UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM FOR

WISCONSIN ELECTRIC POWER COMPANY

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-266 AND 50-301

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain 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 relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 50.55a¶(f)(6)(i), (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that: (1) conformance is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Section 50.55a¶(f)(4)(iv) provides that inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in ¶(b) of Section 50.55a, subject to the limitations and modifications listed, and subject to Commission approval. NRC guidance contained in Generic Letter (GL) 89-04, *Guidance on Developing Acceptable Inservice Testing Programs*, provided alternatives to the Code requirements determined to be acceptable to the staff and authorized the use of the alternatives in Positions 1, 2, 6, 7, 9, and 10 provided the licensee follows the guidance delineated in the applicable position. When an alternative is proposed which is in accordance with Generic Letter (GL) 89-04 guidance and is documented in the IST program, no further evaluation is required; however, implementation of the alternative is subject to NRC inspection.

Section 50.55a authorizes the Commission to grant relief from ASME Code requirements or to approve proposed alternatives upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternative as part of the licensee's IST program are contained in this Safety Evaluation (SE).

In rulemaking to 10 CFR 50.55a effective September 8, 1992, (See 57 Federal Register 34666), the 1989 edition of ASME Section XI was incorporated in ¶(b) of Section 50.55a. The 1989 edition provides that the rules for IST of pumps and valves shall meet the requirements set forth in ASME Operations and

Maintenance Standards Part 6 (OM-6), "Inservice Testing of Pumps in Light-Water Reactor Power Plants," and Part 10 (OM-10), "Inservice Testing of Valves in Light-Water Reactor Power Plants." Pursuant to (f)(4)(iv), portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met, and therefore, relief is not required for those inservice tests that are conducted in accordance with OM-6 and OM-10, or portions thereof. Whether all related requirements are met is subject to NRC inspection.

This SE concerns relief requests and supporting information that were submitted in Wisconsin Electric Power Company's (WE) letters dated March 24, July 29, July 30, and November 16, 1992, March 2, April 2, and April 27, 1993, for the Point Beach Nuclear Plant, Units 1 and 2, inservice testing (IST) program for pumps and valves. The Point Beach Nuclear Plant IST Program was developed to the 1986 Edition of ASME Section XI, for the third ten-year interval of both units which began December 31, 1990. A current status of relief requests is provided in Table 1 of this SE.

2.0 EVALUATION OF MARCH 24, 1992, SUBMITTAL

In Wisconsin Electric Power Company's March 24, 1992, submittal, a relief for the Point Beach Nuclear Plant Inservice Test (IST) Program was requested. Evaluation of the new relief request is provided below.

2.1 RELIEF REQUEST PRR-20

The licensee has requested relief from establishing one or more fixed reference values in accordance with ASME Section XI, Paragraphs IWP-3100 and IWP-3112, for the auxiliary feedwater pumps, 1P-029, 2P-029, P-038A and P-038B.

2.1.1 Proposed Alternate Testing

The licensee proposes to use a reference curve (i.e. "a loci of values located on either side of a specific value"). "The range of the upper and lower limits of the reference values shall be small enough to provide adequate assessment of equipment operation. The tolerance around the selected value shall be ± 2%."

2.1.2 Licensee's Basis for Relief

The licensee states: "The auxiliary feedwater pumps are tested by operating the pumps in a recirculation mode through a fixed, flow-limiting orifice. There is no means within this line to throttle flow and pumps are tested with all valves in the circuit fully open. This manner of operation prevents the setting and maintaining of a single, specific reference value as read on the installed digital flowmeter."

2.1.3 Evaluation

ASME Code Section XI requires the establishment of one or more fixed sets of test reference values of differential pressure and flow. The resistance of the system is to be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value(s). The intent is to create repeatable test conditions for data comparison from test to test, indicating trends of degradation. The modification to the auxiliary feedwater recirculation line allowed for increased flow to address concerns of NRC Bulletin 88-04, *Potential Safety-Related Pump Loss*, relative to operation in a minimum flow condition.

The recirculation flow is fixed by a flow-limiting orifice, with valves fully open during testing. There is no means to throttle the flow, and although the flow is "fixed," it may vary slightly around a "fixed" value on the installed digital flowmeter. The licensee requests to establish the limits of this variance to be within ± 2% of a selected value.

Some designs do not facilitate setting flow, for example, at an exact value due to limitations in instrumentation and controls on maintaining steady flow, or adjusting to exact values due to piping system characteristics. The Code does not address an allowable variance from a fixed reference value. It simply states "[t]he resistance of the system shall be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value." The relief request appears to propose establishing a range of values similar to utilizing a pump curve, but with a very narrow band. For example, plant implementing procedures may provide instruction to "set flow to 1500 gpm." When this step is performed, the operator is expected to set the flow as close as possible to 1500 gpm. In reality, it may not be maintained at exactly 1500 gpm; however, it should be essentially steady at approximately 1500 gpm. However, for the auxiliary feedwater pumps, the capability to adjust flow is limited.

For designs that do not facilitate establishing and maintaining flow at an exact value, achieving a steady flow rate or differential pressure at approximately the set value does not require relief for establishing pump curves. The allowed tolerance for setting the fixed parameter must be established on a case-by-case basis including the instrument accuracy and the readability of the instrument. This may require verification of the affect of readability on accuracy as factored into the instrument/gauge design. In no case is a total tolerance of greater than ± 2% of the <u>reference value</u> allowed without relief. If a total tolerance of less than ± 2% of the reference value is achievable, relief is not required, but the variance and the method for establishing the variance must be documented in the IST program. The licensee's proposal is within a ± 2% tolerance.

The limits for flowrate and differential pressure do not both apply for monitoring the condition of pumps. When the Code specifies that the system resistance be varied until <u>either</u> the flow or differential pressure equals the corresponding reference value, it does not intend that the <u>set value</u> have an acceptable range per Table IWP-3100-2. For the auxiliary feedwater pumps, the

reference value can only be achieved within an approximate value. The licensee should establish the repeatable parameter as close as possible during each test. If, as a result of trending data, the licensee determines that the parameter varies such that the readings are outside the accuracy of the instrument, consideration should be given to establishing pump curves that account for greater than a 2% tolerance of a specific value.

The basis for the acceptability of a ± 2% tolerance around the reference value is from Section XI, IWP-4150, which provides the requirements for instrument fluctuations. IWP-4150 allows symmetrical damping devices or averaging techniques to reduce instrument fluctuations to within 2% of the observed reading. The use of ± 2% of the reference value allows the licensee to specify the values in the implementing procedures.

2.1.4 Conclusion

The staff has determined that the licensee's proposal is acceptable for implementation. While the Code does not specifically address the acceptable variance from reference points, the staff has determined that a variance of up to ± 2% is acceptable if the licensee establishes a basis that the test results provide repeatable, trendable results. Within this variance, the staff has determined that relief is not required; however, for variances above ± 2%, the licensee should consider establishing actual pump curves and relief would be required.

3.0 EVALUATION OF JULY 29/30, 1992, SUBMITTALS

A review of the licensee's response to certain items identified in NRC SE dated April 17, 1992, was performed. The results of this review are provided below. The new or revised relief requests which were included in the submittals are evaluated below. The licensee indicated that a response to the remaining anomalies and action items in the April 17, 1992, SE would be provided by April 17, 1993, as required by the SE. The evaluation of the action items is provided in Section 7.0 below.

3.1 RELIEF REQUEST VRR-4

Relief is requested from the quarterly exercising requirements of IWV-3522 for safety injection (SI) check valves SI-842 A/B and SI-867 A/B. These category A/C valves open with differential pressure to provide flow paths from the safety injection pumps and SI accumulators to the reactor coolant system (RCS) cold legs during an accident. The valves are normally closed. In the closed position, the valves function as RCS pressure isolation valves.

This relief request was evaluated in NRC's April 17, 1992, Safety Evaluation, and granted with the provision that the disassembly and inspection program be implemented according to the guidance in Generic Letter 89-04, Position 2, including justification of the extreme hardship of performing disassembly and inspection on each valve at least once every six years.

3.1.1 Licensee's Basis for Relief

The licensee states: "During normal operation, neither SI pump discharge pressure of 1500 psig nor SI accumulator pressure of 760 psig is sufficient to overcome RCS pressure. Full or partial stroke testing is, therefore, not possible.

During cold shutdown, partial or full-stroke testing via the use of SI pumps or SI accumulators is not permitted so as to prevent the possibility of a low-temperature over-pressurization event.

A full-stroke test to the RCS could be possible during refueling when the reactor vessel head is removed, but the volume and flow rate required for the test could result in damage to the core internals. There is also the potential of forcing a nitrogen bubble into the RCS piping and refueling cavity resulting in possible safety implications, which makes this testing concept inadvisable."

3.1.2 Alternative Testing

The licensee proposes: "The following alternate testing will be performed:

1. At a minimum for these valves, partial open and shut stroke tests will be done at each refueling outage. In addition, partial open and shut stroke tests will be conducted at each cold shutdown which requires an Event V test. (See Technical Specification 15.3.16).

2. Seat leakage tests of SI-00867 A and B will be performed in accordance with Point Beach Technical Specification 15.3.16, "Reactor Coolant System Pressure Isolation Valve Leakage Tests."

3. Seat leakage tests of SI-00842 A&B will be performed quarterly coincident with SI pump tests. A seat leakage rate of five gpm or less will be considered acceptable.

4. Valves SI-00842A and SI-00867A will each be disassembled, inspected, and manually stroked once every six years, rotating the sequence of valves being inspected such that a different one is completed each time until all have been inspected and the sequence repeats. Should a failure be detected, the other valve for that unit shall be disassembled and proper operation verified prior to completion of that outage. The opposite unit's two valves will be disassembled and inspected during that unit's next scheduled refueling outage.

5. Valves SI-00842B and SI-00867B require a complete core offload in order to disassemble and inspect. One valve of the four [two valves in each of two units] will be disassembled, inspected, and manually stroked each outage in which a complete core offload is scheduled. Typically this will be done concurrently with reactor [vessel inservice] inspections. The disassembly schedule will be arranged such that a different valve is disassembled, inspected, and manually stroked during each core offload

and all valves are completed at least once every 120 months. Should a failure be detected, the other valve for that unit will be disassembled and proper operation verified prior to the completion of the outage.

6. In the inspections which result from the detection of a failure, should an additional failure be detected, all remaining six valves will be disassembled, inspected, and manually stroked. Valves associated with the unit in outage will be completed prior to the return of that unit to service, even if it requires an unscheduled core offload to be performed. Valves associated with the opposite unit will be completed during the next scheduled refueling outage, even if a complete core offload was not previously planned.

3.1.3 Basis for Extended Inspection Interval

The licensee states: "The NRC, in Generic Letter (GL) 89-04, Position 2, requested information to support extension of valve disassembly and inspection intervals of greater than once every six years. Within the last three years, each valve of the eight identified in this request has been disassembled, inspected, and manually stroked per the criteria in GL 89-04, Position 2. This maintenance was performed in conjunction with retaining block stud replacement done in response to NRC Information Notice 88-05. To date, no degradation of valve operability or performance has been noted in any disassembly and inspection performed on these valves. The following table lists each specific valve, the individual maintenance work request (MWR) under which the inspection was performed, and the completion date:

	UNIT 1	
SI-00842A	MWR 872759	April 14, 1988
	MWR 890172	April 11, 1990
SI-00842B	MWR 890174	April 21, 1990
SI-00867A	MWR 872755	April 15, 1988
	MWR 890176	April 24, 1990
SI-00867B	MWR 890178	April 21, 1990
	UNIT 2	
SI-00842A	MWR 872760	October 18, 1987
	MWR 890173	October 5, 1989
SI-00842B	MWR 890175	November 4, 1989
SI-00867A	MWR 872753	October 20, 1987
	MWR 890177	October 5, 1989
SI-00867B	MWR 890179	November 3, 1989

The request to provide the basis for an extended inspection interval only applies to SI-00842B and SI-00867B, as these are the only valves which will go beyond the six-year period specified in GL 89-04, Position 2. The maintenance history of all eight valves is provided for completeness to show the trouble-free history of the valves in general.

Additional justification for the extended inspection interval may be found in the NRC Safety Evaluation Report on the Inservice Test Program at Point Beach dated April 17, 1992. The Technical Evaluation Report (TER), Section 3.14.3.4, attached to the SER states, "...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 de-fueled and drained in order to be tested (SI-00842B [and SI-00867B])."

The drawings referenced by this request will show that the conditions which must exist to permit the disassembly of SI-00842B must also exist to permit the disassembly of SI-00867B. Thus, the extended period for inspection should apply to both (four valves total, two per unit) [valves]."

3.1.4 Evaluation

The relief request indicates that the disassembly and inspection program for these valves is in accordance with GL 89-04, Position 2. Therefore, the relief request is approved by the GL 89-04, and as previously evaluated in the April 17, 1992, SE. The staff requested the licensee to revise the relief request, however, to further describe and justify the extreme hardship as discussed in the guidance of GL 89-04, Position 2. The related Position 2 guidance is as follows:

> *Extension of the valve disassembly/inspection interval to one valve every other refueling outage or expansion of the group size above four valves should only be considered in cases of extreme hardship where the extension is supported by actual in-plant data from previous testing. In order to support extension of the valve disassembly/inspection intervals to longer than once every 6 years, licensees should develop the following information:*
>
> a. *Disassemble and inspect each valve in the valve grouping and document in detail the condition of each valve and the valve's capability to be full-stroked.*
>
> b. *A review of industry experience, for example, as documented in NPRDS, regarding the same type of valve used in similar service.*
>
> c. *A review of the installation of each valve addressing the "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants" for problematic locations.*

The licensee describes the extreme hardship in performing a disassembly and inspection of the "B" train check valves. Plants which do not routinely defuel during refueling outages are required to perform inservice inspection of the reactor vessel in accordance with ASME Section XI at least once every 120 months. Therefore, each of these "B" train valves will be disassembled and inspected at least once every 10 years, as opposed to once every 6 years for the "A" train valves. Though this is an extended period, the partial-stroke exercising and the Event V leakage testing provide information on the specific individual valves and the disassembly and inspection of the remaining similar valves provides a status of monitoring for degrading conditions.

In previous correspondence (WE response to GL 89-04, October 3, 1989), the licensee indicated that an NPRDS (Nuclear Plant Reliability Data System - a component maintenance/failure database managed by the Institute of Nuclear Power Operations) search on similar valves indicated no failures, although leakage past the seat was reported in 22 instances, including three instances at Point Beach. Additionally, these valves are not installed in a "problematic location" based on the orientation of the valves in the piping system. The valves are partial-stroke exercised each refueling outage, and a leakage test is performed at least every refueling outage, and also during any cold shutdowns which require an Event V test per Technical Specifications.

The NRC believes that, because disassembly and inspection of check valves is a maintenance activity rather than a test, it should not be used for IST unless there is no test method available, including the use of nonintrusive techniques. The licensee should investigate the use of nonintrusive techniques, or other methods, which would verify that the partial-stroke exercising fully strokes the valve discs. If these techniques or methods are employed, a disassembly and inspection would not be required. This would essentially allow the licensee to credit a test that is already being performed and to eliminate an extensive maintenance activity in disassembling and inspecting the valves. The staff encourages the licensee to pursue the use of these techniques. Additionally, the ASME Operations and Maintenance Codes and Standards Committee is developing a standard on check valve testing that will provide a consensus document for use by the industry.

3.1.5 Conclusion

Relief Request VRR-4 is approved per Generic Letter 89-04, Position 2. However, if the licensee develops nonintrusive techniques for exercising these valves in accordance with the requirements of Section XI, the use of disassembly and inspection in lieu of testing should be discontinued, except as required for preventative maintenance or valve internal inspection (Class 1 valves per Section XI inservice inspection requirements).

3.2 RELIEF REQUEST VRR-23

Relief Request VRR-23 relates to leakage testing of containment isolation valves in groups as listed in Table VRR-23-1. The April 17, 1992, NRC SE granted provisional relief for the auxiliary steam, chemical volume and control system, containment spray, heating and ventilation, and waste disposal system valves provided the limiting leakage rate for the applicable penetration is conservative and does not allow excessive leakage in any particular valve in the group to go uncorrected. Relief was denied for valves in the component cooling water, instrument air, and post-accident containment venting and monitoring systems which appeared to be designed for individual leakage testing. The licensee has revised the relief request to include additional information and includes the valves for which relief was denied. Since the time the NRC SE was issued, the staff has incorporated the 1989 Edition of ASME Section XI in Section 50.55a¶(b) (rulemaking to Section 50.55a effective September 8, 1992). This edition stipulates that the requirements of OM-6, Inservice Testing of Pumps in Light-Water Reactor Power Plants, and OM-10,

Inservice Testing of Valves in Light-Water Reactor Power Plants, be used for inservice testing of pumps and valves. The staff included a limitation on OM-10 for containment isolation valves, qualifying that licensees meet the leakage testing requirements of ¶4.2.2.3, "Leakage Rate for Other Than Containment Isolation Valves," rather than following the requirements of ¶4.2.2.2, "Containment Isolation Valves." The relief request is evaluated based on the changes to the relief request and the Section 50.55a rulemaking.

Table VRR-23-1

System	Valves	
Auxiliary Steam	HV-632 (unit 1)	HV-633 (Unit 1)
	HV-808 (Unit 1)	HV-809 (Unit 1)
	HV-818 (Unit 1)	HV-263 (Unit 2)
	HV-286 (Unit 2)	HV-287 (Unit 2)
	HV-636 (Unit 2)	HV-637 (Unit 2)
Chemical & Volume Control	CV-323B (Units 1&2)	
	CV-384B (Units 1&2)	
Component Cooling Water	CC-755 A&B (Units 1&2)	
	CC-759 A&B (Units 1&2)	
Containment Spray	SI-862 A/B/G/H (Units 1&2)	
	SI-864 A&B (Units 1&2)	
	SI-868 A&B (Units 1&2)	
Heating & Ventilation	VNPSE-3212 (Units 1&2)	
	VNPSE-3212 (Units 1&2)	
	VNPSE-3244 (Units 1&2)	
	VNPSE-3245 (Units 1&2)	
Instrument Air	IA-1182 (Unit 1)	IA-1184 (Unit 1)
	IA-1314 (Unit 2)	IA-1316 (Unit 2)
Post-Accident Containment Vent/Monitoring	H2-V-04 (Units 1&2)	H2-V-05 (Units 1&2)
	H2-V-06 (Units 1&2)	H2-V-07 (Units 1&2)
	H2-V-12 (Units 1&2)	H2-V-13 (Units 1&2)
	H2-V-19 (Units 1&2)	H2-V-20 (Units 1&2)
	H2-V-22 (Units 1&2)	H2-V-23 (Units 1&2)
Waste Disposal	SF-816 (Units 1&2)	WL-1698 (Units 1&2)
	WL-1723 (Units 1&2)	WL-1728 (Units 1&2)
	WL-1003 A&B (Units 1&2)	

3.2.1 Licensee's Basis for Relief

The licensee states: "Due to the configuration of system piping and components, in many cases individual leakage rate tests are impractical or impossible. In these cases, it is customary to perform tests of valves in parallel. This concept of testing and evaluation is consistent with the intent of 10 CFR 50, Appendix J, and Section XI, IWV-3424(b), which permits leakage testing by measurement of feed rate required to maintain pressure between two valves. This method of testing is valid as long as the leakage measured is charged entirely to each valve being tested.

In practice, the leakage rate limit assigned to a set of valves tested in parallel is never greater than the leakage rate limit which would be assigned to the most limiting valve in the set if it were to be tested alone. Hence, the practice of leakage rate testing valves in parallel is at least as conservative as the leakage rate testing required per Section XI. Additionally, when leakage rates exceed the limit specified for a set of valves, testing will be done to determine individual valve leakage rates wherever possible to facilitate corrective maintenance efforts.

This method of testing valves in parallel saves time, manpower resources, and radiation exposure and is a safe and viable alternative to leakage rate testing each valve individually."

3.2.2 Alternative Testing

The licensee proposes: "In those cases where testing individual valves is impractical or impossible, valves will be leak rate tested simultaneously in multiple valve arrangements. A maximum permissible leakage rate will be applied to each combination of valves; and, in no case, will this limit exceed the limit which would be applied to the most limiting valve in the set if it were to be tested individually. If the limit for a set of valves tested in parallel should be exceeded, the test lineup will be modified wherever possible to determine individual valve leakage rates.

3.2.3 Evaluation

Section 50.55a ¶(f)(4)(iv) provides that inservice tests of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in ¶(b) of Section 50.55a, subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. As noted above, the staff has approved OM-10 for inservice testing of valves. A limitation was stipulated in the rulemaking related to containment isolation valves such that the requirements of ¶4.2.2.3 were to be applied to these particular valves for leakage testing rather than ¶4.2.2.2.

OM-10, ¶4.2.2.3, provides the leakage rate testing frequency, methods, measurement, test medium, and corrective action requirements for valves or valve combinations. Previously, ASME Section XI, IWV-3420, "Valve Leak Rate

Test," did not include valve combinations. OM-10 addresses valve combinations because it was recognized that certain valves could not be leak tested individually, and that testing valve combinations can identify excessive leakage which can then be investigated to determine which valve or valves are leaking such that appropriate corrective actions are taken.

3.2.4 Conclusion

The licensee's proposed alternative testing is in accordance with OM-10, ¶4.2.2.3 and is approved for implementation pursuant to 10 CFR 50.55a(f)(4)(iv) provided all related requirements are met. Related requirements are included in ¶4.2.2.1 of OM-10. The implementation is subject to NRC inspection.

3.3 RELIEF REQUEST VRR-35

Relief from the requirements of ASME Section XI, IWV-3510, "Safety Valve and Relief Valves Tests," and OM-1-1981, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices," for the main steam safety valves MS-2005/6/7/8/10/11/12/13 and reactor coolant system pressurizer safety valves RC-434/5 is requested. The main steam safety valves provide steam generator overpressure protection and an additional heat sink for core cooling. The pressurizer safety valves provide overpressure protection for the reactor coolant system. The specific relief relates to a set-pressure test following "jack-and-lap" seat lapping. The relief request also relates to IWV-3200, "Valve Replacement, Repair, and Maintenance," for post-maintenance testing following any activity that affects the performance parameters of these valves.

3.3.1 Licensee's Basis for Relief

The licensee states: "Experience has shown that, for the valves in question, there exists an absolute maximum change in relief set pressure following a "jack-and-lap" procedure where not more than 0.002 inch of seating material is removed. Transmittals from Crosby Valve and Gage Company show the calculated maximum change in valve set pressure resulting from a 0.002 inch "jack-and-lap" is 2.3 psig (0.2%) for main steam safety valves, and 9.0 psig (0.36%) for pressurizer safety valves. Subsequent telephone conversations with Crosby Valve and Gage Company Engineering (Crosby) confirmed that Crosby has performed actual tests to substantiate their calculations. The percentage change in nameplate set pressure in each case is well below the 3% change acceptance criteria called out in ASME/ANSI OM-1-1981, 1.3.3.4. Thus, the change in set pressure due to the "jack-and-lap" is within the tolerance specified by ASME/ANSI OM-1-1981."

3.3.2 Alternative Testing

The licensee proposes: "Following "jack-and-lap" procedures on either a main steam safety valve or pressurizer safety valve in which the maximum total amount of seating material removed is not more than 0.002 inch, no set

pressure test will be performed prior to returning the valve to service provided:

(1) The calculated maximum change in set pressure is applied to the valve set pressure obtained prior to the "jack-and-lap" procedures. This is 0.2% for Main Steam Safety Valves and 0.36% for Pressurizer Safety Valves.

(2) The newly calculated valve set pressure is within the 3% tolerance of valve nameplate set pressure called out in ASME/ANSI OM-1-1981.

If the above conditions are not met, the valve will have its set pressure tested prior to return to service as specified in ASME/ANSI OM-1-1981, 7.3.1.1. In every case, all testing other than the set pressure determination will be performed as required in ASME/ANSI OM-1-1981."

3.3.3 Evaluation

The 1986 Edition of ASME Section XI, IWV-3200, requires that "[w]hen a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters, which could be affected by the replacement, repair, or maintenance, are within acceptable limits. Pressure relief devices shall be tested as required by the replacement, repair, and maintenance requirements of ANSI/ASME OM-1-1981." For the Class 1 pressurizer safety valves, ¶7.4.1.1 of OM-1-1981 provides the disposition after testing, maintenance, or repair, or both, such that "[r]efurbished equipment shall be subjected to test(s) specified in 7.3.1.1 [periodic testing of Class 1 safety valves], as applicable. If extent of disassembly includes valve disk (main) components, then valve disk stroke capability shall be verified by mechanical inspection or tests." For the Class 2 main steam safety valve, ¶7.4.2.1.1 provides the disposition after testing, maintenance, or repair, or both, such that "[r]efurbished equipment shall be subjected to test(s) specified in 7.3.2.1 [periodic testing of Class 2 safety valves], as applicable. If extent of disassembly includes valve disk (main) components, then valve disk stroke capability shall be verified by mechanical inspection or tests."

NRC Information Notice 91-74, *Changes in Pressurizer Safety Valve Setpoint Before Installation*, described a problem related to the "jack-and-lap" procedure, which is often performed after setpoint verification to reduce seat leakage. In certain instances, the setpoint of the valves which had seat lapping performed according to the "jack-and-lap" procedures was affected. The particular valves were manufactured by Dresser, though similar problems may exist with safety valves supplied by other manufacturers due to similarities in design, setpoint testing, maintenance practices, leakage correction practices, and other factors.

The staff has determined that relief from the referenced requirements is not required in order for the licensee to implement a "jack-and-lap" procedure. The licensee has the responsibility for the quality controls placed on the

process such that the limiting material is removed, and if the material removed exceeds that which has been determined not to adversely impact the setpoint, to ensure that a post-maintenance setpoint verification is performed. It is not appropriate for the staff to attempt to make a determination if the process affects the setpoint such that a reverification of the setpoint is required. However, the licensee can make such a determination. The process must be controlled and documented such that the procedures indicate that the process has been performed within the limiting conditions established by the licensee and that a final determination by a qualified individual is made as to whether the activity requires a reverification of the setpoint. The licensee's procedures should specify the qualifications for the individual(s) making this determination. It is the licensee's responsibility to ensure that adequate controls and proper reviews of the process are implemented. In the event a determination by a qualified individual that the procedure has not adversely impacted the setpoint cannot be made, a reverification must be performed. Specifically, the alternative proposed by the licensee complies with the requirements of OM-1-1981, paragraphs 7.3.1.1 and 7.4.2.1.1, if proper controls on the process are implemented as described in the licensee's proposal and as discussed above.

> NOTE: Item 2 of the licensee's proposed alternative testing discusses the 3% tolerance allowed by OM-1-1981. A 3% tolerance is acceptable only within the allowance in a plant's technical specifications. The revised Standard Technical Specifications issued September 1992, stipulate that 3% is an acceptable "as-found" value, but that the "as-left" setpoint is to be within ± 1% of the nominal setpoint value. The licensee's proposal must be implemented consistent with technical specification requirements which may or may not conform with Standard Technical Specifications over the life of the plant and ensure acceptable tolerances for the plant safety analyses.

3.5 COLD SHUTDOWN JUSTIFICATIONS CSJ-33 AND CSJ-34

The licensee submitted two additional cold shutdown justifications for post-accident containment vent manual valves (CSJ-33) and charging pump suction motor-operated valves and check valves from the RWST (CSJ-34). Exercising the subject valves quarterly during power operations would result in a violation of a technical specification for containment integrity (CSJ-33) or a reactivity transient due to boron injection (CSJ-34). The valves will be exercised at a cold shutdown frequency in accordance with the Code requirements; therefore, relief is not required.

3.6 MODIFICATIONS DISCUSSED IN NRC SAFETY EVALUATION - APRIL 17, 1992

The licensee's previous commitments related to plant modifications to achieve compliance with the 1986 Edition of ASME Section XI, or the guidance in Generic Letter 89-04, were discussed in the April 17, 1992, Safety Evaluation (SE). A status of these modifications was provided in the licensee's submittal of July 30, 1992, and each is discussed below.

1. Chemical & Volume Control System (CVCS) - Charging System

The CVCS-charging system is now fully testable in accordance with the IST program. The previously discussed modifications will not be required.

2. CVCS-Boric Acid Transfer System

Modifications to this system have been completed. The modifications allow measurement of pump vibration data, pump pressures, and pump flow rate, as well as full-stroke exercising of the boric-acid transfer pumps discharge check valves. Relief Requests PRR-11 and VRR-26 have been withdrawn based on the completion of these modifications.

Relief Request PRR-12 had previously been requested to allow testing of the boric acid transfer pumps on a refueling outage frequency, and to measure pump vibration as practical considering the insulation encapsulation features of these pumps. This relief request was denied and the licensee was to address installation of flow instrumentation and modifications to the insulation to allow for vibration measurements. PRR-12 was withdrawn in the licensee's March 2, 1993, letter based on completion of modifications.

3. Engineered Safety Features Heating, Ventilation, and Air Conditioning

Modifications to add flow instrumentation for the cable spreading room chilled water pumps and control room chilled water pumps were expected to be completed by the end of 1992, as these modifications are not required to be performed during a refueling outage. Based on completion of these modifications, Relief Request PRR-15 and VRR-31 are no longer required and have been withdrawn (see licensee's letter of March 2, 1993).

4. Component Cooling Water System

The modifications to this system were to be completed in the Fall 1992 Unit 2 refueling outage. Unit 1 modifications had already been completed.

3.7 RELIEF REQUESTS DENIED IN NRC SE - APRIL 17, 1992

1. PRR-5, Auxiliary Feedwater Pumps

This relief request has been withdrawn in the licensee's submittal of March 24, 1992.

2. PRR-12, Boric Acid Transfer Pumps

This relief request has been withdrawn (see Section 6.0).

3. VRR-4, Safety Injection and Safety Injection Accumulator Check Valves

This relief request is further evaluated in Section 3.1 above.

4. VRR-5, Valves Tested During Cold Shutdowns

This relief was approved for implementing OM-10 requirements for testing valves at cold shutdown for valves which are able to be tested during any cold shutdown condition but denied for valves that cannot be tested during any cold shutdown of sufficient duration to complete cold shutdown testing. The denial related to valves which can be tested only during refueling outages, for example, or only during cold shutdowns when the reactor coolant pumps are stopped, because these test frequencies are not in accordance with Section XI. The licensee's response for this relief request appears to indicate that VRR-5 was intended to not only implement the cold shutdown scheduling method provided in OM-10, but also to implement deferral of testing to refueling outages when testing is not practical during power operations or cold shutdown conditions. In the relief request, as currently written, it is not clear that this was the licensee's intent. However, the staff has approved the use of OM-10 in rulemaking effective September 8, 1992, and the licensee may utilize the test frequency requirements of OM-10 ¶4.2.1.2 and ¶4.3.2.2, as well as the cold shutdown scheduling stipulated in these paragraphs. VRR-5 should be revised to clarify the licensee's position. No further review of the relief request, however, will be required as the alternative is in accordance with the rulemaking.

5. VRR-23, Containment Isolation Valves

This relief request is further evaluated in Section 3.2 above.

6. VRR-28, Auxiliary Feedwater Pump Minimum Flow Valves

This relief request has been withdrawn (see Section 6.0).

7. VRR-34, Post-Accident Containment Vent Isolation Valves

This relief request has been withdrawn. Cold Shutdown Justification CSJ-33 has been established and testing will be performed at a cold shutdown frequency for the subject valves. See Section 3.5 above.

3.8 RELIEF REQUESTS WHICH ARE WITHDRAWN DUE TO COMPLETION OF MODIFICATIONS

Modifications to the residual heat removal, containment spray, and safety injection systems were made to address concerns identified in NRC Bulletin 88-04, *Potential Safety-Related Pump Loss*, to allow for full-flow testing of the pumps in these systems. These were extensive modifications and the licensee

is commended for their actions to address this bulletin, and at the same time, meet the requirements for inservice testing for pumps and valves in these systems. As a result several relief requests are no longer required and are, therefore, withdrawn. These relief requests are PRR-3, PRR-4, PRR-6, VRR-6, VRR-7, VRR-8, and VRR-9.

3.9 DESCRIPTION OF IST PROGRAM DEVELOPMENT

The licensee's description of the process for the program development appears adequate for developing the program; however, no information was included on the implementation of the program, such as administrative controls, 10 CFR 50.59 reviews of changes to test procedures when reference values are changed, requirements for review of plant modifications in relation to the IST program, and engineering analysis and documentation of corrective actions taken as a result of pumps and valves exceeding the acceptance criteria. The licensee should ensure that these controls are adequate for maintaining the inservice testing program current. Two further recommendations related to the licensee's information are as follows:

1) It appears that manual valves are not considered within the scope of the IST program (see Item 1 of Enclosure 2 of the July 30, 1992, submittal). Manual valves are not exempted from the scope of Section XI inservice testing.

2) If valves have a specific leakage criteria but are passive valves, leakage testing is still required by Section XI. Additionally, it is the staff's position that check valves for which flow is not blocked are "active" valves.

4.0 EVALUATION OF NOVEMBER 16, 1992, SUBMITTAL FOR PRR-21

WE letter number VPNPD-92-355 requested NRC review of Relief Request PRR-21 for the fuel oil transfer pumps, P-070A/B. The letter indicated that the approval of PRR-21 was necessary for only the period of time until an extensive modification and upgrade for the diesel generating capability of the plant was completed. Specifically, two new emergency diesel generators will be installed and fuel oil will be supplied by four new pumps. Upon completion of the modifications, P-070A/B will be removed from the IST program. Additionally, upon approval of PRR-21, Relief Request PRR-10 will be unnecessary and will be withdrawn. PRR-10 concerned the instrumentation accuracy of all pumps in the IST program and was granted for an interim period in the April 17, 1992, SE.

4.1 RELIEF REQUEST PRR-21

Relief from the requirements of IWP-3100 to measure differential pressure and the requirements of IWP-4110 for flow instrument accuracy of $\pm$ 2% is requested for the emergency diesel generator fuel oil transfer pumps, P-070A/B. These pumps function to supply fuel oil from the fuel oil storage tanks to the fuel oil day tanks.

4.1.1 Licensee's Basis for Relief

The licensee states:

"(1) As discussed in the Alternate Testing Section [below], ASME Section XI-1986 [Edition] does not differentiate between positive displacement and centrifugal pumps when delineating test procedures. Measurement of suction and differential pressures does not provide any meaningful information for evaluating positive displacement pump performance. As discussed [below], use of the procedures outlined in the more recent ASME OMb-1989, Part 6, correctly differentiates between different types of pumps and provides an acceptable alternative to the Section XI Code requirements for assuring pump operational readiness.

(2) The flow rate instruments used for P-070A and P-070B inservice testing have a range of 0-15 GPM, which ideally places pump reference flow at approximately two-thirds of full scale (approximately 10 GPM). An accuracy of ± 3% of full scale translates to ± 0.45 GPM for these instruments, whereas an accuracy of ± 2% of full scale, as called out in IWP-4110, would translate to ± 0.30 GPM. The difference of 0.15 GPM is not significant, especially when considering that since these are positive displacement pumps, flow rate does not vary. The installed instruments with an accuracy of ± 3% of full scale are sufficient in this application to assure pump operational readiness."

4.1.2 Alternative Testing

The licensee proposes:

"(1) P-070A and P-070B are both Crane-Deming gear driven, single speed, rotary gear type positive displacement pumps. For pumps of this type, discharge pressure is independent of suction pressure and is a function only of the pump design. Measuring pump inlet and differential pressure does not provide any meaningful information for evaluating pump performance. Consequently, later editions of the Code do not require the measurement of either inlet or differential pressure for positive displacement pumps.

As opposed to ASME Section XI-1986 [Edition], IWP-3100, which does not differentiate between positive displacement and centrifugal pumps, the more recent ASME OMb-1989, Part 6, Subsection 5.2, "Test Procedure," shall be used for inservice testing of P-070A and P-070B.

(2) Instrument accuracy for the measurement of flow rate during inservice testing of P-070A and P-070B shall be within ± 3% of full scale, as opposed to ± 2% of full scale required by IWP-4110."

4.1.3 Evaluation

(a) The requirement to measure inlet pressure was deleted from OM-6 because there were no acceptance criteria associated with inlet pressure. The measurement requirement in Section XI, IWP-3110, was to ensure that adequate suction pressure was available for the tested pump. With the deletion from OM-6, the owner is responsible to address testing limitations and include these limitations in the test procedures. Additionally, OM-6 changed the parameter for indication of pump degradation for positive displacement (PD) pumps from differential pressure to discharge pressure, since discharge pressure is independent of inlet pressure for PD pumps. Therefore, the licensee's proposal is acceptable for implementation in accordance with OM-6. As noted above in Section 1.0, the NRC has approved the 1989 Edition of Section XI which endorses OM-6 for inservice testing of pumps. The staff may approve the use of later editions, or portions thereof, of the Code provided that all related requirements of the respective editions or addenda are met.

(b) With the installed flow rate instrumentation, a full-scale accuracy of ±3% rather than ±2% will be achieved. The scale of the instruments is 15 gpm; therefore, the accuracy of either value is below 0.5 gpm. The actual difference between readings with a 3% versus a 2% accuracy is 0.15 gpm. Even if the reading could be within 0.15 gpm, a flow variance of this amount is not highly significant. Additionally, the licensee plans to replace the fuel oil system and these instruments will no longer be used. A modification to replace the instruments would be a burden on the licensee with little gain in the capability to monitor the pumps for degrading conditions. Therefore, it would be a hardship to require the licensee to install a more accurate instrument for an interim period without a compensating increase in the quality and safety of the flow rate measurement currently achievable.

4.1.4 Conclusions

(a) The proposed implementation of portions of OM-6 for positive displacement pumps and the deletion of inlet pressure measurements is approved pursuant to 10 CFR 50.55a(f)(4)(iv) and relief is no longer required. There are no related requirements associated with the proposal; however, implementation is subject to NRC inspection.

(b) The proposed alternative for flow rate instrument accuracy is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship without a compensating increase in the level of quality and safety.

5.0 EVALUATION OF NOVEMBER 16, 1992, SUBMITTAL FOR PRR-22 AND VRR-36

As a result of NRC Inspection Report 92-008 for Point Beach Nuclear Plant, Units 1 and 2, two relief requests were submitted related to the scope of the IST Program. A Cold Shutdown Justification for component cooling water valves CCW-LW-63/64 was included in the submittal.

5.1 RELIEF REQUESTS PRR-22 and VRR-36

Relief from the requirements of IWP-1100 and IWV-1100 for the scope of the IST program is requested. Specifically, the scope requires ASME Code Class 1, 2, and 3 pumps and valves which are required to perform a specific function in

shutting down a reactor to the cold shutdown condition, mitigate the consequences of an accident, or provide overpressure protection to be in the IST program.

5.1.1 Licensee's Basis for Relief

The licensee states: "The Point Beach Nuclear Plant Final Safety Analysis Report (FSAR), Chapter 14, "Safety Analysis," evaluates the safety aspects of either Unit 1 or Unit 2 of the plant, demonstrates that either or both units can be operated safely, and shows that exposures from credible accidents do not exceed the guidelines of 10 CFR 100. Given that these evaluations demonstrate that the Point Beach units can be operated safely and do not go beyond the plant achieving a hot shutdown condition in any scenario, specifically requiring the inservice testing of components which are required to achieve cold shutdown under non-accident conditions is unwarranted, and does not provide any increase in the level of program quality or safety to the public."

5.1.2 Alternative Testing

The licensee proposes: "The Point Beach Nuclear Plant Inservice Test (IST) Program includes components (pumps and valves) which are required to perform a specific function in shutting down a reactor to the cold shutdown condition only where those components are utilized under accident conditions. Components which support achievement of cold shutdown under non-accident conditions, and which are not required to achieve cold shutdown following an accident, are not required to be included in the Point Beach Nuclear Plant IST Program."

5.1.3 Evaluation

The NRC has discussed the scope of ASME Section XI regarding "cold" shutdown versus "safe" shutdown with the Code committee. The earlier plants were licensed with hot standby or hot shutdown as the "safe" shutdown condition. For such plants, components and systems necessary to achieve cold shutdown may not be safety-related and subject to quality assurance requirements, and therefore are not credited in plant safety analysis for accident recovery, as for Point Beach. The Code committee has already taken steps to revise the scope statements to reflect "safe" shutdown. With this change, a plant will be required to test components necessary to achieve the licensed safe shutdown condition, whether it is hot standby, hot shutdown, or cold shutdown.

The licensing basis for Point Beach Nuclear Plant, Units 1 and 2, is the FSAR. Chapter 14 of the PBNP FSAR analyzes the effects and consequences of design basis accidents. The ability of the plant to operate within regulatory guidelines without undue risk to public health and safety was evaluated for licensing the plant. The fact that the accidents analyzed in the PBNP FSAR do not continue beyond hot shutdown indicates that the capability to establish this condition provides an acceptable level of quality and safety. The

licensee's proposed alternative would, therefore, be an acceptable alternative to the Code requirements. Any component that performs a safety function to mitigate the consequences, bring the plant to the safe shutdown condition, or maintain the plant in safe shutdown is required to be in the IST program.

5.1.4 Conclusion

The proposed alternative to base the scope of the PBNP on safe shutdown rather than cold shutdown is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the licensing basis providing an acceptable level of quality and safety for the scope of the IST program.

5.2 Cold Shutdown Justification CSJ-35

The licensee indicates that to test valves CCW-LW-63 and CCW-LW-64, both unit's radioactive waste processing system gas strippers would have to be shutdown, resulting in an increase in gaseous coolant activity and airborne radioactivity level. The alternative to quarterly stroke testing is to test these valves at Unit 2 cold shutdown conditions which is in accordance with the Code. CSJ-35 references OM-10, Paragraph 4.3.2.2(c) as the basis for the extension to cold shutdown. The PBNP IST Program was developed to the 1986 Edition of Section XI which does not reference OM-10. However, Relief Request VRR-5 addresses the use of OM-10 requirements for cold shutdown testing.

6.0 EVALUATION OF MARCH 2, 1993, SUBMITTAL

The licensee indicated that several relief requests have been deleted from the IST program due to plant modifications, reassessment of the capability to perform testing in accordance with the Code, or a determination that relief is not required. The relief requests which have been withdrawn are as follows:

Relief Request Number	Affected Component	Reason for Withdrawal
PRR-11 PRR-12	Boric Acid Transfer Pumps and Discharge Check Valves	Modifications discussed in previous submittals are now complete.
PRR-15 and VRR-31	Cable Spreading Room Chilled Water Pumps, Control Room Chilled Water Pumps, and Chilled Water Pump Discharge Check Valves	Modifications have been completed which provide instrumentation enabling measurement of Code required test parameters.
VRR-28	Auxiliary Feedwater Pump Mini-Recirculation Valves	Modifications to the control systems of the auxiliary feedwater pump minimum flow valves enable testing.
VRR-19	Reactor Coolant Pump Seal Injection Throttle Valves	A reevaluation of these valves indicates that they are not relied upon to perform a safety function and have been removed from the IST Program.
VRR-20	Auxiliary Feedwater Pump Cooling Water Supply Valves	The valves have been replaced with valves that have position indication, enabling stroke time testing in accordance with the Code.
PRR-17	Safety Injection and Residual Heat Removal	Modifications to permit testing in accordance with the Code are complete.
PRR-18	Auxiliary Feedwater Pumps	Modifications to permit testing in accordance with the Code are complete.

Relief Request Number	Affected Component	Reason for Withdrawal
VRR-27	Safety Injection Pump Mini-Recirculation Check Valves	The valve will no longer be disassembled and inspected. This relief request has been replaced with VRR-37.
VRR-32	Instrument Air Supply Check Valves to PORVs	This relief request is not required.
VRR-33	Fuel Oil Transfer Pump Transfer Regulating Valves	This relief request is not required.
PRR-16	Measurement of Differential Pressure, All Pumps	This relief request is not required.

In addition to the withdrawal of relief requests, the submittal included three relief requests which are evaluated below.

6.1 RELIEF REQUEST VRR-21

Interim relief was granted in the April 17, 1992, SE for the main feedwater check valves to allow a period for the licensee to review the testing of these valves (Action Item 5.31 of the TER). As a result of the review, Relief Request VRR-21 was revised for these category A/C check valves. Specifically, relief from the test frequency and test method requirements of IWV-3522 and IWV-3420 is requested.

6.1.1 Licensee's Basis for Relief

The licensee states: "The main feed line to each steam generator consists of two series check valves. The Point Beach FSAR makes no assumptions that require both series check valves to function. There are no position indicators on these valves to verify disk position, nor are there any pressure taps between them to enable individual leak rate testing. It is physically impossible, given the present plant configuration, to verify individual valve closure. Closure and seat tightness of at least one of the two series check valves can be verified by measuring the differential pressure across, or the leakage past, the combination of both valves. Since the valves in series are considered to be redundant, testing both valves as a single unit is adequate to ensure that the safety function of the valve combination is verified and maintained.

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 disk position is available. Valve testing can only be conducted during cold shutdowns since flow of main feedwater to the steam generators must be secured in order to perform the tests."

6.1.2 Alternative Testing

The licensee proposes: "A valve exercise test of each series combination of main feedwater check valves will be conducted during cold shutdowns, in accordance with the provisions of IWV-3412(a) and IWV-3522 that address the exercising of valves which have had testing deferred to cold shutdown conditions. At least one of the series valves will be verified closed after flow is secured by measuring the differential pressure across, and the leakage past, the two valves in series.

Leak rate testing to satisfy Category A requirements will meet the criteria outlined in IWV-3420, except that the two valves in series shall be treated as though they were a single component. Additionally, once every 10 years, each main feedwater check valve shall be opened and inspected. The split body construction of valves 1&2 CS-00466 AA and 1&2 CS-00476 AA limits access to the valve internals, and permits inspection only through use of a boroscope. Complete disassembly of these valves is not practical since it would require the movement of piping and the cutting of large pipe support structures. Valves 1&2 CS-00466 BB and 1&2 CS-00476 BB are constructed with no such limitations."

6.1.3 Evaluation

The main feedwater line to each steam generator has two normally open, in-line, series check valves. The function of these valves is to close upon reversal of flow to ensure that auxiliary feedwater flow is unimpaired to at least one of the two steam generators when main feedwater is unavailable. The series check valves also prevent simultaneous blowdown of both steam generators in the event of a main feed pipe failure. Section 10.2.2 of the PBNP FSAR states the following: "The steam and feedwater lines from the steam generators up to and including the check valves are [seismic] Class I. A failure of any [seismic] Class I main steam or feedwater line or malfunction of a valve installed therein will not impair the reliability of the auxiliary feedwater system, render inoperative any engineered safeguard feature, initiate a loss of coolant condition, or cause failure of any other steam or feedwater line." Additionally, FSAR Figure 10.2-2A indicates that the seismic class break is at the second of the two series check valves in the main feedwater lines to the steam generators. This appears to be inconsistent with the licensee's basis for relief.

The feedwater regulating valves (466/480 and 476/481 parallel valves), which are upstream of the series check valves, do not appear to be in the PBNP IST Program, though these valves receive engineered safeguards signals. If these valves were in the PBNP IST Program, they would serve as an additional level of safety for isolating the feedwater lines. The licensee should review the testing requirements for the feedwater regulating valves for inclusion in the IST program and/or to provide an additional level of assurance in the event both check valves fail to close in an accident condition.

The categorization of the series check valves appears to be based on the system function of the auxiliary feedwater system rather than on specific valve leakage criteria. Though the valves are required to prevent reverse flow, the safety function is to prevent diversion of flow to a level that would compromise the assumed auxiliary feedwater flow to the steam generators. The licensee should review the leakage requirements, and if it is determined that no specified leakage limit exists for each valve, the IST Program should so state.

The licensee's basis for relief states that "[s]ince the valves in series are considered to be redundant, testing both valves as a single unit is adequate to ensure that the safety function of the valve combination is verified and maintained." It does appear that the series check valves do serve a "redundant" function to meet single failure criteria requiring both valves to be inservice tested. Therefore, the proposed alternative does not provide assurance that single failure criteria for the valves is met. In order to resolve the IST issues related to these valves, it appears that Section 10.2.2 of the FSAR would have to be changed in accordance with 10 CFR 50.59. With testing providing only assurance that one of two valves will perform the safety function, one valve may be stuck open and a failure of the other valve could prevent the auxiliary feedwater system from supplying adequate water to the steam generators. This does not ensure that the single failure criterion for the pair of valves is met. Therefore, long-term relief cannot be granted as requested.

If the licensee determines that the series check valves do not have individual leakage rate criteria, it may be possible to verify closure of both series check valves, and therefore meet the safety analysis described in Section 10.2.2 of the FSAR, with a nonintrusive method of verification.

6.1.4 Conclusion

While the current method of testing does verify that at least one of the two series check valves is capable of performing the required safety function, there are issues that need to be resolved before long-term relief can be granted. Immediate imposition of the Code requirements would be a hardship in that there is no method currently in place that adequately tests the valves, installation of design features to allow testing require a plant shutdown, and a failure to comply with Code requirements could force a plant shutdown until some method of testing is developed and could be implemented. Requiring the plant to shutdown when the valves have shown no failures with the current test method would not benefit safety in that challenges to plant safety systems would result. Therefore, the proposed alternative is authorized for a period of one year pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship without a compensating increase in the level of quality and safety, to allow the licensee a period of time to evaluate other alternatives and take appropriate actions.

6.2 RELIEF REQUEST VRR-24

VRR-24 was an open item in the NRC SE dated April 17, 1992. Additional justification has been added in the revised relief request for the emergency boration check valves which open to provide a flow path for emergency reactor coolant boration from the discharge of the boric acid transfer pumps to the suctions of the charging pumps. Relief to test these valves on a refueling outage frequency is requested.

6.2.1 Licensee's Basis for Relief

The licensee states: "Stroke testing these valves in the open direction requires the introduction of highly concentrated boric acid solution from the boric acid makeup tanks to the suctions of the charging pumps. This results in the addition of an excessive amount of boron into the RCS [reactor coolant system] which will adversely affect plant power, potentially causing a reactor trip. During cold shutdowns of short duration, the introduction of excessive amounts of boron into the RCS complicates the task of maintaining proper plant chemistry and creates difficulties with subsequent startup, especially later in core life.

In addition to the adverse effects on primary plant chemistry, pumping high concentrations of boric acid through the emergency boration line can cause reactor coolant pump (RCP) seal failure. The RCP seal water supply lines are not heat traced. Crystallization of concentrated boric acid in the RCP seal injection filters will occur and cause a loss of RCP seal water. Consequently, it is only possible to perform stroke testing on 1&2 CV-00351 when reactor coolant pumps are secured and the associated RCP seal water lines are isolated. Crystallization of boric acid may also occur in instrumentation sensing lines as concentrated boric acid is pumped into the chemical and volume control system (CVCS) for the purpose of stroke testing 1&2 CV-00351.

The steps necessary to establish plant conditions to permit the testing of 1&2 CV-00351, and those which are required to recover from that testing, are sufficient to preclude the testing of the valves during cold shutdowns in which there is no reactor refueling. Extending a cold shutdown period for the sole purpose of providing the necessary time to allow for the test and recovery from test conditions is excessively burdensome to the licensee.

Point Beach operates on an annual refueling cycle for each unit, and non-refueling cold shutdowns between cycles are rare. Deferral of testing for 1&2 CV-00351 to refueling outages will test each valve on an annual basis and is in keeping with ASME OMa-1988, Part 10, Section 4.3.2.2(e). Testing during annual refueling outages provides adequate assurance of the ability of these valves to perform their safety function."

6.2.2 Alternative Testing

The licensee proposes: "These valves will be full stroke exercised to the open position during reactor refueling outages."

6.2.3 Evaluation

The 1989 Edition of ASME Section XI references OM-10 for inservice testing of valves. OM-10 recognizes that there may be impracticalities for testing valves quarterly or during cold shutdowns and allows testing to be extended to refueling outages. For check valves, the applicable paragraph of OM-10 is 4.3.2. Provided all related requirements are met, a licensee may use portions of the Code edition approved in 10 CFR 50.55a(b), subject to Commission approval, pursuant to 10 CFR 50.55a(f)(4)(iv). It appears that the revised relief request includes adequate justification to defer testing to refueling outages, particularly with annual refueling outages.

6.2.4 Conclusion

The testing of the boric acid addition system check valves during refueling outages is acceptable pursuant to 10 CFR 50.55a(f)(4)(iv) provided the licensee implements all the requirements of OM-10, Paragraph 4.3.2, for the testing frequency. Relief is not required. Whether all related requirements are met is subject to NRC inspection.

6.3 RELIEF REQUEST VRR-37

VRR-27 indicated that the safety injection pump minimum recirculation check valves would be disassembled and inspected, in lieu of tests, in accordance with the guidance of GL 89-04, Position 2. Experience indicated that for these type of valves, there was a high probability that the threads would be destroyed by the disassembly process. The body-to-bonnet threads on these valves are fine, non-tapered, stainless steel threads which are highly susceptible to galling. Based on the risk of thread damage associated with disassembly and inspection, the licensee has withdrawn VRR-27. Relief Request VRR-37 is submitted to address the flow rate measurement to verify full-flow for testing these valves during quarterly safety injection pump testing.

6.3.1 Licensee's Basis for Relief

The licensee states: "There is no installed flow rate instrumentation available to verify valve full stroke exercising as required by GL 89-04, Attachment 1, Position 1. These valves have no means of local or remote position indication. Disassembly and inspection in accordance with GL 89-04, Attachment 1, Position 2, risk destroying the valve due to galling of the body-to-bonnet threads.

Use of portable instruments provides a suitable means to measure flow rate in the lines containing these valves and enables testing per GL 89-04, Attachment 1, Position 1. Although the portable instruments lack the accuracy and repeatability of permanently installed instrumentation, these difficulties can be overcome. Use of portable instruments can be sufficiently proceduralized to ensure reasonable repeatability and accuracy in measurements. Inaccuracies associated with equipment can be applied conservatively when establishing check valve flow rate acceptance criteria, such that even with the worst

possible instrument accuracy, the check valve must pass the "maximum required accident condition flow" of GL 89-04, Attachment 1, Position 1, if the acceptance criteria is met.

Note that these portable flow rate instruments are only being used for the full stroke exercising of check valves 1&2 SI-00891 A&B, and not for gathering any data related to pump performance. Consequently, the strict Code requirements pertaining to instruments used in pump testing (IWP-4000) do not apply in this instance, and relief is not required from these sections of the Code."

6.3.2 Alternative Testing

The licensee proposes: "During quarterly pump testing, each of these valves will be full stroke exercised via recirculation through the minimum flow test circuits. Quantitative measurement of flow which confirms that "maximum required accident condition flow" has passed through the valve shall be accomplished using portable flow rate instruments. The manner of use of these instruments shall be sufficiently proceduralized to ensure maximum repeatability and accuracy of the measurements. Acceptance criteria established based on flow rate will take portable instrument accuracy into account in such a manner so as to ensure that the check valve must have passed the "maximum required accident condition flow" of GL 89-04, Attachment 1, Position 1, if the acceptance criteria is met."

6.3.3 Evaluation

GL 89-04, Position 1, provided the staff position for full flow testing of check valves, indicating that an acceptable means of meeting the Code requirements would be to ensure that the disc movement was sufficient to pass maximum required accident flow rate. Additionally, GL 89-04, Position 1, indicated that for flow testing that was at a lower flow quantity, methods employing nonintrusive techniques to verify full opening of the valve were considered in accordance with "other means" acceptable per IWV-3522. Neither the guidance in Position 1 nor IWV-3522 address instrumentation accuracy requirements. Therefore, the licensee is responsible for establishing the test method and qualifying that it provides adequate and repeatable results. It appears that the licensee has addressed the necessary elements to ensure that the test method is acceptable for assuring the minimum flow quantity required for the test to be adequate in accordance with the guidance of GL 89-04, Position 1.

6.3.4 Conclusion

Relief is not required, and, therefore, no action by the staff is required. The relief request should be incorporated into the IST Program as a technical position. Implementation of the testing is subject to NRC inspection.

7.0 REVIEW OF APRIL 2, 1993, SUBMITTAL

The response to each of the action items in the NRC April 17, 1992, Safety Evaluation (SE) was provided in the April 2, 1993, submittal. The response for each item appears to address the concerns indicated in the SE. Several relief requests have been withdrawn, editorial changes have been made, relief requests have been revised to include provisions, and relief requests have been revised for further NRC review (see sections above).

8.0 REVIEW OF APRIL 27, 1993, SUBMITTAL

The revised Point Beach IST Program was provided in this submittal. The revision incorporated all the previous submittals, but included no new relief requests. Table 1 reflects the current status of each relief request based on the evaluations above. A complete review of the submittal was not performed; however, it was noted that the licensee references 10 CFR 50.55a(g) for the IST requirements. While Paragraph (g) references Paragraph (f), the rulemaking effective September 8, 1992, added ¶(f) to Section 50.55a to stipulate the regulations for inservice testing of Code Class 1, 2, and 3 (or equivalent) pumps and valves.

The "Background Document," which provides a basis for the development and scope of the IST program, was included in the submittal. For the main feedwater check valves discussed in Section 6.1 above, the licensee indicates these series valves perform a redundant function. Therefore, both valves appear to be required for single failure assurance. Further, for the feedwater regulating valves, the background document indicates that these valves are not tested in IST because their isolation function on SIS initiation is redundant to the "automatic trip function of the main feedwater, condensate, and heater drain tank pumps in the event of containment over-pressure (5 psig)..." In reviewing Section 14.2.5, it is unclear why the isolation function of these valves is not a safety-related function, even though it may be redundant. As recommended in Section 6.1.3 above, the licensee should review the function of these valves.

9.0 CONCLUSION

Based on the review of the Point Beach Nuclear Plant Inservice Testing Program relief requests, the NRC staff concludes that the relief requests as evaluated and modified by the Safety Evaluation will provide reasonable assurance of the operational readiness of the pumps to perform their safety-related functions. The NRC staff has determined that granting relief or approving alternatives pursuant to 10 CFR 50.55a is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon Wisconsin Electric Power Company that could result if the ASME Code requirements were imposed on the facility.

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Date: October 28, 1993

Table 1
Status of Inservice Testing Program Relief Requests
Wisconsin Electric Power Company
Point Beach Nuclear Plant, Units 1 and 2
Docket Numbers 50-266 and 50-301

Relief Request Number	Status Of Relief Request
PRR-1 Instrument Range for Temperature and Speed	Granted 4/17/92 SE
PRR-2 Inlet pressure measurement	Granted 4/17/92 SE
PRR-3	Withdrawn 7/30/92 WE Letter
PRR-4	Withdrawn 7/30/92 WE Letter
PRR-5	Withdrawn 3/24/92 WE Letter
PRR-6	Withdrawn 7/30/92 WE Letter
PRR-7 Vibration Monitoring	Granted with Provision 4/17/92 SE PRR-7 revised to meet OM-6 for vibration monitoring per provision (See 4/2/93 WE Letter)
PRR-8 Delete measurement of bearing temperature	Granted 4/17/92 SE
PRR-9 Pump suction pressure gauge lines correction factor for static pressure in calculated value of pump differential pressure	Granted with Provision 4/17/92 PRR-9 revised to proceduralize calculations of differential where corrections for liquid in gauge sensing lines is necessary to meet provision (See 4/2/93 WE Letter)
PRR-10 Interim loop accuracy	Interim Relief Granted 4/17/92 SE With approval of PRR-21, PRR-10 are withdrawn per 11/16/92 WE Letter. See Section 4.0 of Current SE
PRR-11	Withdrawn 3/2/93 WE Letter
PRR-12	Withdrawn 3/2/93 WE Letter
PRR-13 Calculate inlet pressure for Service Water Pumps	Granted with Provision 4/17/92 SE PRR-13 revised to proceduralize calculation per provision (See 4/2/93 WE Letter)
PRR-14 Monitor Discharge Pressure for Charging Pumps	Granted 4/17/92 SE
PRR-15	Withdrawn 3/2/93 WE Letter

Relief Request Number	Status Of Relief Request
PRR-16	Withdrawn 3/2/92 WE Letter
PRR-17	Withdrawn 3/2/93 WE Letter
PRR-18	Withdrawn 3/2/93 WE Letter
PRR-19 2% tolerance of flow for SE and CCW pumps	Granted 3/26/92 SE See PRR-20 which is a similar relief request
PRR-20 2% tolerance of reference value for AFW pumps	New RR Submitted in 2/24/92 WE Letter See Section 2.1 of Current SE Relief not required.
PRR-21 Monitor discharge pressure Diesel Fuel Oil Transfer Pumps with installed gauges (accuracy ± 3%)	New RR Submitted in 11/16/92 WE Letter Alternative authorized per § 50.55a ¶(a)(3)(ii). See Section 4.1 of current SE.
PRR-22/VRR-36 Scope of IST Program. "Cold" shutdown versus "safe" shutdown.	New RR Submitted 11/16/92 Alternative authorized per § 50.55a ¶(a)(3)(i). See Section 5.1 of current SE.
VRR-1 Rapid-acting valves.	Granted 4/17/92 SE
VRR-2 Full-stroke SI and RHR PIVs during refueling outages.	Granted with Provision 4/17/92 SE VRR-2 revised to per full-stroke exercise in accordance with GL 89-04, Position 1, guidance per provision.
VRR-3 Full-stroke SI and RHR PIVs each refueling and each CSD when Event V testing required.	Granted 4/17/92 SE
VRR-4 Disassemble and inspect SI and SI accumulator check valves in accordance with GL 89-04, Position 2, guidance.	Granted with Provision 4/17/92 SE Additional Information in WE 4/30/92 Letter See Section 3.1 in current SE for additional discussion.
VRR-5 Valves tested during cold shutdown.	Granted with Exceptions 4/17/92 SE See Section 3.7, Item 4, of current SE. VRR-5 revised to note exceptions.
VRR-6	Withdrawn 7/30/92
VRR-7	Withdrawn 7/30/92
VRR-8	Withdrawn 7/30/92
VRR-9	Withdrawn 7/30/92

Relief Request Number	Status Of Relief Request
VRR-10 Verify closure of CCW check valves by App. J leak test.	Granted 4/17/92 SE
VRR-11 Verify closure of PRT N_2 supply check valves by App. J leak test.	Granted 4/17/92 SE
VRR-12 Verify closure of charging pump discharge check valves by App. J leak test.	Granted 4/17/92 SE
VRR-13 Verify closure of charging line check valves by App. J leak test.	Granted 4/17/92 SE
VRR-14 Perform pressure decay test for IA valves.	Granted 4/17/92 SE
VRR-15 Disassemble and inspect SW check valves per GL 89-04, Position 2.	Granted with Provisions 4/17/92 SE VRR-15 revised to incorporate details on disassembly and inspection program.
VRR-16 Verify closure of CAMS CIVs by App. J leak test.	Granted 4/17/92 SE
VRR-17 Verify operational readiness of EDG air start valves during monthly EDG tests.	Granted with Provisions 4/17/92 A maximum time for diesel start has been incorporated into VRR-17. Air motor banks are alternated between tests.
VRR-18 Verify closure of PRT makeup supply check valves by App. J leak test.	Granted 4/17/92 SE
VRR-19	Withdrawn 3/2/93 WE Letter
VRR-20	Withdrawn 3/2/93 WE Letter
VRR-21 Verify closure by performing leak test of pair of series Main FW check valves to SG.	Interim Relief Granted 4/17/92 SE Revised 3/2/93 WE Letter Interim authorization of alternative per § 50.55a ¶(a)(3)(ii) for 1 year. See Section 6.1 of current SE.
VRR-22 Evaluate PIV leakage in accordance with TS.	Granted 4/17/92 SE

Relief Request Number	Status Of Relief Request
VRR-23 Assign maximum leakage to combination of CIVs.	Granted for Certain Valves 4/17/92 SE Denied for Remaining Valves 4/17/92 SE Revised 7/30/92 WE Letter Approved per § 50.55a ¶(f)(4)(iv). See Section 3.2 of current SE.
VRR-24 BAT pump discharge to charging pump suction check valves test frequency.	Open Item 4/17/92 SE Revised 3/2/93 WE Letter Approved per § 50.55a ¶(f)(4)(iv). See Section 6.2 of current SE.
VRR-25 EDG air start valves test method and stroke-time measurement.	Granted with Provision 4/17/92 SE A maximum time for diesel start has been incorporated into VRR-25. Air motor banks are alternated between tests.
VRR-26	Withdrawn 3/2/93
VRR-27	Withdrawn 3/2/93
VRR-28	Withdrawn 3/2/93
VRR-29 CIVs 6" NPS and larger.	Granted 4/17/92
VRR-30 Verify closure of CCW check valves by App. J leak test.	Granted 4/17/92
VRR-31	Withdrawn 3/2/93
VRR-32	Withdrawn 3/2/93
VRR-33	Withdrawn 3/2/93
VRR-34	Withdrawn 7/30/92
VRR-35 Use "jack-and-lap" process to lap MSSVs seats, but not retest set pressure if lapping is within certain limits.	New RR Submitted 7/29/92 WE Letter Relief not required for implementation of the process with applicable controls. See Section 3.3 of current SE.
VRR-36/PRR-22 Scope of IST Program. "Cold" shutdown versus "safe" shutdown.	New RR Submitted 11/16/92 WE Letter Alternative authorized per § 50.55a ¶(a)(3)(i). See Section 5.1 of current SE.
VRR-37 Use of portable instruments for check valve testing with flow.	New RR Submitted 3/2/93 WE Letter Relief not required for implementation. Licensee's method of repeatability and accuracy acceptable as described. See Section 6.3 of current SE.