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SUBJECT: Provides preliminary details & schedule for implementation of auxiliary feedwater pump low suction pressure trip mod. Proposed amend to TS will be submitted within 90 days after low suction pressure trips placed in svc.

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February 26, 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

- References:
- 1) Letter from C.A. Schrock (WPSC) to NRC Document Control Desk dated February 2, 1993.
 - 2) Letter from D.G. Eisenhut (NRC) to E.R. Mathews (WPSC) dated September 21, 1979..

In reference 1, WPSC provided the NRC with the status of the actions being performed and a schedule for completion of all actions associated with the resolution of long-term recommendation GL-4 in reference 2. WPSC made several commitments in reference 1 which were summarized in the Attachment to that letter. This submittal fulfills one of the commitments, namely to provide preliminary details and a schedule for implementation of the auxiliary feedwater (AFW) pump low suction pressure trip modification.

I. SUMMARY OF PRELIMINARY DESIGN

WPSC established a project team responsible for the design and installation of an AFW pump low suction pressure trip. The project team includes a project supervisor, engineers from the mechanical, electrical, and instrumentation & control (I&C) disciplines, a design analyst, and members of the operations and I&C departments. In developing a preliminary design, members of the project team had discussions with several other utilities to help ensure that the design is optimized.

The preliminary design that the project team presented to the KNPP Plant Operations Review Committee (PORC) on February 22, 1993, calls for one pressure switch to be installed on the separate suction piping to each of the three AFW pumps. The pressure setpoint will be based on pump net positive suction head (NPSH) requirements, AFW pump pre-operational test results, and special tests that will be run during the 1993 refueling outage at the KNPP, scheduled to begin on March 5, 1993. These special tests will be simultaneous three pump starts at selected plant conditions. Parameters such as pressures, temperatures and flow rates will be recorded to help determine the lowest pressure that could be expected on a simultaneous three pump start. This will provide an upper bound when choosing the optimal low suction pressure trip setpoint. This test will also aid in the project team's selection of an appropriate pump trip time delay. The lower bound limit for the pressure setpoint will be based on pump operating criteria, namely NPSH requirements.

II. IMPLEMENTATION SCHEDULE

The project team has developed a preliminary project schedule for the implementation of this modification. As stated above, the preliminary design was presented to the KNPP PORC on February 22, 1993; PORC approval of the final design is expected in April. The simultaneous three pump start tests will be conducted during the plant cooldown leading into the refueling outage allowing the design to be finalized in a prompt manner. WPSC has begun the procurement process of the equipment necessary for the modification. It is our intent to perform as much of the installation as practical during the 1993 refueling outage. Some of the equipment, namely the pressure switch and time delay relays, have lead times that will not allow installation during the upcoming refueling outage; this equipment will be installed during the 1993-1994 operating cycle. Included in this installation will be an alarm function in the control room which will provide the operators with indication if pump suction pressure is lost. The equipment installation will be complete by August 1, 1993, including the alarm function in the control room. This date is our current best estimate; however, it may be subject to change based on the final delivery of the purchased equipment.

The low suction trip will be placed into service following acceptance testing. This acceptance testing includes verification that the suction pressure trip for each pump performs its function to trip the pump on a low pressure signal and that the trip circuitry does not inadvertently trip the pumps on a simultaneous three pump start with adequate suction from the preferred water source, the condensate storage tanks. WPSC will complete these tests and place the suction trip into service during the first plant shutdown after the equipment installation is complete.

WPSC has given a great deal of consideration to performing the acceptance testing after placing the plant in a reduced power level mode of operation. We have concluded that the test could physically be performed without any adverse consequences as long as no problems were encountered during the test. However, it is our opinion that this is not the most prudent course of action.

The primary reason for our decision to place the low suction trip in service in a shutdown condition rather than at power is that it is our longstanding operating philosophy to avoid unnecessary plant transients. In order to perform a simultaneous start of all three AFW pumps, a partial backdown would be needed to avoid operating the plant beyond 100 percent reactor power because of the increase in feedwater flow and the lower temperature of the water pumped from the AFW pumps to the steam generators. Whenever a transient like this is performed, there is the possibility of a plant trip. The simultaneous three pump start will serve as a second transient as reactor power will increase due to the increase in feedwater flow and the lower temperature of the water pumped from the AFW pumps. A third transient will occur when the AFW pumps are stopped, and a fourth transient will occur when the plant is brought back to 100 percent power. In addition to subjecting the plant through several small transients, there is a small possibility that all three AFW pumps could trip during the simultaneous three pump start if the suction pressure setpoint is not optimal.

Another factor that has contributed to this decision is that the initiating events that this modification is being installed to mitigate are earthquakes or tornados that strike the condensate storage tanks; both are considered to be low frequency events. Finally, as described earlier, the lead times for some of the equipment are such that equipment installation will not be complete until late summer; therefore, the latest that the trip would be placed in service would be 7-8 months after equipment installation. This would be for the case when the first shutdown after equipment installation is the 1994 refueling outage scheduled for next spring. Based on all of these considerations, we do not feel that the relative benefit of the suction trip warrants the risks associated with imposing unnecessary plant transients and/or possible challenges to safety systems while the plant is operating at power. However, we will continue to evaluate the merits of placing the trip into service at power as the project progresses.

III. TECHNICAL SPECIFICATIONS

WPSC will submit a Proposed Amendment to the KNPP Technical Specifications within 90 days after the low suction pressure trips are placed into service. The expected surveillance requirements will include a channel calibration and a trip actuating device operational test. The trip actuating device operational test will test the pressure switch, time delay relay, and the alarm in the control room. The channel calibration will include verification of the pressure switch and time delay relay setpoints, and that each AFW pump trips at the appropriate pressure setpoint.

In addition to the actions being performed associated with the installation of the low pressure suction trip modification, WPSC has also made progress on the other commitments described in reference 1. Administrative controls were placed in the control room on February 3, 1993, identifying the concern of loss of AFW pump suction supply as per the commitment made in reference 1. The remaining two commitments will also be completed within the time frames listed in reference 1. If there are any questions regarding the actions or schedule described in this letter, please contact me or a member of my staff.

Sincerely,



Charles A. Schrock
Manager - Nuclear Engineering

PMF/jms

cc: U.S. NRC, Region III
Mr. Patrick Castleman, U.S. NRC