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SUBJECT: Requests that NRC review relief request re resolution of inservice testing program safety evaluation anomalies.

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June 2, 1995

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U.S Nuclear Regulatory Commission
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Ladies\Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Resolution of Inservice Testing Program Safety Evaluation Anomalies

Reference: 1) Letter from John N. Hannon (NRR) to C.A. Schrock (WPSC) dated July 15, 1994

On July 25, 1994, Wisconsin Public Service Corporation (WPSC) received the Safety Evaluation (SE) of the Inservice Testing (IST) plan for the Kewaunee Nuclear Power Plant (KNPP) from the Nuclear Regulatory Commission (NRC) (Reference 1). The NRC determined that the KNPP IST plan relief requests are acceptable for implementation provided the anomalies identified in Appendix A to the SE are addressed within one year of the date of the SE or by the date of the next refueling outage, whichever is later. WPSC has addressed each of the SE concerns and presents the resolution of each concern in the attachments to this letter. Attachment 1 contains each anomaly identified in the SE, with a corresponding WPSC response. Attachment 2 contains modified relief requests including additional information, and Attachment 3 contains a new relief request regarding the testing of the service water pumps.

WPSC requests that the NRC review these relief requests in accordance with 10 CFR 50.55a(f)(6)(i). Subsequent to NRC review and approval, WPSC will formally submit a revision to the KNPP IST plan. If you have any questions or comments, please contact me or a member of my staff.

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Sincerely,

M. L. Marchi
Manager - Nuclear Business Group

KPH/jmf

Attach.

cc - US NRC Region III
US NRC Senior Resident Inspector

ATTACHMENT 1

Letter from M. L. Marchi (WPSC)

To

Document Control Desk (NRC)

Dated

June 2, 1995

WPSC Response to NRC Anomalies

1) Relief Request IST-RR-10A

The relief granted in accordance with Generic Letter 89-04 for the use of disassembly and inspection for the accumulator discharge check valves for the second inservice testing interval was discussed in NRC's safety evaluation dated September 13, 1990. The extension of the schedule for the disassembly and inspection was indicated acceptable based on the information provided by the licensee. Reactor coolant system inventory must be reduced to disassemble SI-22A/B and the core has to be defueled to reduce water to a level that allows disassembly of SI-21A/B. However, the discussion indicated that the change from one valve each refueling outage to disassembly and inspection of all four valves each defueling outage was acceptable. The relief request provides an adequate basis for extension of the interval for each of the valves to defueling outages, but states that "one of these valves will be disassembled and inspected during the 120-month interval in order to verify the ability of the valves to open to the full-stroke position." The extension of the interval to one valve every 10 year period is not justified. Each of the valves must be inspected at least once nominally during the 10 year interval unless other test methods are used.

If other test methods, such as nonintrusive techniques, can be used to verify a full stroke exercise of these valves, disassembly and inspection should no longer be used as a routine alternative. The relief request discussed the potential application of such techniques.

WPSC Response

IST-RR-10A has been modified to require disassembly and inspection of SI-21A/B and SI-22A/B at least once each during the 120-month interval to verify the ability of the valves to open to the full-stroke position. If nonintrusive techniques can be used to verify full-stroke of the valves, disassembly and inspection will no longer be used (see Attachment 2).

2) Relief Request IST-RR-11

The licensee should ensure that the issues discussed and the elements listed in the evaluation are incorporated into the implementation of the testing using pump curves for the inservice testing of the component cooling pumps.

Safety Evaluation:

The following elements are to be incorporated into the IST of pumps using pump curves:

1) Curves are developed, or the manufacturer's pump curves are validated, when the pumps are known to be operating acceptably.

2) The reference points used to develop or validate the curve are measured using instruments at least as accurate as required by the code.

3) Curves are based on an adequate number of points, with a minimum of five.

4) Points are beyond the "flat" portion (low flow rates) of the curves in a range which includes, or as close as practicable to design basis flow rates.

5) Acceptance criteria based on the curves does not conflict with Technical Specifications or Facility Safety Analysis Report operability criteria, for flow rate and differential pressure, for the affected pumps.

6) If vibration levels vary significantly over the range of pump conditions, a method for assigning appropriate vibration acceptance criteria should be developed for regions of the pump curve.

7) When the reference curve may have been affected by repair, replacement, or routine service, a new reference curve shall be determined or the previous curve revalidated by an inservice test.

WPSC Response

IST-RR-11 has been modified with additional information to address each of the seven issues discussed in the SE (see Attachment 2).

3) Note 39

In categorizing these manual valves (3/4" service air to containment annulus non-code class valves) as passive, but allowing periodic repositioning during operating conditions as needed, the licensee should ensure that the administrative controls verify that the valves are properly restored to their safety position.

WPSC Response

Administrative controls have been established which require the Shift Supervisor to log these valves on his status board any time that they are open. Following the use of these valves, independent verification is performed to ensure that the valves are in the closed "safety" position.

4) Note 40

When calculating the inlet pressure for determining differential pressure for the service water pumps using the level of the forebay, the method to measure the level must be in a procedure and must meet the intent of the instrument accuracy requirements of the Code.

WPSC Response

A graph within the service water pump testing procedure is used to convert the indicated forebay level, which is measured with instruments calibrated to the code requirements, to service water pump suction pressure. The graph was developed using the relative elevations of the forebay level instruments and the service water pumps and the nearly constant density of water over the expected operating temperatures.

5) Note 41

When calculating the inlet pressure for determining differential pressure for the containment spray pumps using the level of the refueling water storage tank, the method to measure the level must be in a procedure and must meet the intent of the instrument accuracy requirements of the Code.

WPSC Response

Inlet pressure to the containment spray pumps is included in the testing procedure as a fixed value based on the narrow band in which refueling water storage tank (RWST) level is maintained. The maximum difference in level between the Technical Specification limit and the RWST overflow piping is 9.2 inches which corresponds to 0.33 psi or approximately 1% of the calculated suction pressure.

ATTACHMENT 2

Letter from M. L. Marchi (WPSC)

To

Document Control Desk (NRC)

Dated

June 2, 1995

Modified Relief Requests

Relief Request IST-RR-10A
Relief Request IST-RR-11

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Relief Request IST-RR-10A

Components Affected

Valve #	Flow Diagram
SI-21A	X-K100-28
SI-21B	X-K100-28
SI-22A	X-K100-28
SI-22B	X-K100-28

Code Requirement

Section 4.3.2 of Part 10 of the Code requires that active check valves be exercised to the position required to fulfill their function at least once every 3 months.

Basis for Requesting Relief

These check valves will be part-stroke exercised during cold shutdowns (see Note 18). It is never feasible to exercise these check valves at the design basis LOCA flow rate (approximately 14,000 gpm). Further, frequent disassembly and inspection of these valves is particularly burdensome because:

1. It requires defueling,
2. it requires draining of the reactor vessel,
3. frequent disassembly is inconsistent with ALARA principles, with radiation dose rates as high as 1400 mRem/hr,
4. all previous inspections have found no degradation that could lead to the inability of the valves to open to their full flow position,
5. all previous inspections have found that the valves could open to the full-stroke position,
6. a large number of man-hours are required for planning the disassembly/inspection, attaining the required plant conditions, performing the disassembly/inspection, documenting the findings, and performing the necessary Quality Control measures,
7. unnecessarily disassembling the valves greatly increases the risk of a maintenance induced failure,

8. inspections of all four of these valves in 1990, after 16 years of power operation, showed all of the valves to be in pristine condition,
9. the probability of a check valve failing to open on demand is very low both at the Kewaunee Plant and industry wide.

Alternate Method of Testing

These check valves will be part-stroke exercised during cold shutdowns in a manner demonstrating that the disk moves freely off its seat by comparison of pressure differential and flow rate. This test will not be repeated if the previous test was completed within 3 months. In addition, each of these valves will be disassembled and inspected at least once during the 120-month interval in order to verify the ability of the valve to open to the full-stroke position. The disassembly, inspection, and corrective action will use Generic Letter 89-04 as guidance, and a post-inspection part-stroke will be performed following reassembly. If the disassembled valve is not capable of being full-stroke exercised, or if there is binding or failure of valve internals, the remaining valves in this group will be disassembled, inspected, and manually full-stroke exercised during the same outage. Disassembly and inspection beyond what is stated here would be particularly burdensome with little or no improvement to safety, and may actually be detrimental to safety.

Furthermore, WPSC is considering adopting Non-Intrusive Testing as an alternative to disassembly and inspection. If Non-Intrusive Testing is adopted, it will be conducted in lieu of the disassembly and inspection described above.

Relief Request IST-RR-11

Components Affected

Component Cooling Pump A
Component Cooling Pump B

Code Requirement

Paragraph 5.2 of Part 6 of the Code details the pump parameters that must be measured or observed at least once every 3 months with the pump operating. Included in the parameters to be measured is flow rate.

Basis for Requesting Relief

Component Cooling flow will vary depending on plant mode and amount of equipment in service needing cooling. Therefore, a stable flow rate at a predefined reference value cannot be reproduced during each quarterly test.

Alternate Methods of Testing

Pump performance measurements are made with the flow condition of nominal flow during power operation plus flow through RHR heat exchanger 1B. Flow measurements are made from a computer point and differential pressures are measured and recorded. The differential pressure is compared to that predicted by the pump curve for the measured flow rate. Action levels have been established based on the deviation from the predicted pump curve values. This method of establishing Action levels is consistent with Paragraph 6.1 of Part 6 of the Code.

The following elements are used in developing and implementing the reference pump curve:

1) The data used to develop the pump acceptance criteria curve have been compared to the manufacturer supplied pump curve and the comparison does validate the proper operation of the pump.

2) The instruments used to measure the operating characteristics of the pump meet the ±2% accuracy requirements stated in Table 1 of ASME/ANSI OM Part 6.

3) The pump curve is based on six data points.

4) The six data points chosen are beyond the "flat" portion of the curve in the region in which the pump is normally operating. The design flowrate of the pumps is 3650 gpm and the acceptance criteria curve has a range of 2300 gpm to 3700 gpm.

5) KNPP Technical Specification and Updated Safety Analysis Report were reviewed to ensure that the pump curve does not conflict with any operability criteria.

6) The vibration levels do not vary significantly over the operating range of the pumps, therefore, one set of vibration acceptance criteria will be used.

7) An inservice test is performed on all equipment within the scope of the IST plan following repair, replacement, or service to determine a new acceptance criteria or revalidate the old acceptance criteria prior to returning the equipment to service.

ATTACHMENT 3

Letter from M. L. Marchi (WPSC)

To

Document Control Desk (NRC)

Dated

June 2, 1995

New Relief Request

Relief Request IST-RR-27

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Relief Request IST-RR-27

Components Affected

Service Water Pump A1
Service Water Pump A2
Service Water Pump B1
Service Water Pump B2

Code Requirements

Paragraph 5.2 of Part 6 of the Code details the pump parameters that must be measured or observed at least once every 3 months with the pump operating. Included in the parameters to be measured is flow rate.

Basis for Requesting Relief

Service Water flow will vary depending on the plant mode and amount of equipment in service needing cooling. Therefore, a stable flow rate at a predefined reference value cannot be reproduced during each quarterly test.

Alternate Method of Testing

Pump performance measurements are made with the flow condition of nominal flow during power operation.

Flow measurements are made locally with ultrasonic flow meters and differential pressures are calculated and recorded. The differential pressure is compared to that predicted by the pump curve for the measured flow rate. Alert and Action levels have been established based on the deviation from the predicted pump curve values. This method of establishing Alert and Action levels is consistent with paragraph 6.1 of Part 6 of the Code.

The following elements are used in developing and implementing the reference pump curves:

1) The data used to develop the pump acceptance criteria curves have been compared to the manufacturer supplied pump curves and the comparison does validate the proper operation of the pumps.

2) The instruments used to measure the operating characteristics of the pumps meet the ±2% accuracy requirements stated in Table 1 of ASME/ANSI OM Part 6.

3) The pump curves are based on six data points.

4) One data point is on the "flat" portion of the curve and the remaining five data points are beyond the "flat" portion of the curve in the region in which the pump is normally operating. The design flowrate of the pumps is 6400 gpm and the data used to develop the acceptance curves ranges from 350 gpm to 5970 gpm.

5) KNPP Technical Specification and Updated Safety Analysis Report were reviewed to ensure that the pump curves do not conflict with any operability criteria.

6) The vibration levels do not vary significantly over the operating range of the pumps, therefore, one set of vibration acceptance criteria will be used.

7) An inservice test is performed on all equipment within the scope of the IST plan following repair, replacement, or service to determine a new acceptance criteria or revalidate the old acceptance criteria prior to returning the equipment to service.