be compared to a calculated pressure rise for an assumed leakage rate. This method is opposite to, but essentially equivalent to, the method allowed by OMa-1988 Part 10, ¶ 4.2.2.3, which applies to valve seat leakage rate tests for other than containment isolation valves. Specifically, ¶ 4.2.2.3(c)(3) states that valve seat leakage rate may be determined by measuring pressure decay in a test volume, provided the total apparent leakage rate is charged to the valve cr valve combination being tested, provided that the requirements for differential test pressure specified in ¶ 4.2.2.3(b) are satisfied. The licensee must ensure that no other leakage paths are present from the fixed volume upstream of the valve.

It is recommended that the alternative proposed by the licensee be approved with provisions pursuant to § 50.55a ¶ (a)(3)(i) on the basis that the proposed alternative provides an equivalent level of safety to OM Part 10 requirements, provided the licensee ensure's that no other leakage path is possible from the fixed volume upstream of the valve. This would result in an inaccurate pressure use indication and an incorrect valve leakage rate.

5. The relief requested under Item 5 is a new request. The licensee states that valves for which leakage rates exceed the criteria of ¶ IWV-3427(b) will be evaluated to determine whether the leakage rate is unacceptable. If the leakage rate is determined to be unacceptable, the valves will be repaired or replaced prior to returning the unit to service.

As per Generic Letter 89-04, Position 10, the NRC staff stated that although ¶ IWV-3427(b) specifies additional requirements on increased test frequencies for valve sizes 6 in. and larger, and repairs or replacements over the requirements of ¶ IWV-3427(a), based on input from many utilities and staff review of testing data at some plants, the usefulness of ¶ IWV-3427(b) does not justify the burden of complying with this requirement. The analogous ¶ IWV-3427 paragraph in OMa-1988 Part 10, i.e., ¶ 4.2.2.3(f), does not specify any increased frequency requirement. Therefore, the alternate requested by the licensee exceeds the requirements of OMa-1988 Part 10, ¶ 4.2.2.3.

In rulemaking to 10 CFR 50.55a effective September 8, 1992 (see Federal Register, Vol. 57, No. 152, page 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of § 50.55a. The 1989 Edition provides that the rules for inservice testing of valves are as specified in OMa-1988 Part 10. The NRC staff imposed no limitations to OMa-1988 Part 10 associated with corrective actions following valve leakage rate testing for valves other than containment isolation valves. Section 50.55a ¶ (f)(4)(iv) provides that inservice testing of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of §50.55a, subject to the limitations and modifications listed, and subject to NRC approval. Portions of editions and addenda may be used provided that all related requirements of the respective editions and addenda are met. Accordingly, the relief requested by the licensee is covered by the rulemaking, effective September 8, 1992, as described above, and relief is not required. It is recommended that the alternative proposed by the licensee be approved pursuant to § 50.55a ¶ (f)(4)(iv).

6. The licensee is requesting relief from the requirements of Section XI, ¶ IWV-3522 that check valves be exercised to the position required to fulfill their function. The licensee is proposing to perform the testing at a lower than accident pressure and flow condition and to analyze the data to verify that the valves will pass the required flow under accident conditions. The test data are used to calculate the flow coefficient (Cv) of the check valves. The calculated Cv is then compared to the accident required Cv. The licensee has revised the request to state that the qualification of the methodology is provided by independent review of the calculation in accordance with the licensee's Quality Assurance Program.

As discussed in the July 23, 1993 SE and in Draft NUREG-1482, Section 4.1.2 and also Appendix A, NRC Staff Position 1 concerning full flow testing of check valves, under Question Group 8, the NRC discusses alternative techniques to confirm that the check valve is exercised to the position required to perform its safety function. Non-intrusive methods are acceptable techniques to verify that the system conditions specified in the test procedures cause the valves to fully stroke. In general, the licensee should demonstrate that the alternate test is quantifiable and repeatable. Qualification should involve more than a review of a calculation, such as a physical verification that the test procedures cause the valves to fully stroke. This qualification of the alternate test should be documented by the licensee and available for review by NRC inspectors.

Therefore, since the intent of Generic Letter 89-04, Position 1 is to quantify a valve's full-stroke, it is recommended that provisional relief be granted per Generic Letter 89-04, Position 1 provided the licensee ensures that the methodology is quantifiable and repeatable, particularly by addressing the issue of uncertainties in the calculation, and is qualified.

3.9 Valve Relief Request RR-VLV-21 (Previously Valve Relief Request 21), Low Pressure Injection Coolers Outlet Check Valves to High Pressure Injection Pumps Suction

Relief Request: The licensee has requested relief from ASME Section XI requirements for the check valves on the low pressure injection (LPI) cooler "A" and "B" outlet to the high pressure injection (HPI) pump suction, 1LP-55, 57, 2LP-55, 57, and 3LP-55,57.

The code requirements which the licensee has determined to be impractical are:

1) IWV-3200, "Valve Replacement, Repair, and Maintenance" - Relief is requested from the requirement to full-stroke test valves following maintenance which could affect operability of the valves.

2) IWV-3521, "Test Frequency" - Relief is requested from the requirement to exercise these valves quarterly or at cold shutdown.

Licensee's Basis for Requesting Relief: The licensee states: "These are bolted bonnet swing check valves with body hung disks. The hinge pins do not penetrate the body, and are not accessible from outside of the valve body. Therefore, any maintenance which could affect valve performance would require disassembly of the valve. This maintenance would be performed during the defueled maintenance period of the refueling outage. Performing full flow retests at the end of a refueling outage would require reconfiguring the system to the full flow lineup after ensuring system integrity and adequate venting. These steps cannot be performed without severe impact to the outage schedule. Such impact is not justified by a compensatory increase in level of safety.

Exercising these valves at power would inject highly borated water from the BWST into the RCS, possibly causing a shutdown. Full stroke exercising of these valves requires operation of the HPI system at full flow conditions, and if performed at power or during cold shutdown could cause RCS over pressurization."

Proposed Alternate Testing: The licensee proposes: "The valves will be manually exercised prior to returning the valves to service following maintenance requiring disassembly. This is a recognized alternative to full-flow testing as provided in Generic Letter 89-04.

These valves will be full flow tested each refueling outage during a full flow HPI system test. This test ensures adequate venting of the RCS to prevent overpressurization and also ensures adequate management oversight since operating the HPI system at full flow conditions is an infrequently performed evolution."

Evaluation: In an emergency these 3 in. check valves open to supply flow from the Reactor Building emergency sump to the HPI pump suction via the LPI System. Exercising these valves during operation would require injecting borated water into the RCS. This would cause reactivity excursions and possibly a reactor trip. It is not practical to perform testing that will most probably cause a reactor trip, because of the unnecessary stresses on systems and components. It is impractical to full-stroke exercise the valves during cold shutdowns because this would require the HPI pumps to inject into the RCS, possibly causing a low temperature overpressurization and reactor vessel damage.

In the July 23, 1993 SE, relief was granted to perform full flow exercising at the beginning of each refueling outage during a full flow test of the HPI system and partial stroke exercising at cold shutdowns and after maintenance. The revised relief request has deleted the partial-stroke test and the basis has not been revised to discuss the impracticality of this test. The SE approved the use of OM Part 10, ¶ 4.3.2.2, provided that related requirements are met, including ¶ 6.2. The latter paragraph requires the documentation of the justification of deferral. Therefore, the licensee should perform partial-stroke exercising at cold shutdown and after maintenance, or revise the relief request.

It was also noted in the July 23, 1993 SE that the licensee had not specifically requested relief from ¶ IWV-3200 in Section II of the relief request. Section XI ¶ IWV-3200 states that when a valve or its control system has undergone maintenance (or repairs or replacements) that could affect its performance, it shall be tested, prior to the time it is returned to service, to demonstrate that the performance parameters that could be affected by the maintenance (or repair or replacement) are within acceptable limits. Additionally, the licensee had not identified the maintenance activity(ies) that will be performed on the check valves, including their frequency (e.g., every refueling outage), or the specific burden associated with performing the post-maintenance test.

It was concluded in the July 23, 1993 SE that without additional information regarding the specific maintenance activity and burden of performing the required post-maintenance test, generic relief from ¶ IWV-3200 could not be recommended. However, it was noted that when full-stroke exercising with flow is impractical, Generic Letter 89-04 provides relief to disassemble, inspect, manually stroke, and partial exercise the valve with flow following reassembly. Therefore, if the valve is disassembled for maintenance and Position 2 is utilized, relief was granted per the Generic Letter. However, it was stated that the licensee's IST Program should be revised to document use of this position. It was also stated that the licensee must revise and resubmit the request if relief from post-maintenance testing is required for maintenance that does not involve disassembly but could affect the valves performance parameters.

In the current relief request, the licensee has clearly stated that the valves will be manually exercised prior to returning the valves to service following maintenance requiring disassembly, such actions being an alternative to full flow testing under Generic Letter 89-04, Position 2. Therefore, the licensee has adequately responded to the requirements of the July 23, 1993 SE concerning post-maintenance testing.

3.10 Valve Relief Request RR-VLV-29 (Previously Valve Relief Request 29), Low Pressure Service Water to Turbine Building Header Isolation Valve

Relief Request: The licensee has requested relief from full-stroke exercising the low pressure service water (LPSW) "A" line to turbine building header motor-operated valve, 1LPSW-139, quarterly or during cold shutdowns as required by Section XI, ¶ IWV-3412.

Licensee's Basis for Requesting Relief: The licensee states: "This valve is a single isolation forming the Seismic/non-Seismic boundary between the LPSW Header and both Unit 1 and Unit 2 Turbine Building non-Seismic loads.

Loads Include:

Main Turbine Oil Tank Coolers
Alterrex (Generator exciter) Coolers
Chiller "A" and "B" for Control Room Cooling

Battery Room HVAC
Main Vacuum Pumps A, B, C
Moisture Separator Reheater Drain pump cooling
Various Air Handling Units
Seal Water to Polishing Demineralizer Air Compressor
Make-up water for reaction tank supplying Demineralized and Drinking water.
Continuous Vacuum Priming Pumps

During the stroke test these loads would be without any cooling. The most "time" critical items during operation are the Main Turbine Oil Tank Coolers, the Alterrex Coolers and slightly later the Chillers used for Control Room Cooling. In the case of the Main Turbine Oil Tank Coolers and the Alterrex, it has been evaluated that equipment damage would occur if the valve failed to reopen. Without reestablishing this cooling the main turbine and alterrex could not be shutdown before bearing failure would occur.

Several testing configurations were explored in addition to stroking the valves on-line as discussed above.

The alternative of a bypass line has been considered and rejected as unfeasible. The pipe routing and Support/Restraint configuration for such a bypass is restrictive due to existing space constraints. A two unit outage (both Units 1 & 2) would be required for installation of the tie-ins for the bypass. Approximate replacement power costs for 14 days at $226,400/unit/day is $6,339,200. This cost is in addition to the costs of piping, valves, design and installation labor.

The alternative of relocation of the Seismic/non-Seismic boundary was also evaluated. The piping changes would only slightly be more feasible physically to install and economically than the bypass."

Proposed Alternate Testing: The licensee proposes: "This valve will be manually partial stroked during a refueling outage on either Unit 1 or Unit 2. The valve will be full stroked exercised during concurrent Unit 1 and Unit 2 cold shutdowns."

Evaluation: This is a 24 in. motor-operated butterfly valve which isolates Units 1 and 2 Turbine Building (non-seismic) LPSW Loads from the "A" LPSW (seismic) header. Isolation is required to assure adequate flow to required LPSW loads in the case of a LOCA/LOOP event in concurrence with a seismic event.

In the July 23, 1993 SE, it was noted that although there is the potential burden of having to shut two plants down if the valve failed closed, the licensee had not discussed the safety function of the valve. It was further noted that as proposed by the licensee, the valve may not be full-stroke exercised for years, depending on the two units' outage frequency. Therefore, the licensee was advised to evaluate the amount of time required to perform the test and the consequences.

It was also noted that based on the plants' vulnerability with regard to this valve, the licensee should consider installing a bypass line in order to perform testing and increase the plants' reliability. Relief could not be recommended at that time because the request contained insufficient information. The licensee was advised to revise the request and provide additional information and justification.

In the current relief request, the licensee has responded adequately to all of the concerns identified in the July 23, 1993 SE. If the code requirements were imposed, the system would have to be redesigned or the units would have to be shut down. The alternate testing should provide reasonable assurance of the valve's operational readiness.

Therefore, it is recommended that relief be granted in accordance with 10 CFR 50.55a(f)(6)(i) to manually partial stroke this valve during refueling outages on either Unit 1 or Unit 2, and be full stroked exercised during concurrent Unit 1 and Unit 2 cold shutdowns based on the impracticality of full-stroke exercising this valve quarterly or during cold shutdowns as required by Section XI, ¶ IWV-3412.

4.0 IST PROGRAM RECOMMENDED ACTION ITEMS

Inconsistencies, omissions, and required licensee actions identified during the review of the licensee's Inservice Testing Program, Revision 21 of the third interval, including those specifically identified in Sections 2.0 and 3.0 of this report, are summarized below. The licensee should resolve these items in accordance with the evaluations presented in this report.

4.1 In GNR-VLV-10, the licensee proposed to consider the application of pressure relief devices when determining how many additional valves are to be selected in the event one fails to meet the set pressure acceptance criteria. In cases where the common mode of failure is directly related to the application, and can apply to dissimilar valves, the licensee should assess testing additional valves of different type and manufactures also.

4.2 The licensee, in GNR-VLV-11, requests relief from ANSI/ASME OM Part 1, ¶8.3 and proposes to use the relief valve manufacturer's published cold set pressures. The assignment of responsibility to the valve vendor does not require relief. If the licensee, or his designee, cannot comply with specific Code requirements, the request should be revised to discuss the burden or impracticality of meeting those requirements. See TER Section 2.2.

4.3 Pump relief request RR-PMP-01 may be deleted from the program, once instruments that meet the Code requirements are installed. Also, as currently worded, the request refers to GNR-PMP-08, which is not included in the Revision 21 IST Program. It appears that the correct reference is to GNR-PMP-05. See TER Section 3.1.

4.4 Request GNR-PMP-03 is identified as a generic request. However, it addresses only the "A" LPI pump's flow instrumentation. Request RR-PMP-02 also addresses the "A" LPI pump's flow instrumentation accuracy and range and states that instruments which meet the Code requirements will be installed by the end of 1993. Therefore, Request GNR-PMP-03 and the portion of RR-PMP-02 concerning flow instrumentation should be deleted from the program, as relief appears to no longer be required. If the instrumentation is not installed, RR-PMP-02 must be revised to address the instrument accuracy, as requested in the July 23, 1993 Safety Evaluation.

Furthermore, the Pump IST List in the "Unit Status" column indicates that RR-PMP-02 applies to the B and C pumps, as well as the A pumps, while the request only addresses the A pumps. The program should be revised accordingly.

RR-PMP-02 addresses vibration instrument accuracy and range requirements and is identical to GNR-PMP-05. It is recommended that RR-PMP-02 be revised to simply reference GNR-PMP-05. See TER Section 3.2.

4.5 In accordance with Section XI, ¶IWP-3210, the licensee may use alternate acceptance criteria. However, the expanded ranges and basis for the finding that the pump performance does not demonstrate degrading conditions must be documented in the record of tests. These records are subject to NRC inspection. (Relief Requests GNR-PMP-04 and RR-PMP-02) See Table 1.1 and TER Section 3.2.

4.6 Relief from the Code required valve post-maintenance testing, ¶IWV-3200, is not appropriate (GNR-VLV-07). If the licensee cannot justify that packing adjustment does not adversely affect the performance parameters, including leakage rates, there is no basis for relief. This request should be deleted. The evaluation that the maintenance procedure does not adversely affect the valve's performance parameters is subject to NRC inspection. See TER Section 3.4.

4.7 Request GNR-VLV-09 has been revised and the proposed alternate testing is unclear. The licensee should clarify the request and the "ONS ASME Valve and Pump Testing Directive" to be consistent with the request. See TER Section 3.5.

4.8 As discussed in the July 23, 1993 Safety Evaluation, the use of alternate techniques to verify a valve's full-stroke must be qualified (RR-VLV-10 and 17). The licensee has proposed to qualify an alternate technique by performing a calculation review. The intent of Generic Letter 89-04, Position 1 is to quantity a valve's full-stroke. The alternate techniques qualification should involve more than a review of a calculation, such as a physical verification that the test procedures cause the valve to fully stroke. Relief is granted in accordance with Generic Letter 89-04, Position 1 only provided the methodology is quantifiable, repeatable and is qualified. This qualification documentation is subject of NRC inspection. See TER Sections 3.6 and 3.8.

4.9 The licensee should provide an explanation of why the existing RBS suction and discharge valves cannot be disassembled and inspected (RR-VLV-11 and 12). Interim relief cannot be recommended. The licensee should revise and resubmit the requests. The licensee should also consider the practicality of non-intrusive testing techniques to verify the valve's full-stroke capability. See TER Section 3.7.

4.10 The July 23, 1993 Safety Evaluation discussed the NRC's position on the use of disassembly and inspection and stated that disassembly should only be used as an alternate when no other means of testing is practical and recommended the use of non-intrusives. The licensee should provide a description of their intended use of non-intrusive testing techniques. See TER Section 3.7.

4.11 The licensee has revised Valve Relief Request 21, now RR-VLV-21, to delete partial stroke exercising at cold shutdowns and the basis has not been revised to discuss the impracticality of this test. The licensee should perform partial-stroke exercising at cold shutdowns and after maintenance, or revise the relief request. See TER Section 3.9.

4.12 The licensee has proposed disassembly and inspection of the normal and emergency supply to the HPI pump motor bearing valves in Relief Request RR-VLV-28. The licensee states that leak testing is impractical "because of piping configuration." Relief is granted in accordance with Generic Letter 89-04, Position 2 provided that the licensee revises the request to clarify why leak testing is impractical. See Table 1.1.

4.13 Section 2 of relief request GNR-PMP-02 includes all centrifugal pumps. However, the basis and alternate testing sections only address positive displacement pumps. The request should be revised accordingly. See Table 1.1.

4.14 A number of action items identified in the July 23, 1993 Safety Evaluation were not incorporated into the revised IST Program (Revision 21). For example, Action Item 5.13 and 5.14. The licensee should addresses these concerns and revise the program accordingly. Additionally, in the future, the licensee should provide the resolution to each action item.

4.15 Relief to measure seat leakage by a change in LDST level is not required (RR-VLV-32), provided the valve record provides the basis for concluding that operational observations constitute satisfactory demonstration of seat tightness. Test records are subject to NRC inspection. See Table 1.1.

4.16 The licensee should apply page numbers to the IST document. Additionally, the licensee should maintain the same relief request numbers throughout the ten year interval and include in the IST Program a status of each request identifying the changes made. Attachment 1 to the December 6, 1993 submittal letter incorrectly identified the status of several requests.

4.17 The Program includes a section called "Pump Cold Shutdown Justifications" and the "ONS ASME Valve and Pump Testing Directive," Section 5.1 and 5.4 discuss deferral of pump testing to cold shutdowns. Although there are no pump deferrals in the current program, the licensee should be advised that the Code requires quarterly testing of pumps and does not allow deferral to cold shutdowns. If quarterly testing is impractical, a relief request must be submitted and approved.

4.18 Section 4.1.1 of the "ONS ASME Valve and Pump Testing Directive" states that leak testing of containment isolation valves will be performed in accordance with 10CFR, Appendix J. As discussed in Generic Letter 89-04, Position 10, the licensee must also comply with the requirements of Section XI, ¶IWV-3426 and 3427(a). The program should be revised to include these requirements.

5.0 REFERENCES

1. NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 10, July 1993.

2. ASME Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, 1986 Edition.

3. Oconee Technical Specifications.

4. ASME/ANSI OMa-1988, Part 6, "Inservice Testing of Pumps in Light-Water Reactor Power Plants."

5. ASME/ANSI OMa-1988, Part 10, "Inservice Testing of Valves in Light-Water Reactor Power Plants."

6. 10CFR50.55a

7. Standard Review Plan, NUREG 0800, Section 3.9.6, Inservice Testing of Pumps and Valves, Rev. 2, July 1981.

8. NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," April 3, 1989.

9. Minutes of the Public Meetings on Generic Letter 89-04, October 25, 1989.

10. Supplement to the Minutes of the Public Meetings on Generic Letter 89-04, September 26, 1991.

11. "Inservice Testing (IST) Program, Revision 21", J.W. Hampton, Duke, to USNRC, December 6, 1993.

12. Draft NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," P. Campbell, November 1993.

13. Safety Evaluation of the Inservice Testing Program Relief Requests for Pumps and Valves-Oconee Nuclear station (TAC NOs. M84025, M84026 and M84027), July 23, 1993.

14. "Inservice Testing Program, Revision 21, Safety Evaluation Report Response Additional Information," J.W. Hampton, Duke, to USNRC, January 11, 1994.

APPENDIX A-OCONEE P&IDS

P&ID	Revision	System
OFD-100A-1.1	11	Reactor Coolant
OFD-100A-1.2	7	Reactor Coolant
OFD-101A-1.1	17	High Pressure Injection
OFD-101A-1.2	6	High Pressure Injection
OFD-101A-1.3	3	High Pressure Injection
OFD-101A-1.4	11	High Pressure Injection
OFD-101A-1.5	8	High Pressure Injection
OFD-101A-2.1	17	High Pressure Injection
OFD-101A-2.4	16	High Pressure Injection
OFD-101A-3.4	12	High Pressure Injection
OFD-102A-1.1	13	Low Pressure Injection
OFD-102A-1.2	12	Low Pressure Injection
OFD-102A-1.3	7	Low Pressure Injection
OFD-102A-2.1	8	Low Pressure Injection
OFD-102A-2.3	3	Low Pressure Injection
OFD-103A-1.1	2	Reactor Building Spray
OFD-104A-1.1	14	Spent Fuel Pool Cooling
OFD-106E-1.1	3	Demin. Water
OFD-107A-1.1	3	Coolant Storage
OFD-110A-1.3	2	Chemical Addition
OFD-116A-1.1	3	Reactor Building Purge
OFD-121A-1.8	6	Condensate System
OFD-121B-1.3	13	Feedwater
OFD-121D-1.1	9	EFW
OFD-121D-1.2	6	EFW
OFD-122A-1.1	5	Main Steam

Appendix A (Cont'd)

P&ID	Revision	System
OFD-122A-1.2	7	Main Steam
OFD-122A-1.3	5	Main Steam
OFD-122A-1.4	10	Main Steam
OFD-122B-1.1	5	Turbine Exhaust
OFD-124A-1.1	10	Low Pressure Service Water
OFD-124A-3.1	6	Low Pressure Service Water
OFD-124B-1.4	7	Low Pressure Service Water
OFD-127B-1.2	10	Nitrogen Purge
OFD-135A-1.2	1	Diesel Fuel Oil
OFD-144A-1.2	6	Component Cooling
OFD-144A-1.3	4	Component Cooling

Table 1.1 Inservice Testing Program Action Items
Listed in the July 23, 1993, Safety Evaluation
Oconee Nuclear Station
Duke Power Company

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.1	The IST Program does not include a description of how the components were selected and how testing requirements were identified for each component. The review performed for this TER did not include verification that all pumps and valves within the scope of 10 CFR 50.55a and Section XI are contained in the IST Program, and did not ensure that all applicable testing requirements have been identified. Therefore, the licensee is requested to include this information in the IST Program. The program should describe the development process, such as a listing of the documents used, the method of the basis for categorizing valves, and the method or process used for maintaining the program current with design modifications or other activities performed under 10 CFR 50.59.	The licensee has provided a Testing Directive (System Engineering Manual 4.7) which describes the IST Program development and maintenance.	The licensee has addressed the concerns of the action item. No further action is required.
Action Item 5.2	There appears to be numerous valves in safety-related systems that are not contained in the IST Program (e.g., 1HP-236, 242, and 355). Additionally, all valves in the "ONS Performance Valve Program Retest List-Rev. 3" are not included in the "Oconee Inservice Testing Program Manual Rev. 20-Valve Tables" (e.g., FO-78 through 84). The IWV Tables provide the components and associated relief request or cold shutdown justification. The Retest List provides the valves' general function (e.g., SG Emergency Header Check), and the leak test and stroke test frequency. As discussed above, the licensee should describe the IST Program development and should ensure that all the required pumps and valves are included in the Program.	The Testing Directive provided clarifies the various tables provided. The Valve Test List provides a list of valves included in the IST and "Appendix B" programs.	The licensee has addressed the concerns of the action item. No further action is required.
Action Item 5.3	The IST Program does not reference the pump P&IDs. Adding these references would assist both the Program users and reviewers.	The licensee has designated the appropriate flow diagrams for the pumps in the IST program.	The licensee has addressed the concerns of the action item. No further action is required.
Action Item 5.4	Section 50.55a ¶(f)(4)(iv) provides that inservice testing of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of §50.55a, subject to the limitations and modifications listed, and subject to Commission approval. Portions of those editions and addenda may be used provided that all related requirements are met. The licensee is permitted to use portions of OMa-1988, Parts 6 and 10, as described in TER Sections 2.1.1, 2.1.2, 2.3.3, 2.1.5, 3.1.1, 3.1.4, 3.1.6, 3.1.9, 3.2.1, 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.6, 3.3.7, 3.4.1, 3.4.2,3.4.3, 3.4.4, 3.6.1, 3.7.1, 3.8.1, and 3.10.1. For example, relief from measuring the differential pressure has been authorized for all positive displacement pumps, provided that the licensee uses the acceptance criteria of OMa-1988 Part 6 when evaluating discharge pressure. Implementation of all related requirements is subject to NRC inspection. (TER Section 2.1.2)	None.	Implementation of all related requirements is subject to NRC inspection.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.5 (GNR-PMP-04, formerly Pump Relief Request #7)	It is recommended that Pump Relief Request #7 be denied. The licensee has not provided adequate technical justification for not using the hydraulic acceptance criteria of Section XI or OMa-1988 Part 6. The licensee has proposed an alternate that will be used at "their discretion". (TER Section 2.1.3)	The licensee has revised Pump Relief Request # 7 and redesignated it Generic Pump Relief Request GNR-PMP-04. The following statement was added to the basis: Safety significance for this deviation from code is insignificant. The requested code deviation is for the upper ranges only. Pumps do not improve over time, thus the increase in acceptable upper limits is justified. Enhanced vibration analysis including spectral analysis to identify pump problems is being used at multiple points. Enhanced vibration analysis techniques to further justify relaxed hydraulic limits.	Since the July 23, 1993 SE was issued, draft NUREG-1482 was published. In Section 5.6, it discusses the use of expanded ranges in accordance with Section XI, ¶IWP-3210. The use of alternate acceptance criteria is acceptable in accordance with Section XI, and no relief is required. However, as required by the Code and discussed in the NUREG, the expanded ranges must be documented in the record of tests, and the record of tests must state the basis for the finding that the pump performance does not demonstrate degrading conditions.
Action Item 5.6 (GNR-PMP-05, formerly Pump Relief Request #8)	An alternative to the Code required vibration instrument accuracy and range has been recommended provided that the instrument accuracy is addressed in the analysis and evaluation of pump test data, with the acceptance criteria adjusted to account for inaccuracies, if necessary. In addition, the licensee should investigate the possibility of using other calibration techniques to meet the accuracy requirements of the Code. (TER Section 2.1.4)	The licensee has redesignated Pump Request #8 as Generic Pump Relief Request GNR-PMP-05. The licensee revised the relief request to include a 2.37% reduction of the allowable acceptance criteria for an interim period until a new calibration system is available in the second quarter of 1994 which will allow the instruments to meet the Code required accuracy.	The licensee has addressed the concerns of the action item. No further action is required.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.7 (RR-PMP-02 and GNR-PMP-03, formerly Pump Relief Request #3)	The licensee has not addressed all flow paths for the A LPI pump. If the optional test path described in TER Section 2.2.1 is feasible, and the instrument accuracy and range are acceptable, Relief Request #3 should be deleted. If the optional test path is not feasible and the instrumentation does not meet the Code requirements, the licensee should revise the request and provide information to substantiate that this option was considered and explain why it is not feasible. In addition, information should be provided specifying what the accuracy and range of the installed instrumentation are. Based on these outstanding issues, relief cannot be recommended. The licensee should continue testing in accordance with the proposed alternative while reviewing the optional flow path and instrumentation range and accuracy. This will be considered an open item, pending further action by the licensee. (TER Section 2.2.1)	Pump Relief Request #3 was redesignated as a Generic Pump Relief Request, GNR-PMP-03, and only the format was changed. No technical changes were made. However, the licensee also included a "new" relief request RR-PMP-02 which relates to the same components and which requests more extensive relief from the Code.	Request GNR-PMP-03 is identified as a generic request. However, it addresses only the "A" LPI pump flow rate measurement. Request RR-PMP-02: The licensee's request for relief from the requirements of Section XI, Table IWP-31001 that pump inlet pressure be measured before pump startup and during pump testing was previously approved in the July 23, 1993 SE. With regard to relief from the flowrate and differential pressure acceptance criteria, this request and Generic Pump Relief Request GNP-PMP-04, have been accepted on the basis that Section XI, ¶ IWP-3210 allows alternate acceptance criteria to be used. Therefore, relief is not required. (See TER Section 3.2). The licensee has addressed the feasibility of the optional flow path discussed in the July 23, 1993 SE. However, the request does not discuss the accuracy of the new 0-2000 GPM flow gages which were to have been installed by the end of 1993. Provided gauges are installed which meet the Code accuracy and range requirements, no relief is required and this portion of RR-PMP-02 and GNR-PMP-03 should be deleted. Otherwise the request must be revised to address instrument accuracy. The relief requested for vibration instrument accuracy and range requirements is identical to that requested in GNR-PMP-05. The licensee may revise the current relief request to reference GNR-PMP-05. The evaluation of GNR-PMP-05 applies to the LPI "A" pumps.
Action Item 5.8 (RR-PMP-03, formerly Pump Relief Request #4)	The licensee has been authorized to calculate the Boric Acid and RC Bleed Transfer pumps' inlet pressure based on tank level, provided that the accuracy of the reading scale of the level measurement and calculation method is acceptable. (TER Section 2.3.1)	The licensee has redesignated Pump Relief Request #4 as RR-PMP-03. This request has been revised to delete the Boric Acid Pumps and to clarify that the Reactor Coolant bleed pumps are not ASME Code Class.	Relief for non-ASME Code Class components is not required by the regulations. No further action is required.
Action Item 5.9 (NA, formerly Pump Relief Request #5)	It is recommended that Pump Relief Request #5 be denied. The licensee has not provided adequate technical justification for not installing flow instrumentation for the Boric Acid and RC Bleed Transfer pumps. (TER Section 2.3.2)	Pump Relief Request #5 has been deleted from the program.	No further action is required.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.10 (RR-PMP-01, formerly Pump Relief Request #10)	An alternative has been recommended for Relief Request #10 for one year or until the next refueling outage in order to install vibration instrumentation that complies with the Code accuracy requirements for the RC Makeup pumps. The licensee should provide an implementation plan which includes the schedule for completion and information on the accuracy of the new instrumentation. (TER Section 2.4.1)	Pump Relief Request #10 has been redesignated RR-PMP-01. The licensee has revised this request to include the implementation schedule (i.e., the modifications will be completed in 1994) and a discussion of the new vibration instrumentation's accuracy.	It appears that the licensee will comply with the Code required accuracy requirements within the interim period allowed by the 7/23/93 SE and that relief will no longer be required. See TER Section 3.1.
Action Item 5.11 (GNR-VLV-02, formerly Generic Valve Request b)	Relief has been granted per Generic Letter 89-04, Position 6 for rapid-acting valves. The NRC recommends, where instrumentation is capable of accurately measuring stroke times to fractions of a second, that licensees use the actual measured values and not round off the times. Stroke times that exceed 2 seconds should be declared inoperable in accordance with Position 2. (TER Section 3.1.2)	Generic Valve Request b has been redesignated GNR-VLV-02. The request has been revised in format only.	No further action is required.
Action Item 5.12 (GNR-VLV-03, formerly Generic Valve Request c)	It is recommended that Generic Valve Relief Request #c be denied. The licensee has not provided adequate technical justification for not fail-safe testing valves. (TER Section 3.1.3)	Generic Valve Request c has been redesignated GNR-VLV-03. The request has been revised to clarify that operating the valve with the normal or ESG switch has the same affect as physically disconnecting the actuator power.	The licensee has addressed the concerns of the action item. No further action is required. See TER Section 3.3.
Action Item 5.13 (GNR-VLV-04, formerly Generic Valve Request d)	The licensee is authorized to use the Technical Specifications to determine startup requirements (Relief Request #d) provided that if corrective action is deferred in order to allow the plant to startup, a retest of that valve demonstrating acceptable operation shall be made before the valve is returned to service, in accordance with the Code. This testing should be performed prior to entering any mode of operation which requires the valve to be in service, even if the plant must be shutdown in order to perform the testing. (TER Section 3.1.4)	Generic Valve Request d has been redesignated GNR-VLV-04. The request (GNR-VLV-04) has been revised in format only.	Open. The request should be revised to discuss the concerns of the 7/23/93 SE.
Action Item 5.14 (GNR-VLV-05, formerly Generic Valve Request e)	Relief from measuring the pressure differential for swing or tilting disc check valves is recommended provided the maximum required accident flowrate is passed through the valve. (TER Section 3.1.5)	Generic Valve Request e has been redesignated GNR-VLV-05. The request has been revised in format only. The request still states only that "flow" will be observed without discussing whether that flow is the maximum required accident flowrate.	Open. The request should be revised to discuss the concerns of the 7/23/93 SE.
Action Item 5.15 (GNR-VLV-06, formerly Generic Valve Request f)	Provided that the licensee complies with OMa-1988 Part 10, ¶4.2.1.2(g), 4.3.2.2(g), and related requirements; relief from testing all cold shutdown frequency valves every cold shutdown is not required. (TER Section 3.1.6)	Generic Valve Request f has been redesignated GNR-VLV-06. The request (GNR-VLV-06) has been revised in format only.	Implementation of all related requirements is subject to NRC inspection.
Action Item 5.16 (GNR-VLV-07, formerly Generic Valve Request g)	It is recommended that generic relief not to perform post-maintenance testing be denied. Provided that it is impractical to full-stroke exercise and leak test containment isolation valves following maintenance, and the licensee provides in the test records an explanation of the impracticality of testing the containment isolation valve following packing adjustment and an evaluation of the specific valve packing adjustment to demonstrate that the activity would not affect the valves' stroke time or seat leakage parameters, such that corrective action would be required in accordance with ¶IWV-3417 or 3427, and complies with the requirements discussed in TER Section 3.1.7; relief to defer stroke and leak testing until the first available opportunity when the plant enters an operating mode which allows testing could be granted on a case-by case basis. However, relief as requested is not recommended. (TER Section 3.1.7)	Generic Valve Request h has been redesignated GNR-VLV-07. The basis of the request was revised to demonstrate the impracticality of testing.	Generic relief is not appropriate. No relief is required but the licensee must consider this issue for each valve individually. See TER Section 3.4.

Table 1.[illegible] (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.17 (GNR-VLV-09, formerly Generic Request i)	The licensee's proposed testing for power-operated valves (Relief Request #i) is less conservative than OMa-1988 Part 10; therefore it is recommended that relief as requested be denied. The licensee may, however, use OMa-1988 Part 10, ¶4.2.1.8 and related requirements, without relief per §50.55a ¶(f)(4)(iv). Implementation of related requirements is subject to NRC inspection. (TER Section 3.1.9)	Generic Valve Request i has been redesignated GNR-VLV-09. The relief request has been revised to state that the acceptance criteria for allowable changes in stroke times are in accordance with OM Part 10, ¶4.2.1.9.	The proposed alternate testing is unclear. As stated in the 7/23/93 SE, it is acceptable for the licensee to use Part 10, ¶4.2.1.9 if all related requirements are met. The licensee should clarify the request and the "Testing Directive." See TER Section 3.5.
Action Item 5.18 (RR-VLV-04, formerly Valve Relief Request #4)	With regard to the licensee's request to verify the closure capability of the HPI supply check valves at refueling outages, the licensee has not provided a basis in Relief Request #4 for not performing this test quarterly or at cold shutdowns. Provided that the licensee has adequate justification and documents this justification, relief to test the valves at refueling outages is not required, pursuant to §50.55a ¶(f)(4)(iv). Otherwise, the licensee should perform this testing in accordance with the Code. (TER Section 3.3.1)	Valve Relief Request #4 has been redesignated RR-VLV-04 and has been revised to require quarterly reverse flow testing.	The licensee has addressed the concerns of the action item. No further action is required.
Action Item 5.19 (RR-VLV-04 to 09 and RR-VLV-21, formerly Valve Relief Request #s 4 to 9 and 21)	The licensee states that check valves will be full-stroke exercised at the beginning of each refueling outage and only partial-stroke exercised following maintenance in Relief Requests #4,5,6,7,8,9, and 21. The licensee has not, however, specifically requested relief from ¶ IWV-3200 in Section II of the relief requests. Section XI ¶ IWV-3200 states that when a valve or its control system has undergone maintenance (or repairs or replacements) that could affect its performance, it shall be tested, prior to the time it is returned to service, to demonstrate that the performance parameters that could be affected by the maintenance (or repair or replacement) are within acceptable limits. Additionally, the licensee has not identified the maintenance activity(ies) that will be performed on the check valves, including their frequency (e.g., every refueling outage), or the specific burden associated with performing the post-maintenance test. Therefore, without additional information regarding the specific maintenance activity and burden of performing the required post-maintenance test, generic relief from ¶ IWV-3200 cannot be recommended. However, as discussed in TER Section 3.4.1, when full-stroke exercising with flow is impractical, Generic Letter 89-04 provides relief to disassemble, inspect, manually stroke, and partial exercise the valve with flow following reassembly. Therefore, if the valve is disassembled for maintenance and Position 2 is utilized, relief is granted per the Generic Letter. The licensee's IST Program should be revised to document use of this position. The licensee must revise and resubmit the request if relief from post-maintenance testing is required for maintenance that does not involve disassembly but could affect the valves performance parameters.	The relief requests have been redesignated as RR-VLV-04 to 09 and 21 and revised to specifically request relief from the requirements of Section XI, ¶IWV-3200 and document the use of Generic Letter 89-04, Position 2 for post-maintenance testing.	The licensee has addressed the concerns of the action item. No further action is required.
	Additionally, relief from exercising the valves quarterly or at cold shutdowns is not required provided that the licensee implements OM Part 10, ¶4.3.2.2 and all related requirements. This includes partial-stroke exercising the valves quarterly or providing justification of the impracticality. Implementation of related requirements is subject to NRC inspection. (TER Section 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.6, 3.10.1)	None.	Implementation of related requirements is subject to NRC inspection.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.20 (RR-VLV-01, 02, 13, 15, 23, 26 and CSD-VLV-19; formerly Relief Requests # 1, 2, 13, 15, 23, 26, 31, respectively. Relief Request #27 was deleted)	As discussed in Generic Letter 89-04, when exercising a valve using flowrate is impractical, disassembly and inspection is an acceptable alternative technique. However, the NRC considers disassembly and inspection a maintenance procedure and not a test equivalent to the exercising produced by fluid flow. This procedure has some risk, which makes its routine use as a substitute for testing undesirable when some other method of testing is practical. Check valve disassembly is a valuable maintenance tool that can provide much information about a valve's internal condition and, as such, should be performed under the maintenance program at a frequency commensurate with the valve type and service. The licensee has proposed disassembly and inspection as an alternative to testing with flow in Valve Relief Requests #1, 2, 13, 15, 23, 26, 27 and 31. Relief is recommended provided the licensee complies with all the criteria in Generic Letter 89-04, Position 2. The licensee should, however, be aware of the risks associated with disassembly and investigate alternative methods to verify the valve's position, for example non-intrusive methods. Disassembly should only be used as an alternative when no other means of testing is practical.	None. The licensee has not addressed the use of nonintrusive methods in the IST program or submittal. Additionally, Valve Relief Requests 11 and 12, now designated VLV-RR-11 and VLV-RR-12, respectively, have been revised to include disassembly and inspection without any discussion of the licensee's position with respect to the use of nonintrusive techniques.	As discussed in the 7/23/93 SE, disassembly should only be used as an alternative when no other means of testing is practical. The licensee should provide a description of their intended use of nonintrusives. See TER Section 3.7.
Action Item 5.21 (RR-VLV-32 and CSD-VLV-28, formerly Valve Relief Request #32.	The licensee's proposed testing for the LDST outlet check valve meets the Code requirements for verifying closure and relief is not required from ¶ IWV-3520. The licensee should revise this "request" into a "cold shutdown justification." The licensee has also requested relief from ¶ IWV-3420, which requires a leak rate test every two years. It is not apparent which specific requirements of ¶ IWV-3420 the licensee is requesting relief from. Paragraph IWV-3424 allows the determination of seat leakage by measuring leakage through a telltale connection or the feed rate. It appears that the feed rate may be determined every two years utilizing test connections upstream of the HPI pumps. The licensee should review this request and determine if relief from ¶ IWV-3420 is still required. If required, the licensee should discuss the specific paragraphs in the Code for which relief is requested. (TER Section 3.3.8)	Valve Relief Request 32 has been split into cold shutdown justification CSD-VLV-28 and Valve Relief Request RR-VLV-32. The licensee is now requesting relief from Section XI ¶-IWV-3424 to measure seat leakage at Cold Shutdowns and refueling outages by the change in level in the Letdown Storage Tank (LDST), using control room instrumentation, during the HPI system test.	Section XI, ¶IWV-3424 specifies measuring seat leakage by either measuring leakage thru a downstream flowrate connection or measuring the feed rate thru two valves required to maintain pressure. The licensee is requesting relief for alternative means of measuring the seat leakage, i.e., by measuring change in level in the LDST. However, ¶IWV-3421 allows that valves which function in the course of plant operation in a manner that demonstrates functionally adequate seat tightness need not be leak tested. In such cases, the valve record shall provide the basis for concluding that operational observations constitute satisfactory demonstration of seat tightness. Therefore, no relief is required provided the valve record provides the basis for concluding that operational observations constitute satisfactory demonstration of seat tightness.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.22 (RR-VLV-10 and RR-VLV-17, formerly Valve Relief Request #10 and #17)	-Relief from the Code required test method has been recommended for the CFT outlet (Relief Request #10) and LPI inlet header check valves (Relief Request #17) provided the licensee complies with all the criteria in Generic Letter 89-04, Position 1, including qualifying the test method. -The licensee should review the LPI inlet header check valves and determine if relief from post-maintenance testing is also required (Relief Request #17). Relief from post-maintenance (requiring disassembly) full-stroke exercising is granted in accordance with Generic Letter 89-04, Position 2 for the CFT outlet valves, provided that the licensee inspects and manually full-stroke exercises the valve following maintenance, in addition to leak testing and partial-stroke exercising the valve. -Additionally, the licensee should provide an explanation of the effect of testing on shutdown risk in Relief Request #10. (TER Sections 3.4.1 and 3.4.2)	Valve Relief Request #s 10 and 17 have been redesignated RR-VLV-10 and RR-VLV-17. -The licensee has added to both requests a statement that the qualification of the full-stroke test method is provided by independent review of the calculation. -Relief Request RR-VLV-17 has been revised to request relief from IWV-3200 and reference Generic Letter 89-04, Position 2. Also the request now includes request from relief for IWV-3523; 3424; and 3427. -Relief Request RR-VLV-10 has been revised to request relief from IWV-3523, 3424, and 3427 and to clarify the effect of testing on the shutdown risk.	Relief granted in accordance with Generic Letter 89-04, Position 1, with provisions. The qualification of the test method is subject to NRC inspection. -See TER Sections 3.6 and 3.8.
Action Item 5.23 (RR-VLV-11 and RR-VLV-12, formerly Valve Relief Requests 11 and 12)	The licensee has proposed only to partial-stroke exercise the RBS pump suction and discharge check valves quarterly and has not provided justification for not using the Generic Letter alternatives for full-stroke testing. The licensee should investigate the use of non-intrusive testing to verify the valve is full open, if the recirculation flowrate is adequate to fully open the valve, or disassembly and inspection in accordance with the Generic Letter. Granting relief, as requested, cannot be recommended. (TER Sections 3.5.1 and 3.5.2)	Valve Relief Requests 11 and 12 have been redesignated RR-VLV-11 and 12, and have been revised to require disassembly and inspection in accordance with Generic Letter 89-04, in lieu of full-flow testing, once replacement valves have been installed. However, the licensee has not discussed the use of nonintrusive testing techniques.	Relief is granted in accordance with Generic Letter 89-04, Position 2. However, the licensee should provide an explanation of why the existing valves cannot be disassembled. Additionally, the licensee should discuss why full-stroke testing is impractical. See TER Section 3.7 and action item 5.20.
Action Item 5.24 (CSD-VLV-09, formerly Valve Relief Request #20)	The licensee has not shown that it is impractical or burdensome to test the RCS vent and vent block valves during cold shutdowns. OM Part 10, ¶4.2.1.2 requires valves to be exercised during cold shutdowns, when exercising during operation is impractical and exercising during cold shutdowns is practical. The licensee must exercise the valves during cold shutdowns, if practical. If the licensee reviews this request and determines that exercising during cold shutdowns is impractical, OM Part 10 allows the valves to be exercised at refueling outages. Therefore, provided the licensee utilizes Part 10, ¶4.2.1 and all related requirements, including documentation of the justification for deferral of testing, relief to test the valves at refueling outages is not required pursuant to §50.55a ¶(f)(4)(iv). (TER Section 3.9.1)	Valve Relief Request #20 has been deleted and replaced with Cold Shutdown Justification CSD-VLV-09.	The licensee has addressed the concerns of the action item. No further action is required.
Action Item 5.25 (RR-VLV-24, formerly Valve Relief Request #24)	The licensee has not provided in Relief Request #24, the test method for full-stroke exercising the reactor vessel internal vent check valves. The evaluation was based on information contained in the FSAR. Relief was recommended pursuant to Generic Letter 89-04, Position 2, provided that all the criteria of that position are met. The licensee should confirm that the test method described in the FSAR is used, revise the request to describe the full-stroke test method, and submit it to the NRC for review. (TER Section 3.9.2)	Valve Relief Request #24 has been redesignated RR-VLV-24 and has been revised to reference FSAR Section 4.5.4.2.6.	The licensee has addressed the concerns of the action item. No further action is required.

Table 1.1 (Cont'd)

Action Item Number (Relief Request or other reference)	Description of Item in NRC SE Dated July 23, 1993	Description of Actions Taken In Revision 21 of the Licensee's IST Program December 6, 1993 (or other reference)	Status of Item and Remaining Action
Action Item 5.26 (NA, formerly Valve Relief Request #3)	Section XI, ¶ IWV-3413 requires that stroke times be measured as a means to monitor valve condition and detect degradation. The licensee has requested relief from measuring the PORVs' stroke time. The licensee's proposed alternative does not, however, provide a means to monitor the valve's condition. The licensee should evaluate non-intrusive diagnostic techniques or an alternate indirect method to measure stroke time (such as flow rate versus time). Any indirect method should include sufficiently restrictive acceptance criteria to permit monitoring and determination of valve degradation. Therefore, relief as requested from ¶ IWV-3413 for the PORVs cannot be recommended. (TER Section 3.9.3)	Relief Request #3 has been deleted.	No further action is required.
Action Item 5.27 (NA, formerly Valve Relief Request #28)	The licensee has proposed verifying a change in air pressure in lieu of measuring the stroke time of solenoid valves in the post accident gas sampling system. However, without some way to ensure the stroke time, based on monitoring a system parameter such as air pressure, is less than a limit, the valves' condition is not monitored and degradation may go undetected. Provided a limit for taking corrective action on a degraded component is developed, monitoring valve degradation based on a change of pressure is an acceptable alternative to the Code requirements. Therefore, provided the licensee establishes limits for the change in air pressure, relief can be recommended. (TER Section 3.11.1)	Valve Relief Request #28 for certain solenoid valves in the Post Accident Gas Sampling System, has been deleted.	No further action is required.
Action Item 5.28 (RR-VLV-29, formerly Valve Relief Request #29)	Relief from the Code required test frequencies cannot be recommended at this time for the LPSW to turbine building header valve because the request contains insufficient information. The licensee should revise Relief Request 29 and provide additional information and justification. This, at least, should include information concerning the test time and consequences, the safety function and the consequences of the valve not performing this function, and the estimated frequency of full-stroke testing the valve. (TER Section 3.12.1)	Valve Relief Request #29 has been redesignated RR-VLV-29 and has been revised to further discuss the consequences of testing.	The licensee has addressed the concerns of the action item. Relief is recommended in accordance with 10CFR50.55a(f)(6)(i). See TER Section 3.10. No further action is required.
Action Item 5.29	In general there is insufficient information in the cold shutdown justifications. The licensee does not generally discuss the impracticality of partial-stroke exercising the valves quarterly. The licensee states in numerous justifications that the testing cannot be performed because of consequences if the valve failed during testing. Section 4 of this TER provides a discussion of the acceptable basis for not performing tests at operation. The licensee should review all the cold shutdown justifications given this direction and provide additional information to support not testing the valves quarterly. (TER Section 4)	The licensee has stated that "All Cold Shutdown Justifications were reviewed: some were revised to document better our reason, and some were deleted based on re-evaluating the testing consequences during operation."	The Justifications were not reviewed as part of this TER. The basis for each justification is subject to NRC inspection.

Oconee Nuclear Station
SE Table 1 Summary of Relief Requests
(IST Program Rev. 21)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
GNR-PMP-01 (Pump No. 1)		IWP-3300, Inlet pressure measurement prior to pump startup	All pumps	Measure inlet pressure prior to startup of standby pumps only.	Alternative approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv).
GNR-PMP-02 (Pump No. 2)	4.13	IWP-3100, Differential pressure measurement	All positive displacement pumps	Measure discharge pressure.	Alternative approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
GNR-PMP-03 (Pump No. 3)	4.4	IWP-4100, 4120, Flow instrument accuracy	"A" LPI Pumps	Instrument accuracy requirements will only be met during cold shutdowns when the pumps are operating at a high flow. Requirements will not be met during reduced flow quarterly tests.	Formerly open item as Pump No. 3 in July 23, 1993 SE. Licensee has improperly designated request as generic. Licensee should delete this request as it is redundant to RR PMP-02.
GNR-PMP-04 (Pump No. 7)	4.5 and Table 1.1, Action Item 5.5	IWP-3300, ΔP and flow acceptance criteria	All pumps	Licensee has proposed alternate ranges to be used at their discretion.	Relief was denied in July 23, 1993 SE. Draft NUREG-1482 discusses use of expanded ranges as per Section XI, ¶ IWP-3210. No relief is required, provided the expanded ranges and basis are documented.
GNR-PMP-05 (Pump No. 8)	Table 1.1, Action Item 5.6	IWP-4110, 4120, Vibration instrument accuracy and range	All Pumps	Vibration accuracy of 6.6% or 7.4% is proposed. Licensee has revised relief request to include 2.37% reduction of allowable acceptance criteria for interim period until new calibration system is installed in 1994.	Alternative was authorized in July 23, 1993 SE pursuant to §50.55a ¶(a)(3)(ii), with provisions. Licensee has addressed concerns of action item.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
GNR-PMP-06 (Pump No. 9)		IWP-3500(b), Measure quantities after bearing temperature stabilizes.	All pumps	Measure quantities (except bearing temperature) after 5 minutes.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv).
RR-PMP-01 (Pump No. 10)	3.1, 4.3, and Table 1.1, Action Item 5.10	IWP-4100, Vibration instrument accuracy	SSF RC Makeup Pumps	Licensee has proposed modifications that will be completed in 1994 and the accuracy of new vibration instrumentation will meet the code requirements.	Interim relief was granted in July 23, 1993 SE accordance with §50.55a ¶(f)(6)(i). It appears that licensee will comply with Code required accuracy requirements within the interim period and that relief will no longer be required.
RR-PMP-02 (Pump No. 3) (See also GNR-PMP-03)	3.2, 4.4, 4.5, and Table 1.1, Action Item 5.7	Table IWP-3100-1 Pump inlet pressure; Table IWP-3100-2 Pump differential pressure and flow rate acceptance criteria; Table IWP-4110-1 and IWP-4120 Pump required flow rate and vibration instrument accuracy requirements and full-scale range requirements.	"A" LPI Pumps	1. Pump inlet pressure to be measured before pump startup and during pump testing, i.e. without stopping and restarting pump. 2. Two sets of reference values for differential pressure range and flow rate range will be defined. 3(a). Flow gages meeting range requirements of IWP-4120 will be installed. (b). Vibration instrument accuracy and range requirements will be as per GNR-PMP-05.	1. Alternative was approved in July 23, 1993 SE in accordance with §50.55a¶(f)(4)(iv). 2. No relief required on basis that Section XI, ¶IWP-3210 allows alternate acceptance criteria to be used. 3.(a) No relief is required, provided that new flow gages meet both the Code accuracy and range requirements. Accuracy of flow gages was not discussed in request. (b) Alternative was authorized in July 23, 1993 SE pursuant to §50.55a ¶(a)(3)(ii), with provisions. Licensee has met the provisions of the SE.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-PMP-03 (Pump No. 4)	Table 1.1, Action Item 5.8	IWP-3300, 4230, Inlet pressure measurement	RC Bleed Transfer Pumps	Use tank levels to calculate pressure.	Reactor Coolant Bleed pumps are not ASME Code class, therefore relief is not required.
RR-PMP-04 (Pump No. 6)		IWP-3300, Lube oil level	Concentrated Boric Acid Pump	Check lube oil during maintenance at least semi-annually.	Alternative approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv).
Deleted (Pump No. 5)					None. The licensee has deleted Pump Relief Request No. 5.
GNR-VLV-01 (Generic Valve No. a)		IWV-3427(b), valve acceptance criteria	All Category A Valves	None.	Alternative approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
GNR-VLV-02 (Generic Valve No. b)	Table 1.1, Action Item 5.11	IWV-3413(b), 3417, rapid acting valve's acceptance criteria	Rapid-Acting Valves	Assign a maximum limiting stroke time of 3 seconds to rapid-acting valves.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 6.
GNR-VLV-03 (Generic Valve No. c)	3.3 and Table 1.1, Action Item 5.12	IWV-3415, Fail-safe testing	Fail-Safe Valves	Test valves with normal and engineered safeguards control switches.	Relief was denied in the July 23, 1993 SE. Licensee has revised designation no., format, and basis for impracticality. Relief granted pursuant to §50.55a(f)(6)(i).

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
GNR-VLV-04 (Generic Valve No. d)	Table 1.1, Action Item 5.13	IWV-3417(b), Corrective action	All Valves	Use Technical Specifications to determine startup requirements.	Open. Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. However, the licensee has not responded to issue identified in 7/23/93 SE that if corrective action is deferred to allow plant startup, retest of valve demonstrating acceptable operation shall be made before returning valve to service.
GNR-VLV-05 (Generic Valve No. e)	Table 1.1, Action Item 5.14	IWV-3522(b), ΔP measurement for swing or tilting disk check valves	Normally Closed Swing and Tilting Disk Valves	Verify flow.	Open. Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 1, with provisions. However, the licensee has not discussed whether test flow rate is maximum required accident flow rate.
GNR-VLV-06 (Generic Valve No. f)	Table 1.1, Action Item 5.15	IWV-3412, 3522, test all valves each cold shutdown	All Valves	For short cold shutdowns where all valves cannot be tested, start testing as soon as reasonably possible but no later than 48 hrs.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
GNR-VLV-07 (Generic Valve No. g)	3.4, 4.6, and Table 1.1, Action Item 5.16	IWV-3200, Testing after maintenance	Containment Isolation Valves	Defer test to App. J, Type A or C test.	In the July 23, 1993 SE, relief was denied. Generic relief is not appropriate. The licensee must consider issue of packing adjustments for each valve individually.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
GNR-VLV-08 (Generic Valve No. h)		IWV-1100, Scope	Valves required for Cold Shutdown	Test in accordance with Appendix B.	Alternative was authorized in July 23, 1993 SE in accordance with §50.55a ¶(a)(3)(i).
GNR-VLV-09 (Generic Valve No. i)	3.5, 4.7, and Table 1.1, Action Item 5.17	IWV-3417(a), valve acceptance criteria	Power-Operated Valves	Compare stroke times to reference values.	Open. In the July 23, 1993 SE, relief as requested was denied. Licensee has revised designation no., format and alternate testing. Proposed alternate testing is unclear. Licensee should clarify this request and the "Testing Directive."
GNR-VLV-10 (New)	2.1 and 4.1	OM-1-1981 Part 1, ¶ 1.3.3.1.5 (a) & 1.3.4.1.5(a), Additional testing requirements	Pressure Relief Devices	Additional valves to be tested on basis of application if failure cause is related directly to application.	Alternative authorized in accordance with §50.55a ¶(a)(3)(i).
GNR-VLV-11 (New)	2.2 and 4.2	OM-1-1981 Part 1, ¶ 8-3, Alternative test media requirements	Pressure Relief Devices	For valves with manufacturer published "cold set pressures", manufacturer's data will be used in lieu of performing correlation required by ¶ 8.3.	Relief not required, providing documentation is available that manufacturers has performed appropriated certification of correlation to licensee's operating conditions in accordance with ¶8.3.2 and 8.3.3.
RR-VLV-01 (Valve No. 1)	4.10 and Table 1.1, Action Item 5.20	IWV-3520, Test frequency	(1, 2, or 3) HP-189; LDST Outlet Check Valves	Sample disassembly at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-02 (Valve No. 2)	4.10 and Table 1.1, Action Item 5.20	IWV-3520, Test frequency	(1, 2, or 3) HP-364; LDST Outlet Check Valves	Sample disassembly at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.
Deleted (Valve No. 3)					None. The licensee has deleted this relief request.
RR-VLV-04 (Valve No. 4)	Table 1.1, Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1, 2, or 3)HP-101, 102; HPI Pump Emergency Supply Check Valves	Full flow test at refueling outages, partial-stroke test at cold shutdowns and after maintenance. Verify closure quarterly. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.
RR-VLV-05 (Valve No. 5)	Table 1.1, Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1, 2, or 3)HP-105, 109, 113; HPI Pump Discharge Valves	Partial-stroke exercise quarterly and after maintenance, full-stroke exercise each refueling outage. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-06 (Valve No. 6)	Table 1.1, Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1, 2, or 3)HP-126, 127; RC Loop A Injection Stop Check Valves	Full-stroke exercise at refueling outages, partial-stroke test at cold shutdowns and after maintenance. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In the July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.
RR-VLV-07 (Valve No. 7)	Table 1.1, Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	RC Loop B Injection Stop Check Valves	Full-stroke exercise at refueling outages, partial-stroke test at cold shutdowns and after maintenance. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In the July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.
RR-VLV-08 (Valve No. 8)	Table 1.1 Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1, 2, or 3)HP-188; HPI Loop B Check Valve	Full-stroke exercise at refueling outages, partial-stroke test at cold shutdowns and after maintenance. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In the July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-09 (Valve No. 9)	Table 1.1 Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1, 2, or 3)HP-194; HPI Loop A Check Valve	Partial-stroke exercise quarterly and after maintenance, full-stroke exercise each refueling outage. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In the July 23, 1993 SE, alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-10 (Valve No. 10)	3.6, 4.8, and Table 1.1 Action Item 5.22	IWV-3520, Test frequency, method, and corrective actions, IWV-3200,Post-maintenance testing, and IWV-3424, Seat leakage measurement, and IWV-3427, Corrective actions	(1,2, or 3)CF-11, 13; Core Flood Tank A and B Outlet Check Valves	Part-stroke valve at cold shutdowns. Full-stroke valve at refueling. Full-stroke test will be performed using less than required pressure and flowrate. Manually stroke valve following disassembly and partial-exercise with flow, after maintenance or corrective action. Verify seat leakage by measuring pressure rise upstream due to pressure applied downstream of valve. Valves exceeding seat leakage criteria will be evaluated and repaired or replaced if necessary prior to returning valves to service.	Relief from IWV-3200, Post maintenance testing, was previously granted in the July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2. Relief from ¶IWV-3523 is also granted in accordance with Generic Letter 89-04, Position 2. The alternative to the Code frequency requirements for full-stroke open was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met in July 23, 1993 SE. The proposed alternate to ¶ IWV-3424 is authorized in accordance with §50.55a ¶(a)(3)(i). The proposed alternate to ¶ IWV-3427 (b) is authorized in accordance with §50.55a ¶ (f)(4)(iv). Relief from ¶IVW-3522 is granted in accordance with Generic Letter 89-04, Position 1, with provisions.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-11 (Valve No. 11)	3.7, 4.9, and Table 1.1, Action Item 5.23	IWV-3520, Test method	(1,2, or 3)BS-5,6; A or B RBSP Suction Check Valves	Partial-stroke exercise quarterly, and disassembly and inspection at refueling outages once existing valves are replaced.	In the July 23, 1993 SE, relief was denied because the licensee proposed only quarterly part-stroke flow testing. The licensee has the revised request to add disassembly and inspection at refueling outages. The relief requested is or will be granted, as replacement valves are installed, in accordance with Generic Letter 89-04, Position 2. The licensee has not provided sufficient information in the relief request as to why disassembly and inspection cannot be performed on the existing valves for interim relief to be granted pending installation of replacement valves. The licensee should also consider the practicality of non-intrusive testing techniques to verify the valve's full-stroke capability.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-12 (Valve No. 12)	3.7, 4.9 and Table 1.1, Action Item 5.23	IWV-3520, Test method	(1,2, or 3)BS-11, 16; A or B RBS Pump Discharge Check Valves	Partial-stroke exercise quarterly, and disassembly and inspection at refueling outages once existing valves are replaced.	In the July 23, 1993 SE, relief was denied because the licensee proposed only quarterly part-stroke flow testing. The licensee has revised the request to add disassembly and inspection at refueling outages. The relief requested is or will be granted, as replacement valves are installed, in accordance with Generic Letter 89-04, Position 2. The licensee has not provided sufficient information in the relief request as to why disassembly and inspection cannot be performed on the existing valves for interim relief to be granted pending installation of replacement valves. The licensee should also consider the practicality of non-intrusive testing techniques to verify the valve's full-stroke capability.
RR-VLV-13 (Valve No. 13)	4.10 and Table 1.1, Action Item 5.20	IWV-3520, Test frequency	(1,2, or 3)BS-14, 19; A or B RBS Line Reactor Bldg. Isolation Check Valves	Sample disassembly at refueling outages, partial-stroke test with air at refueling outages.	Relief was granted in July 23, 1993 SE accordance with Generic Letter 89-04, Position 2.
RR-VLV-14 (Valve No. 14)		IWV-3520, Test frequency	(1,2, or 3)CS-11, 12; Quench Tank Recirculation Penetration Check Valves	Exercise closed at refueling outages.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-15 (Valve No. 15)	4.10 and Table 1.1, Action Item 5.20	IWV-3520, Test frequency	(1,2, or 3)HP-248, 250, 252	Sample disassembly at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.
RR-VLV-16 (Valve No. 16)		IWV-3520, Test frequency	(1,2, or 3)CC-20, 24, 76, 77; Component Cooling Supply Header to RC Pumps, Letdown Cooler, CRD.	Full-stroke exercise closed at refueling outages.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-17 (Valve No. 17)	3.8, 4.8, and Table 1.1, Action Item 5.22	IWV-3520, Test method, frequency, and corrective actions, IWV-3200, post-maintenance testing, IWV-3424, seat leakage measurement, and IWV-3427, corrective actions.	(1,2, or 3)CF-12, 14; LPI Inlet Header A and B Check Valves	Part-stroke valve at cold shutdowns. Full-stroke valve at refueling. Full-stroke test will be performed using less than required pressure and flowrate. Manually stroke valve following disassembly and partial-exercise with flow, after maintenance. Verify seat leakage by measuring pressure rise upstream due to pressure applied downstream of valve. Valves exceeding seat leakage criteria will be evaluated and repaired or replaced if necessary prior to returning valves to service.	Relief from IWV-3200, Post maintenance testing, is granted in accordance with Generic Letter 89-04, Position 2. Relief from ¶IWV-3523 is also granted in accordance with Generic Letter 89-04, Position 2. The alternative to the Code frequency requirements for full-stroke open was approved pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met in July 23, 1993 SE. The proposed alternate to ¶ IWV-3424 is authorized in accordance with §50.55a ¶(a)(3)(i), with provisions. The proposed alternate to ¶ IWV-3427 (b) is authorized in accordance with §50.55a ¶ (f)(4)(iv). Relief from ¶IVW-3522 is granted in accordance with Generic Letter 89-04, Position 1, with provisions.
RR-VLV-18 (Valve No. 18)		IWV-3520, Test frequency	1DW-155, 156; Demineralized Water to RCP Seal Vent	Exercise closed at refueling outages by leak testing.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-19 (Valve No. 19)		IWV-3520, Test frequency	(1,2, or 3)HP-144, 145, 146, 147, 390, 454; 1HP-457, 393; 2HP-286, 389; 3HP-285, 457; Seal Supply to RC Pumps A1, A2, B1, or B2.	Exercise closed at refueling outages by leak testing.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
Deleted (Valve No. 20)					Licensee has converted request to cold shutdown justification. (CSD-VLV-09)
RR-VLV-21 (Valve No. 21)	3.9, 4.11, and Table 1.1, Action Item 5.19	IWV-3520, Test frequency, and IWV-3200, Post-maintenance testing	(1,2, or 3)LP-55,57; A or B LPI Cooler Outlet to HPI Pump Suction Check Valves	Full-stroke exercise at refueling outages during a full flow HPI system test. Following maintenance, utilize Generic Letter 89-04, Position 2 (i.e., manually exercise valve).	In the July 23, 1993 SE, the alternative test frequency was approved pursuant to §50.55a ¶(f)(4)(iv), with provisions. Relief from IWV-3200 is granted in accordance with Generic Letter 89-04, Position 2.
RR-VLV-22 (Valve No. 22)		IWV-3520, Test frequency	(1,2, or 3)C-850, 852; MDEFWP's Suction from Hotwell Check Valves	Full-stroke exercise at refueling outages and cold shutdowns when the condenser vacuum is broken.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
RR-VLV-23 (Valve No. 23)	4.10 and Table 1.1, Action Item 5.20	IWV-3520, Test frequency	(1,2, or 3)AS-39; EFWP Turbine Auxiliary Steam Supply Check Valves	Sample disassembly at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.
RR-VLV-24 (Valve No. 24)	Table 1.1, Action Item 5.25	IWV-3520, Test frequency	(1,2, or 3) Reactor Vessel Internal Vent Check Valves (8 per Unit)	Full-stroke exercise at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-25 (Valve No. 25)		IWV-3520, Test frequency	(1,2, or 3)CF-42, 44; Core Flood Tanks A and B Inlet Check Valves	Exercise closed at refueling outages by leak testing.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
RR-VLV-26 (Valve No. 26)	4.10 and Table 1.1 Action Item 5.20	IWV-3520, Test frequency	(1,2, or 3)FDW-39, 432; Normal FW to EFW Check Valves	Sample disassembly at refueling outages.	Relief was granted in July 23, 1993 SE in accordance with Generic Letter 89-04, Position 2.
Deleted (Valve No. 27)					Relief request has been deleted.
RR-VLV-28 (New)	4.12	IWV-3520, Test frequency	(1 and 3) LPS-148, (2 and 3) LPS-503, (1) LPS-151, Normal and Emergency Supply Check Valves to Unit 1 HPI Pump Motor Bearings	Quarterly exercise valves open during normal periodic testing of Aux. Service Water pump and HPI Pump Motor Bearing cooling. Disassemble at refueling outages to verify closure.	Relief is granted in accordance with Generic Letter 89-04, Position 2 to verify closure at refueling outages by disassembly, with provisions.
RR-VLV-29 (Valve No. 29)	3.10 and Table 1.1, Action Item 5.28	IWV-3412, Test frequency	1LPSW-139; LPSW A to Turbine Bldg. Header Valve.	Partial-stroke exercised at refueling outages, full stoke exercise during concurrent Unit 1 and 2 cold shutdowns.	Relief is granted for frequency of valve testing pursuant to §50.55a(f)(6)(i).
RR-VLV-30 (Valve No. 30)		IWV-3520, Test frequency	(1,2, or 3)N-129, 131; Core Flood Tanks A and B Inlet Checks	Exercise closed at refueling outages by leak testing.	Alternative was approved in July 23, 1993 SE pursuant to §50.55a ¶(f)(4)(iv), provided that all related requirements are met.
Deleted (Valve No. 31)					None. Licensee has converted request to cold shutdown justification.

Table 1 (Cont'd)

Rev. 21 Relief Request No. (Rev. 20 No.)	TER Section	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
RR-VLV-31 (New)		IWV-3520, Test frequency and method	(1, 2, or 3) AS-1, Main Steam Supply Check Valves; (1, 2, or 3) MS-25, 34 Main Steam Line A/B to Aux. Steam Check Valves	Partial stroke during normal plant operation. Sample disassembly at refueling outages.	None. These valves are not ASME Code Class 1, 2, or 3 valves and do not fall under the scope of the regulations. Relief is not required.
RR-VLV-32 (Valve No. 32)	4.15 and Table 1.1 Action Item 5.21	IWV-3424, Test method	(1,2, or 3)HP-97; LDST Outlet Check Valve	Exercise closed at cold shutdowns per CSD-VLV-28 and measure seat leakage by measuring change in Letdown Storage Tank (LDST) level, using control room instrumentation, at refueling outages.	No relief is required under ¶ IWV-3421 provided the valve record provides the basis for concluding that operational observations constitute satisfactory demonstration of seat tightness.