ENERGY NORTHWEST

P.O. Box 968 ■ Richland, Washington 99352-0968

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Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2 OPERATING LICENSE NPF-21**
**REQUEST FOR AMENDMENT, POST-ACCIDENT NEUTRON FLUX MONITORING, LICENSE CONDITION 2.C.(16), ATTACHMENT 2, ITEM 3(b)**
**(ADDITIONAL INFORMATION)**

Reference: Letter, dated February 15, 2000, Jack Cushing (NRC) to JV Parrish (Energy Northwest), "Request for Additional Information (RAI) for the Energy Northwest Nuclear Project No. 2 (TAC No. MA6165)

In the referenced letter, the staff requested that additional information be provided to support review of our pending request that License Condition 2.C.(16), Attachment 2, Item 3(b), Wide Range Neutron Monitor, be removed from the WNP-2 Operating License.

The additional information is included as an attachment. Should you have any questions or require additional information regarding this matter, please call me or PJ Inserra at (509) 377-4147.

Respectfully,

D. W. Coleman

DW Coleman
Manager, Regulatory Affairs
Mail Drop PE20

Attachment

cc: EW Merschoff - NRC RIV
JS Cushing - NRC NRR
NRC Resident Inspector - 927N
DL Williams - BPA/1399
TC Poindexter - Winston & Strawn

A001

**REQUEST FOR AMENDMENT, POST-ACCIDENT NEUTRON FLUX MONITORING LICENSE CONDITION 2.C(16), ATTACHMENT 2, ITEM 3(b) (ADDITIONAL INFORMATION)**



**Question 1** ***In Section 2.2, Accuracy: NEDO Section 5.2.2, of your July 29, 1999, submittal, you state that due to inaccuracies in the detectors, amplifiers and recorders, the APRMs would slightly exceed the accuracy requirement of +/- 2% of rated thermal power. Please provide additional clarification of the APRM accuracy and justification if the criterion cannot be met.***

Response

A reanalysis of the Average Power Range Monitor (APRM) instrument loop accuracy has determined that WNP-2 meets the criteria with existing equipment. Specifically, a calculation was performed that determined the APRM instrument loop accuracy is 1% of 100% of the rated power range under pre-accident conditions.

WNP-2 calibration procedures for Local Power Range Monitor (LPRM) and APRM gain adjustment and trip setpoints provide channel calibration in accordance with the WNP-2 Technical Specifications. Additionally, weekly surveillances verify the APRMs are accurate to +/- 2% rated thermal power based on the power values calculated by a heat balance during Mode 1 (Power Operation) while operating $\geq$ 25% rated thermal power.

NEDO-31558, Section 5.2.2, specifies an accuracy requirement of 2% of rated power. This requirement is more restrictive than Regulatory Guide 1.97, which is silent on instrumentation accuracy. The WNP-2 APRM system may not meet the NEDO accuracy requirement under all post-accident conditions. This judgement is based on the effects of anticipated off-normal core conditions following an Anticipated Transient Without Scram (ATWS) event (power < 25%, asymmetric control rod patterns, xenon, etc.). Therefore, the total APRM power measurement uncertainties may be in excess of 2% during an ATWS event but the exact degree of inaccuracy cannot be determined.

WNP-2 has evaluated the impact of not conforming to NEDO-31558, Section 5.2.2 post-accident and concludes the deviation is acceptable. The justification for this conclusion is provided below and is consistent with the BWROG position on the subject.

WNP-2 uses the Emergency Procedure Guidelines (EPGs) to achieve shutdown during an ATWS event. When the ATWS condition potentially threatens containment, shutdown is accomplished by injecting boron via the Standby Liquid Control system. The decision to inject boron is not dependent on APRM indications and is predicated on degrading containment conditions (such as rising suppression pool temperature). As a result, an APRM system uncertainty beyond that specified in NEDO-31558 is acceptable and does not compromise plant safety.

This position was accepted by the NRC for LaSalle County Station, Units 1 and 2 by letter dated September 17, 1999, from D.M. Skay to O.D. Kingsley, 'Regulatory Guide 1.97 – Boiling Water Reactor Neutron Flux Monitoring – LaSalle County Station, Units 1 and 2' (TAC NO. M77660). The letter dated June 21, 1999, from J.A. Benjamin, to U.S. NRC, concerning 'LaSalle County Station, Units 1 and 2 Compliance with Regulatory Guide 1.97 – Boiling Water Reactor Neutron Flux

Monitoring,' provided the final LaSalle responses for paragraph 5.2.2 of NEDO 31558-A. This position was also accepted by the NRC for Quad Cities Nuclear Power Station Units 1 and 2 by letter dated December 31, 1998, from R.M. Pulsifer to O.D. Kingsley (TAC NOs. M51124 and M51125) as noted in the referenced LaSalle letter of June 21, 1999.

**Question 2** ***In section 2.8, Power Sources: NEDO section 5.2.8, you stated that the APRMs will lose power on a loss of offsite power until power is restored by the division 1 and 2 diesel generators and the motor generator breakers are manually reset. The NEDO criterion is for an uninterruptable and reliable power source. Please provide additional justification for not meeting this criterion.***

Response

The WNP-2 Neutron Monitoring System (NMS) is fed from highly reliable power sources. The LPRM/APRM subsystem is powered from redundant 480/120 Volt AC motor-generator (MG) sets configured in two Reactor Protection System (RPS) divisional buses (A and B). The MGs are fed from redundant and separate divisional (ESF Divisions 1 and 2) 480 Volt AC buses in separate motor control centers. Either RPS Division Bus A or B can be energized by a reserve feed from a non-divisional source via main control room operator action. Two Electrical Protection Assemblies (EPAs) are installed in series between each of the two RPS MG sets and RPS buses and between the reserve feed and the RPS buses. The EPA assemblies are packaged in enclosures that are mounted on Seismic Category I structures. EPAs provide redundant protection to the RPS buses by acting to disconnect the RPS from the power circuits.

Each MG set is equipped with a high inertia flywheel which is sufficient to maintain the voltage and frequency of generated voltage within -5% of the rated values for at least 1 second following a loss of power to the drive motor.

The MG set power sources are reliable and *uninterrupted* as required to properly perform all the functions discussed in the WNP-2 FSAR. Neutron Monitoring System power will not be lost due to load shedding logic or a single failure that would cause the loss of redundant RPS buses powering the NMS instrumentation. In the unlikely event of the loss of one RPS Division, the power level indication will be provided on the redundant Division of NMS.

The power sources for the NMS meet the NEDO requirement for uninterruptibility, because they are reliable and capable of providing continuous power so that NMS safety functions discussed in the FSAR are met.

However, for a Loss of Offsite Power (LOOP) event, WNP-2 deviates from the NEDO requirements because both RPS power sources will be lost temporarily. For this event, restoration of power to the APRM subsystem is dependent upon emergency diesel generator (DG) startup time

plus manual restart of the RPS MG sets and reset of the EPAs. In accordance with station procedures for loss of all offsite electrical power, immediate operator actions are to ensure that all automatic actions have occurred which include verifying reactor SCRAM (all rods inserted) and the diesel generators auto start and reenergize their respective buses. The subsequent operator action following verification of automatic actions is to restart the RPS MG sets and ensure neutron monitoring systems return to service. In accordance with design, the DGs are running and supplying power to safety buses in approximately 15 seconds. Reset of the EPAs and manual restart of the RPS MG set are in the same location (Rad Waste Bldg 467'), however, this location is remote from the main control room (Rad Waste Bldg 501') and operator dispatch is required.

During this period of time, the control room operator can determine if control rods inserted properly using the Control Rod Position Indication System (RPIS) which remains available to provide backup to the NMS. Source Range Monitor (SRM) and Intermediate Range Monitor (IRM) systems, utilize detectors that are withdrawn from the core during normal power operation. The drive motors for the SRM/IRM detectors are powered from Engineered Safety Feature (ESF) divisional sources which will be energized upon DG startup. The SRM and IRM systems have redundant channel capability. The system sensors and associated equipment are powered by a 24 Volt DC battery/charger system. The battery chargers for this system receive their power source from ESF divisional sources.

In summary, the present design of the WNP-2 NMS meets the intent of Section 5.2.8 of NEDO 31558-A in that the system is reliable and uninterruptible for NMS required safety functions. It should be noted that with a concurrent LOOP the RPS MG set would be interrupted, but can be manually restored as described above. The operator still has information available as described above to determine reactor status during RPS MG set restoration. This non-conformance with the NEDO is consistent with the BWROG Reg Guide 1.97 Neutron Monitoring System subcommittee for the RG 1.97 NMS – Power Supplies position that the existing MG set power supplies meet the intent of the BWROG post-accident monitoring functional criteria as described in paragraph 5.2.8 of NEDO 31558-A and does not compromise plant safety.

This position was accepted by the NRC for LaSalle County Station, Units 1 and 2 by letter dated September 17, 1999, from D.M. Skay to O.D. Kingsley, 'Regulatory Guide 1.97 – Boiling Water Reactor Neutron Flux Monitoring – LaSalle County Station, Units 1 and 2' (TAC NO. M77660). The letter dated June 21, 1999, from J.A. Benjamin, to U.S. NRC, concerning 'LaSalle County Station, Units 1 and 2 Compliance with Regulatory Guide 1.97 – Boiling Water Reactor Neutron Flux Monitoring,' provided the final LaSalle responses for paragraph 5.2.2 of NEDO 31558-A. This position was also accepted by the NRC for Quad Cities Nuclear Power Station Units 1 and 2 by letter dated December 31, 1998 from R.M. Pulsifer to O.D. Kingsley (TAC NOs. M51124 and M51125) as noted in the referenced LaSalle letter of June 21, 1999.