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February 2, 1993

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Auxiliary Feedwater Pump Low Suction Pressure Trip Evaluation

References:

1. Letter from D.G. Eisenhut (NRC) to E.R. Mathews (WPS) dated September 21, 1979.
2. Letter from C.W. Giesler (WPS) to S.A. Varga (NRC) dated May 6, 1983.
3. Letter from S.A. Varga (NRC) to C.W. Giesler (WPS) dated August 10, 1983.
4. Letter from D.C. Hintz (WPS) to M.B. Fairtile (NRC) dated May 30, 1986.
5. Letter from C.R. Steinhardt (WPS) to NRC Document Control Desk dated April 18, 1989.
6. NRC IE Information Notice 85-75, dated August 30, 1985.
7. NRC Information Notice 87-53, dated October 20, 1987.

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8. INPO 85-036, The Operational Performance of AFW Systems in U.S. PWRs 1980-1984, dated September 1985.

9. EPRI NSAC-150, Operating Experience of Auxiliary Feedwater Systems at PWR Power Plants, 1990.

10. Letter from C.R. Steinhardt (WPSC) to NRC Document Control Desk dated December 1, 1992.

Pursuant to recent discussions between Wisconsin Public Service Corporation (WPSC) and NRC staff, WPSC is providing the following submittal which describes the actions that are currently being performed and a schedule for completion of all actions associated with the resolution of long-term recommendation GL-4 contained in reference 1.

I. BACKGROUND

Long-term recommendation GL-4 in reference 1 required that WPSC evaluate the design of the auxiliary feedwater (AFW) system at the Kewaunee Nuclear Power Plant (KNPP) to determine whether automatic protection of the AFW pumps following a seismic event or a tornado is necessary. The NRC recommended that we consider items such as time available before pump damage, alarms and indications available to the control room operators, and the time necessary for operators to assess the problem and take appropriate actions in our evaluation. At the time reference 1 was issued there was very little understanding in the industry on determining the effectiveness of operator actions. For this reason, WPSC committed to install an automatic AFW pump trip on low suction pressure (reference 2). The NRC responded in reference 3 that the WPSC response to long-term recommendation GL-4 was acceptable. In addition, the NRC recommended that WPSC take note of the failures that occurred at Zion Units 1 and 2 in which the momentary drop in suction pressure during AFW pump starts caused the pumps to trip.

WPSC initiated a design change request (DCR) to install this modification at the KNPP in May of 1983. During the design phase of this DCR, WPSC staff began to reconsider whether this modification would be prudent, and had several discussions with the NRC Resident Inspector indicating that we were considering options other than the modification. In September, 1984, Zion experienced another AFW pump trip on low suction pressure, their fourth such trip since the suction pressure trip was installed in 1980. In the next three years Trojan, D.C. Cook 1, and Millstone 3 all had similar events, and Catawba 2 had an event in which their low suction design automatically realigned one train of AFW supply to service water which led to an intrusion of asiatic clams into the AFW system causing a reduction of AFW flow in the affected train. The NRC discussed some of these failures in Information Notice 85-75 (reference 6) and

Information Notice 87-53 (reference 7), as did INPO in INPO 85-036 (reference 8) and EPRI in NSAC-150 (reference 9). As each of these events occurred, WPSC staff doubts on the benefits of this modification increased. Concerns over the installation of this modification and the overall reliability of AFW systems in the industry prompted WPSC to perform a probabilistic risk assessment (PRA) on the AFW system. WPSC informed the NRC of this in reference 4.

The AFW PRA was completed in October 1987. Further evaluations were initiated and preliminary results indicated only a minimal improvement in AFW system reliability if the low suction pressure trip was installed. WPSC verbally informed the NRC Project Manager for the KNPP of the preliminary results. The extent of the AFW PRA was not carried out to complete the evaluation of the benefit of the low suction pressure trip because the discussions associated with the Individual Plant Examination (IPE) project indicated that the Generic Letter initiating the IPE was imminent. For this reason, WPSC made the decision to resolve this issue as part of the IPE project as it was felt that the larger plant-wide scope of an IPE would provide a more definitive determination of the benefit of the modification. In addition, the PRA technology advances that resulted from all of the industry and NRC work associated with the IPE would be a marked improvement from that used in the KNPP AFW PRA. At this point, WPSC was remiss in that we did not submit our plans to include this evaluation as part of the IPE project in a letter to the NRC. Instead, only the internal commitment tracking item for resolution of this issue was updated to include this information. In April of 1989, (reference 5) in response to an NRC request for the status of all Action Plan Items, WPSC listed that the AFW system long-term modifications were closed out in the August 10, 1983, NRC letter (reference 3). This, of course, was incorrect as WPSC was still evaluating whether or not a modification was necessary. The error appears to have occurred in part because the short response time requested for submittal of reference 5 resulted in insufficient internal review of the letter.

WPSC completed the IPE for KNPP and submitted the results to the NRC on December 1, 1992 (reference 10). WPSC evaluated the merits of installing low suction pressure trips as part of the IPE and determined that for internal initiating events there was only a very minor safety increase. Namely, the overall core damage frequency decreased on the order of 5E-8/year. This indicates that from an internal initiating events standpoint the modification is not necessary. However, the initiators that the NRC was concerned with when the initial recommendation was made were seismic events and tornados. WPSC is currently performing work associated with the Individual Plant Examination of External Events (IPEEE) and is currently scheduled to submit the results to the NRC on June 28, 1994. WPSC believes that the results of this evaluation will not indicate a significant risk improvement associated with installation of a low suction pressure trip.

II. CURRENT STATUS & SCHEDULE

After the recent discussions with NRC staff and taking into consideration the considerable length of time that this issue has been open, WPSC has decided to forego any further evaluations and to perform the modification. WPSC staff has already begun preliminary work on the modification and is currently evaluating the design packages of the low suction pressure trip modifications installed at plants of similar design to the KNPP. WPSC will submit preliminary design details and a schedule for implementing the modification on February 26, 1993. It is our intent to complete this modification as soon as possible commensurate with equipment availability, good design practices, and overall plant safety.

In parallel with initiating the modification process, WPSC has evaluated the existing procedures available to the operations crew and has determined that the alarm response procedures associated with abnormal AFW pump conditions and seismic events and the emergency procedure for natural disasters need enhancement. Revisions have been drafted and are currently under review by the operations department, the PRA group for human reliability evaluation, and the engineering staff. The procedures will be revised as appropriate prior to going above cold shutdown following the 1993 Refueling Outage. In the interim, administrative controls will be kept in the control room alerting the operations crews of the concerns associated with this issue. It should be noted that operations crews are trained on loss of AFW pump suction events and how to recognize pump cavitation.

In addition to the actions listed above which address the AFW pump low suction pressure trip, WPSC will also perform a review of all open NRC commitments to ensure that all action items are receiving the appropriate priority and resources. The information submitted to the NRC in reference 5 will be included in this review. WPSC will complete a review of all outstanding open commitments and the information in reference 5 on or before May 1, 1993. WPSC will inform the NRC if we determine that there are any other commitments that are not being adequately addressed as soon as they are identified.

WPSC regrets the long delay in resolving this issue and the consequential concerns this has caused the NRC. WPSC is committed to resolving this issue in the time frame outlined above and summarized in the Attachment, and is confident that the actions we take will meet with NRC approval. If there are any questions regarding the actions or schedule described above, please contact me or a member of my staff.

Sincerely,

for C. A. Schrock
Manager-Nuclear Engineering

PMF/cjt

Attach.

cc - US NRC - Region III
Mr. Patrick Castleman, US NRC

LIC\NRC\PRSREVAL.WP

ATTACHMENT

to

Letter from C. A. Schrock (WPSC)

to

Document Control Desk (NRC)

Dated

February 2, 1993

WPSC SCHEDULE FOR COMPLETION OF ACTIVITIES ASSOCIATED WITH THE INSTALLATION OF A LOW SUCTION PRESSURE AFW PUMP TRIP	
ACTIVITY	COMPLETION DATE
Implement administrative controls in KNPP control room identifying NRC concern associated with loss of AFW pump suction supply.	2-3-93
Provide preliminary details and a schedule for implementation of the low pressure suction trip modification.	2-26-93
Revise procedures associated with identifying a loss of AFW pump suction supply.	Prior to going above cold shutdown following 1993 Refueling Outage.
Review all outstanding NRC commitments to ensure that all action items are receiving the appropriate priority and resources. Review information submitted in reference 5.	5-1-93