TECHNICAL EVALUATION REPORT

Pump and Valve Inservice Testing Program
Point Beach Nuclear Power Plant, Units 1 and 2
Wisconsin Electric Power Company

Docket Number: 50-266 and 50-301
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ABSTRACT

This report presents the results of Brookhaven National Laboratory's evaluation of the Point Beach Nuclear Plant Pump and Valve Inservice Testing Program relief requests.

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1.0 INTRODUCTION

Contained herein is a technical evaluation of the ASME Section XI pump and valve inservice testing (IST) program relief requests submitted by Wisconsin Electric Power Company for its Point Beach Nuclear Plant, Units 1 and 2. The Point Beach Units are Westinghouse Pressurized Water Reactors (PWRs) that began commercial operation in 1970 and 1972.

Wisconsin Electric submitted revision 1 of "The Pump and Valve Inservice Testing Program, Point Beach Nuclear Plant" by a letter dated June 10, 1991. This program addresses the third interval, which began December 31, 1990, and complies with the 1986 edition of the ASME Section XI Code. This program supersedes Rev. 0 of the program submitted December 31, 1990. Any IST program revisions other than those noted above are not addressed in this Technical Evaluation Report (TER).

The Code of Federal Regulations, 10CFR50.55a(g) requires that inservice testing of ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where specific relief has been requested by the licensee and granted by the commission pursuant to 10CFR50.55a(a)(3)(i), (a)(3)(ii), or (g)(6)(i).

Wisconsin Electric has requested relief from certain ASME Section XI testing requirements in revision 1 of their IST program. A number of these relief requests are outside of the scope of Generic Letter 89-04, Attachment 1, and are identified as "Approved via GL89-04." Relief requests submitted after April 3, 1989 require specific NRC staff approval and may not be implemented until receipt of such approval. The relief requests are subject to review by the staff at the ten year update for consistency with current NRC regulatory positions. These requests have not been "grandfathered" (i.e., approved by the Generic Letter) and have been evaluated herein to determine if the criteria in 10CFR50.55a for granting relief have been met. This review was performed utilizing the Standard Review Plan, Section 3.9.6; Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs;" and the minutes of the Public Meeting on Generic Letter 89-04, dated October 25, 1989. The IST Program requirements apply only to component testing (i.e., pumps and valves) and are not intended to provide a basis to change the licensee's current Technical Specifications for system test requirements.

Section 2 of this report presents the eighteen Point Beach Nuclear Plant relief requests and Brookhaven National Laboratory's (BNL) evaluations and conclusions regarding these requests for the pump testing program. Similar information is presented

in Section 3 for the thirty-four relief requests for the valve testing program. A review of thirty the valve cold shutdown justifications was performed and details of this review are contained in Section 4.

Other inconsistencies and omissions in the licensee's IST program noted during the course of the cold shutdown justification reviews and relief request evaluations are presented in Section 5. Additionally, any actions required of the licensee in the relief request evaluations are presented in Section 5. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

2.0 PUMP IST PROGRAM RELIEF REQUESTS

In accordance with 10CFR50.55a, Wisconsin Electric Power Company has submitted relief requests for specific pumps at the Point Beach Nuclear Plant that are subject to inservice testing under the requirements of ASME Section XI. These relief requests have been reviewed to verify their technical basis and determine their acceptability. Each relief request is summarized below, along with the technical evaluation by the BNL reviewer.

2.1 Generic Pump Relief Requests

2.1.1 All Pumps in the IST Program, Relief Request No. PRR-1

Note: Although the relief request applies to "various" pumps, Appendices A and B of the IST Program reference this relief request for all pumps in the IST program.

2.1.1.1 *Relief Request:* The licensee has requested relief from ASME Section XI, paragraph IWP-4120, which requires that the full scale range of each instrument used to measure pump test parameters shall be three times the reference value or less. The relief request specifically addresses instruments used to measure pump bearing temperature and pump speed.

2.1.1.2 *Proposed Alternate Testing:* Whenever portable instruments are used for measuring performance parameters, the instruments will be such that the "reading" accuracy is ± 5 percent for temperature and ± 2 percent for speed.

2.1.1.3 *Licensee's Basis for Relief:* "Table IWP-4110-1 requires the accuracy of instruments used to measure temperature and speed to be equal to or better than ± 5 percent of full scale for temperature, and ± 2 percent for speed, both based on the full scale reading of the instrument. This means that the accuracy of the measurement can vary as much as ± 15 percent and ± 6 percent, respectively, assuming the range of the instruments extended to the allowed maximum.

These IST pump parameters are often measured with portable test instruments where commercially available instruments do not necessarily conform to the Code requirements for range. In these cases, high quality calibrated instruments will be used where the 'reading' accuracy is at least equal to the Code-requirement for full-scale accuracy. This will ensure that the measurements are always more accurate than the accuracy as determined by combining the requirements of Table IWP-4110-1 and Paragraph IWP-4120."

2.1.1.4 *Evaluation:* ASME Section XI, paragraph IWP-4100 includes Table IWP-4110-1 which specifies an acceptable instrument accuracy of ± 2 percent of full-scale for speed, and ± 5 percent of full-scale for temperature. Also, subparagraph IWP-4120 requires that the full-scale range of each instrument shall be three times the reference value or less. The intent of these requirements is to ensure that an acceptable "reading" accuracy is obtained when test parameters are measured. The combination of these requirements could result in a "reading" accuracy of ± 6 percent for speed and ± 15 percent for temperature to be considered acceptable. Since the licensee's instruments provide a "reading" accuracy which exceeds the Code requirement for full-scale accuracy, as determined by combining the requirements of Table IWP-4110-1 and paragraph IWP-4120, the proposed alternative instrument accuracies are equivalent to the Code requirements and will provide an acceptable level of quality and safety. Therefore, it is recommended that relief be granted from the full-scale range requirements of Section XI paragraph IWP-4120 in accordance with 10CFR50.55a(a)(3)(i).

2.1.2 All Pumps in the IST Program, Relief Request No. PRR-2

2.1.2.1 *Relief Request:* The licensee has requested relief from measuring pump inlet pressure prior to starting the pump, which is a requirement of ASME Section XI, paragraph IWP-3100, Table IWP-3100-1. If the pump being tested is already operating the licensee does not wish to stop it for the sole purpose of measuring static inlet pressure.

2.1.2.2 *Proposed Alternate Testing:* No alternate test is proposed. Static inlet pressure will not be measured on operating pumps.

2.1.2.3 *Licensee's Basis for Relief:* "If a pump being tested is in operation as a result of plant or system needs, it is unreasonable to reconfigure system lineups simply to provide for measurement of static inlet pressure.

Inlet pressure prior to pump startup is not a significant parameter needed for evaluating pump performance or its material condition."

2.1.2.4 *Evaluation:* ASME Section XI, Table IWP-3100-1 requires that pump inlet pressure be measured prior to starting the pump and during the test. However, the measurement of static inlet pressure is not intended to be used as a test parameter for evaluating pump performance, and there are no acceptance criteria specified for this parameter. Static inlet

pressure measurement is only included to help the licensee set up the test and recognize that adequate suction pressure should be available. In ASME/ANSI OMa-1988, Part 6, the requirement for measuring static inlet pressure is eliminated since it is recognized that the licensee is responsible for addressing testing limitations, and that those limitations will be incorporated into the procedures. Compliance with the Code requirements would result in a hardship to the licensee without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted from measuring pump inlet pressure before starting the pump in accordance with 10CFR50.55a(a)(3)(ii). All other pump parameters, including operating pump inlet pressure, should continue to be measured unless specific relief has been granted.

2.1.3 All Pumps in the IST Program, Relief Request No. PRR-7

2.1.3.1 *Relief Request:* The licensee is requesting relief from measuring pump vibration displacement amplitude, and from determining the direction perpendicular to the pump shaft which has the largest deflection, which are requirements of ASME Section XI, paragraph IWP-4510.

2.1.3.2 *Proposed Alternative Testing:* Pump vibration measurements may be taken in either displacement or velocity Units. When velocity Units are used, the acceptance criteria will conform to those set forth in OMb-1989, Part 6, Tables 3 and 3a.

For centrifugal and rotary (non-reciprocating) positive displacement pumps, vibration readings will be taken in a plane perpendicular to the operating shaft in two mutually perpendicular directions. Test data shall be evaluated per IWP-3100 with successive vibration readings compared to reference values previously taken at that specific location.

2.1.3.3 *Licensee's Basis for Relief:* "Measuring vibration in velocity Units rather than displacement is an industry-accepted practice considered to be more sensitive to small changes that are indicative of developing mechanical problems. Velocity measurements detect not only high-amplitude vibration, characteristic of major mechanical problems, but low-amplitude vibration, as well, caused by misalignment, imbalance, or minor bearing wear.

It is impractical to search for the direction with the largest deflection and procedurally return to that precise location on successive tests. In addition, the direction of maximum deflection may vary with the material condition and age of the pump, thus eliminating consistency between test data. Adapting this requirement to test procedures could cause confusion as to the proper locations for measuring pump vibration. Also, comparing subsequent test data to reference test data taken at different locations does not provide a good measure of pump degradation.

ASME/ANSI OMa-1987, Operation and Maintenance of Nuclear Power Plants, Part 6, Section 4.6.4 has adopted the concept of measuring vibration at two mutually

perpendicular locations and comparing subsequent test data to the reference value at that specific location.

Measuring vibration in velocity Units is permitted by the most recent version of OMb-1989-Standard for Inservice Testing at Nuclear Power Plants, Part 6."

2.1.3.4 *Evaluation:* The use of vibration velocity measurements is recognized in the industry as a more sensitive and effective indicator of mechanical degradation than displacement measurements for pumps with speeds greater than 600 rpm. Displacement measurements are useful primarily for detecting relatively high-amplitude vibration, which is characteristic of major mechanical problems, such as bearing failure or shaft warpage. Velocity measurements detect not only high-amplitude vibration, but also low-amplitude vibration, which can be caused by misalignment, imbalance, or minor bearing wear. This makes velocity measurement a more versatile parameter for monitoring pump degradation.

ASME/ANSI OMa-1988, Part 6 allows vibration measurements to be taken in either displacement or velocity Units. For centrifugal pumps, it also requires the measurements to be taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump bearing housing and in the axial direction on each accessible pump thrust bearing housing. The vibration measurement requirements of ASME/ANSI OM Part 6 provide an acceptable alternative to the Section XI Code requirements for assuring pump operational readiness and for detecting pump degradation. In addition, Revision 8 (November 1990) of Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability ASME Section XI Division 1," has approved Code Case N-465, which states that the NRC has approved the use of ASME/ANSI OMa-1988, Part 6 for pump testing in lieu of Section XI Subsection IWP. Therefore, if the licensee were to adopt the use of OM, Part 6 for pump vibration measurement it would provide an acceptable level of quality and safety.

In the licensee's description of alternative testing there is an apparent discrepancy in whether Section XI or OM, Part 6 will be followed for vibration testing. In the first paragraph it is stated that "pump vibration measurements may be taken in either displacement or velocity Units. Acceptance criteria for velocity measurements will conform to those set forth in OMb-1989, Part 6, Tables 3 and 3a." However, in the second paragraph it is stated that "test data shall be evaluated per IWP-3100...", which is a part of Section XI. If the requirements of OM, Part 6 are to be adopted for vibration measurements, all of the requirements specified in OM, Part 6 pertaining to vibration measurements must be met, including evaluation criteria. The licensee should not collect test data per OM, Part 6 requirements and then evaluate it using Section XI Code requirements since this could violate the intent of the Code.

The alternative testing description also does not address axial thrust bearing vibration measurement, which is a requirement of OM, Part 6. In addition to measuring vibration in two orthogonal directions perpendicular to the pump shaft, measurements must

also be taken in the axial direction on each accessible pump thrust bearing housing. This should be specified as part of the IST program if OM, Part 6 will be adopted.

Therefore, it is recommended that relief from measuring pump vibration displacement amplitude and from determining the direction perpendicular to the shaft which has the largest deflection be granted in accordance with 10CFR55a(a)(3)(i) provided that all of the requirements of ASME/ANSI OMb-1989, Part 6 are met with regard to vibration measurement, including evaluation criteria and axial thrust bearing vibration measurement.

> Note: The only difference between the 1989 and the NRC approved 1988 Addenda of OM, Part 6 is the addition of Figure 1 to Table 3 as errata (i.e., this "revision was inadvertently omitted from OMa-1988.") The 1988 Addenda referenced the missing figure.

2.1.4 All Pumps in the IST Program, Relief Request No. PRR-8

2.1.4.1 *Relief Request:* The licensee is requesting relief from the ASME Section XI, paragraphs IWP-3300 and IWP-4310 requirements for measuring the temperature of all centrifugal pump bearings outside the main flow path, and the main shaft bearings of reciprocating pumps.

2.1.4.2 *Proposed Alternative Testing:* Bearing temperature will not be measured as part of the inservice test. Vibration monitoring will be performed, which will provide adequate monitoring and evaluation of the material condition of the pump bearings.

2.1.4.3 *Licensee's Basis for Relief:* "The data associated with bearing temperatures taken at one-year intervals provides little statistical basis for determining the incremental degradation of a bearing or any meaningful trending information or correlation.

In many cases, the pump bearings are water-cooled and, thus, bearing temperature is a function of the temperature of the cooling medium, which can vary considerably.

Vibration measurements are significantly more reliable indication of pump bearing degradation than are temperature measurements. All pumps in the program are subjected to vibration measurements in accordance with IWP-4500.

Although excessive bearing temperature is an indication of an imminent or existing bearing failure, it is highly unlikely that such a condition would go unnoticed during routine surveillance testing since it would manifest itself in other obvious indications such as audible noise, unusual vibration, increased motor current, etc.

Any potential gain from taking bearing measurements, which in most cases would be done locally using portable instrumentation, cannot offset the cost in terms of dilution

of operator effort, distraction of operators from other primary duties, excessive operating periods for standby pumps especially under minimum flow conditions, and unnecessary personnel radiation exposure."

2.1.4.4 *Evaluation:* The industry recognizes that an increase in bearing temperature can be used as an indicator of bearing failure. However, in most cases the temperature does not increase to any measurable degree until failure is imminent. By this time other indications of bearing failure would also be present, such as increased vibration or audible noise. Therefore, the data obtained from measuring bearing temperature once a year would be of little use, unless it happened to occur when a bearing failure was imminent. This is recognized in ASME/ANSI OMa-1988, Part 6 (OM-6), Inservice Testing of Pumps in Light Water Reactor Plants, which eliminates the requirement for measuring bearing temperature. Measurement of pump vibration provides a means of monitoring bearing wear. By recording and trending this information, a more effective method of detecting bearing degradation is provided. Since it is consistent with OM-6, the elimination of bearing temperature measurement will not adversely effect the level of quality or safety provided by the inservice pump test. Therefore, it is recommended that relief be granted from measuring bearing temperature pursuant to 10CFR55a(a)(3)(i).

2.1.5 All Pumps in the IST Program, Relief Request No. PRR-9

2.1.5.1 *Relief Request:* The Licensee is requesting relief from the requirement of ASME Section XI, paragraph IWP-4210 when measuring pump suction pressure. This requirement states that if the presence or absence of liquid in a gage line could produce a difference of more than 0.25% in the indicated value of the measured pressure, means shall be provided to ensure or determine the presence or absence of liquid as required for the static correction used.

2.1.5.2 *Proposed Alternative Testing:* If the presence or absence of liquid in a gage line used for sensing pump suction pressure could produce a difference of more that 0.25% in the calculated value of pump differential pressure, means shall be provided to ensure or determine the presence or absence of liquid as required for the static correction used.

2.1.5.3 *Licensee's Basis for Relief:* "When this requirement is applied to the measurement of pump suction pressure, the 0.25% limit is overly restrictive and oftentimes results in complicated venting procedures and unnecessary health physics risks associated with handling and disposal of radioactive contaminated water with no commensurate gain or improvement of test reliability.

Normally, the only quantitative use of suction pressure is in determining pump differential pressure or head. In most cases, suction pressure is relatively low, and discharge pressure exceeds it by at least a factor of five. This being the case, a .25% error introduced into the suction pressure measurement results in an error of .05% in the differential pressure calculation. This is insignificant in light of the potential 6% error

allowance applied to both the suction and discharge pressure instruments (Reference IWP-4110)."

2.1.5.4 *Evaluation:* The requirement to account for the presence or absence of liquid in pressure sensing lines is intended to ensure that accurate pressure measurements are obtained. Pump suction pressure itself is not required to determine pump performance, and there are no acceptance criteria for it. This is recognized in ASME/ANSI OMa-1988, Part 6, which eliminates pump suction pressure measurement as a requirement. It was included in the Section XI Code to help the licensee recognize that adequate suction pressure is required for proper pump operation. Its only quantitative use is in calculating pump differential pressure, if differential pressure cannot be measured directly. Therefore, the error in suction pressure measurement is only important to the calculated value of differential pressure. The licensee's alternative for accounting for liquid in the gage lines is acceptable since it meets the intent of the Code. However, it must be properly procedduralized to ensure that differential pressure accuracy meets Code requirements. S. e the licensee's alternative will provide an acceptable level of quality and safety, it is recommended that relief from the requirements of IWP-4210 be granted in accordance with 10CFR55a(a)(3)(i) provided that the calculation of pump differential pressure is properly procedduralized to account for liquid in the pressure sensing gage lines so that the accuracy of the final value meets Code requirements.

2.1.6 All Pumps in the IST Program, Relief Request No. PRR-10

2.1.6.1 *Relief Request:* The licensee is requesting relief from the requirements of ASME Section XI, paragraph IWP-4110, which requires that the instrument accuracy be as specified in Table IWP-4110-1.

2.1.6.2 *Proposed Alternative Testing:* For instruments which have primary sensors associated with the instrument loop (an orifice for flow, for example), the primary sensor accuracy is not considered. For instruments which have instruments and indicators positioned locally, and when remote computerized indication is used, Table IWP-4110-1 will be applied. For instrument loops which consist of transmitters and remote readouts for pressure, differential pressure, and flow rate, an acceptable accuracy is $\pm 3\%$.

2.1.6.3 *Licensee's Basis for Relief:* "The intent of Articles 4110 and 4120 is to ensure that the recorded test parameters are accurate within certain bounds, thereby providing assurance of accuracy and repeatability.

The articles do not provide any guidance on the specific bounds within which they apply. It is unclear whether or not primary sensors are considered.

Further, numerous instrument loops in our facility utilize remote indicators without redundant, local indication."

2.1.6.4 *Evaluation:* The intent of the Code requirements on instrument accuracy is to ensure that accurate test data is obtained that is representative of actual pump operating conditions so that a meaningful evaluation of pump performance can be made. The instrument accuracies specified in Section XI, Table IWP-4110-1 are based on a percentage of full scale for individual analog instruments. In cases where an instrumentation loop consisting of a combination of instruments is used, the accuracy should be interpreted to be the loop accuracy, which represents the accuracy of the final measured value obtained from the loop. As clarified in OM Code Interpretation 91-3, issued May 14, 1991, the accuracy requirements apply only to the calibration of the instruments. Attributes such as orifice plate tolerances, tap locations and process temperatures do not have to be included.

The licensee has not, however, demonstrated that it would be impractical or would impose a hardship without a compensating increase in the level of quality or safety to procure and install instrumentation that meets the Code requirements. The proposed alternative provides no technical justification for establishing an acceptable accuracy of $\pm 3\%$ for instrument loops. The licensee should review current instrumentation accuracy and determine whether the Code requirements can be met. If they cannot, the licensee should determine whether modifications can be made to bring the instrumentation into compliance. If this is impractical, technical justification should be provided for establishing instrumentation accuracies that can be met. Additionally, the relief request should be revised to address specific instrumentation and pumps.

Compliance with Code requirements would result in a hardship since it would require a plant shutdown to install instrumentation that will have to be procured. Safety related instrumentation requires a long procurement lead time. The licensee's alternate testing using existing instrumentation provides an acceptable level of safety and quality for an interim period. The Code required accuracy exceeds the licensee's instrument accuracy by only 1%. Although this is acceptable for an interim period, long term the licensee should meet the Code requirements or provide justification. Therefore, it is recommended that interim relief from the instrument accuracy requirements be granted in accordance with 10CFR50.55a(a)(3)(i) for one year or until the next refueling outage, whichever comes later, to allow the licensee time to complete their review.

2.1.7 All Pumps in the IST Program, Relief Request No. PRR-16

2.1.7.1 *Relief Request:* The licensee is requesting relief from measuring pump differential pressure directly in accordance with ASME Section XI, paragraph IWP-3100.

2.1.7.2 *Proposed Alternative Testing:* Differential pressure will be a calculated value based on the values of suction and discharge pressure.

2.1.7.3 *Licensee's Basis for Relief:* "Pumps are not equipped with instruments which directly provide a value of differential pressure."

2.1 [illegible] Section XI, paragraph IWP-4240 allows the calculation of pump [illegible] sure using measured values of pump inlet and discharge pressure. [illegible] is not required.

2.2 Safety Injection and Residual Heat Removal System

2.2.1 Safety Injection Pumps, Relief Request No. PRR-3

2.2.1.1 *Relief Request:* The licensee is requesting relief from measuring the Unit 1 and 2 Safety Injection Pumps', P-015A&B, flow rate quarterly, which is a requirement of ASME Section XI, [illegible]agraph IWP-3100. In addition, the licensee is requesting relief from performing post maintenance testing prior to, or within 96 hours after returning the pump to normal service, which is a requirement of Section XI, paragraph IWP-3111.

2.2.1.2 *Proposed Alternate Testing:* The pumps will continue to be tested quarterly using the recirculation line during which all required pump parameters, except flow rate, will be measured, recorded, and evaluated. In addition, at least once during each reactor refueling, when significant flow can be established through an instrumented test circuit, an inservice test will be performed where all required pump parameters, including flow rate, will be measured and recorded at three points along the pump curve. Test data taken at these points will be evaluated in accordance with IWP-3200.

Should maintenance be performed that requires post-maintenance testing per IWP-3111, testing will be performed as follows:

- If the plant is not in a refueling shutdown condition such that the testing in the recirculation mode is the only testing practical, then such testing will be performed and the test results evaluated per IWP-3111. Following this, the subject pump will be tested during the next refueling shutdown period where all parameters (including flow rate) will be measured and evaluated with respect to IWP-3111.

- If the plant is in a refueling shutdown condition, the subject pump will be tested with all parameters (including flow rate) measured and evaluated with respect to IWP-3111.

2.2.1.3 *Licensee's Basis for Relief:* "The inservice testing of these pumps is accomplished by operating the pumps in a recirculation mode through a fixed flow-limiting orifice. The orifice is sized such that pump operation is in the flat (horizontal) region of the pump characteristic curve where the pump head is relatively independent of flowrate. Under these test conditions, flowrate measurements may not be indicative of pump performance.

NRC Generic Letter 89-04, Position 9, allows elimination of flowrate measurements during quarterly testing where flowrate instrumentation is unavailable provided that

appropriate inservice tests are performed during cold shutdowns or refueling where full or substantial flow conditions can be established and flowrates measured.

The only practical means of establishing full or substantial flow and obtaining quantitative flowrate data during testing of these pumps requires pumping into the reactor coolant system (RCS). During plant operation under normal conditions, this is not possible due to the large differential between the RCS and the maximum pump discharge pressure. Under shutdown conditions when the RCS is depressurized, operation in such a mode is precluded by low-temperature over-pressurization concerns and restrictions.

Performing post-maintenance testing for all reference values would require a plant shutdown and cooldown prior to returning a repaired pump to service. Tests performed in the recirculation mode (quarterly) are sufficient to provide adequate assessment of the pump to perform its safety function."

2.2.1.4 *Evaluation:* Review of the safety injection system Piping and Instrument Diagram (P&ID) verifies that testing of the pumps in their primary flow path during normal plant operation would require water injection directly into the reactor coolant system, which is not possible due the large differential pressure between the RCS (over 2200 psia) and the maximum safety injection pump discharge pressure (approximately 1500 psia). A recirculation line with a flow limiting orifice is available for quarterly and post-maintenance pump testing, however, it does not currently include flow instrumentation. Compliance with the Code would require modifications to include flow instrumentation.

In addition to the normal 2-inch recirculation flow line, the P&IDs indicate the existence of test lines (3/4 - SI-1501R-4) which includes flow indicators (FI-929). It appears that the system can be aligned such that the pumps can pump through this line to the refueling water storage tank for test purposes. Therefore, an instrumented path does exist for measuring pump flow during normal plant operation. The licensee has not addressed the potential use of this line for quarterly or post-maintenance testing of the safety injection pumps. However, the size of this test line (3/4 inch) would not allow full flow testing of the pumps. The alternative test proposed by the licensee includes full flow testing during refueling outages where all pump parameters are measured and three points on the pump curve are verified. In addition, quarterly testing using the recirculation flow line will continue with measurement of pump differential pressure and vibration being performed. This would provide a more comprehensive evaluation of pump operational readiness than only performing quarterly testing where a small pump flow can be established and measured. The proposed alternative has also been approved by Generic Letter 89-01, Attachment 1, Position 9. Therefore, the proposed alternative is considered to be a more appropriate option. However, the licensee should address the test line in the inservice test program and document why it is not used. Additionally, the licensee should address the modifications to allow testing at flowrates equal to or greater than the minimum flows recommended by the manufacturer discussed in the licensee's letter to the USNRC, dated October 2, 1990, as they pertain to this relief request. The licensee should

consider installing flow instrumentation if the system is to be redesigned. In addition to this relief request, relief request VRR-27 concerning the minimum flow check valves would not be required if instrumentation was installed.

Therefore, based on the determination that compliance with the Code requirements is impractical and considering the burden on the licensee if the Code requirements were imposed and since inservice testing will be performed at refueling outages with all parameters measured, and quarterly testing will continue with pump differential pressure and vibration being measured, which is consistent with the NRC position stated in Generic Letter 89-04 (Attachment 1, Position 9), it is recommended that relief from measuring pump flowrate quarterly be granted in accordance with 10CFR50.55a(g)(6)(i).

The licensee has also proposed deferring post-maintenance testing where flowrates are measured to the next refueling outage, when maintenance is not performed during a refueling outage. Testing the pump at the design flowrates would require the plant to be shut down and vented to preclude low temperature overpressurization. The pump will be tested following maintenance using the minimum flow line. The minimum flow line, however, does not contain flow instrumentation and the 3/4" test line would not result in stable flow conditions. Therefore, based on the determination that compliance with the code requirements is impractical and considering the burden on the licensee if the Code requirements were imposed, it is recommended that relief from post-maintenance testing be granted in accordance with 10CFR50.55a(g)(6)(i) provided that the licensee performs post-maintenance tests during the next plant shutdown when the RCS is vented to preclude low temperature overpressurization.

2.2.2 Safety Injection Pumps and Residual Heat Removal Pumps, Relief Request No. PRR-17

2.2.2.1 *Relief Request:* The licensee is requesting relief from running the Unit 1 and 2 Safety Injection Pumps, P-015A&B, and RHR Pumps, P-010A&B, at least five minutes under conditions as stable as the system permits before measuring test parameters during the three-data-point pump curve testing performed during refueling outages. The five minute hold period is a requirement of ASME Section XI, paragraph IWP-3500.

2.2.2.2 *Proposed Alternative Testing:* When performing the three-data-point pump curve test, an overall run time of five minutes will be met. Pump operation during periodic recirculation line testing will be at least five minutes in duration.

2.2.2.3 *Licensee's Basis for Relief:* "When performing the three-data-point fully instrumented, significant flowrate test at refueling shutdown conditions, the pumps use the RWST as a suction source and deliver to the refueling cavity. The RWST does not contain a sufficient amount of fluid to allow each pump to run at the reference point for five minutes plus get performance data at two other points.

The overall run time for the complete test of each pump (three or more data points) does exceed five minutes. When performing periodic noninstrumented recirc line testing, the pump will be operated for at least five minutes."

2.2.2.4 *Evaluation:* Examination of the P&IDs indicates that the RWST is the only practical source of fluid for full-flow testing of these pumps. Since the RWST inventory is limited, it would be impractical for the licensee to operate the pumps for five minutes before taking data. However, the intent of the Code in imposing the five minute hold period is to ensure that pump operating conditions have stabilized before data is recorded. This eliminates the possibility of recording erroneous data during temporary fluctuations in operating conditions, which are likely whenever a pump is moved to a new point on its operating curve. The overall run time of five minutes proposed in the alternative testing does not satisfy this intent since there is no stabilization period specified before recording data after pump operating conditions are changed.

ASME/ANSI OMa-1988, Part 6 revises the hold period to two minutes before data measurements are taken. The requirements of Part 6 provide an acceptable alternative to the Section XI requirements for assuring pump operational readiness. The staff has determined that it provides an acceptable level of quality and safety, and has approved its use in Regulatory Guide 1.147 (Code Case N-465).

Therefore, it is recommended that relief from the five minute hold period be granted in accordance with 10CFR50.55a(a)(3)(i) provided the licensee establishes a two minute hold period before taking data measurements in accordance with OM, Part 6.

2.2.3 Residual Heat Removal Pumps, Relief Request No. PRR-4

2.2.3.1 *Relief Request:* The licensee is requesting relief from measuring the Unit 1 and 2 RHR pumps', P-010A&B, flow rate quarterly, which is a requirement of ASME Section XI, paragraph IWP-3100. In addition, the licensee is requesting relief from performing post maintenance testing prior to, or within 96 hours after returning the pump to normal service, which is a requirement of Section XI, paragraph IWP-3111.

2.2.3.2 *Proposed Alternate Testing:* The pumps will continue to be tested quarterly using the recirculation minimum-flow line during which all required pump parameters, except flow rate, will be measured, recorded, and evaluated. In addition, at least once during each reactor refueling when significant flow can be established through an instrumented test circuit, an inservice test will be performed where all required pump parameters, including flowrate, will be measured and recorded at three points along the pump curve. Test data taken at these points will be evaluated in accordance with IWP-32

Should maintenance be performed that requires post-maintenance testing per IWP-3111, testing will be performed as follows:

- If the plant is not in a refueling shutdown condition such that the testing in the recirculation mode is the only testing practical, then such testing will be performed and the test results evaluated per IWP-3111. Following this, the subject pump will be tested during the next refueling shutdown period where all parameters (including flow rate) will be measured and evaluated with respect to IWP-3111.

- If the plant is in a refueling shutdown condition, the subject pump will be tested with all parameters (including flow rate) measured and evaluated with respect to IWP-3111.

2.2.3.3 *Licensee's Basis for Relief:* "The only practical means of establishing full or substantial flow and obtaining quantitative and meaningful flowrate data during testing of these pumps requires pumping into the reactor coolant system (RCS). During plant operation under normal conditions, this is not possible due to the large differential between the RCS and the maximum pump discharge pressures. Thus, the quarterly inservice testing of these pumps is accomplished by operating the pumps in a recirculation mode through a fixed flow-limiting orifice. The orifice is sized such that pump operation in the flat (horizontal) region of the pump characteristic curve where pump head is relatively independent of flowrate. In addition, the range and accuracy of the flow instrumentation do not provide adequate repeatability at the reduced flowrate available in this flow scheme. Under such test conditions, flowrate measurements may not be indicative of pump performance.

NRC Generic Letter 89-04, Position 9, allows elimination of flowrate measurements during testing where flowrate instrumentation is unavailable provided that appropriate inservice tests are performed during cold shutdowns or refueling where full or substantial flow conditions can be established and flowrates measured.

Performing post maintenance testing for all reference values would require a plant shutdown and cooldown prior to returning a repaired pump to service. Tests performed in the recirculation mode are sufficient to provide adequate assessment of the pump to perform its safety function."

2.2.3.4 *Evaluation:* Review of the residual heat removal system P&ID verifies that full-flow testing of the pumps in their primary flow path during normal plant operation would require water injection directly into the reactor coolant system, which is not possible due to the large differential pressure between the RCS (over 2200 psia) and the maximum residual heat removal pump discharge pressure (less than 200 psia). An instrumented minimum-flow recirculation line is available for pump testing during normal plant operation, however, the range and accuracy of the flow instrumentation are not suitable for the low flow rates obtainable. The licensee has stated in Relief Request VRR-3 that the RHR PIVs will be full-stroke exercised at cold shutdowns when "Event V" valve testing is required. It is assumed that the RHR pumps will be operated to perform the valve tests.

Therefore, based on the determination that compliance with the Code requirements is impractical during operation due to system pressures and considering the burden on the licensee if the Code requirements were imposed which would require a major system modification to include a full-flow test loop, and since inservice testing at full or substantial flow can be performed at refueling outages and cold shutdowns with all parameters measured, which is consistent with the NRC position stated in Generic Letter 89-04 (Attachment 1, Position 9); it is recommended that relief be granted in accordance with 10CFR50.55a(g)(6)(i) provided testing is performed at both refueling outages and cold shutdowns when "Event V" valve testing is performed. The licensee should however address the modifications to allow testing at flowrates equal to or greater than the minimum flows recommended by the manufacturer, which is discussed in their letter, dated October 2, 1990, as they pertain to this relief request. The licensee should consider installing flow instrumentation if the system is to be redesigned.

The licensee has also proposed deferring post-maintenance testing where pump flowrates are measured to the next refueling outage, when maintenance is not performed during a refueling outage. Testing the pump at design flowrates would require the plant to be shutdown where the RCS pressure is less than 200 psia. The pump will be tested following maintenance using the minimum flow line. However, accurate flow measurements are not obtainable at the low flowrates. Therefore, based on the determination that compliance with the Code requirements is impracti al and considering the burden on the licensee if the Code requirements were imposed, it is recommended that relief from post-maintenance testing be granted in accordance with 10CFR50.55a(g)(6)(i) provided that the licensee performs post-maintenance tests during the next cold shutdown when "Event V" valve testing is performed.

2.3 Auxiliary Feedwater System

2.3.1 Auxiliary Feedwater Pumps, Relief Request No. PRR-5

2.3.1.1 *Relief Request:* The licensee is requesting relief from measuring the Auxiliary Feedwater Pumps', P-029 (Unit 1 and 2) and P-038A&B (shared by Units 1 and 2), flow rate quarterly, which is a requirement of ASME Section XI, paragraph IWP-3100. In addition, the licensee is requesting relief from performing post maintenance testing prior to, or within 96 hours after returning the pump to normal service, which is a requirement of Section XI, paragraph IWP-3111.

2.3.1.2 *Proposed Alternate Testing:* The pumps will continue to be tested q arterly using the uninstrumented recirculation minimum-flow line during which all required pump parameters except flow rate will be measured, recorded, and evaluated. In addition, during cold shutdown periods when significant flow can be established through an instrumented test circuit to the steam generators, an inservice test will be performed where all required pump parameters will be measured and recorded at three points along the pump curve. Test data taken at these points will be evaluated in accordance with IWP-3200. The

inservice testing will be performed at each cold shutdown, unless less than three months has elapsed since the last cold shutdown.

Should maintenance be performed that requires post-maintenance testing per IWP-3111, testing will be performed as follows:

- If the plant is not in a cold shutdown condition such that the testing in the recirculation mode is the only testing practical, then such testing will be performed and the test results evaluated with respect to IWP-3111. Following this, the subject pump will be tested during the next cold shutdown period where all parameters (including flow rate) will be measured and evaluated with respect to IWP-3111.

- If the plant is in a cold shutdown condition, the subject pump will be tested with all parameters (including flow rate) measured and evaluated with respect to IWP-3111.

2.3.1.3 *Licensee's Basis for Relief:* "The only practical means of establishing full or substantial flow and obtaining quantitative and meaningful flowrate data during testing of these pumps requires pumping into the steam generators. During plant operation under normal conditions, this is undesirable due to the possibility of causing thermal shock to the auxiliary feedwater piping nozzles. For this reason the inservice testing of these pumps is accomplished by operating the pumps in a recirculation mode through a fixed flow-limiting orifice. The orifice is sized to provide pump operation in the flat (horizontal) region of the pump characteristic curve where pump head is relatively independent of flowrate. In addition, flow instrumentation is not provided in this test scheme. Thus, under these test conditions, flowrate measurements are neither practical nor would they provide any meaningful information if available.

NRC Generic Letter 89-04, Position 9, allow elimination of flowrate measurements during quarterly testing where flowrate instrumentation is unavailable provided that appropriate inservice tests are performed during cold shutdowns or refueling where full or substantial flow conditions can be established and flowrates measured.

Performing post-maintenance testing for all reference values would require a plant shutdown and cooldown prior to returning a repaired pump to service. Tests performed in the recirculation mode (quarterly) are sufficient to provide adequate assessment of the pump to perform its safety function."

2.3.1.4 *Evaluation:* Review of the auxiliary feedwater system P&ID verifies that the uninstrumented minimum-flow recirculation line is the only available pump test flow path during plant operation. Testing of the pumps in their primary flow path during normal plant operation would require water injection directly into the steam generators, which could cause thermal shock to the auxiliary feedwater nozzles and possibly lead to

equipment damage. Compliance with the Code would require system modifications to include instrumentation or a full-flow test loop.

The licensee has stated that both the turbine driven pumps (P-029) and motor driven pumps (P-038A&B) will be tested at cold shutdowns. There is no motive power (i.e. steam) available at cold shutdowns to test the turbine driven pumps. Therefore, relief cannot be recommended for these pumps. The staff's position is that in the cases where only the minimum flow line is available for pump testing, regardless of the test interval, flow instrumentation that meets the requirements of the Code must be installed (Reference Generic Letter 89-04, Attachment 1, Position 9).

Based on the determination that compliance with the Code requirements is impractical and considering the burden on the licensee if the Code requirements were imposed and since inservice testing will be performed at cold shutdown periods for the motor driven pumps with all parameters measured, which is consistent with the NRC position stated in Generic Letter 89-04 (Attachment 1, Position 9); it is recommended that relief from measuring pump flowrate quarterly and post-maintenance be granted in accordance with 10CFR50.55a(g)(6)(i). Note: The minimum flow check valves are not addressed in the IST Program. Full stroke exercise tests are not possible due to the lack of instrumentation as discussed above. (See TER Section 5.25)

2.3.2 Auxiliary Feedwater Pumps, Relief Request PRR-18

2.3.2.1 *Relief Request:* The licensee is requesting relief from running the Auxiliary Feedwater Pumps, P-029 (Unit 1 and 2) and P-038A&B (shared by Units 1 and 2), at least five minutes under conditions as stable as the system permits before measuring test parameters during the three-data-point pump curve testing performed during cold shutdowns. The five minute hold period is a requirement of ASME Section XI, paragraph IWP-3500.

2.3.2.2 *Proposed Alternative Testing:* When performing the three-data-point pump curve test, an overall run time of five minutes will be met. Pump operation during periodic recirculation line testing will be at least five minutes in duration.

2.3.2.3 *Licensee's Basis for Relief:* "During cold shutdown periods when operation of the auxiliary feedwater pumps pumping to a steam generator is possible without the potential of thermal shock, inservice testing will be performed such that all required pump parameters will be measured and recorded at three (3) points along the pump curve.

At this time, however, there is very little decay heat remaining in the RCS system. Sustained operation of auxiliary feedwater at substantial flow rates causes significant pressure decreases in the reactor coolant system which challenge reactor coolant pump operation limits and cause reactor coolant level decreases due to temperature induced shrink."

2.3.2.4 *Evaluation:* Examination of the auxiliary feedwater P&IDs indicates that the flow path to the steam generators is the only practical path for full flow testing of these pumps. During cold shutdown, sustained operation of the auxiliary feedwater pumps could result in reactor coolant system pressure decrease when the level of decay heat in the reactor is low. The licensee believes it is impractical to operate the pumps for five minutes prior to recording data. However, the intent of the Code in imposing the five minute hold period is to ensure that pump operating conditions have stabilized before data is recorded. This eliminates the possibility of recording erroneous data during temporary fluctuations in operating conditions, which are likely whenever a pump is moved to a new point on its operating curve. The overall run time of five minutes proposed in the alternative testing does not satisfy this intent since there is no stabilization period specified before recording data after pump operating conditions are changed.

ASME/ANSI OMa-1988, Part 6 revises the hold period to two minutes before data measurements are taken. The requirements of Part 6 provide an acceptable alternative to the Section XI requirements for assuring pump operational readiness. The staff has determined that it provides an acceptable level of quality and safety, and has approved its use in Regulatory Guide 1.147 (Code Case N-465).

Therefore, it is recommended that relief from the five minutes hold time be granted in accordance with 10CFR50.55a(a)(3)(i) provided the licensee establishes a two minute hold period before taking data measurements in accordance with OM, Part 6.

2.4 Containment Spray System

2.4.1 Containment Spray Pumps, Relief Request No. PRR-6

2.4.1.1 *Relief Request:* The licensee is requesting relief from measuring the Unit 1 and 2 Containment Spray pumps', P-014A&B, flow quarterly, which is a requirement of ASME Section XI, paragraph IWP-3100.

2.4.1.2 *Proposed Alternative Testing:* No alternative testing is proposed for measuring pump flow rate. The pumps will continue to be tested quarterly in the recirculation mode with all parameters specified in Section XI Table IWP-3100-1, except flow rate, measured, recorded, and evaluated.

2.4.1.3 *Licensee's Basis for Relief:* "The only practical means of establishing full or substantial flow and obtaining quantitative and meaningful flowrate data during testing of these pumps requires pumping into the containment spray headers and into the containment atmosphere. This is obviously impractical and undesirable. For this reason the quarterly inservice testing of these pumps is accomplished by operating the pumps in a recirculation mode through a fixed flow-limiting orifice. The orifice is sized such that pump operation is in the flat (horizontal) region of the pump characteristic curve where pump head is relatively independent of flowrate. Note also that flow instrumentation is not

provided in the recirculation circuit nor in the constant recirculation line through the eductors. Thus, under these test conditions, flowrate measurements are not possible.

During each inservice test of these pumps performed in the recirculation mode via the fixed orifice, all required pump parameters (per IWP-3100), except flow, will be measured, recorded, and evaluated."

2.4.1.4 *Evaluation:* Review of the Containment Spray System P&ID verifies that use of the primary flow path would require pumping directly into the containment atmosphere, which is impractical. An uninstrumented minimum-flow recirculation line with a flow limiting orifice is available for pump testing during normal plant operation. In addition, an alternate test line is available (3/4-SI-1501R-4) which includes a flow indicator (FI-933). In their response to Generic Letter 89-04 (letter from C.W. Fay, Wisconsin Electric to U.S. NRC dated October 3, 1989), the licensee stated that this alternate test flow path would be investigated to determine if it is a viable option since it contains only single valve isolation between the spray pump discharge and the spray header in containment. Testing was to be completed by December 31, 1989 for Unit 2, and June 1, 1990 for Unit 1. If testing indicated that this flow path was not viable, the licensee stated that modifications would be made to install flow instrumentation in the recirculation line. However, neither this alternate flow path nor the installation of flow instrumentation was addressed in the relief request. Additionally, in the licensee's letters dated March 2 and October 2, 1990 to the USNRC, they committed to modifying the containment spray system to allow full-flow testing. This is also not discussed in the relief request.

Generic Letter 89-04, Attachment 1, Position 9 clearly states that in cases where only the minimum flow line is available for pump testing, regardless of the test interval, flow instrumentation which meets the requirements of IWP-4110 and 4120 must be installed in the mini-flow return line. Pump flow rate is a key parameter in assessing pump performance and the licensee has not provided any alternative for this information. If flow rate measurement is eliminated, the pump tests may not assure that pump performance has not degraded. Although the licensee has stated that the flow limiting orifice in the mini-flow line limits pump operation to the flat portion of the pump characteristic curve, where flow rate measurements may not provide meaningful data, no technical justification is given for not removing or resizing the orifice to allow an adequate flow rate to be obtained during testing. In addition, the licensee has not addressed the existing alternate flow path, which includes flow instrumentation and may be a viable option.

The licensee has not shown that it is impractical, or that it imposes an excessive hardship without a compensating increase in safety to modify the mini-flow line configuration to allow an adequate flow and install flow instrumentation, or that it is impractical to use the existing alternate flow path. Also, the proposed alternative does not provide a reasonable alternative to the Code requirements for long term. The licensee should review the recirculation line configuration and investigate potential modifications to allow an increased flow to be achieved, and the appropriate flow instrumentation to be

installed. Also, the licensee should investigate the use of the existing alternate test flow path for quarterly pump testing. If the licensee is only requesting relief until the system modifications to allow full-flow testing are installed, the request should so state. Otherwise, it is assumed based on the more recently submitted relief request, that these modifications are not being performed.

In the interim, the licensee's current inservice test should provide an acceptable level of quality and safety and should be continued. Immediate compliance with Code requirements would be burdensome to the licensee since it could require testing by methods not yet developed or plant shutdown to install instrumentation. Therefore, it is recommended that interim relief from measuring flowrate quarterly be granted in accordance with 10CFR50.55a(a)(3)(i) for one year or until the next refueling outage, whichever comes later, to allow the licensee time to complete their review and investigation.

2.5 Chemical and Volume Control System

2.5.1 Boric Acid Transfer Pumps, Relief Request No. PRR-11

2.5.1.1 *Relief Request:* The licensee is requesting relief from measuring the Unit 1 and 2 Boric Acid Transfer pumps', P-004A&B, flow rate quarterly, which is a requirement of ASME Section XI, paragraph IWP-3100.

2.5.1.2 *Proposed Alternate Testing:* During the quarterly inservice test the pumps will be operated using the uninstrumented recirculation minimum-flow line. In addition, the pumps will be tested during refueling outages on an instrumented flow path at full or substantial flow conditions. The refueling outage test will include measurement of all parameters required by IWP-3100.

2.5.1.3 *Licensee's Basis for Relief:* "The quarterly inservice testing of these pumps is accomplished by operating the pumps in a recirculation mode in a circuit having no capability for flow measurement. A test circuit is available in which pump flowrate can be measured, however, it requires injection of highly concentrated boric acid solution into the reactor coolant system. During plant operation, this is not practical since it would upset the reactor coolant boric acid balance and adversely effect reactor power and create a plant power transient. If injection were to be performed during cold shutdown periods (other than refueling) the result would be over-boration of the RCS and associated potential operating difficulties during the subsequent plant startup.

NRC Generic Letter 89-04, Position 9, allows elimination of flowrate measurements during quarterly testing where flowrate instrumentation is unavailable provided that appropriate inservice tests are performed during cold shutdowns or refueling where full or substantial flow conditions can be established and flowrates measured."

2.5.1.4 *Evaluation:* Review of the boric acid transfer system P&ID verifies that the minimum-flow recirculation line is the only available pump test flow path during plant operation. Testing of the pumps in their primary flow path during normal plant operation would require boric acid injection directly into the reactor coolant system. This would result in unnecessary plant power transients and potential safety systems challenges.

Generic Letter 89-04 (Attachment 1, Position 9) states that in cases where flow can only be established through a non-instrumented minimum-flow path during quarterly pump testing and a path exists at cold shutdown or refueling outages to perform a test of the pump under full or substandal flow conditions, measurement of flow rate can be eliminated from the quarterly inservice test. However, in order for this to be an acceptable alternative, during the quarterly pump test using the mini-flow line at least pump differential pressure and vibration must be measured. Merely operating the pump in the recirculation mode without measuring any performance parameters is not an acceptable alternative test long term. Review of the P&IDs indicates that no instrumentation is available in the mini-flow line to measure pump suction or discharge pressure. This is corroborated by the licensee's relief request PRR-12 for the same pumps, which states that the system installations do not provide any mechanism for measuring pump suction pressure, discharge pressure, or pump flow rate during normal plant operation. In order for this relief request to be consistent with the NRC's position in Generic Letter 89-04, the quarterly pump test using the mini-flow line must include the measurement of pump differential pressure and vibration. However, from the information available, it appears that the licensee cannot meet these requirements. Therefore, this relief request is not consistent with Generic Letter 89-04, Attachment 1, Position 9 and relief should not be granted.

The licensee should review this relief request and resubmit it with clarification of how the criteria of Generic Letter 89-04 will be met with regard to quarterly measurement of pump differential pressure and vibration. If the appropriate instrumentation is not available, the licensee should evaluate the procurement and installation of instrumentation. Since imposition of Code requirements would require a plant shutdown to install instrumentation, which would be burdensome to the licensee, it is recommended that interim relief from measuring flowrate quarterly be granted in accordance with 10CFR50.55a(a)(3)(i) for 12 months or until the next refueling outage, whichever comes later, to allow the licensee time to complete their review. In the interim, the licensee's proposed testing at refueling outages will provide an acceptable level of quality and safety.

2.5.2 Boric Acid Transfer Pumps, Relief Request No. PRR-12

2.5.2.1 *Relief Request:* The licensee is requesting relief from the requirements of Section XI, paragraph IWP-3400(a), which requires that an inservice test shall be run on each Boric Acid Transfer pump, P-004A&B (Unit 1 and 2), nominally every 3 months during normal plant operation. Relief is also requested from the requirements of ASME Section XI, Paragraph IWP-3100, which requires that all parameters listed in Table IWP-3100-1 must be measured.

2.5.2.2 *Proposed Alternative Testing:* During reactor refueling outages, each of these pumps will be tested and flow rate will be verified to be adequate to serve its safety function. In conjunction with these tests, pump vibration will be measured as practical considering the insulation encapsulation.

2.5.2.3 *Licensee's Basis for Relief:* "The system installations do not provide any mechanism for measuring pump suction pressure, discharge pressure, or pump flowrate during normal plant operation. The only practical means of determining pump flowrate is to pump to the RCS. Due to the problems associated with over-boration of the RCS, this can only be done during reactor refueling outages.

To prevent boric acid crystallation each of these pumps is encapsulated in insulation and is heat traced precluding access for measuring pump or motor vibration. It is impractical to routinely remove this insulation to provide such access.

The CVCS system is configured such that any of the four (4) boric acid transfer pumps (2 in each Unit) can supply either Unit if necessary. This provides a significant amount of redundancy and reliability for the function of RCS boration. In consideration of this, a reduced frequency and reduced scope of testing of these pumps is adequate."

2.5.2.4 *Evaluation:* Lack of instrumentation and component redundancy are not sufficient justifications for not complying with Code requirements. The pumps cannot be full-flow tested during normal plant operation since this would require the injection of boric acid into the reactor coolant system, which would cause a plant power transient. Therefore, the pumps are tested quarterly in a minimum-flow recirculation line. This was evaluated in a previous relief request (PRR-11), which was submitted to obtain relief from measuring pump flow rate quarterly. However, the licensee has not demonstrated that procurement and installation of instrumentation to comply with Code requirements would be impractical or impose a hardship without a compensating increase in the level of quality or safety. The licensee has also not demonstrated that it would be impractical to remove sufficient pump insulation to provide access for vibration measurements. In a letter from C.W. Fay Wisconsin Electric to the U.S. NRC, dated April 22, 1991, the licensee stated that a modification to change the insulation will be evaluated by June 1, 1992. The licensee has not addressed this evaluation in the relief request, therefore, modification of the pump insulation may be a viable option for allowing vibration measurements to be taken.

The fact that redundant components are included in the design is not a justification for reducing the testing frequency or scope. Redundancy is used to improve reliability and is an indication that the function of the components is very important. Reducing the testing requirements is contrary to the intent of this design feature and acts to negate its purpose. Each of the components must be maintained in a condition of operational readiness to attain the full benefits of the redundancy. Therefore, testing frequency and scope should not be reduced.

The alternative testing proposed in this relief request is not consistent with that proposed in relief request PRR-11 for the same pumps. In PRR-11 it was stated that quarterly inservice testing would continue, and at least once during each refueling outage an inservice test would be performed where all pump parameters would be measured and evaluated in accordance with Code requirements. The alternative testing proposed here implies that only testing during refueling outages will be performed, and that the Code acceptance criteria will not be used for evaluating performance parameters. In addition, it does not specify what criteria will be used to verify that pump flow rate is "adequate to serve its safety function." The alternative testing also does not define what is considered "practical" in relation to measuring pump vibration. In light of the inconsistency with previously proposed alternative testing, and the vague terminology used, the alternative testing cannot be judged to provide an acceptable alternative to the Code requirements.

The licensee has not provided sufficient justification to conclude that it is impractical or would result in undue hardship to impose Code requirements. Based on the unacceptable basis for relief and the unacceptable alternative testing proposed, it is recommended that relief be denied.

2.5.3 CVCS Charging Pumps, Relief Request No. PRR-14

2.5.3.1 *Relief Request:* The licensee is requesting relief from measuring the Unit 1 and 2 CVCS Charging Pumps', P-002A through C', suction and differential pressure, which are requirements of ASME Section XI, paragraph IWP-3300.

2.5.3.2 *Proposed Alternative Testing:* During inservice testing, suction and differential pressure will not be measured or recorded. Pump discharge pressure will be measured and evaluated per IWP-3200 and IWP-6000.

2.5.3.3 *Licensee's Basis for Relief:* "The CVCS configuration is such that there is no installed instrumentation provided for measuring charging pump suction or differential pressures. Installation of temporary instrumentation is burdensome and there is little value in measuring these parameters.

The Charging Pumps are multiple plunger, positive-displacement reciprocating pumps where the pump discharge pressure is purely a function of pump design and is independent of suction pressure. This is reflected in ASME/ANSI OMa-1987, Operation and Maintenance of Nuclear Power Plants, Part 6 (Tables 2 and 3b) where this new standard requires measurement and evaluation of pump discharge pressure as opposed to differential pressure. Further, suction pressure measurements are not required."

2.5.3.4 *Evaluation:* Review of the Chemical and Volume Control System P&IDs indicates that the charging pumps are positive-displacement type pumps. For pumps of this type, discharge pressure is independent of suction pressure and is a function only of the pump design. Therefore, measuring pump inlet and differential pressure would not provide any

meaningful information for evaluating pump performance. This is recognized in ASME/ANSI OMa-1988, Part 6, which eliminates the requirement for measuring inlet pressure and differential pressure for positive-displacement pumps. Since the alternative testing includes the measurement and evaluation of pump discharge pressure, it provides an acceptable alternative to the Code requirements for assuring pump operational readiness. Therefore, it is recommended that relief from measuring suction and differential pressure be granted as requested in accordance with 10CFR50.55a(a)(3)(i).

2.6 Service Water System

2.6.1 Service Water Pumps, Relief Request No. PRR-13

2.6.1.1 *Relief Request:* The licensee is requesting relief from measuring the shared Unit 1 and 2 Service Water pumps, P-052A through F, inlet pressure, which is a requirement of ASME Section XI, paragraph IWP-3300. In addition, relief is requested from measuring inlet pressure before starting the pump.

2.6.1.2 *Proposed Alternative Testing:* During testing of these pumps, one value of inlet pressure will be calculated based on water level at the intake structure.

2.6.1.3 *Licensee's Basis for Relief:* "The pumps listed above are vertical line shaft pumps submerged in the intake structure with no practical means of measuring pump inlet pressure. The inlet pressure, however, can be determined by calculation using, as input, the measured height of water above the pump inlet as measured at the intake.

During each inservice test, the water level in the intake pit remains relatively constant, thus only one measurement of level and the associated suction pressure calculation need be performed."

2.6.1.4 *Evaluation:* Review of the service water system P&IDs indicates that the location of the pumps in the intake structure would make it impractical to measure inlet pressure directly. To require the licensee to make system modifications to enable inlet pressure to be measured would be burdensome. Calculating inlet pressure based on the measured intake structure water level is a reasonable alternative test to assure component operational readiness, provided it is properly proceduralized and the accuracy of the calculation is within the accuracy required by Code using direct measurement. In addition, static inlet pressure is not intended to be used as a measure of pump performance and no acceptance criteria are specified. This is recognized in ASME/ANSI-OMa-1988, Part 6 which eliminates static inlet pressure as a test requirement. Calculating one value of pump inlet pressure based on intake structure water level will provide an acceptable level of quality and safety in evaluating pump operational readiness. Therefore, it is recommended that relief be granted from the Section XI requirements of measuring inlet pressure and determining static inlet pressure in accordance with 10CFR50.55a(g)(6)(i) provided the

calculation of inlet pressure is properly proceduralized and within the accuracy of the Code requirement using direct measurement.

2.7 Chilled Water System

2.7.1 Cable Spreading Room Chilled Water Pumps and Control Room Chilled Water Pumps, Relief Request No. PRR-15

2.7.1.1 *Relief Request:* The licensee is requesting relief from measuring the shared Unit 1 and 2 Cable Spreading Room Chilled Water Pumps', P-111A&B, and Control Room Chilled Water Pumps', P-112A&B, flow rate quarterly, which is a requirement of ASME Section XI, paragraph IWP-3300.

2.7.1.2 *Proposed Alternative Testing:* During inservice testing the pumps will be operated in a mode such that the system resistance is fixed and repetitive. Pump differential pressure will be measured and evaluated in accordance with the requirements of ASME Section XI, paragraph IWP-3210.

2.7.1.3 *Licensee's Basis for Relief:* "The chilled water system configuration is such that there is no installed instrumentation provided for measuring flowrate, however, the installation does provide for the capability of operation under a constant (fixed) resistance mode such that pump can be monitored and evaluated from pump differential pressure."

2.7.1.4 *Evaluation:* Lack of instrumentation is not sufficient justification for not complying with Code requirements. The licensee has not demonstrated that the procurement and installation of appropriate instrumentation would be impractical or would impose undue hardship without a compensating increase in the level of quality or safety. Measurement of pump differential pressure is a requirement of Section XI, paragraph IWP-3300. The proposed alternative testing provides no alternative to replace the evaluation of flow rate data. Therefore, the alternative testing does not provide an acceptable alternative to the Code requirements long term. The licensee should investigate the practicality of procuring and installing instrumentation to meet the Code requirements. In the interim, the current quarterly test measuring pump differential pressure will provide an acceptable level of quality and safety and should be continued. Since immediate imposition of Code requirements could require plant shutdown to perform system modifications, which would be burdensome to the licensee, it is recommended that interim relief from measuring flowrate quarterly be granted per 10CFR50.55a(a)(3)(i) for 12 months or until the next refueling outage, whichever comes later, to allow the licensee time to complete their investigation.

3.0 VALVE IST PROGRAM RELIEF REQUESTS

In accordance with 10CFR50.55a, Wisconsin Electric Power Company has submitted relief requests for specific valves at the Point Beach Nuclear Plant that are subject to

inservice testing under the requirements of ASME Section XI. These relief requests have been reviewed to verify their technical basis and determine their acceptability. Each relief request is summarized below, along with the technical evaluation by BNL.

3.1 Auxiliary Feedwater System

3.1.1 Auxiliary Feedwater Pump Minimum Flow Valves, Relief Request No. VRR-28

3.1.1.1 *Relief Request*: The licensee has requested relief from measuring the full-stroke time of the air operated auxiliary feedwater (AFW) pump minimum flow valves, AF-4002 (Units 1 and 2), 4007 (Unit 1), and 4014 (Unit 1), in accordance with ASME Section XI, paragraph IWV-3413.

3.1.1.2 *Proposed Alternate Testing*: The licensee has proposed verifying that the valves close when the pump main line flow reaches a value which assures the pump will not be damaged. No stroke-time will be measured.

3.1.1.3 *Licensee's Basis for Requesting Relief*: "These valves are actually control valves, in that they respond to discharge flow and may actually end up in a throttled position. As control valves, according to IWV-1200, they could be exempt from testing. They do provide an important function, to shut when sufficiently large main line flows are achieved, thereby ensuring full pump capacity is available to meet any accident requirements. The appropriate acceptance criteria for these valves is to assure they respond properly to flow."

3.1.1.4 *Evaluation*: ASME, Section XI, Subsection IWV provides the rules and requirements for inservice testing of valves which are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident. Paragraph IWV-1200(b) exempts only those control valves that do not have a required safety function. This position is clarified in ASME Code interpretation XI-1-83-59 and Generic Letter 89-04, Attachment 1, Position 11. These AFW pump minimum flow valves perform a safety function to close, ensuring full design flow to the steam generators and to open to provide minimum flow for pump protection. Therefore, these valves are not exempt from the requirements of Subsection IWV. Note: The IST Program currently does not require these valves to be tested open (See TER Section 5.25).

These valves operate based on the AFW pump flowrate into the steam generators. The valves' full stroke time is dependent on the AFW pump's operation, the flow logic, and the valve's condition. Measuring stroke times during AFW pump operation would not provide an accurate assessment of the valves ability to close. The licensee has stated, however, that the valves are exercised closed and fail-safe tested each cold shutdown, since AFW pump operation is not practical during plant operation. The licensee should investigate measuring full-stroke times during the cold shutdown fail-safe tests or quarterly in order to verify valve operational readiness and detect valve degradation.

Based on the determination that the valves can at least be full-stroke exercised during the fail-safe cold shutdown tests in accordance with ASME Section XI, Paragraph IWV-3412, it is recommended that relief be denied.

3.2 Auxiliary Steam, Heating Steam, Chilled and Hot Water System

3.2.1 Chilled Water Pump's Discharge Check Valves, Relief Request No. VRR-31

3.2.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the chilled water pumps' discharge valves, HV-00898A, 0900A, 00914A and 00916A (shared Unit 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.2.1.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke testing these valves quarterly and disassembling and inspecting each valve at least once every six years. One valve will be inspected every two years. If the disassembled valve is in a condition that would have prevented it from stroking full open, one additional valve will be inspected. If the second valve is found in a condition that would prevent it from stroking full open, the remaining two valves will be inspected.

3.2.1.3 *Licensee's Basis for Relief:* "There is no instrumentation available with which to measure system flowrate in order to satisfy the requirements of NRC Generic Letter 89-04, Position 1, for full-stroke exercising check valves."

3.2.1.4 *Evaluation:* ASME, Section XI, paragraph IWV-3522 requires, for valves that are to be tested to the open position, confirmation that the disk moves away from the seat. This can be determined by visual observation, an electrical signal initiated by a position indicating device, observation of substantially freeflow through the valve, or other positive means. The NRC staff believes that other positive means could include confirmation of valve disk position by qualified methods, including non-intrusive methods, and valve disassembly and inspection. Position 2 of Attachment 1 of NRC Generic Letter 89-04 provides the criteria for utilizing valve disassembly and inspection as an alternative to full flow testing of check valves. Partial valve stroking quarterly or during cold shutdowns is required, if possible. The NRC recommends, however, that other techniques such as non-intrusive test methods be utilized, instead of disassembly and inspection. Position 1 of Attachment 1 to NRC Generic Letter 89-04 and the response to Question 8 in the Minutes of the Public Meetings on Generic Letter 89-04 provide guidance on qualifying alternative techniques for meeting ASME Code requirements.

The licensee has proposed to utilize valve disassembly and inspection and partial stroke exercising as an alternative to full stroke exercising. The licensee's disassembly/inspection program does not comply with the criteria provided in Position 2 of the Generic Letter. The NRC guidelines for sample disassembly and inspection are as follows:

"The sample disassembly and inspection program involves grouping similar valves and testing one valve in each group during each refueling outage. The sampling technique requires that each valve in the group be the same design (manufacturer, size, model number, and materials of construction) and have the same service conditions including valve orientation. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that the internals of the valve are structurally sound (no loose or corroded parts). Also, if the disassembly is to verify the full-stroke capability of the valve, the disk should be manually exercised.

A different valve of each group is required to be disassembled, inspected, and manually full-stroke exercised at each successive refueling outage, until the entire group has been tested. If the disassembled valve is not capable of being full-stroke exercised or there is binding or failure of valve internals, the remaining valves in that group must also be disassembled, inspected, and manually full-stroke exercised during the same outage. Once this is completed, the sequence of disassembly must be repeated unless extension of the interval can be justified."

The licensee's proposal requires only one additional valve be inspected if the disassembled valve is not capable of being full-stroke exercised. The licensee has not provided justification for not disassembling, inspecting, and exercising the remaining 3 valves in the group discussed in Position 2. Additionally, the licensee has not provided sufficient information to ascertain that the four valves are of the same design and service, that the valves will be manually exercised and internals visually inspected for worn or corroded parts, and that a different valve will be disassembled, inspected and exercised each refueling outage and the sequence will be repeated.

Therefore, it is recommended that relief from the full-stroke exercise be granted in accordance with Generic Letter 89-04 provided the licensee's inspection, disassembly, and inspection program was revised to conform with all criteria in Position 2 of the Generic Letter. The Generic Letter states: "The staff has determined that relief is granted to follow the alternate testing delineated in Positions 1, 2, 6, 7, 9, and 10, pursuant to 10CFR50.55a(g)(6)(i)." The licensee should investigate the use of non-intrusive methods to verify valve position. Note: TER Section 2.7.1.4 recommends the licensee investigate the installation of flow instrumentation for pump testing. This would eliminate the need for this relief request.

3.3 Chemical and Volume Control System

3.3.1 Charging Pump Discharge to Reactor Coolant Pump Seal Check Valves, Relief Request No. VRR-12

3.3.1.1 *Relief Request:* The licensee has requested relief from exercising the charging pump discharge to reactor coolant pump (RCP) seal check valves, CV-00304C and D (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.3.1.2 *Proposed Alternate Testing:* The licensee has proposed verifying the valves can fulfill their safety function to close during the 10CFR50, Appendix J leak rate tests. These tests are performed at each refueling outage.

3.3.1.3 *Licensee's Basis for Relief:* "These valves are normally open. They are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. During plant operation, such testing would require securing the RCP's which is not practical. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during cold shutdown outages is impractical."

3.3.1.4 *Evaluation:* These normally open check valves provide RCP seal water injection from the charging pumps. The RCPs employ a controlled leakage seal assembly to restrict leakage along the pump shaft and minimize the leakage of reactor coolant into the containment atmosphere. The plant safety analysis (FSAR) states that the plant can be operated indefinitely without seal water injection flow since "the RCP thermal barrier cooler has sufficient capacity to cool the reactor coolant flow which would pass through the thermal barrier cooler and seal leakoff from the pump casing." Loss of injection flow will normally lead to an increase in the pump lower bearing temperature, an increase in the seal temperature and an increase in the No. 1 seal leak rate. The thermal barrier cooler can prevent bearing and seal temperatures from exceeding the maximum recommended temperatures and thus possible seal failure, and a resulting unisolatable small break loss of reactor coolant accident. Therefore, the only safety-related function of these valves is to close to provide containment isolation for the CVCS system in the event of an accident.

However, although the pumps can operate with short term interruptions of seal injection flow (generally up to 24 hours as recommended by the pump vendor), the increased potential of seal damage and pump bearing damage due to overheating and the introduction of crud from the RCS into the seals which can result in seal wear and subsequent failure makes it impractical to test the valves during pump operation. Additionally, these valves are simple check valves which are located inside containment and are not equipped with position indication instrumentation. The only practical method available to verify closure of these valves is to perform a leak test. The test connections are inside containment which would require a containment entry in order to verify valve closure. Routine containment entries are not made during power operations due to high radiation levels and a potentially harsh environment. Performing this testing during cold shutdowns would subject plant personnel to increased radiation doses due to the extensive set up required to perform valve leak tests. The time required to set up and perform the leak test could result in a delay in plant start up which would be burdensome to the licensee. It would be impractical to require the licensee to make containment entry

quarterly during power operation or during cold shutdown in order to verify closure of these valves. The licensee's proposal to Appendix J, Type C, leak rate test these valves during refueling outages provides a reasonable assurance of their ability to perform their safety function in the closed position.

Based on the impracticality of full-stroke exercising these valves quarterly and during cold shutdowns, the burden on the licensee if these Code requirements were imposed, and considering that the licensee's proposal to Appendix J, Type C, leak rate test these valves during refueling outages provides a reasonable assurance of their ability to perform their safety function in the closed position, it is recommended that relief from exercising the valves quarterly be granted as requested pursuant to 10CFR50.55a(g)(6)(i).

3.3.2 Charging Line Containment Isolation Valve, Relief Request No. VRR-13

3.3.2.1 *Relief Request:* The licensee has requested relief from exercising the charging line containment isolation check valves, CV-00370 (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.3.2.2 *Proposed Alternate Testing:* The licensee has proposed verifying that the valves fulfill their safety function to close during the 10CFR50, Appendix J leak-rate tests, which are performed at each refueling outage.

3.3.2.3 *Licensee's Basis for Relief:* "This valve is normally open. It is a simple check valve with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. During plant operation, such testing would require securing the charging pumps which is not practical or prudent and could result in a plant trip if done. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during cold shutdown outages is impractical."

3.3.2.4 *Evaluation:* These valves are simple check valves located inside containment. They are normally open to supply charging water to the RCS. Their safety position is to close to provide containment isolation for the CVCS in the event of an accident. Since the valves are not provided with position indication instrumentation, the only practical means of testing this valve is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields and potentially harsh environments. Performing this test during cold shutdowns would subject plant personnel to high radiation levels and, due to the time required to perform this test, the shutdown could be extended which would be burdensome. Therefore, it would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valve's ability to close and perform its safety function.

Based on the impracticality of full-stroke exercising this check valve in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed, and the determination that the licensee's proposed testing provides reasonable assurance of the valve's ability to perform its safety function in the closed position, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.3.3 Charging Pump Discharge to Reactor Coolant Pump Manual Throttle Valves, Relief Request No. VRR-19

3.3.3.1 *Relief Request:* The licensee has requested relief from exercising the charging pump discharge to reactor coolant pump (RCP) manual throttle valves, CV-00300 A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3411 and 3412.

3.3.3.2 *Proposed Alternate Testing:* The licensee has proposed to verify the valves can fulfill their safety function to close during the 10CFR50, Appendix J leak rate test, which will be performed at each refueling outage.

3.3.3.3 *Licensee's Basis for Relief:* "Exercising these valves during RCP operation would result in significant damage to the pumps. During cold shutdown periods, it is customary to maintain the RCP's in operation unless plant conditions required securing them. Thus, requiring the exercising of these valves would result in a considerable operational burden. Note that these small manual valves are highly reliable with respect to their capability to close and exercising during refueling outages will adequately demonstrate their operability."

3.3.3.4 *Evaluation:* These normally open manual needle valves provide RCP seal water injection from the charging pumps. The RCPs employ a controlled leakage seal assembly to restrict leakage along the pump shaft and minimize the leakage of reactor coolant into the containment atmosphere. The plant safety analysis (FSAR) states that the plant can be operated indefinitely without seal water injection flow since "the RCP thermal barrier cooler has sufficient capacity to cool the reactor coolant flow which would pass through the thermal barrier cooler and seal leakoff from the pump casing." Loss of injection flow will normally lead to an increase in the pump lower bearing temperature, an increase in the seal temperature and an increase in the No. 1 seal leak rate. The thermal barrier cooler can prevent bearing and seal temperatures from exceeding the maximum recommended temperatures and thus possible seal failure and a resulting unisolatable small break loss of reactor coolant accident. Therefore, the only safety related function of these valves is to close to provide containment isolation.

However, although the pumps can operate with short term interruptions of seal injection (generally up to 24 hours as recommended by the pump vendor), the increased potential of seal damage and pump bearing damage due to overheating and the introduction of crud from the RCS into the seals, which can result in seal wear and subsequent failures, makes it impractical to test the valves during pump operation. Compliance with the Code would require plant shutdown and RCP isolation quarterly. The

licensee has not, however, provided sufficient information and justification to support the relief request to not test these valves during cold shutdowns. There may be cold shutdowns when the RCPs are not running. Therefore, it is recommended that relief from exercising the valves quarterly be granted in accordance with 10CFR50.55a(g)(6)(i) provided that the licensee exercise the valves closed during any cold shutdowns when the RCP are not running.

3.3.4 Boric Acid Transfer Pump Discharge to Charging Pump Suction Check Valves, Relief Request No. VRR-24

3.3.4.1 *Relief Request:* The licensee has requested relief from exercising the boric acid transfer pump discharge to charging pump suction check valves, CV-00351 (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.3.4.2 *Proposed Alternate Testing:* The licensee has proposed forward flow exercising these valves during each refueling outage.

3.3.4.3 *Licensee's Basis for Relief:* "Testing these valves in the open direction requires the introduction of highly concentrated boric acid solution from the boric acid makeup tanks to the suction of the charging pumps. This, in turn, would result in the addition of excess boron to the RCS which would adversely affect plant power level and operational parameters with the potential for an undesirable plant transient and a plant trip or shutdown. During cold shutdown the introduction of excess quantities of boric acid is undesirable from the aspect of maintaining proper plant chemistry and the inherent difficulties that may be encountered during the subsequent startup."

3.3.4.4 *Evaluation:* Full flow testing of these check valves quarterly, would require the injection of boron into the RCS during power operation. This would cause a power transient and may result in a reactor trip, making this test impractical. However, the licensee has stated that performing this test during cold shutdown is also undesirable. The licensee has failed to provide sufficient information and justification which demonstrate that the testing of these valves, in compliance with ASME Section XI, at every cold shutdown results in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proper actuation of these check valves is required to provide emergency makeup of borated water to the RCS. Therefore, relief cannot be recommended. The licensee should provide additional justification to justify why the valves cannot be tested at any cold shutdowns.

3.3.5 Boric Acid Transfer Pumps Discharge Check Valves, Relief Request No. VRR-26

3.3.5.1 *Relief Request:* The licensee has requested relief from exercising the boric acid transfer pumps' discharge check valves, CV-00333 A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.3.5.2 *Proposed Alternate Testing:* The licensee has proposed full-flow exercising these valves open each refueling outage during the pumps' tests. Additionally, the valves will be tested quarterly, however, the flow through the valve will not be known.

3.3.5.3 *Licensee's Basis for Relief:* "Full-stroke testing these valves requires operating the boric acid makeup pumps at or near rated flow and verifying full accident flow through each valve. This can be performed during plant operation, however there is no instrumentation available in the test loop by which flow can be measured.

Flow through the individual valves can be measured by pumping into the charging pump suction header and measuring charging flow using installed instrumentation. This, however, requires the introduction of highly concentrated boric acid solution from the boric acid makeup tanks to the suction of the charging pumps. This, in turn, would result in the addition of excess boron to the RCS which would adversely affect plant power level and operational parameters with the potential for an undesirable plant transient and a plant trip or shutdown. During cold shutdown, the introduction of excess quantities of boric acid is undesirable from the aspect of maintaining proper plant chemistry and the inherent difficulties that may be encountered during the subsequent startup in over-boration of the RCS. In addition to the above, there is no flowrate measurement instrumentation installed in this flowpath."

3.3.5.4 *Evaluation:* It is impractical to measure the flowrate through the boric acid transfer pumps quarterly during recirculation to the boric acid tank due to the lack of installed instrumentation. The recirculation path is the only practical flow path to use when testing these pumps quarterly. The only other flow path is to the charging pumps suction. Testing through this flow path would require injection of boron into the RCS. Power transients and a reactor trip could result. In the request's "Basis," the licensee has stated in the second paragraph that flow into the charging pump suction will be measured "using installed instrumentation." The last line of that paragraph states that there is "no flowrate measurement instrumentation installed in this flowpath." This discrepancy should be resolved.

The licensee has stated that performing this test during cold shutdown is also undesirable. The licensee has failed to provide sufficient information and justification which demonstrates that testing these valves, in compliance with ASME Section XI, at every cold shutdown results in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, relief cannot be recommended. The licensee should evaluate the use of other techniques, such as non-intrusive methods to verify valve position during the quarterly testing as discussed in Generic Letter 89-04, Attachment 1, Position 1.

3.4 Component Cooling Water System

3.4.1 Component Cooling Water to RCP Check Valves, Relief Request No. VRR-10

3.4.1.1 *Relief Request:* The licensee has requested relief from exercising the component cooling water to the reactor coolant pump (RCP) check valves, CC-00755 A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.4.1.2 *Proposed Alternate Testing:* The licensee has proposed exercising these valves closed during the 10CFR50, Appendix J leak tests.

3.4.1.3 *Licensee's Basis for Relief:* "These are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. During plant operation, such testing would require securing the RCP's which is not practical. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during cold shutdown outages is impractical."

3.4.1.4 *Evaluation:* These valves are simple, normally open check valves located inside containment. They provide cooling water to the RCP motor bearing cooler and thermal barrier cooling coil. Their safety position is to close to provide containment isolation. The valves are not provided with position indication. The only practical means of testing these valves is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields and potentially harsh environments. Additionally, the associated RCP must be stopped when exercising these valves, because loss of cooling water during pump operation could cause degradation of the pump seals and bearings and eventually pump failure or small loss of coolant through the seals. Although the RCP are not required to operate, (i.e., they are not actively safety related) they provide a passive safety related function to maintain the reactor coolant pressure boundary. It would be burdensome to require the licensee to perform a plant shutdown quarterly in order to establish plant conditions that allow the RCP to be stopped. Performing this test during cold shutdowns would subject plant personnel to high radiation levels and, due to the time required to perform this test, the shutdown could be extended. Therefore, it would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valve's ability to close and perform their safety function.

Based on the impracticality of exercising these check valves in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed, and the determination that the licensee's proposed testing provides reasonable assurance of the valve's ability to perform their safety function in the closed position, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.4.2 Component Cooling to Excess Letdown Heat Exchangers Check Valves, Relief Request No. VRR-30

3.4.2.1 *Relief Request:* The licensee has requested relief from exercising the component cooling water to the excess letdown heat exchanger check valves, CC-00757 (Units 1 and 2); quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.4.2.2 *Proposed Alternate Testing:* The licensee has proposed exercising these valves closed during the 10CFR50, Appendix J leak tests.

3.4.2.3 *Licensee's Basis for Relief:* "These are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during plant operation or cold shutdown outages is impractical."

3.4.2.4 *Evaluation:* These normally open valves are simple check valves located inside containment. They provide cooling water to the chemical and volume control excess letdown heat exchangers. Their safety position is to close to provide containment isolation. The valves are not provided with position indication. The only practical means of testing these valves is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields and potentially harsh environments. Performing this test during cold shutdowns would subject plant personnel to high radiation levels, and due to the time required to perform this test, the shutdown could be extended which would be burdensome. It would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valves' ability to close and perform their safety function.

Based on the impracticality of exercising these check valves in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed, and the determination that the licensee's proposed testing provides reasonable assurance of the valves' ability to perform their safety function in the closed position, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.5 Containment Spray System

3.5.1 Refueling Water Storage Tank to Containment Spray Pumps Suction Check Valves, Relief Request No. VRR-8

3.5.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the Refueling Water Storage Tank (RWST) to containment spray pump suction check valves,

SI-00858 A and B (Units 1 and 2), quarterly, in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.5.1.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves during plant operation and disassembling and inspecting each valve during refueling outages.

3.5.1.3 *Licensee's Basis for Relief:* "Full-stroke exercising of these valves would require operating the containment spray pumps at nominal accident flowrate and spraying into the containment building since no full flow recirculation path exists. This is obviously impractical and undesirable."

3.5.1.4 *Evaluation:* These valves are required to open to allow water from the RWST to the containment spray pump section. The system test line will permit partial-stroke exercising quarterly. However, the only full flow path is into the containment spray headers and utilizing this pathway is impractical due to the potential containment equipment damage and extensive cleanup required. Compliance with the Code requirements would require the installation of a full-flow test loop. The licensee is proposing to utilize disassembly and inspection as a means to determine the valve will perform its safety function to open. It is acceptable to utilize disassembly and inspection provided that the program meets all the criteria established in Generic Letter 89-04, Position 2 of Attachment 1, including performing a partial stroke exercise quarterly or during cold shutdowns, if possible, and after reassembly and manually exercising the disk. The NRC, however, recommends that other techniques such as non-intrusive test methods be used to verify full-stroke opening in lieu of disassembly. Position 1 of the Generic Letter provides criteria on establishing alternate test programs.

The licensee has not described the disassembly and inspection program in sufficient detail to ascertain that it meets all the criteria established in Position 2 of Generic Letter 89-04. Provided the licensee's program does meet Position 2, a positive means of determining the valve disk will full-stroke exercise is achieved and relief can be granted in accordance with Generic Letter 89-04. The Generic Letter states: "The staff has determined that relief is granted to follow the alternate testing delineated in Positions 1, 2, 6, 7, 9, and 10, pursuant to 10CFR50.55a(g)(6)(i)."

3.5.2 Containment Spray Nozzles' Supply Check Valves, Relief Request No. VRR-9

3.5.2.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the containment spray nozzles supply check valves, SI-00862A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522. Note: The valve function described in the request is incorrect (see TER Section 5.29).

3.5.2.2 *Proposed Alternate Testing:* The licensee has proposed disassembling and inspecting the valves at refueling outages and performing 10CFR50, Appendix J leakage tests.

3.5.2.3 *Licensee's Basis for Relief:* "Full or part-stroke exercising of these valves would require operating the containment spray pumps at normal accident flowrate and spraying into the containment building since no recirculation path is available. This is obviously impractical and undesirable.

These are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. Performing such tests of these valves involves considerable effort and system realignment such that routine testing during plant operation or cold shutdown outages is impractical."

3.5.2.4 *Evaluation:* These valves are required to open to allow the containment spray system to depressurize and cool the containment, given a loss of coolant accident, and to rapidly reduce fission product iodine concentration in the containment atmosphere. In addition, they must close to provide containment isolation. It is impractical to full-stroke exercise these valves open with flow because equipment in the containment would be damaged and an extensive cleanup would be required. The licensee has stated that there is no test recirculation path available. Upon review of drawings 110E035 and 110E017, it appears that a test line is available through valves 864A and B for a partial-stroke test. Compliance with the Code full-stroke requirements would require the instrumentation of a full-flow test loop, which is burdensome.

The licensee is proposing to utilize disassembly and inspection as a means to determine that the valve will perform its safety function to stroke open. It is acceptable to utilize disassembly and inspection provided that the program meets the criteria established in NRC Generic Letter 89-04, Position 2 of Attachment 1, including performing a partial stroke exercise quarterly or during cold shutdowns, if possible, and after reassembly. The NRC, however, recommends that other techniques such as non-intrusive test methods be used to verify full-stroke opening in lieu of disassembly. One option the licensee may consider is to stroke exercise the valve using air with non-intrusive diagnostic methods to verify valve disk movement.

The licensee has not described the disassembly and inspection program in sufficient detail to ascertain that it meets all the criteria established in Position 2 of Generic Letter 89-04. Provided the licensee's program meets all the criteria provided in Position 2 of the Generic Letter including performing a partial-stroke exercise, a positive means of determining the valve disk will full-stroke exercise is achieved and relief can be granted in accordance with Generic Letter 89-04. The Generic Letter states: "The staff has determined that relief is granted to follow the alternate testing delineated in Positions 1, 2, 6, 7, 9, and 10, pursuant to 10CFR50.55a(g)(6)(i)."

Based on the check valves' design, the only practical method of verifying the valves are in the closed position is by a leakage test. These valves and the test connections are located outside containment. The licensee has not provided sufficient justification of the hardship resulting from testing these valves quarterly or during cold shutdowns. It is,

therefore, recommended that relief from performing backflow testing of these valves be denied.

3.6 Emergency Diesel Generator Air Start System

3.6.1 Emergency Diesel Generator Air Starting Motors' Starting Valves, Relief Request No. VRR-17.

3.6.1.1 *Relief Request:* The Licensee requests relief from exercising the emergency diesel generator air starting motor's starting valves, DA-03057A and B and DA-3058A and B shared by Units 1 and 2, in accordance with ASME Section XI, Paragraphs IWV-3413 and IWV-3417, which require measurement of stroke time for all power operated valves whenever the valve is full stroke tested.

3.6.1.2 *Proposed Alternate Testing:* In lieu of performing the tests required by ASME Section XI, Paragraph IWV-3413, the licensee proposes to perform a monthly valve stroking test performed in conjunction with the associated emergency diesel generator start testing. Valve stroking parameters will be considered acceptable upon diesel generator start. If the diesel generator fails to start, at no fault of the respective valves, the valve stroking parameters will be considered acceptable, and will be proven with the diesel generator restart following corrective action.

3.6.1.3 *Licensee Basis For Relief:* "These are enclosed air-pilot operated valves with no remote or local position indication and where the valve design prohibits visual observation of valve operation or position. Thus, stroke time measurements are not possible. Failure of a valve to operate properly would result in unacceptable start and operation of the associated diesel generators."

3.6.1.4 *Evaluation:* These valves are not equipped with position indication and valve stem movement cannot be observed, therefore, it is impractical to measure valve stroke time using conventional techniques.

In order to test these valves in accordance with ASME Section XI, significant modifications to the system would be required; including possible valve replacement. These modifications would be burdensome for the licensee and would allow only a limited increase in valve degradation data.

These valves operate to admit starting air to the emergency diesel generators starting air motors. Each generator is capable of starting by either one of two pairs of air motors. A selector switch determines which pair of air motors are activated first on the diesel initiation signal. If the diesel fails to start after 3 seconds, a failure alarm comes on and the diesel will attempt to start using both pairs of starting motors. The air-operated valve's opening can indirectly be verified by monitoring the diesels start times. Any degradation in the valves stroke time would result in longer diesel start times. A maximum, allowable

start time should be specified. This limiting value should be less than or equal to the Technical Specification requirement. Therefore, the licensees proposed testing of measuring the diesel generators start times should provide indication of the valves' operation and allow degradation detection.

Therefore, based on the determination that compliance with the Code requirements in impractical and considering the burden on the licensee if the Code requirements were imposed, it is recommended that relief from measuring valve stroke time be granted pursuant to 10CFR50.55a(g)(6)(i), provided the licensee assigns a maximum limiting diesel start time and verifies the operational readiness of the valves in each air start bank at least quarterly by alternating the air motor bank selected during diesel testing.

3.6.2 Emergency Diesel Generator Air Start Valves, Relief Request No. VRR-25

3.6.2.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the emergency diesel generator air start check valves; DA-00125, 126, 225, 226 (shared by Units 1 and 2), in accordance with ASME Section XI, paragraphs IWV-3521 and 3522, and stroke time exercising the emergency diesel generator air start solenoid valves, DA-06316A and B, 6317A and B, 6318A and B, 6319A and B (shared by Units 1 and 2), in accordance with paragraph IWV-3413.

3.6.2.2 *Proposed Alternate Testing:* The licensee has proposed exercising these valves in conjunction with the diesel generator tests. Stroke times of the solenoid valves and flowrates through the check valves will not be measured. The starting times for each diesel generator will be verified.

3.6.2.3 *Licensee's Basis for Relief:* "These valves are integral (skid-mounted) with the diesel air start system for each emergency diesel generator with no valve position indication mechanism, and, as such, there is no practical method for measuring the stroke times or flowrates of each individual valve. If a valve were to fail to stroke as required it would be reflected in an unacceptable starting time and/or performance of the respective diesel generator."

3.6.2.4 *Evaluation:* These valves are not equipped with position indication and valve stem movement cannot be observed, therefore it is impractical to measure stroke time or determine check valve disk position using conventional techniques. Additionally, there are no flowmeters installed to verify full-flow check valve stroking.

In order to test these valves in accordance with ASME Section XI, significant modifications to the system would be required; including possibly solenoid valve replacement. These modifications would be burdensome for the licensee and would be only a limited increase in valve degradation data.

These valves operate to admit starting air to the emergency diesel generators starting air motor. Each generator is capable of starting by either one of two pairs of air motors. A selector switch determines which pair of air motors are activated first on the diesel initiation signal. If the diesel fails to start after 3 seconds, a failure alarm comes on and the diesel will attempt to start using both pairs of starting motors. The fast-acting solenoid valve's opening can indirectly be verified by monitoring the diesels start times. Any degradation in the solenoid valves stroke time or check valves full opening would result in longer diesel start times. A maximum, allowable start time should be specified. This limiting value should be less than or equal to the Technical Specification requirement. Therefore, the licensees proposed testing of measuring the diesel generators start times should provide indication of the solenoid and check valves operation and allow degradation detection.

Therefore, based on the determination that compliance with the Code requirements in impractical and considering the burden on the licensee if the Code requirements were imposed, it is recommended that relief from full-stroke exercising the air start check valves and stroke time exercising the solenoid valves be granted pursuant to 10CFR50.55a(g)(6)(i), provided the licensee assigns a maximum limiting diesel start time and verifies the operability of the valves in each air start bank at least quarterly by alternating the air motor bank selected during diesel testing.

3.7 Emergency Diesel Generator Fuel Oil System

3.7.1 Emergency Diesel Fuel Oil Transfer Pumps' Discharge Valves, Relief Request No. VRR-33

3.7.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the fuel oil transfer pumps discharge pressure control valves, FO-03940 and 03941 (shared by Units 1 and 2), in accordance with ASME Section XI paragraph IWV-3412.

3.7.1.2 *Proposed Alternate Testing:* The licensee has proposed verifying valve disk movement by monitoring system operating parameters.

3.7.1.3 *Licensee's Basis for Relief:* "Since these are essentially back-pressure regulating valves requiring no outside source of power to operate, they are exempt from stroke time measurements per IWV-3413, however, it is not practical to perform a full-stroke test since the position of the valve disc cannot be determined visually or by any other practical means.

Considering the type and function of these valves, an operational (functional) test is an effective way of ascertaining the condition of the valves and proving their operability."

3.7.1.4 *Evaluation:* ASME Section XI, paragraph IWV-3412 requires valves to be exercised to the position required to fulfil their function. The necessary valve disk movement shall be determined by exercising the valve while observing an appropriate indicator or observing

indirect evidence (such as changes in system pressure, flow rate, level, or temperature) which reflect stem or disk position. Although the subject valves position cannot be determined directly, each valves' position both open and closed, can be determined indirectly based on the emergency fuel tank level changes and pump discharge pressure. Therefore, the requirements of paragraph IWV-3412 can be met.

Paragraph IWV-3413 applies to power operated valves only. Measurement of full-stroke times is not required for self activating control valves. Therefore, relief from Code requirements is not required.

3.8 Heating and Ventilation System

3.8.1 Containment Atmospheric Monitoring System Containment Isolation Valves, Relief Request No. VRR-16

3.8.1.1 *Relief Request:* The licensee has requested relief from exercising the containment atmospheric monitoring system return check valves, RM-03200AA (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522. Note: The valve numbers do not appear on the referenced drawings. The reviewer has assumed that the valves addressed in the relief request are the "check valves located in the drawing coordinates "G-3" referenced in the IST Valve Program Tables, Appendices D and E, that do not have their internals removed.

3.8.1.2 *Proposed Alternate Testing:* The licensee has proposed exercising these valves to the closed position during the 10CFR50, Appendix J leak tests.

3.8.1.3 *Licensee's Basis for Relief:* "During normal plant operation, gases from a continuous sampling system return sample flow to the containment through these lines/valves. To test these valves during operation or cold shutdown, it would be necessary to discharge potentially radioactive gases to the environment. There is no mechanism to partial stroke these valves."

3.8.1.4 *Evaluation:* These valves are simple check valves located inside containment that are normally open. Their safety position is to close to provide containment isolation. The valves are not provided with position indication. The only practical means of testing these valves is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields and potentially harsh environments. Performing this test during cold shutdowns would be burdensome due to the time required to perform this test, and the potential for extending the shutdown. It would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valves' ability to close and perform their safety function.

Based on the impracticality of exercising these check valves in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed and the determination that the licensee's proposed testing provides reasonable assurance of the valve's ability to perform it's safety function in the closed position, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.9 Instrument Air System

3.9.1 Instrument Air Check Valves To Purge Valve Boot Seals, Relief Request No. VRR-14.

3.9.1.1 *Relief Request:* The licensee has requested relief from testing the instrument air check valves used to purge valve boot seals; IA-00644,645,1280,1281 (Unit 1) and 00876,877,1401,1402 (Unit 2); in accordance with ASME Section XI, Paragraph IWV-3424, which requires valve leakage to be determined by either measuring leakage directly or measuring the feed rate required to maintain test pressure.

3.9.1.2 *Proposed Alternate Testing:* In lieu of leakage tests required by ASME Section XI, paragraph IWV-3424, the licensee proposes to test for valve leakage by measuring pressure decay in the test volume. All detected leakage will be assigned to the valve being tested. Differential pressure will be applied in the same direction as when the valve is performing its function.

3.9.1.3 *Licensee Basis For Relief:* "There are other acceptable techniques available which demonstrate leak rates through valves. OM Part 10, Section 4.2.2.3 describes such techniques."

3.9.1.4 *Evaluation:* These Category A/C check valves open to provide air to inflate the purge valve boot seals and, upon loss of supply air pressure, close to maintain the boot seals inflated. The licensee has requested relief from the ASME Code specified methods for determining leakage through these check valves. As specified in ASME Section XI, paragraph IWV-3424, valve leakage is to be measured directly or by measuring the feed rate required to maintain test pressure.

The main purpose of an in-service testing program is to identify valve degradation. While the methods specified by ASME Section XI are valid test methods to determine check valve leakage, there are other equivalent test methods which also will detect and quantify leakage. ASME/ANSI OMa-1988, Part 10, Section 4.2.2.3 describes such techniques. Specifically, these are by 1) measuring leakage through a downstream telltale connection while maintaining test pressure on one side of the valve, or 2) measuring the feed rate required to maintain test pressure in the test volume, provided the total apparent leakage rate is charged to the valve being tested, or 3) determine leakage by measuring pressure decay in the test volume, provided the apparent leakage rate is charged to the valve being tested.

The licensee proposes to ascertain valve leakage by measuring pressure decay in the test volume. All leakage will be assigned to the valve being tested. Test pressure will be applied in the same direction as when the valve is performing its function. This is an acceptable alternate test method as specified in OM, Part 10, Section 4.2.2.3, which meets the intent of ASME Section XI, and provides an acceptable level of quality and safety.

Based upon the equivalence of the proposed test methods, and given that the licensee will perform these tests at the required two year frequency, it is recommended that relief from measuring leakage directly or measuring the feed rate required to maintain test pressure be granted pursuant to 10CFR50.55a(a)(3)(i).

3.9.2 PORV Instrument Air Supply Check Valve, Relief Request No. VRR-32

3.9.2.1 *Relief Request:* The licensee has requested relief from leak testing the PORV instrument air supply check valves; 1-IA-01206,01209,01605,01606 (Unit 1) and 2-IA-01335,01338,01652,01653 (Unit 2); in accordance with ASME Section XI, paragraph IWV-3420. Note: The request and Appendix D identifies valve 1-IA-01600. However, based on a review of drawing M-209, Sheet 11, Revision 15, the correct valve number appears to be 1-IA-01605 (see TER Section 5.3).

3.9.2.2 *Alternate Testing:* The licensee has proposed performing a leak test with two valves in series.

3.9.2.3 *Licensee's Basis for Relief:* "The plant configuration for these valves is such that two valves are installed in series with no test connection in the common piping between them that could be used to test the valves individually. The function of closure and isolation can be accomplished with only one valve, thus if either valve has acceptable leak-tight integrity, then the system remains fully functional.

Testing two valves in combination adequately demonstrates the functional adequacy of the system.

Note that these valves are included in the testing program for information and tracking purposes and do not strictly meet the requirements of IWV-1100 for inclusion."

3.9.2.4 *Evaluation:* These simple check valves isolate the PORV nitrogen accumulators from the normal instrument air system. The PORVs are required to prevent over-pressurization of the Reactor Coolant System during both normal operation and low temperature water solid operation.

The valves are not provided with a position indicating device. There are no drain, vent, or test connections installed between these series valves to individually verify the closure of each valve. Individually testing the valves is required in accordance with Section XI, unless the safety analysis does not require both check valves to isolate the instrument

system. Leak testing the valves in series will verify that at least one of the two valves is capable of closing, but provides no indication about the condition of the other valve. System modifications would be required to individually test each valves capability to perform its safety function. The licensee has stated that only one valve is required to isolate the instrument system to fulfil the system's function. Therefore, based on the burden on the licensee if the Code requirements were imposed and considering the licensee's proposed alternative provides reasonable assurance of operational readiness, relief could be recommended.

The licensee has stated however, that these valves are included in the IST Program for information and tracking purposes only. They are identified for testing per NRC Generic Letter 90-06 and "must (sic) not satisfy the requirements of Subsection IWV or Generic Letter 89-04." (See TER Section 5.17) Non-Code components may be included in the ASME Code IST Program, as this program is a reasonable vehicle to provide a periodic demonstration of the operability of pumps and valves. However, if non-Code components are included in the Code IST Program and certain Code provisions cannot be met, 10CFR50.55a does not require a request for relief to be submitted to the staff. Documentation that provides assurance of the continued operability of the non-Code components that are important to safety through the performed tests should be available at the plant site.

Therefore, no relief is required.

3.10 Main Feedwater System

3.10.1 Main Feedwater Check Valves to Steam Generators, Relief Request No. VRR-21.

3.10.1.1 *Relief Request:* The licensee has requested relief from exercising the main feedwater system check valves to the steam generators, CS-00466 AA & BB and CS-00476 AA & BB (Units 1 and 2), quarterly in accordance with the requirements of ASME Section XI, paragraphs IWV-3521 and 3522.

3.10.1.2 *Proposed Alternate Testing:* The licensee has proposed verifying that each set of series check valves fulfil their safety functions through a leakage test to be performed during each refueling outage. Valve closure of at least one of the two in-line series check valves will be verified. Additional information on the condition of the valves will be obtained through a periodic disassembly and inspection of each valve.

3.10.1.3 *Licensees Basis For Relief:* "There are no position indicators on these valves nor are there any pressure taps between the valves. It is therefore not feasible, with the present plant configuration, to verify individual valve closure. Closure of at least one of the two series check valves can be verified by measuring the differential pressure across, or leakage past the combination of both valves. This is adequate to ensure the safety function of the valve combination is maintained and verified.

Prompt seating of each valve on cessation or reversal of flow cannot be verified at the instant of closure since no direct indication of valve disc position is available. Valve testing can be conducted only during Unit shutdowns since the flow of main feedwater to the steam generators must be secured in order to perform the tests."

3.10.1.4 *Evaluation:* These main feedwater series check valves are located upstream of the auxiliary feedwater injection line to the steam generators. These check valves are open during normal plant operation, and close upon reversal of flow to ensure that the auxiliary feedwater flow is unimpaired to at least one of the two steam generators while main feedwater is unavailable. The check valves also prevent simultaneous blowdown of both steam generators in the event of a main feed pipeline failure. Appendix D identifies these valves as Category A/C. As such, seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their function (Reference paragraph IWV-2100(a)).

Since there are no position indicators on these check valves, or pressure taps between them, it is not possible to verify individual valve closure as discussed in the relief request or valve leakage as required by IWV-3420. Individual verification of each valve's closure and leak tight capability would require significant system modifications. The licensee plans to conduct a test for each set of series check valves during Unit shutdowns. After flow is secured, the differential pressure across or the leakage past the valves will be measured and evaluated with respect to system operability and its capability to perform the safety function.

The purpose of an in-service testing program is to monitor each individual check valve for degradation. The proposed series leak test provides information on the closure of one or both of the valves, but does not allow for condition monitoring of each individual valve. The licensee should review the safety analysis for each Unit to ensure that only one of the two series check valves is required to function. If the safety analysis assumes that only one of the two series check valves is required to function, each set of two series redundant valves could be treated as one for testing purposes.

The proposed testing frequency of each Unit shutdown is not in compliance with ASME Section XI, paragraphs IWV-3521 and 3522. The Code specifies that check valves shall be exercised to the position required to fulfill their function at a frequency of once every 3 months. If not practical, the Code allows for extending the test frequency to cold shutdowns. The licensee has requested relief from this requirement by specifying that the testing will be conducted during refueling outages. However the "Basis for Relief" states that testing will be conducted during Unit shutdowns, when the flow of the main feedwater to the steam generators is secured. Additional justification is required before relief from exercising the valves during cold shutdowns can be granted.

Acceptable methods which may be used to verify Category C valve closure include visual observation, electrical signal initiated by a position indicating device, observation of

appropriate pressure indication in the system, leak testing, or other positive means. The proposed additional disassembly and visual examination program detailed by the licensee will provide additional pertinent information on valve condition. However, as discussed in the Minutes of the public meetings on Generic Letter 89-04, valve disassembly and inspection is not an acceptable method for the demonstration of leak-tight integrity.

Due to the impracticality of individually leak testing the valves with current system configuration, an interim period is necessary to provide the licensee time to complete the safety analysis review, make changes to the test procedure, and perform the necessary system modifications, if required. Immediate compliance could result in declaring the valves inoperable, and initiating a plant shutdown to either perform testing by methods not yet developed or perform system modifications that may be unnecessary based upon the safety analysis review. It is recommended that an interim relief period of one year or until the next refueling outage, whichever is later, be granted in accordance with 10CFR50.55a(a)(3)(i), provided the licensee performs leakage tests of each set of valves during cold shutdowns and that both valves in the pair are declared inoperable and repaired or replaced if excessive leakage is detected during testing. The proposed alternate program of testing each series of check valves, with the provisions previously mentioned, provides an acceptable level of quality and safety in the interim period. The relief request should be revised to address Category A leak test requirements, in addition to valve closure requirements, as it appears these requirements cannot be met. Appendices D and E identify these valves as Category A/C and refer to this relief request for leak testing.

3.11 Main and Reheat Steam System

3.11.1 Rapid-Acting Valves, Relief Request No. VRR-1

3.11.1.1 *Relief Request:* The licensee has requested relief from testing rapid-acting valves in accordance with ASME Section XI, paragraph IWV-3417(a).

3.11.1.2 *Proposed Alternate Testing:* The licensee has proposed assigning a maximum limiting full-stroke time of 2 seconds and upon exceeding this limit, the valve will be declared inoperable and corrective action will be taken in accordance with paragraph IWV-3417(b).

3.11.1.3 *Licensee's Basis for Relief:* "The stroke time measurements taken during testing of fast-acting valves (those less than 2 seconds) are subject to considerable variation due to conditions unrelated to the material condition of the valve (e.g., test conditions, operator reaction time). In accordance with Reference 2.8, Position 6 [Generic Letter 89-04], an alternate method of evaluating stroke times is considered acceptable."

3.11.1.4 *Evaluation:* An acceptable alternative to the stroke timing requirements of paragraph IWV-3417(a) for rapid-acting valves (normal stroke times of 2 seconds or less) is provided in Generic Letter 89-04, Attachment 1, Position 6. The licensee's proposed

testing meets this position. Therefore, it is recommended that relief be granted in accordance with Generic Letter 89-04. The Generic Letter states: "The staff has determined that relief is granted to follow the alternate testing delineated in Positions 1, 2, 6, 7, 9, and 10, pursuant to 10CFR50.55a(g)(6)(i)."

The relief request states that it is generic. However, it specifically lists valve MS-02082 as the only component to which it applies. Despite this inconsistency, generic relief is recommended.

3.11.2 Service Water To Auxiliary Feedwater Pumps Solenoid Operated Valves, Relief Request No. VRR-20.

3.11.2.1 *Relief Request:* The licensee has requested relief from exercising the auxiliary feedwater pumps cooling water solenoid valves, MS-02090 (Units 1 and 2), in accordance with ASME Section XI, Paragraphs IWV-3413 and IWV-3417.

3.11.2.2 *Proposed Alternate Testing:* In lieu of measuring stroke time, proper operation of the valves will be determined by observing pump bearing cooling water pressure and bearing temperatures. Failure of the valves to operate properly would result in a loss of bearing cooling water pressure at the bearing cooling water inlet.

3.11.2.3 *Licensee Basis For Relief:* "These are enclosed solenoid-operated valves with no remote or local position indication and where the valve design prohibits visual observation of valve operation or position. Thus stroke time measurements are impractical. Failure of a valve to operate properly would result in a lack of bearing cooling water pressure at the bearing cooling water inlet."

3.11.2.4 *Evaluation:* The purpose of an inservice testing program is to monitor each of the solenoid operated valves for degradation. In accordance with ASME Section XI, paragraphs IWV-3413 and 3417, the stroke time of all power operated valves shall be specified by the licensee. For small solenoid operated valves with a stroke time of ten seconds or less, measurements are to be made to the nearest second. If an increase in stroke time of 50% or more is found from the previous test, the licensee is required to increase the test frequency to once per month, until the valve is repaired.

For small solenoid operated valves, such as these, the NRC has recognized that stroke time measurement is difficult, since the valves actuate and stroke normally in two seconds or less. Generic Letter 89-04, Position 6, "Stroke Time Measurement for Rapid Acting Valves," provides an acceptable alternative to the Code requirement of comparing stroke times to previous tests, by allowing a maximum stroke time of two seconds for these valves.

The licensee has requested relief from these stroke time measurements due to the absence of remote and local position indication instrumentation, as well as the lack of

visual observation of valve operation and position due to the valve design. In lieu of these tests, the licensee will monitor the pump bearing cooling water pressure and bearing temperatures during the testing of the associated auxiliary feedwater pump. The licensee has proposed that acceptable measurements of these parameters will be indicative of proper valve operation.

Although no position indication is available on these valves, there are non-intrusive test methods which can be employed to provide stroke time measurements within two seconds, allowing for data collection inconsistencies. Measurement of stroke time for these valves is impractical given the current design and test methods customarily used, however it may not be impractical using other test methods. Valve exercising with no limit on actuation time does not meet the intent of the ASME Code for full stroke time testing of the valves.

These valves are normally closed and are required to open upon start of the auxiliary feedwater pump. Monitoring downstream pump bearing temperature and pressure provides much delayed information on the position of the valve. The licensee should evaluate testing these valves while the pumps are not running by isolating and draining the downstream piping and then opening the valves.

If the Code requirements were immediately imposed, a plant shutdown to perform the testing by methods not yet developed may be required. An interim period is necessary to provide the licensee time to evaluate alternate test methods and determine a means to measure the stroke time of rapid acting solenoid valves. Provided the proposed alternate testing plan is performed quarterly, and if any degradation in these valves is noted, corrective action is taken and the valves declared inoperable; an acceptable level of quality and safety will be provided for the interim period.

It is recommended that an interim relief period of one year, or until the next refueling outage, whichever is later, be granted in accordance with 10CFR50.55a(a)(3)(i), provided the licensee tests these valves quarterly, and if any degradation in these valves is noted, corrective action is taken and the valves declared inoperable.

3.12 Post-Accident Containment Vent/Monitoring System

3.12.1 Post-Accident Containment Vent Containment Isolation Valves, Relief Request No. VRR-34

3.12.1.1 *Relief Request:* The licensee has requested relief from exercising the post-accident containment vent manual containment isolation valves, H2-V-04, 05, 12, 13, 19, 20, 22, and 23 (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraph IWV-3411.

3.12.1.2 *Proposed Alternate Testing:* The licensee proposes to exercise these valves once per year.

3.12.1.3 *Licensee's Basis for Relief:* "These valves are manual valves which remain shut at all times except to perform stroke testing. They are diaphragm-type valves, thus they do not have a disc which can separate from the stem. Frequent flexing of diaphragms is a failure mechanism. These valves use stainless steel in their construction, thus they are susceptible to galling. Frequent stroking of these valves could lead to inoperability rather than improving operability."

3.12.1.4 *Evaluation:* These valves are normally closed manual diaphragm valves that are required to open to vent the containment, providing a long-term method of controlling hydrogen accumulation within the containment following a loss of coolant accident. The licensee has proposed stroke testing these valves once per year in lieu of the Code required quarterly testing, due to the damage which could be caused by testing. The licensee's opinion is that frequent flexing of the diaphragms is a failure mechanism and that the valves are susceptible to galling. However, the licensee has not provided evidence that there is a history of valve degradation due to testing at Point Beach. Additionally, a review of industry experience, for example as documented in NPRDS, regarding the same type of valve used in similar service should be performed to justify extending the test frequency. EPRI Report NP-6526, "Guide for the Application and Use of Valves in Power Plant Systems" states that although diaphragm valves have been tested and operated satisfactorily with cycles in excess of 50,000, a design life of 20,000 cycles or 10 years should be considered. Testing the valves quarterly is well within the recommended 20,000 cycles. Without documented evidence, it appears that the risk associated with the valve not performing its safety function to open, outweighs the risk of valve degradation due to testing. Therefore, it is recommended that relief be denied.

3.13 Reactor Coolant System

3.13.1 Pressurizer Relief Tank Nitrogen Supply Check Valve, Relief Request No. VRR-11

3.13.1.1 *Relief Request:* The licensee has requested relief from exercising valves, RC-00528 (Units 1 and 2), the pressurizer relief tank nitrogen supply check valves, quarterly in accordance with the requirements of ASME Section XI, paragraphs IWV-3521 and 3522.

3.13.1.2 *Proposed Alternate Testing:* The licensee has purposed verifying the valves can fulfill their safety function to close during the 10CFR50, Appendix J leak rate test. This test is performed at refueling outages.

3.13.1.3 *Licensee's Basis for Relief:* "Because nitrogen makeup to the PRT is seldom required, these valves are normally closed. These are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during plant operation or cold shutdown outages is impractical."

3.13.1.4 *Evaluation:* These valves are simple check valves located inside containment that are normally closed. They are opened to provide nitrogen to the pressurizer relief tank. Their safety position is to close to provide containment isolation. The valves are not provided with position indication. Therefore, the only practical means of testing these valves is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields and potentially harsh environments. Performing this test during cold shutdowns would subject plant personnel to high radiation levels, and due to the time required to perform this test, the shutdown could be extended which would be burdensome. It would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valves' ability to close and perform their safety function.

Based on the impracticality of exercising these check valves in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed, and the determination that the licensee's proposed testing provides reasonable assurance of the valves' ability to perform their safety function, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.13.2 Pressurizer Relief Tank Primary Makeup Supply Check Valves, Relief Request No. VRR-18

3.13.2.1 *Relief Request:* The licensee has requested relief from exercising valves, RC-00529 (Units 1 and 2), the pressurizer relief tank primary makeup supply check valves, quarterly in accordance with the requirements of ASME Section XI, paragraphs IWV-3521 and 3522.

3.13.2.2 *Proposed Alternate Testing:* The licensee has proposed verifying the valves can fulfill their safety function to close during the 10CFR50, Appendix J leak rate test. This test is performed at refueling outages.

3.13.2.3 *Licensee's Basis for Relief:* "These are simple, normally-closed, check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. Performing such tests of these valves involves considerable effort and system re-alignment such that routine testing during plant operation or cold shutdown outages is impractical."

3.13.2.4 *Evaluation:* These valves are simple check valves located inside containment that are normally closed. They are opened to provide makeup water to, or depressurize the pressurizer relief tank. Their safety position is to close to provide containment isolation. The valves are not provided with position indication. Therefore, the only practical means of testing these valves is a leakage test. The test connections are located inside containment and would require a containment entry to perform this test. Containment entries are not routinely performed during power operation due to the high radiation fields

and potentially harsh environments. Performing this test during cold shutdowns would subject plant personnel to high radiation levels, and due to the time required to perform this test, the shutdown could be extended which would be burdensome. It would be impractical to require the licensee to perform this test quarterly during power operation or during cold shutdowns. Performing the Appendix J leak rate test during refueling outages provides reasonable assurance of the valves' ability to close and perform their safety function.

Based on the impracticality of exercising these check valves in accordance with the frequency required by ASME Section XI, the burden on the licensee if these Code requirements were imposed, and the determination that the licensee's proposed testing provides reasonable assurance of the valves' ability to perform its safety function, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.14 Safety Injection and Residual Heat Removal System

3.14.1 Safety Injection Pressure Isolation Check Valves, Relief Request No. VRR-2

3.14.1.1 *Relief Request:* The licensee has requested relief from exercising the safety injection pressure isolation check valves, SI-00845A through F (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3[illegible] , and 3522.

3.14.1.2 *Proposed Alternate Testing:* The licensee has proposed full-stroke exercising the valves open at each refueling outage and verifying valve closure in accordance with Technical Specification 15.3.16.

3.14.1.3 *Licensee's Basis for Relief:* "Full stroke exercising of these valves would require operating a safety injection pump at nominal accident flowrate and injecting into the reactor coolant system since no full flow recirculation path exists. During normal operation the safety injection discharge pressure of 1500 psig is insufficient to overcome reactor coolant system pressure. During shutdown conditions, injection via the SIS pumps is precluded by restrictions related to low-temperature over-pressurization protection concerns in accordance with Technical Specifications, Section 15.3.15.B.

The lack of recirculation flowpath precludes partial stroking during operation and cold shutdown conditions. These are simple check valves with no external means of position indication, thus the only practical means of verifying closure is by performing a leak test or backflow test. Such testing requires that the valve first be taken out of its safety position when it may operationally be left undisturbed, i.e., moved solely for test purposes. This reduction in plant safety is not warranted. Additionally, such testing occurs in radiation areas, thereby increasing personnel radiation exposure."

3.14.1.4 *Evaluation:* These normally closed check valves are required to open to admit flow from the high head safety injection pumps into the reactor coolant system. In addition to

this open safety function, the valves are required to normally be closed and leak tight to isolate the high pressure reactor coolant system from the lower pressure safety injection system and to close to prevent backflow from the SI accumulators and RHR system. These valves cannot be practically full-stroke exercised during power operation because the only full-flow path is into the RCS, and the SI pumps cannot overcome the normal operating RCS pressure. Additionally, the relatively cooler injection water could result in thermal and pressure transients if testing could be performed at power. Full-stroke testing during cold shutdowns is impractical due to low-temperature over-pressurization concerns. In accordance with Technical Specification 15.3.15, when the RCS cold legs are $\leq$ 275°F, one SI pump shall be demonstrated *inoperable*. The PORV's setpoints are determined assuming a worse case transient of one SI pump discharging into the RCS. However, it would be imprudent to challenge the low-temperature over-pressure Protection System by operating the other SI pump. If the Code requirements were imposed, the plant would have to shutdown and the RCS be vented in order to perform testing. This would be burdensome.

The licensee has stated that a lack of recirculative flowpath precludes partial stroking during operation and cold shutdown conditions. It appears, based on a review of drawings 110E035 and 110E017, that 3/4" test lines are available for partial-stroke testing valves SI-00845A,B,E, and F. There is no practical method of partial-stroke testing valves SI-00845C and D due to the lack of test lines, as stated in the relief request.

Although partial-stroke testing valves SI-00845A,B,E, and F open is possible, it is impractical to perform during operation or every cold shutdown because reverse flow or leakage testing would be required to assure the valve's ability to prevent an intersystem LOCA. These valves are located inside containment and it is impractical to leak test these valves during operation due to high radiation and personnel safety concerns. Leak testing these valves during every cold shutdown would be burdensome because it could delay reactor startup due to the time required to perform the test.

The licensee's proposal to full-stroke exercise valves SI-00845C and D open each refueling outage and verify reverse closure by leak testing in accordance with Technical Specification 15.4.16 is a reasonable alternative to the requirements of the Code. Therefore, based on the impracticality of complying with the Code frequency requirements, the burden on the licensee if the Code requirements were imposed and considering that testing the valves in accordance with the licensee's proposal is a reasonable alternative to the requirements of the Code, it is recommended that relief be granted for valves SI-00845C and D pursuant to 10CFR50.55a(g)(6)(i).

The licensee's proposal to exercise valves SI-00845A,B,E, and F open each refueling outage however, is not acceptable due to the existence of test lines. Relief from exercising the valves quarterly or every cold shutdown can be recommended pursuant to 10CFR50.55a(g)(6)(i), provided the licensee partial-stroke exercises the valves during the Technical Specification 15.4.16 cold shutdown leak tests and full-stroke exercises the valves each refueling outage.

3.14.2 Safety Injection and RHR Pressure Isolation Valves, Relief Request No. VRR-3

3.14.2.1 *Relief Request:* The licensee has requested relief from exercising the Safety Injection (SI) and RHR pressure isolation valves, SI-00853A through D (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.14.2.2 *Proposed Alternate Testing:* The licensee has proposed full-stroke exercising and leakage testing the valves each refueling outages and during cold shutdowns when "Event V" valve testing is required. In accordance with Technical Specification 15.4.16, periodic leakage testing of pressure isolation valves ("Event V" valve testing) is required each time the plant is placed in a cold shutdown condition for 72 hours if testing has not been accomplished in the preceding 9 months; prior to returning the valve to service after maintenance, repair or replacement work is performed; and every refueling outage.

3.14.2.3 *Licensee's Basis for Relief:* "Full or partial stroking during normal operation is not possible because low-head safety injection pump discharge pressure is insufficient to overcome reactor coolant system pressure. Even if pump discharge pressure were adequate, any stroking would cause the injection of cold borated water into the system, resulting in power and thermal transients.

Stroke testing the subject valves during cold shutdowns is possible, however, not desirable unless "Event V" leak testing is also scheduled. The "Event V" testing assures valve integrity, thus minimizing the possibility of an inter-system LOCA which bypasses containment. Exercising these valves during every cold shutdown may reduce the assurance that a valve is, in fact, properly seated, as established via the "Event V" testing."

3.14.2.4 *Evaluation:* These check valves are normally closed valves that are required to open to admit flow from the low-head safety injection pumps (RHR) and high head safety injection pumps (SI) into the reactor vessel. Valves SI-00853A and B open to admit RHR flow only. In addition to this open safety function, the valves are required to close and be leak tight to isolate the high pressure reactor coolant system (RCS) from the lower pressure RHR or SI systems. These valves cannot be practically full- or partial-stroked open during power operation because the only flow path is into the RCS, and the SI or RHR pumps cannot overcome the normal operating RCS pressure. Additionally, the relatively cooler injection water could result in thermal and power transients if testing could be performed at power. Full-stroke testing during cold shutdowns is possible. However, it is impractical to exercise these valves open every cold shutdown because reverse flow or leakage testing would be required to assure the valve's ability to prevent an inter-system LOCA. These valves are located inside containment and it is impractical to leak test these valves during operation due to high radiation and personnel safety concerns. Leak testing these valves during every cold shutdown would be burdensome, because it could delay reactor startup due to the time to perform the test. The licensee's proposal to full-stroke exercise the valves open and verify reverse closure by leakage test each refueling outage and each time the plant is placed in a cold shutdown condition for 72 hours, if testing has not been

accomplished in the preceding 9 months, is a reasonable alternative to the requirements of the Code. It is assumed that the valves will be full-flow exercised, as well as leak tested prior to returning the valve to service after maintenance, repair or replacement, in accordance with Section XI, paragraph IWV-3200. Therefore, based on the impracticality of complying with the Code frequency requirements, the burden on the licensee if the Code requirements were imposed and considering that exercising these valves in accordance with the test frequency required by the Point Beach Technical Specification 15.4.16 is a reasonable alternative to the Code, it is recommended that relief be granted pursuant to 10CFR50.55a(g)(6)(i).

3.14.3 Safety Injection and Safety Injection Accumulator Check Valves, Relief Request No. VRR-4

3.14.3.1 *Relief Request:* The licensee has requested relief from exercising the safety injection and safety injection accumulator check valves, SI-00867A and B and SI-00842A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.14.3.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves open at each refueling outage and at each cold shutdown which requires "Event V" testing in accordance with Technical Specification 15.3.16. Valve SI-00867B will also be partial-stroke exercised at each cold shutdown which utilizes an RHR pump.

Valves SI-00867A and B will be exercised closed in accordance with Technical Specification 15.3.16, "Reactor Coolant System Pressure Isolation Valve Leakage Tests." Valves SI-00842A and B will be exercised closed by a leakage test quarterly.

Additionally, valves SI-00842A and 867A and B will be disassembled and exercised at least once each 10 years. If a condition is discovered during an inspection that would have prevented the valve from stroking full open, a second "identical valve in the same Unit" will be opened and inspected. Also, during the next refueling outage on the other Unit, the sister valve to the inoperable valve will be inspected. If a second valve is found inoperable in the expanded sample, all remaining valves will be inspected during the current outage for the Unit refueling and during the next scheduled refueling outage from the Unit not in a refueling outage.

3.14.3.3 *Licensee's Basis for Relief:* "During normal operation, neither safety injection pump discharge pressure of 1500 psig nor accumulator pressure of 760 psig, are sufficient to overcome reactor coolant system pressure. Full or partial stroke testing is, therefore, not possible.

During cold shutdown, partial or full stroke testing of valves SI-00867A, SI-00842A, and SI-00842B via the use of the accumulators or safety injection pumps is not permitted

so as to prevent the possibility of a low-temperature over-pressurization event. Partial stroking of SI-00867B is, however, possible using the RHR pumps.

A full-stroke test by dumping the accumulator to the reactor coolant system could be possible during refueling when the reactor vessel head is removed, but the volume and flowrate required for the test could result in damage to the core internals. There is also the potential of forcing a nitrogen bubble into the reactor coolant system piping and refueling cavity resulting in possible safety implications which makes this testing concept inadvisable." (VRR-4, IST Program, Rev. 1)

The licensee has also provided a basis for extending the inspection interval beyond that allowed by Generic Letter 89-04, Attachment 1, Position 2 and has referenced their response to the Generic Letter dated October 3, 1989 for the "justification of the long frequency surveillance internals..." Generic Letter 89-04, Position 2 requires a disassembly and inspection of each valve in the valve group. "Valves 2-SI-00842A and 2-SI-00867A were disassembled in 1987. Valve 2-SI-842B was not disassembled..." (VRR-4)

"Because of their elevation and their proximity to the residual heat removal connection to the reactor coolant system, Valves 867B and 842B cannot be opened and inspected unless the entire core is unloaded and the reactor coolant system is drained to the elevation of the reactor vessel nozzles. The need to achieve this plant condition is rare. It has only occurred once for Unit 1 and once for Unit 2. To achieve the required plant condition and to disassemble and inspect Valve 842B would require approximately five additional critical path days." (April 2, 1987 letter from Wisconsin Electric Power Company to USNRC attached to the October 3, 1989 letter.)

"Over the last 16 years we have observed nothing which would be indicative of a problem that would inhibit any of the check valves' ability to stroke fully open. The 867A check valves on both units were opened and inspected after approximately six years of service due to suspected seat leakage. In both cases, seating surface wear was observed but no problems were noted with either valve's ability to stroke open freely." (April 2, 1987 Letter)

"Four valves, two per unit (SI-842A and SI-867A), have been opened and inspected. The results of these inspections are documented and have been reviewed. No problems were noted which could affect valve operability.

Two other valves (1SI-842B and 2SI-842B), will be disassembled and inspected during the upcoming refueling outages. These results will be reviewed when available." (Response to Generic Letter 89-04, October 3, 1989)

"In response to NRC Information Notice 88-85, in 1989 the retaining block studs in each of the valves in Unit 2 were replaced and in the process each of these valves were

disassembled and inspected for freedom of motion as per the requirements of NRC Generic Letter 89-04, Position 2.

During all inspections that have been performed on these valves to date, no defects have been discovered that would signify that they were not fully functional and capable of performing their required function to full stroke. These valves have now performed acceptably at Point Beach for over 19 years with no indications of degradation. This is in agreement with industry experience that shows these valves to be extremely reliable." (VRR-4)

"A listing of the reported failures for valves of this type was requested from the INPO NPRDS data. There were 22 failures reported, including three failures at Point Beach. All of these failures involved leakage past the seat. There were not reported cases of failure of these valves to open, or operate freely." (Response to Generic Letter 89-04, October 3, 1989)

"These six valves have been reviewed against the EPRI Installation Guidelines. It was noted that all but one valve (1SI-842A) is located close to a source of turbulence. The past maintenance history has identified no problems. Recommendations as a result of this review was to inspect and replace the retaining block hold down studs." (Response to Generic Letter 89-04, October 3, 1989)

3.14.3.4 *Evaluation:* These 10 inch Anchor/Darling swing disk check valves perform a safety function in both the open and closed position. Closed, they prevent leakage from the high pressure Reactor Coolant System (RCS) to the lower pressure SI system. During Emergency Core Cooling System injection, these valves open allowing flow from the SI pumps and accumulators into the RCS. These valves cannot be full-stroke exercised quarterly during power operation because the only flow path is into the RCS and the SI pumps' and accumulators' operating pressure is less than the normal RCS operating pressure, preventing flow into the RCS. The safety injection system test line is inadequate for full-stroke exercising the accumulator check valves due to its size. Additionally, these valves cannot be full-stroke exercised at cold shutdowns due to the low-temperature overpressurization concerns, or at refueling outages due to the potential damage to the core internals.

ASME Section XI requires check valves to be exercised to the positions in which they perform their safety functions. A check valve's full-stroke to the open position may be verified by passing the maximum required accident condition flow through the valve. Position 1 of Generic Letter 89-04 allows the use of alternate techniques to verify that the valve opens sufficiently to pass the maximum required accident flowrate, such as non-intrusive methods, when full-stroke testing is impractical. Generic Letter 89-04, Position 2 also provides valve disassembly and inspection as an acceptable alternative. The NRC staff position is that where it is burdensome to disassemble and inspect all valves each refueling outage, a sample plan for groups of identical valves in similar applications may

be employed. One valve in the group must be inspected each refueling outage such that each valve is inspected every six years. Extending the inspection interval may be considered in cases of "extreme hardship" where the extension is supported by actual in-plant data from previous testing.

The licensee has proposed inspecting six of eight valves (including three valves from each Unit) once every ten years. For each Unit one of the three valves will be inspected every five to six years. The other two valves are not to be inspected unless there are two failures detected from inspecting the other six valves. In support of extending the inspection interval, the licensee has stated that valves SI-00842A and 67A from Unit 2 were disassembled in 1987 and each of the valves in Unit 2 were inspected in 1989 in response to Information Notice 88-85. Additionally 1-SI-00867A was inspected after six years of service (~ 1977) and 1-SI-00842A was inspected (Date unknown). Position 2 of Generic Letter 89-04 requires that each valve be disassembled and inspected and that the valves' condition and capability to be full-stroked be documented in detail.

The licensee has reported, in their response to Generic Letter 89-04, their review of INPO NPRDS data. Based on the 1989 review, there were no cases of similar valves failing to open. Historically however, there have been various problems with Anchor/Darling swing check valves including retaining block stud cracking (NRC Bulletin No. 89-02) and hinge pin problems (NRC Information Notice No. 81-35).

It would be excessively burdensome for the licensee to inspect all eight valves each refueling outage. Additionally, it would be an extreme hardship to require the licensee to comply with the six year inspection interval for the two valves which require the reactor to be defueled and drained in order to be tested (SI-00842B). However, the licensee has not provided sufficient evidence that the burden of inspecting the remaining six valves in accordance with Position 2 is extreme. Therefore, is recommended that relief only be granted for valves SI-00842B (for both Units) in accordance with Generic Letter 89-04, Attachment 1, Position 2 provided the licensee has disassembled and inspected the valves and the valves' condition and capability to be full-stroked is documented in detail. Relief can only be recommended for the remaining valves provided they are disassembled and inspected in accordance with Position 2 (including the frequency). Additionally, if the valve disassembled is not capable of being full-stroke exercised, or there is binding or failure of valve intervals, the other two valves in the group for that Unit shall be inspected during the same outage. The other Unit's three valves shall be inspected at the next scheduled refueling outage. If a second failure is detected, valves SI-00842B shall also be inspected. Otherwise, it is recommended that relief be denied.

3.14.4 RWST to RHR Pump Suction Check Valves, Relief Request No. VRR-6

3.14.4.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the Refueling Water Storage Tank (RWST) to RHR pump suction check valves, SI-00854A

and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.14.4.2 *Proposed Alternate Testing:* The licensee has proposed full-stroke exercising the valves during plant refueling outages.

3.14.4.3 *Licensee's Basis for Relief:* "Valve stroking is not possible during normal operation because the RHR pump discharge pressure is insufficient to overcome reactor coolant system pressure during normal operation. During cold shutdown periods, full-stroke testing of these valves is not possible because the reactor coolant system does not contain a sufficient expansion volume and there is no return flowpath to the refueling water storage tank for recirculation."

3.14.4.4 *Evaluation:* The function of this normally closed check valve is to open to permit flow from the RWST to the RHR pump suction. The valve is required to close to prevent backflow from the RHR pump suction header (including when RHR takes suction from the RCS) to the RWST. A full flow test of the valves would require the RHR pumps to inject water into the RCS. During power operation the RHR pump head is inadequate to inject into the RCS.

During cold shutdowns RHR is in operation with the suction and discharge to the RCS to remove decay heat. Injecting the maximum required accident condition flowrate into the RCS could subject the RCS to a low temperature overpressurization. Additionally, the RCS could not accommodate the flow required due to the limited letdown capacity.

The licensee has stated that there is no return flowpath to the RWST for recirculation. A review of the Point Beach drawings provided, 110E029, Sheet 1, 110E035, Sheet 2, 110E018, Sheet 1, and 110E017, Sheet 2, has identified a "refueling water return" path to the RWST through manual valve RH-742. The licensee should provide an explanation in the relief request why these valves cannot be tested using this flowpath. NRC IE Information Notice 87-01, "RHR Valve Misalignment Causes Degradation of ECCS in PWRs," should be reviewed. Therefore, without justification for not using this flowpath, relief cannot be recommended.

3.14.5 Safety Injection Pump's Discharge Check Valves, Relief Request No. VRR-7

3.14.5.1 *Relief Request:* The licensee has requested relief from full-flow exercising the safety injection pumps' discharge check valves, SI-00889A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraph IWV-3521 and 3522.

3.14.5.2 *Proposed Alternate Testing:* The licensee has proposed partially-stroking these valves quarterly and full-stroke exercising them at refueling outages.

3.14.5.3 *Licensee's Basis for Relief:* "Full stroke exercising of these valves would require operating a safety injection pump at nominal accident flowrate and injecting into the reactor coolant system since no full flow recirculation path exists. During normal operation the safety injection pump discharge pressure of 1500 psig is insufficient to overcome reactor coolant system pressure. During cold shutdown conditions, injection via the SIS pumps is precluded by restrictions related to low-temperature over-pressurization protection concerns."

3.14.5.4 *Evaluation:* These check valves perform a safety function in the open position to allow flow from the safety injection pumps to the reactor coolant system (RCS). These valves cannot be practically full-stroke exercised during power operation because the only full-flow path is into the RCS and the discharge pressure of the pumps cannot overcome the normal RCS operating pressure. The safety injection test lineup only permits partial flowrates due to the return line's size. It is impractical to exercise these valves during cold shutdowns because a low-temperature over-pressure condition could occur. These valves could only be full stroke exercised quarterly or during cold shutdowns if extensive system modifications were performed, such as full-flow test loops. These modifications would be burdensome to the licensee.

The licensee's proposal to partial stroke exercise the valves quarterly and full stroke exercise them during refueling outages provides reasonable assurance of the valves operational readiness.

Based on the impracticality of full-stroke exercising these valves quarterly or during cold shutdowns, the burden on the licensee if these Code requirements were imposed and, considering that the proposed alternate testing provides reasonable assurance of operational readiness, it is recommended that relief be granted in accordance with 10CFR50.55a(g)(6)(i).

3.14.6 Safety Injection and RHR Pressure Isolation Valves. Relief Request No. VRR-22

3.14.6.1 *Relief Request:* The licensee has requested relief from evaluating the leakage of pressure isolation valves (PIV) SI-00845A through F, 00853A through D, and SI-00867A and B (Units 1 and 2), in accordance with ASME Section XI, paragraph IWV-3427(b).

3.14.6.2 *Proposed Alternate Testing:* The licensee has proposed evaluating the leakage in accordance with the acceptance criteria given in Technical Specification 15.3.16 for pressure isolation valves.

3.14.6.3 *Licensee's Basis for Relief:* "Leak testing of these valves is primarily for the purpose of confirming their capability of preventing over-pressurization and catastrophic failure to the safety injection piping and components. In this regard, special leakage acceptance criteria is established and included in the Point Beach Technical Specifications 15.3.16 that addresses the question of valve integrity in a more appropriate manner for these valves.

Satisfying both the Technical Specification and the Code acceptance criteria is not warranted and implementation would be difficult and confusing."

3.14.6.4 *Evaluation:* Position 4 of Generic Letter 89-04, Attachment 1 states that all PIVs listed in plant Technical Specification should be listed in the IST program as category A or AC valves and that the Technical Specification requirements be referenced in the IST Program. The licensee has requested relief from evaluating the pressure isolation valves in accordance with paragraph IWV-3427(b) and has proposed utilizing the Technical Specification. The Point Beach Technical Specification acceptance criteria specifies the maximum permissible leakage rate for the pressure isolation valves to be 5 gpm. Leakage rates greater than 1 gpm and less than or equal to 5 gpm are unacceptable (and require corrective action) if the latest measured rate exceeds the rate determined by the previous test by an amount that reduces the margin between the measured leakage rate and 5 gpm by 50% or greater. This Technical Specification requirement exceeds the requirements of IWV-3427(b) which requires only that the test frequency be increased. The Technical Specifications considers leakage rates less than or equal to 1 gpm to be acceptable. Although the Technical Specifications do not require evaluations based on previous leak tests as required by IWV-3427(b), leakage rates 1 gpm and less cannot reduce the margin between measured leakage and 5 gpm by 50%.

The Technical Specifications do not require repairing or replacing a valve if the tests show a leakage rate increasing with time and a projection based on three or more tests indicates that the leakage rate of the next scheduled test will exceed the maximum permissible leakage rate of greater than 10%. However, the Technical Specification acceptance criteria discussed above provides reasonable assurance of the pressure isolation valves ability to isolate the RCS from an attached low pressure system and to detect valve degradation. Therefore it is recommended that relief from evaluating leakage in accordance with paragraph IWV-3427(b) be granted in accordance with 10CFR50.55a(a)(3)(i).

Note: Relief Request No. VRR-22 requests relief from evaluating valves 6 inches and greater in accordance with the Code. In accordance with the IST Program and referenced drawings, valves SI-00845A through F are 2 inches; therefore, relief is not required for these valves.

3.14.7 Safety Injection Pumps' Minimum Flow Line Check Valves, Relief Request No. VRR-27.

3.14.7.1 *Relief Request:* The licensee has requested relief from exercising the safety injection pumps' minimum flow line check valves, SI-00891A and B (Units 1 and 2), quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.14.7.2 *Proposed Alternate Testing:* The licensee has proposed partial-stroke exercising the valves quarterly and disassembling and inspecting one valve each refueling outage on a

rotational basis. If one valve is found inoperable, the other valve in that Unit will be inspected during the same outage.

3.14.7.3 *Licensee's Basis for Relief:* "There is no flow instrumentation available to verify valve full-stroke exercising as required by Reference 28 (Generic Letter 89-04), Position 1."

3.14.7.4 *Evaluation:* The safety function of these valves to open provides a minimum flow return line to prevent pump degradation during no or low injection flow conditions. There is no flow instrumentation currently installed in the flowpath through these check valves. Therefore, it is impractical to full-flow exercise these valves during any plant condition in accordance with Generic Letter 89-04, Position 1. Compliance with the Code requirements would require installation of flow instrumentation and possibly extensive piping system modifications. The licensee has proposed disassembly and inspection in accordance with Generic Letter 89-04, Position 2 as an alternative to this full-stroke exercising requirement. Position 2 allows a sampling plan for groups of identical valves in similar applications. Each of the two sample groups proposed includes both valves from one Unit. However, the licensee has not provided documentation that the valves are the same design and have the same service conditions including valve orientation.

Although valve disassembly and inspection in accordance with Position 2 of the Generic Letter is acceptable, the NRC staff recommends that other methods such as non-intrusive techniques be used which can verify full-stroke exercising. Generic Letter, Position 1 and Question 8 in the minutes of the public meetings in Generic Letter 89-04 discuss the qualification program required for these alternate techniques.

Therefore, it is recommended that relief from full-stroke exercising the valves quarterly be granted pursuant to Generic Letter 89-04 provided the licensee ensures that the program meets all the criteria, including the criteria for determining groups of valves, as provided in the Generic Letter, Attachment 1, Position 2.

Note: The licensee's IST Program requires that the valves only be tested open. The licensee should review the function of these valves to ensure that they are not required to close to prevent flow interactions between the safety injection trains (reference TER Section 5.39).

3.15 Service Water System

3.15.1 Service Water to AFW Pump Check Valves, Relief Request No. VRR-15

3.15.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising the service water to the steam driven auxiliary feedwater pump and turbine check valves; SW-00112A (Unit 2), 00135A (Unit 1); quarterly in accordance with ASME Section XI, paragraphs IWV-3521 and 3522.

3.15.1.2 *Proposed Alternate Testing:* The licensee has proposed partial stroke exercising the valves quarterly and disassembling and inspecting the valves each refueling outage.

3.15.1.3 *Licensee's Basis for Relief:* "There is no practical means of measuring flow through these check valves. In accordance with NRC Generic Letter, an acceptable alternative is a program of valve disassembly and inspection to verify operability."

3.15.1.4 *Evaluation:* ASME Section XI, paragraph IWV-3522 requires for valves that are to be tested in the open position, confirmation that the disk moves away from the seat by visual observation, by an electrical signal initiated by a position indicating device, by observation of substantially free flow through the valve, or by other positive means. The NRC staff believes that other positive means could include confirmation of valve disk position by qualified methods, including non-intrusive methods, and valve disassembly and inspection. Position 2 of Attachment 1 of NRC Generic Letter 89-04 provides the criteria for utilizing valve disassembly and inspection as an alternative to full flow testing of check valves. Partial valve stroking quarterly or during cold shutdowns is required if possible. The NRC recommends, however, that other techniques such as non-intrusive test methods be utilized, instead of disassembly and inspection. Position 1 of Attachment 1 to NRC Generic Letter 89-04 and the response to Question 8 in the Minutes of the Public Meetings on Generic Letter 89-04 provide guidance on qualifying alternative techniques for meeting ASME Code requirements.

There is no installed instrumentation for verifying sufficient flow to full-stroke exercise the valves open. The licensee has proposed partial-stroke exercising the valves and utilizing valve disassembly and inspection. The licensee has not, however, provided sufficient information to ascertain that the valve disassembly/inspection program meets all the criteria established in Position 2 of the Generic Letter including visually inspecting the valve internals for worn or corroded parts and manually exercising the valve disk.

Therefore, it is recommended that relief from full-stroke exercising the valves quarterly be granted in accordance with Generic Letter 89-04 provided the licensee's disassembly/inspection program meets all the criteria of Position 2 of Generic Letter 89-04.

3.16 Containment Isolation Valves

3.16.1 Containment Isolation Valves, Relief Request No. VRR-23

3.16.1.1 *Relief Request:* The licensee has requested relief from specifying individual leakage rates in accordance with ASME Section XI, paragraphs IWV-3426 and 3427 for specific containment isolation valves.

Note: Relief Request No. VRR-23 is referenced in Appendix E for the Unit 2 Auxiliary Steam Valves; HV-0263, 286, 287, 636 and 637, and Instrument Air Valves, IA-

1315 and 1316. The relief request, however, does not include these valves in Table VR-5-1. TER Section 3.16.1.4 only evaluates those valves identified in the relief request. The licensee should review Appendices D and E and revise the relief request to address any additional valves. Additionally, Waste Disposal Valve WL-00816 is identified in Appendices D and E as SF-00816.

3.16.1.2 *Proposed Alternate Testing:* The licensee has proposed assigning maximum leak rates to combinations of valves where individual valve testing is impractical. The test results will be evaluated for corrective action in accordance with paragraphs IWV-3426 and 3427 and 10CFR50, Appendix J.

3.16.1.3 *Licensee's Basis for Relief:* "Due to the configuration of the system piping and components, in many cases individual leakage rate tests are impractical. In these cases, it is customary to perform tests with the test volume between valves in series or behind valves in parallel paths. This concept of testing and evaluation is consistent with the intent of 10CFR50, Appendix J."

3.16.1.4 *Evaluation:* Where it is impractical to leak test containment isolation valves individually due to system design and/or lack of test connections, leak rate testing them as a group should demonstrate the leak tight integrity of the group. The licensee has stated that a maximum leakage limit will be assigned to combinations of valves and not to an individual valve. This limitation is acceptable provided that the limiting leak rate for the valve combination is conservative considering the number and size of the valves in the group and does not allow excessive leakage through any particular valve in the group to go uncorrected.

According to the piping and instrument diagrams for the Auxiliary Steam, Chemical and Volume Control, Containment Spray, Heating and Ventilation, and Waste Disposal Systems, there are an inadequate number of test connections to individually leak test the valves referenced in the relief request. It would be burdensome to require these valves to be leak tested individually because the systems would have to be substantially redesigned. The only practical method to leak test these valves appears to be as a group with a maximum permissible leakage rate assigned to the penetration.

Based on the impracticality of individually leak testing these valves, the burden on the licensee if these Code requirements were imposed, and considering that the proposed alternative should provide reasonable assurance of operational readiness, relief may be granted as requested for the Auxiliary Steam [HV-00632, 635, 808, 809, 818 (Unit 1 only)], Chemical and Volume Control [CV-00323B, 384B (Unit 1 and 2)], Containment Spray [SI-00862A&B, 864A&B (Unit 1 and 2)], Heating and Ventilation [VNPSE-03212, 3213, 3244, 3245 (Unit 1 and 2)], and Waste Disposal System Valves [WL-00816, 1698, 1723, 1728, 1003A&B (Unit 1 and 2)], in accordance with 10CFR50.55a(g)(6)(i) provided that the limiting leak rate for the penetration is conservative and does not allow excessive leakage through any particular valve in the group to go uncorrected.

It appears based on a review of the Component Cooling Water [CC-00755A&B, 759A&B (Unit 1 and 2)], Instrument Air [IA-01182, 1184 (Unit 1 only)] and Post-Accident Containment Venting and Monitoring Systems [H2-V-04, 5, 6, 7, 12, 13, 19, 20, 22, 23 (Unit 1 and 2)], that it is possible to determine individual leakage rates for the valves referenced in the relief request. Therefore, it is recommended that relief be denied for these valves.

3.16.2 Containment Isolation Valves NPS 6 and Greater, Relief Request No. VRR-29

3.16.2.1 *Relief Request:* The licensee has request relief from evaluating containment isolation valves' (CIVs) NPS 6 and greater leakage rates in accordance with ASME Section XI, paragraph IWV-3427(b).

3.16.2.2 *Proposed Alternate Testing:* The licensee has proposed evaluating CIV leakage rates in accordance with paragraphs IWV-3426 and 3427(a).

3.16.2.3 *Licensee's Basis for Relief:* "The usefulness of applying this requirement does not justify the burden of compliance. This position is supported by NRC Generic Letter, Position 10."

3.16.2.4 *Evaluation:* This relief request complies with Generic Letter 89-04, Attachment 1, Position 10, and it is recommended that relief from evaluating leakage in accordance with paragraph IWV-3427(b) be granted in accordance with the Generic Letter.

3.17 Generic Relief Requests

3.17.1 Valves Tested During Cold Shutdowns, Relief Request No. VRR-5

3.17.1.1 *Relief Request:* The licensee has requested relief from full-stroke exercising all valves deferred to cold shutdowns each cold shutdown in accordance with ASME Section XI, paragraphs IWV-3412 and 3522.

3.17.1.2 *Proposed Alternate Testing:* The licensee has proposed commencing valve exercising within 48 hours of achieving cold shutdown. If an outage is sufficiently long, testing need not be commenced in 48 hours provided all valves required to be tested during cold shutdown will be tested prior to plant startup. Valve testing need not be performed more often than once every three months except as provided for in IWV-3417(a). Completion of all valve testing during a cold shutdown is not required if plant conditions preclude testing of specific valves or if the length of the shutdown period is insufficient to complete all testing. Testing not completed prior to startup will be rescheduled for the next cold shutdown in a sequence such that the test schedule does not omit nor favor certain valves or groups of valves.

3.17.1.3 *Licensee's Basis for Relief:* "In many instances testing of all valves designated for testing during cold shutdown cannot be completed due to the brevity of an outage or the

lack of plant conditions needed for testing specific valves. It has been the policy of the NRC that if testing commences in a reasonable time and reasonable efforts are made to test all valves, then outage extension or significant changes in plant conditions are not required when the only reason is to provide the opportunity for completion of valve testing. ASME/ANSI OMa-1987, Operation and Maintenance of Nuclear Power Plants, Part 10 (Paragraphs 4.2.1.2 and 4.3.2.2) recognizes this issue and allows deferred testing."

3.17.1.4 *Evaluation:* Due to the hardship that delaying plant startup places on a licensee, the NRC does not require completion of all testing identified to be performed during cold shutdown prior to startup from each cold shutdown. Requiring completion of all testing prior to startup could delay the return to power, which would be costly. The proposed alternate test frequency, as stated above (with the exception discussed below), agrees with previously approved alternatives for valves that can be tested during any cold shutdown and complies with ASME/ANSI OMa-1988, Part 10. OM Part 10 is referenced in the 1989 Edition of Section XI. This Edition has been referenced in 10CFR50 in a proposed rule. For these valves this alternate test frequency should not have an adverse effect on the assessment of operational readiness. Therefore, the licensee's proposal provides a reasonable alternative to the Code test frequency requirements.

However, the licensee has included the following statement in their request "Completion of all valve testing during a cold shutdown outage is not required if plant conditions preclude testing of specific valves..." For any specific valve, or class of valves, that cannot be tested during each cold shutdown of sufficient duration to complete all testing, a relief request must be submitted and approved by NRC prior to implementation since the test interval for these valves could exceed that allowed by Section XI. The relief request should identify the valves and the specific plant conditions when testing is impractical.

Therefore, based on the determination that the licensee's proposal provides a reasonable alternative to the Code test frequency requirements and considering the hardship on the licensee without a compensating increase in safety, it is recommended that relief be granted for valves that can be tested during any cold shutdown in accordance with 10CFR50.55a(a)(3)(ii). Generic relief should be denied for valves that cannot be tested during any cold shutdown of sufficient duration to complete cold shutdown testing.

4.0 COLD SHUTDOWN JUSTIFICATIONS

As part of the inservice test program update, Wisconsin Electric Power Company has proposed that specific valves in the Point Beach Nuclear Plant can only be tested during cold shutdown instead of quarterly, as required by ASME Section XI. The basis for these alternative test frequencies include impracticality due to equipment and operational limitations, potential equipment damage, reduction in safety, or disruption of reactor operation. A total of 30 separate justifications were submitted. Each justification was reviewed to verify its technical basis. All justifications were found to be acceptable, with

the exception of CSJ-17, 22 and 24. Concerns with these three justifications are provided below.

4.1 The justification provided in CSJ-22 appears not to address the normally closed motor-operated valves, SI-00878A and C. These valves allow flow from the SI pump discharge into the RCS and are unrelated to the SI accumulator's injection path as discussed in the justification.

4.2 CSJ-24 states that exercising the SI pump suction valves from the BAST, SI-00826B and C, requires isolating valve SI-00826A and that this action would isolate all water sources to both SI pumps. Isolating SI-00826A appears not to affect the SI pumps' RWST suction path or the BAST's water volume. Therefore, testing these valves quarterly appears to be practical.

4.3 In accordance with Appendix D, CSJ-17 applies to MS-02018CS and DS. The CSJ incorrectly identifies the subject valves. TER Section 5.7 addresses additional concerns related to the MSIVs.

5.0 IST PROGRAM ANOMALIES AND ACTION ITEMS

ASME Section XI inconsistencies, omissions, and required licensee actions identified during the review of the licensee's inservice testing program are summarized below. The licensee should resolve these items in accordance with the evaluations presented in this report.

5.1 As discussed in TER Section 1, the relief request status provided in the IST Program is misleading. Relief requests submitted with the ten-year update are not approved by Generic Letter 89-04, unless the relief requests comply with the positions provided in Attachment 1 of the Generic Letter.

5.2 Interpretation i.1.3 provided in the IST Program Introduction states that, "Modifications to the plant to accommodate changes in inservice testing requirements in later editions of the Code are not specifically required." 10CFR50.55a(g) requires that components comply with the requirements of the latest edition and addenda of the Code incorporated by reference 12 months prior to the start of the ten-year interval to the extent practical. Relief from these requirements may be granted when compliance would result in hardship or unusual difficulty without a compensating increase in the level of safety, the proposed alternatives would provide an acceptable level of quality and safety, or the Code requirements are impractical. Modifications to the plant to accommodate changes in the Code requirements are required, unless relief from these requirements has been granted.

5.3 Revision 1 of the IST Program was submitted. However, numerous pages reference a Revision 2 (e.g. page 1 of 4 through page 4 of 4). Additionally, there are

numerous typographical errors including valve number errors (see TER Sections 5.12, 3.16.1.1, and 3.9.2.1). The program should be reviewed to ensure that typographical errors do not impact the relief requests submitted.

5.4 In generic pump Relief Request PRR-7, the licensee proposes to follow the requirements of ASME/ANSI OM, Part 6 for measuring pump vibration. This is an acceptable alternative to the Section XI requirements provided that all of the requirements of ASME/ANSI OMb-1989, Part 6 related to taking and evaluating vibration measurements are met. (Reference TER Section 2.1.3.4)

5.5 In generic pump Relief Request PRR-9, the licensee proposes to make corrections for the presence or absence of liquid in the pressure sensing gage lines only to the extent that they will ensure a difference of no more than 0.25% exists in the calculated value of pump differential pressure. This is acceptable provided that the calculation of pump differential pressure is properly proceduralized to address this correction. This licensee should develop or modify existing procedures to satisfy this requirement. (Reference TER Section 2.1.5)

5.6 In generic pump Relief Request PRR-10, the licensee requested relief from instrumentation accuracy requirements. However, the licensee did not demonstrate that it would be impractical or would impose a hardship without a compensating increase in the level of quality or safety to procure and install instrumentation that meets the Code requirements. In addition, the proposed alternative provides no technical justification for establishing an accuracy of $\pm 3\%$ for instrument loops. The licensee should review current instrumentation accuracy in light of the intent of the Code and determine whether the Code requirements can be met. If they cannot, the licensee should determine whether modifications can be made to bring the instrumentation into compliance. If this is impractical, technical justification should be provided for establishing instrumentation accuracies that can be met. The request should address specific instrumentation and pumps and not be generic. This review should be complete in one year or until the next refueling outage, whichever is later. (Reference TER Section 2.1.6)

5.7 In pump Relief Requests PRR-17, for the safety injection and residual heat removal pumps, and PRR-18, for the auxiliary feedwater pumps, the licensee requested relief from running the pumps for five minutes before taking data measurements. However, the proposed alternative does not satisfy the intent of the Code. ASME/ANSI OMa-1988, Part 6 revises the hold period to two minutes before data measurements are taken. Relief is granted provided the licensee utilizes a two minute hold period for pump testing. (Reference TER Sections 2.2.2 and 2.3.2)

5.8 In pump Relief Request PRR-6, for the containment spray pumps, the licensee requested relief from the requirements of measuring pump flow. However, the licensee did not show that it is impractical, or that it imposes an excessive hardship

without a compensating increase in safety to modify the mini-flow line configuration to allow an adequate flow and install flow instrumentation, or that it is impractical to use an existing alternate flow path which includes flow instrumentation. Also, the proposed alternative does not provide a reasonable alternative to the Code requirements. The licensee should review the recirculation line configuration and investigate potential modifications to allow an increased flow to be achieved and the appropriate flow instrumentation to be installed. In addition, the licensee should investigate the use of the existing alternate flow path for quarterly pump testing and discuss the proposed system modifications discussed in their March 2 and October 2, 1990 letters. If these options are not practical, the licensee should resubmit this relief request and provide the technical justifications for their being impractical. (Reference TER Section 2.4.1)

5.9 In pump Relief Requests PRR-11 and 12, for the boric acid transfer pumps, the licensee requested relief from measuring pump flow rate quarterly and performing an inservice test quarterly, respectively. The proposed alternate testing in Relief Request PRR-11 states that during refueling outages all parameters required by IWP-3100 will be met. However, Relief Request PRR-12 states that only the flow rate will be verified and vibration will be measured as practical. In order to be consistent with the NRC's position stated in Generic Letter 89-04, the licensee must at least measure pump differential pressure and vibration quarterly and all parameters at refueling outages. From the information provided it appears that instrumentation is not currently available to measure pump differential pressure using the quarterly test flow path. The licensee should review the relief requests and resubmit them with clarification of how the criteria of Generic Letter 89-04 will be met with regard to measurement of pump differential pressure and vibration. If the appropriate instrumentation is not available, the licensee should evaluate the procurement and installation of instrumentation to meet the criteria contained in Generic Letter 89-04. (Reference TER Sections 2.5.1 and 2.5.2)

5.10 In pump Relief Request PRR-13, for the service water pumps, the licensee requested relief from measuring pump inlet pressure. The proposed alternative involving the calculation of inlet pressure based the water level in the intake structure is an acceptable alternative as long as it is properly proceduralized to ensure the result is within the Code accuracy requirements using direct measurement. The licensee should develop or modify existing procedures to satisfy this requirement. (Reference TER Section 2.6.1)

5.11 In pump Relief Request PRR-15, for the chilled water pumps, the licensee requested relief from measuring pump flow rate quarterly. However, the licensee did not demonstrate that the procurement and installation of appropriate instrumentation would be impractical or would impose undue hardship without a compensating increase in the level of quality or safety. The proposed alternative testing does not provide an acceptable alternative to the Code requirements. The

licensee should investigate the practicality of procuring and installing instrumentation to meet the Code requirements. Installation of flow instrumentation would also eliminate the need for Relief Request No. VRR-31. (Reference TER Section 2.7.1)

5.12 In pump Relief Request PRR-3, for the safety injection pumps, the licensee did not address an instrumented test line which exists and could provide an alternate test flow path. The licensee should address this test line in the inservice test program and provide justification for not using it. Additionally, the licensee should address the modifications discussed in their October 2, 1990 letter to the USNRC. (Reference TER Section 2.2.1)

5.13 Section 4.2 of the IST Program incorrectly references ASME Section XI paragraph IWP-3400. The correct references are paragraphs IWV-3400, 3500 and 3600. The legend of the IST Valve Program Tables (Appendices D and E) incorrectly reference paragraph IWV-2200 for the valve category. The correct reference is IWV-2100 for the 1986 Edition of the Code.

5.14 Section 4.4 of the IST Program states that the full-stroke check valve exercises are required to be performed at "the predicted full accident condition flowrate." Relief Request VRR-2 states that full-stroke exercising requires the "nominal accident flowrate." In accordance with Generic Letter 89-04, Attachment 1, Position 1 check valves shall be full-stroke exercised by passing the "maximum required accident condition flow through the valve." Specific relief is required if a flowrate other than that specified in the Generic Letter is utilized. The licensee should clarify the test flowrates used.

5.15 The legend of Appendices D and E states that leakage test "SLT-5" requires a "seat leakrate test to identify gross leakage. Specific leakage rates will not be measured." ASME Section XI, paragraph IWV-3420, requires leakage to be measured and corrective actions if the leakage rates exceed the permissible leakage rates (IWV-3426). Test "SLT-5" has been specified for Category A valves (e.g., RH-00742, 742A). Specific relief is required if leakage rates are not measured in accordance with the Code.

5.16 The legend of Appendices D and E states that proper operation of the associated main valve verifies operability of the pneumatic pilot valve. (Reference test "BTPV"). Section XI provides requirements for testing individual valves for degradation. There has been a history of problems associated with the solenoid-operated pilot valves (e.g., Generic Letter 88-14, "Instrument Air Supply System Problems Affecting Safety-Related Equipment," NRC Information Notices 88--43, "Solenoid Valve Problems," 90-11, "Maintenance Deficiency Associated with Solenoid-Operated Valves," 86-57, "Operating Problems with Solenoid Operated

Valves at Nuclear Power Plants," and NUREG-1275, Vol. 6, "Operating Experience Feedback Report-Solenoid-Operated Valve Problems").

Testing the main valves may provide sufficient information for determining the operability of the pilot pneumatic valves. However, this is not always the case. For example, testing the MSIVs (MS-02017 and 02018) will assure that either MS-02017(8)C or D will open to fulfill their safety function. These valves are redundant per the FSAR and the operation of only one of the valves will close the MSIVs. Therefore, the "PT-PV" test specified does not meet the intent of the Code to verify the operational readiness of individual valves. The licensee should review those valves tested by the "PT-PV" method and ensure that each valve's operational readiness can be assessed by testing the main valve.

Additionally, valves MS-02017(8)A and B are not included in the IST program. It appears in reviewing the FSAR that these valves are required to close by a signal from the steam line break protection system. The licensee should review these valves for inclusion in the IST Program.

5.17 Note 1 of Appendices D and E states that "the tests specified must not necessarily satisfy the corresponding requirements of Subsection IWV or NRC Generic Letter 89-04." "May not" is more appropriate wording.

5.18 There are numerous cases where solenoid or air-operated valves are not fail-safe tested (e.g., RC-00580A and B, RH-00624 and 625). The licensee has not provided any justification in the IST Program for not testing these valves. Valves that are passive should be so noted in the program.

5.19 In reviewing Relief Request No. VRR-33, it was noted that valves FO14, FO85, FO3922, FO3930 and FO3031 are not included in the IST Program while other valves in the emergency diesel generator fuel oil system are included (FO-03940 and 3941). The licensee should review this system to ensure all valves necessary for safe operation are tested to demonstrate that they will perform satisfactorily in service.

5.20 In Relief Request No. VRR-31, the licensee has proposed a disassembly and inspection program and partial-stroke exercising the chilled water pumps' discharge check valves. The proposed disassembly and inspection program does not comply with Generic Letter 89-04, Attachment 1, Position 2, therefore relief has been granted with the provision that the disassembly and inspection program be revised. The licensee has also been requested to investigate the use of non-intrusive methods to verify valve position to comply with the criteria contained in the Generic Letter. (Reference TER Section 3.2.1)

5.21 The applicable Point Beach Unit(s) to which the valve relief requests apply is confusing. Some relief requests specifically list both Units' valve numbers (e.g.,

VRR-20 and 30) and other requests imply, through the referenced system drawing numbers, that the relief applies to both Units (e.g., VRR-1 and 2). The licensee should identify the applicable Unit(s) consistently and clearly. Additionally, Relief Request No. VRR-32 and the Table of Contents identifies valves 01652 and 01653 as Unit 1 valves. Appendix E lists these valves as Unit 2 valves.

5.22 Relief Request No. VRR-1 states that the relief is generic. However, it specifically lists valve MS-02082 as the only component to which it applies. The licensee should resolve this apparent inconsistency. (Reference TER Section 3.11.1.4)

5.23 Relief Request No. VRR-22 requests relief from evaluating 2 inch valves SI-00845A through F in accordance with ASME Section XI, paragraph IWV-3427(b). This paragraph is only required for valves 6 inches and greater. Therefore, relief is not required. (Reference TER Section 3.14.6)

5.24 In Relief Request No. VRR-28, the licensee has proposed in lieu of stroke testing, verifying the auxiliary feedwater pump minimum flow valve closes when the pump mainline flow reaches a value which assures the pump will not be damaged. Relief has not been recommended, since it appears that stroke tests can be performed at least during cold shutdowns in accordance with Section XI. (Reference TER Section 3.1.1)

5.25 In reviewing Relief Request No. PRR-18 and VRR-28, it was noted that valves AF-00114, 115, 116, and 117 are not addressed in the IST Program and valves AF-4002, 7 and 14 are not tested in the open position. As stated in the relief request, "these valves open to ensure minimum recirculation flow from the pumps to prevent pump damage." The program should be revised to address these valves' safety function in the open direction.

5.26 In Relief Request No. VRR-19, the licensee has proposed exercising the charging pump discharge to RCP Manual throttle valves each refueling outage. Relief is recommended provided the licensee exercises the valves closed during any cold shutdowns when the RCP are not running. (Reference TER Section 3.3.3)

5.27 In Relief Requests No. VRR-24 and 26, the licensee has proposed testing the Boric Acid Transfer Pumps' suction and discharge check valves each refueling. The licensee has not provided sufficient information and justification to demonstrate the hardship or unusual difficulty of performing the tests during cold shutdowns. Therefore, relief has not been recommended. Additionally Relief Request No. VRR-26 contains a discrepancy concerning installed flow instrumentation in the charging pump's flowpath. (Reference TER Sections 3.3.4 and 3.3.5)

5.28 In Relief Requests No. VRR-8, 9, 27, and [illegible] the licensee has proposed valve disassembly and inspection programs as a means to verify the valves will full-stroke

open. The licensee has not, however, described the disassembly and inspection programs in sufficient detail to ascertain they meet Generic Letter 89-04, Attachment 1, Position 2. Relief is granted provided the licensee's program meets all the criteria provided in the Generic Letter. (Reference TER Sections 3.5.1, 3.5.2, 3.14.7, and 3.15.1)

5.29 In Relief Request No. VRR-9, the licensee has proposed verifying the containment spray nozzles' supply check valve exercise in the closed direction by the Appendix J leakage tests each refueling outage. The licensee has not provided sufficient justification for not testing these valves quarterly or during cold shutdowns. Relief has, therefore, not been recommended. Additionally, the "Function" stated in the request appears incorrect. The valves open to provide flowpath from the containment spray pumps to the spray nozzles. (Reference TER Section 3.5.2)

5.30 The licensee has proposed testing the emergency diesel generator air starting motor valves during the EDG start tests (Relief Requests No. VRR-17 and 25). The proposed testing has been determined to be acceptable provided the licensee assigns a maximum limiting diesel start time and verifies the operational readiness of the valves in each air start bank at least quarterly by alternating the air motor bank selected during testing. (Reference TER Sections 3.6.1 and 3.6.2)

5.31 Interim relief has been recommended for one year or until the next refueling outage, whichever is later, for Relief Request No. VRR-21 provided the licensee performs leakage tests of each set of feedwater check valves during cold shutdowns and both valves in a pair are declared inoperable and are repaired or replaced if excessive leakage is detected. In the interim, the licensee should review the safety analysis, make changes to the test procedure and perform the necessary system modifications, if individual testing is required. Additionally, the Relief Request should be revised to address the Category A leak test requirements as stipulated in the IST Program, Appendices D and E and correct the reference to IWV-3522(a) in the "Section XI Requirement" paragraph. (Reference TER Section 3.10.1)

5.32 In Relief Request No. VRR-34, the licensee has proposed testing the post-accident containment vent manual containment isolation valves yearly. The licensee has not provided sufficient justification for extending the test frequency and relief has therefore not been recommended. (Reference TER Section 3.12.1)

5.33 The licensee has proposed in Relief Request No. VRR-2 to full-stroke exercise the SI pressure isolation valves at refueling outages. Relief has been recommended for valves SI-00845C and D. Based on the existence of a partial-flow test line for valves SI-00845 A, B, E, and F, relief has been recommended for these valves provided that the licensee performs a partial-stroke test during the Technical Specification 4.4.16 tests. (TER Section 3.14.1)

5.34 In Relief Request No. VRR-4, the licensee has proposed partial-stroke exercise tests and a valve disassembly and inspection program to verify the operational readiness of the SI and SI accumulator check valves to open. Relief has been recommended for valves SI-00842B. However, relief can only be recommended for the remaining valves if the disassembly and inspection program is revised to comply with Generic Letter 89-04, Attachment 1, Position 2. (TER Section 3.14.3)

5.35 In Relief Request No. VRR-6, the licensee has stated that there is no return flowpath to the RWST to test the RWST to RHR Pump Suction check valves. The Point Beach drawings identify a "refueling water return" path to the RWST. The licensee should provide a explanation of why this flowpath cannot be used for testing. (TER Section 3.14.4)

5.36 The licensee has requested relief from stroke-time testing the auxiliary feedwater pumps cooling water solenoid valves and has proposed measuring system parameters (Relief Request No. VRR-20). Interim relief has been recommended for one year or until the next refueling outage, whichever is later, to provide the licensee time to evaluate alternate test methods. In the interim, the licensee should perform the proposed tests quarterly and if any degradation in these valves is noted, corrective action is taken and the valves declared inoperable if they cannot be repaired within the 24 hour specified time period. (Reference TER Section 3.11.2)

5.37 The licensee has proposed assigning a maximum leak rate for combinations of valves where individual testing is impractical in Relief Request No. VRR-23. Based on a review of the piping and instrument diagrams (P&IDs), it appears that for the component cooling water, instrument air and post-accident containment venting and monitoring systems that it is practical to individually test the valves. Therefore, relief has not been recommended for the valves in these systems. Relief has been recommended for the other system's valves referenced in the request. Only those valves referenced in Table VR-5-1 were evaluated. The licensee should revise the relief request to address the additional valves that reference Relief Request No. VRR-23 in Appendices D and E. (Reference TER Section 3.16.1)

Additionally, based on a review of the P&IDs and FSAR figures 5.2-10, 5.2-12, and 5.2-20 (June 1991 revision), there appears to be discrepancies on the location of test connections.

5.38 Relief Request No. VRR-5, the licensee has proposed utilizing the ASME/ANSI OM, Part 10 requirements for cold shutdown testing valves. Additionally, the licensee has proposed that completion of all valve testing during cold shutdowns is not required if plant conditions preclude testing. Use of ASME/ANSI OM, Part 10 is determined to be acceptable. However, generic relief cannot be recommended for valves that cannot be tested during any cold shutdown of sufficient duration to complete cold shutdown testing. Additionally, the request's "Alternate Testing"

references paragraph IWP-3417(a). The correct reference is IWV-3417(a). (Reference TER Section 3.17.1)

5.39 Relief Request No. VRR-27 and the IST Program Appendices D and E only address testing the valve in the open direction. The licensee should review the safety function at the Safety Inspection Pumps' minimum flow line check valves (SI-00891A and B) and ensure that they are tested in all direction(s) required to verify their safety function(s). (Reference TER Section 3.14.7)

5.40 Based on a review of the containment spray system for Relief Request No. PRR-6, it was noted that the minimum flow line check valves, SI-00849A and B, are not included in the licensee's IST Program. The licensee should review the safety function(s) of these valves and ensure they are tested to verify their safety function(s).

5.41 The valve numbers referenced in Relief Request No. VRR-16 do not appear on the referenced drawings. The TER evaluation is only valid if the reviewers assumptions on the subject valves are correct. (Reference TER Section 3.8.1.1)

5.42 The licensee should address the proposed system modifications discussed in their October 2, 1990 letter to the USNRC in Relief Request No. PRR-4. (Reference TER Section 2.2.3)

5.43 In Relief Request No. PRR-5, the licensee has proposed testing the turbine-driven auxiliary feedwater pumps at cold shutdowns. Based on the apparent lack of motive power (i.e., steam) during cold shutdown conditions, relief was denied. The licensee should revise the relief request to discuss the conditions required for testing these pumps. (Reference TER Section 2.3.1.4)

5.44 In Relief Request Nos. PRR-4, 5, 17 and 18, the licensee has referred to using a three data-point pump curve. It is the opinion of the NRC that if pump reference curves are used in lieu of reference point(s) as required by Section XI, paragraph IWP-3100, relief is required. It is unclear from Relief Request Nos. PRR-4, 5, 17 and 18 whether a reference curve or multiple reference points (IWP-3112) are utilized.

6.0 REFERENCES

1. "Inservice Testing Program for Pumps and Valves, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEP Co) to USNRC, June 10, 1991, VPNPD-91-186.

2. "1990 Pump and Valve Inservice Test Program, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEP Co) to USNRC, April 22, 1991, VPNPD-91-128.

3. "Inservice Testing Program for Pump and Valves, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEP Co) to USNRC, December 21, 1990, VPNPD-90-500.

4. "Supplement to Generic Letter 88-14 Responses, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEP Co) to USNRC, September 5, 1991, VPNPD-91-303.

5. "Inservice Testing Program Point Beach Nuclear Plant," C.W. Fay (WEP Co) to A. DiBiasio (BNL), September 18, 1991, VPNPD-91-363 (Transmittal of RHR and AFW Pump Curves and Procedures IT-01 and 02).

6. "Guidance on In-Service Testing Programs, Generic Letter 89-04 Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEP Co) to USNRC, October 3, 1989, VPNPD-89-519.

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

8. Point Beach FSAR and Technical Specifications.

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

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

11. 10CFR50.55a

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

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

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

15. NRC Generic Letter No. 90-06, Resolution of Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," Pursuant to 10CFR50.54(f).

16. EPRI NP-6516, "Guide for the Application and Use of Valves in Power Plant Systems."

17. NRC Information Notice 8[illegible], "Check Valve Failures," December 2, 1981.

18. NRC Information Notice 88-85, "Broken Retaining Block on Anchor Darling Check Valves," October 14, 1988.

19. NRC Bulletin 89-02, "Stress Corrosion Cracking of High-Hardness Type 410 Stainless Steel Internal Preloaded Bolting in Anchor Darling Model S350W Swing Check Valves or Valves of Similar Design," July 19, 1989.

20. NRC Information Notice 88-43, "Solenoid Valve Problems," June 23, 1988.

21. NRC Information Notice 90-11, "Maintenance Deficiency Associated with Solenoid-Operated Valves," February 28, 1990.

22. NRC Information Notice 86-57, "Operating Problems with Solenoid Operated Valves at Nuclear Power Plants," July 11, 1986.

23. NUREG-1275, Vol. 6, "Operating Experience Feedback Report - Solenoid-Operated Valve Problems."

24. NRC Information Notice 87-01, "RHR Valve Misalignment Causes Degradation of ECCS in PWRs," January 6, 1987.

25. NRC Generic Letter 88-14, "Instrument Air Supply System Problems Affecting Safety-Related Equipment," August 8, 1988.

26. NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 8, November 1990.

27. "Generic Letter 89-04, Guidance on IST Programs Point Beach Nuclear Plant Units 1 and 2," C.W. Fay (WEPCo) to USNRC, January 16, 1991, VPNPD-91-029.

28. "Guidance on IST Programs, Generic Letter 89-04 Follow Up, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEPCO) to USNRC, March 2, 1990, VPNPD-90-101.

29 "Guidance on IST Programs, Generic Letter 89-04 Follow Up, Point Beach Nuclear Plant, Units 1 and 2," C.W. Fay (WEPCO) to USNRC, June 28, 1990, VPNPD-90-310.

30. "NRC Bulletin 88-04 and Generic Letter 89-04, Minimum Flow Testing Capabilities for RHR, SI and Containment Spray Pumps," C.W. Fay (WEPCO) to USNRC, October 2, 1990, VPNPD-90-429.

Appendix A: Point Beach Piping and Instrument Diagrams (P&IDs)

P&ID	Sheet	System	Revision	Alternate Drawing Number
M-201	1	Main and Reheat Steam	27	(PB-01-MMSK-000-001-27)
M-202	1	Condensate	23	(PB-01-MCDK-000-001-23)
	2	Feedwater	22	(PB-01-MFWK-000-001-22)
M-207	1	Service Water	38	(PB-01-MWSK-000-003-38)
	2	" " "	25	(PB-01-MWSK-000-001-25)
	3	" " "	24	(PB-01-MWSK-000-004-24)
	4	" " "	11	(PB-01-MWSK-000-002-11)
M-209	2	Service Air	03	(PB-31-MSAK-000-001-03)
	7	Instrument Air	17	(PB-31-MIAK-000-007-17)
	5	" " "	14	(PB-31-MIAK-000-006-14)
	11	" " "	15	(PB-31-MIAK-000-008-15)
	12	Emergency Diesel Air Starting	06	(PB-31-MDGK-000-001-06)
M-214	1	Aux. Stm. Heating Stm. Chilled & Hot Water	33	(PB-01-MASK-000-001-33)
	2	" " "	17	(PB-01-MASK-000-002-17)
M-213	1	Heating & Ventilation	27	(PB-01-MVRK-000-001-27)
	2	" " "	12	(PB-01-MVRK-000-002-12)
M-217	1	Aux. Feedwater	48	(PB-01-MAFK-000-001-48)
M-219	1	Fuel Oil	21	(PB-01-MFOK-000-001-21)
M-223	1	Instrument & Service Instrument Air	24	
	7		0	
M-224	1	Post-Acc. Containment Venting	16	(PB-01-MRMW-000-001-16)
M-2201	1	Main and Reheat Steam	20	(PB-02-MMSK-000-001-20)
M-2202	2	Feedwater	21	(PB-02-MFWK-000-001-21)
M-2207	1	Service Water	34	(PB-02-MWSK-000-002-34)
M-2214	1	Aux. Stm. Heating Stm.	11	(PB-02-M007-005-900-11)
M-2215	1	Heating and Ventilation	17	(PB-02-M001-008-902-17)
	2	" " "	7	(PB-02-MVRK-000-001-07)
M-2244	1	Heating and Ventilation Temperature Control	6	
	2		3	(PB-31-M001-008-908-03)
PBM-230	1	Radwaste Comp. Cool.	7	(PB-31-M008-001-901-07)
PBM-231	1	Deionized & Reactor Make-up Water	22	(PB-31-MRWK-000-002-22)
	2	" " "	5	(PB-31-MRWK-000-001-05)

110E017	1 2	Safety Injection " " "	32 31	(PB-01-MESK-000-002-32) (PB-01-MSIK-000-001-31)
110E018	1 2 3 4	Auxiliary Coolant " " " " " " " " "	36 13 21 24	(PB-01-MSFK-000-002-36) (PB-01-M008-000-901-13) (PB-01-MCCK-000-001-21) (PB-01-MSFK-000-001-24)
110E029	1 2 3	Auxiliary Coolant " " " " " "	32 11 21	(PB-02-MSFK-000-001-32) (PB-02-M008-000-901-11) (PB-02-MSFK-000-003-21)
110E035	1 2 3	Safety Injection " " " " " "	31 30 31	(PB-02-M008-019-900-31) (PB-02-MSIK-000-001-30) (PB-02-MSIK-000-002-31)
541F091 541F092	1 2 1	Reactor Coolant " " " Sampling	27 15 24	(PB-01-MRCK-000-001-27) (PB-01-MRCK-000-002-15) (PB-01-MPSK-000-001-24)
541F445	1 2	Reactor Coolant " " "	30 12	(PB-02-MRCK-000-001-30) (PB-02-MRCK-000-002-12)
541F448	1	Sampling	26	(PB-02-MPSK-000-001-26)
685J175	1 2	C&VCS "	37 37	(PB-02-MCVK-000-002-37) (PB-02-MCVK-000-001-37)
684J741	1 2	C&VCS "	41 41	(PB-01-MCVK-000-002-41) (PB-01-MCVK-000-001-41)
684J971	1 2	Waste Disposal " " "	40	(PB-31-MRLK-000-002-40) (PB-31-MRLK-000-001-40)