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SUBJECT: Responds to verbal questions from NRC staff re proposed amend,revising TS to reflect replacement of existing reactor recirculation flow control sys w/adjustable speed drive sys.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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May 16, 1996
GO2-96-104

Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NO. NPF-21**
REQUEST FOR AMENDMENT TO TECHNICAL SPECIFICATIONS, REACTOR RECIRCULATION SYSTEM ADJUSTABLE SPEED DRIVE UPGRADE - ADDITIONAL SUPPLEMENTAL INFORMATION (TAC NO. M93949)

References:

1. Letter GO2-96-098, dated May 8, 1996, JV Parrish (SS) to NRC, "Request for Amendment to Technical Specifications, Reactor Recirculation System Adjustable Speed Drive Upgrade - Additional Supplemental Information (TAC NO. M93949)"

2. Letter GO2-96-075, dated April 4, 1996, JV Parrish (SS) to NRC, "Request for Amendment to Technical Specifications, Reactor Recirculation System Adjustable Speed Drive Upgrade - Additional Supplemental Information (TAC NO. M93949)"

3. Letter GO2-96-051, dated March 12, 1996, JV Parrish (SS) to NRC, "Request for Amendment to Technical Specifications, Reactor Recirculation System Adjustable Speed Drive Upgrade - Supplemental Information (TAC NO. M93949)"

4. Letter, dated February 13, 1996, JW Clifford (NRC) to JV Parrish (SS), "Request for Additional Information for the Washington Public Power Supply System (WPPSS) Nuclear Project No. 2 (WNP-2) (TAC NO. M93949)"

5. Letter GO2-95-228, dated October 26, 1995, JV Parrish (SS) to NRC, "Request for Amendment to Technical Specifications, Reactor Recirculation System Adjustable Speed Drive Upgrade"

A001

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - ASD SUBMITTAL

The purpose of this letter is to respond to three verbal questions from the NRC staff related to the proposed amendment that revises the WNP-2 Technical Specifications to reflect the replacement of the existing Reactor Recirculation (RRC) flow control system with an adjustable speed drive (ASD) system. The questions and associated responses are presented below:

Question 1:

Assuming the ASDs are operational, what analyses were performed by the Supply System to provide assurance that the safety-related 4.16 kV undervoltage and degraded voltage protective relaying would not be inadvertently challenged during the normal and accident loading conditions established for the TR-S transformer? What were the results of the analyses?

Response:

The voltage drops at the safety-related 4.16 kV buses (SM-4, SM-7, and SM-8) were evaluated for the maximum ASD operational design loading (including house loads), as well as for the bounding Loss of Coolant Accident (LOCA) loading, while connected to the TR-S transformer.

As specified in the Reference 1 submittal, the maximum ASD operational loading while connected to the TR-S transformer will be administratively restricted to two ASDs at 50% drive speed or a single ASD at 100% drive speed. The minimum steady-state voltages expected at the 4.16 kV buses assuming these loading restrictions are shown in the "TR-S Loading Comparison" table provided below.

A LOCA scram will cause a main turbine trip and leads to a fast transfer of the TR-N1 and TR-N2 transformer loads to the "Y" (4.16 kV) and "X" (6.9 kV) windings of the TR-S transformer, respectively. The LOCA scram and turbine trip also cause a fast closure of the turbine stop and control valves and result in an initiation of the End-of-Cycle RRC pump trip (and ASD trip). Thus, the LOCA loads supplied by the TR-S transformer include the design basis safety-related loads, but do not include the RRC pump drive motors or the ASDs.

As indicated in the "TR-S Loading Comparison" table provided below, the minimum steady-state voltages at the safety-related 4.16 kV buses for ASD operation while connected to the TR-S transformer (1 ASD at 100% speed or 2 ASDs at 50% speed) are greater than the minimum steady-state voltages established for the LOCA loads in deriving the degraded voltage relay settings. Therefore, the voltage drops at the safety-related 4.16 kV buses due to ASD operational loading are bounded by the voltage drops due to LOCA loading. Furthermore, since the minimum steady-state voltages established for the LOCA loads are above the maximum Technical Specification allowable values for the undervoltage and degraded voltage relay setpoints (also indicated in the table below), the safety-related 4.16 kV undervoltage and degraded voltage protective relaying will not be inadvertently challenged during the normal or accident loading conditions.

TR-S Loading Comparison

Safety-Related Bus	1 ASD at 100% Speed	2 ASDs at 50% Speed	LOCA Loads *	UV Relay Max TS Allowable Value	Degraded Voltage Relay Max TS Allowable Value
SM-4	3835 V	3828 V	3807 V	3045 V	3756.2 V
SM-7	3835 V	3828 V	3816 V	3045 V	3756.2 V
SM-8	3832 V	3825 V	3816 V	3045 V	3756.2 V

* ASDs are automatically tripped on a scram signal. Minimum steady-state voltages established for LOCA loads in deriving the degraded voltage relay settings.

Question 2:

Implementation of the ASD design change results in additional TR-S and TR-N2 transformer loading and a necessity to derate the transformers. With these changes to the WNP-2 onsite electrical power system, will the plant still remain within its design basis?

Response:

In accordance with WNP-2 Final Safety Analysis Report (FSAR), Section 8.1.5.2, the design basis of the onsite electrical power system is to supply the functional requirements of all auxiliary plant loads required for all modes of operation. Those portions of the system required for the distribution of power to Engineered Safety Feature (ESF) electrical components are designed to provide reliable availability of power essential to shutdown and maintain the plant in a safe condition and/or limit the release of radioactivity to the environment following a design basis accident. Furthermore, the physical events that accompany such an accident will not interfere with the ability of the system to mitigate the consequences of that accident within the acceptable limits, even assuming a single, simultaneous failure in the electrical system.

The Supply System has evaluated the additional TR-S and TR-N2 loading and transformer derating associated with the ASD design change to ensure that WNP-2 remains within its design basis.

The Reference 1 submittal showed that the expected loading amps for the TR-S and TR-N2 transformers during ASD operation in the plant startup and normal operating modes would be less than the derated ampere ratings for the transformers. Based on this result, it was concluded that both the TR-S and TR-N2 transformers have sufficient capacity to supply the required fundamental and harmonic currents for ASD operation during the required modes of operation.

As discussed in the response to Question 1 above, a LOCA scram will cause a main turbine trip and leads to a fast transfer of the TR-N1 and TR-N2 transformer loads to the "Y" (4.16 kV) and

"X" (6.9 kV) windings of the TR-S transformer, respectively. The LOCA scram and turbine trip also cause a fast closure of the turbine stop and control valves and result in an initiation of the End-of-Cycle RRC pump trip (and ASD trip). Since the TR-N2 transformer is unloaded during a LOCA, the additional loading and derating of the TR-N2 transformer during ASD operation will have no impact on a LOCA. Furthermore, since the ASDs are tripped on a LOCA, the ASDs will have no impact on the LOCA loading for the TR-S transformer. Hence, no derating of the TR-S transformer is necessary for a LOCA. The TR-S transformer retains its original ratings of 2510.2 Amps (30 MVA) for the "X" winding and 5551.4 Amps (40 MVA) for the "Y" winding for LOCA loading. The expected LOCA loading (in Amps) for the TR-S transformer are 885.3 Amps for the "X" winding and 4904.7 Amps for the "Y" winding, which are within the rated capability of the transformer. The TR-S transformer thus remains capable of providing the power essential to shutdown and maintain the plant in a safe condition and/or limit the release of radioactivity to the environment following a design basis accident.

Based on the above evaluation, the TR-S and TR-N2 transformers will still be capable of supplying the functional requirements of the plant loads (including the ESF loads) required for the normal and accident modes of operation assuming the additional loading and derating necessary to implement the ASD design change. Therefore, the Supply System has concluded that WNP-2 will remain within its design basis following the changes to the onsite electrical power supply system related to the ASD design change.

Question 3:

What is the contribution of the ASDs to the "Expected Loading Amps" for the different loading and percent speed combinations shown in the Reference 1 "Transformer Loading Summary Table" for the TR-S and TR-N2 transformers?

Response:

The following table provides the ASD contribution to the "Expected Loading Amps" for the same TR-S and TR-N2 transformer loading and percent speed combinations shown in the Reference 1 "Transformer Loading Summary Table."

ASD Load Contribution Table

Transformer	% Speed	Expected Loading Amps	ASD Contribution (Amps)
TR-S	50	1425 **	378 **
TR-S	100	1885 *	803 *
TR-N2	100	2231.6 **	1606 **
TR-N2	105	2379.7 **	1753 **

* One RRC pump in 12 pulse mode

** Two RRC pumps in 12 pulse mode

Question 4:

Why does the Supply System believe that it is not necessary to test the ASD runback feature which, upon a loss of one ASD channel (in 12-pulse mode), automatically reduces the frequency of the remaining ASD channel to 52 Hz?

Response:

As part of the power ascension testing program to be conducted following the Spring 1996 (R-11) Maintenance and Refueling Outage, both ASD channels in each RRC pump loop will be tested to provide assurance that each of the four ASD channels has sufficient load capability for 52.2 Hz operation. Each ASD channel will also be tested to ensure that, upon a loss of a single channel (when operating in 12-pulse mode), the remaining operational channel will runback from an initial speed greater than 52.2 Hz to the 52.2 Hz setpoint.

Should you have any questions or desire additional information regarding this matter, please call me or Lourdes Fernandez at (509) 377-4147.

Respectfully,

J. V. Parrish
Chief Executive Officer
(Mail Drop 1023)

CDM/cdm

cc: LJ Callan - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Sr. Resident Inspector - 927N

STATE OF WASHINGTON)
)
COUNTY OF BENTON)

Subject: Amendment to Technical Specifications
Reactor Recirculation System Adjustable
Speed Drive Upgrade - Additional
Supplemental Information

I, J. V. PARRISH, being duly sworn, subscribe to and say that I am the Chief Executive Officer for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE 5/16, 1996

J. V. Parrish
Chief Executive Officer

On this date personally appeared before me J. V. PARRISH, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 16th day of May 1996.

Notary Public in and for the
STATE OF WASHINGTON

Residing at Kennewick WA

My Commission Expires 4/28/98