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RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Submits response to violations noted in Insp Rept 50-397/96-15.Corrective actions:individuals involved in 1993 mod & startup testing no longer employed by util & many mgt personnel changes taken place,resulting in effective mgt.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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September 9, 1996
GO2-96-179

Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
RESPONSE TO AN APPARENT VIOLATION
IN INSPECTION REPORT 50-397/96-15

Reference: Letter dated August 9, 1996, KE Brockman (NRC) to JV Parrish (SS), "NRC Inspection Report 50-397/96-15"

The Supply System's response to an apparent violation identified in the reference is included in Appendix A. An assessment of the safety impact of the condition is included in Appendix B.

The Supply System agrees that the apparent violation occurred. As acknowledged in the reference, the condition was self-identified, resolved through the corrective action program, reported as required, corrective actions taken promptly upon our discovery of the condition, and no further action is currently indicated. The Supply System is confident that these corrective actions will preclude recurrence of similar events.

It should be noted that the Attachment to the reference indicates that violation 50-397/9610-01, "Reactor Building Stack Effluent Monitor Calibration Error" was being opened under Inspection 96-15. Violation 50-397/9610-01 was opened under Inspection 96-10, pertaining to inadvertent loss of power to high-high radiation warning beacons. We bring this to your attention to avoid potential ambiguity in administrative tracking of violations.

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

Respectfully,

P.R. Bemis
Vice President, Nuclear Operations
Mail Drop PE23

Attachments

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

RESTATEMENT OF APPARENT VIOLATION

As a result of an NRC inspection conducted on June 24-28, 1996, an apparent violation of NRC requirements is being considered for issuance, as summarized below:

> Based on the results of this inspection, one apparent violation is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Action (Enforcement Policy), NUREG-1600. This apparent violation involved your failure to maintain adequate methods and systems for assessing and monitoring potential offsite consequences resulting from a radiological emergency condition. Specifically, from July 1993 through March 1996, an incorrect calibration factor (determined during the initial primary calibration of the intermediate and high range monitors in the reactor building stack effluent monitoring system) would have been used in calculating offsite radiation doses in the event of a radiological emergency. They would have resulted in calculated radiation doses being approximately five times too low. This is of concern because it could have caused inaccurate and non-conservative protective action recommendations to be made during an emergency.
>
> The circumstances surrounding this apparent violation, the significance of the issues, and the need for effective long-term corrective actions were discussed with members of your staff during the inspection and at the inspection exit meeting on July 29, 1996. As a result, it may not be necessary to conduct a predecisional enforcement conference in order to enable the NRC to make an enforcement decision. However, a Notice of Violation is not presently being issued for this inspection finding. Before the NRC makes its enforcement decision, we are providing you the opportunity to either (1) respond to the apparent violation addressed in this inspection report within 30 days of the date of this letter, or (2) request a predecisional enforcement conference within 7 days of this letter.

REASON FOR THE APPARENT VIOLATION

Installation of a new radioactive monitoring system for post-accident gaseous discharges was completed during the maintenance and refueling outage in the Spring of 1993. This system replaced a previously installed system which had been found to be inadequate because of uncertainty as to the ability of the sampling system to obtain representative samples from the effluent discharge in the elevated discharge release duct. The new system was designed to use gamma spectroscopy equipment to directly monitor the effluent flow in the elevated release discharge duct, rather than sample the discharge, and thus would be able to satisfy the requirements of Regulatory Guide (RG) 1.97 for post-accident monitoring of both noble gas and halogen releases without recourse to a sampling system.

Calibration of the new system was performed by sampling flow from the elevated release duct, analyzing the samples, and comparing the results with the indications from the new monitoring system. In order to make this feasible, it was necessary to perform these activities during normal plant operation which would result in low levels of radionuclides being present in the elevated release duct. Since WNP-2 Technical Specifications requires having the post-accident monitoring system operable in Modes 1, 2, or 3, a one time request for a 30-day exemption from Technical Specification 3.0.4 was requested and granted by the NRC.

The new system was unique in design, in that it had been designed using equipment and components normally used for gamma spectroscopy in a laboratory setting rather than in a nuclear plant environment. The modification was more complex and difficult than originally envisioned, and there were a limited number of technically qualified engineers available to complete the design and post-installation testing. As a result, delays in completing the design package reduced the time available to prepare for post-outage calibration and startup testing.

WNP-2 restarted the reactor in early June, 1993, and entered Mode 2 at 1653 hours on June 18. This started the clock on the 30-day exception to Technical Specification 3.0.4. The test procedure governing the startup and calibration of the new post-accident monitoring system was approved by the Plant Operations Committee (POC) on June 19, and testing was initiated on June 20. The procedure did not explicitly invoke the requirements of RG 1.97 as acceptance criteria for the testing, nor did it specify a specific methodology for calibrating the mid or high range monitors. However, these weaknesses were not identified during the procedure approval process.

The testing was conducted by three engineers. The engineers worked extensive overtime during this period in an effort to meet the 30-day exemption to Technical Specification 3.0.4. The requisite overtime was preapproved.

Three methods were available to the engineers to obtain the post-accident monitor count rate: (1) indications on a chart recorder in the Control Room, (2) readings from a log scaled ratemeter located adjacent to the monitoring equipment in the Reactor Building, and (3) summation of output of the individual channels of the multi-channel analyzer (MCA) included in the monitoring system. The test procedure specified that the test data be obtained from the log scaled ratemeter.

For the mid-range monitor calibration, the engineer obtained the basic calibration data from the log scaled ratemeter instrument, which has a scale ranging switch. The engineer transcribed the data onto a data sheet under the mistaken belief that the ranging switch was in a 1 to 10 scale position, while actually it was in a 1 to 3 scale position. Consequently the reading was recorded as 8000 cps, while it should have been recorded as 2400 cps. This error resulted in establishing a calibration between post-accident mid-range monitor indication and radionuclide content in the elevated release duct that was low by approximately a factor of 4.4.

The low concentrations of radionuclides in the elevated release duct were such that there was essentially no response on the log scaled ratemeter to use for the high range monitor calibration. The monitor was designed to operate over a range of 10^{-1} to 10^{+5} µCi/cc, while the radioactive gas concentration in the elevated release duct during the calibration was approximately $5x10^{-4}$ µCi/cc. The engineer obtained calibration data by summation of output of the individual channels of the MCA for the background and calibration count times. The MCA summation yielded a differential between calibration gas output and background output that was statistically insignificant. This insufficiency was formally noted by the engineer on July 11, who expected that design information to be supplied by the equipment vendor would subsequently be used in conjunction with the test data to provide an acceptable calibration. However, the test data were used alone to provide a calibration factor for the high range monitor. This error resulted in establishing a calibration between post-accident high-range monitor indication and radionuclide content in the elevated release duct that was low by approximately a factor of 8.1.

The test procedure was completed on July 13. The completed procedure consisted of approximately 400 pages, was approved by POC on July 14, and the post-accident monitoring system was declared operable on July 15, 1993.

A longer range task associated with completion of the test was verification that the system conformed to the standards of performance outlined in ANSI N42.18-1990. This was originally scheduled to be completed by July 1994, after a one-year period of data acquisition to provide sufficient information to allow assessment of system performance. The one-year period was based on the difficulty of getting statistically valid radioactive concentration data from the elevated release duct because of the low levels actually present during normal operation. Due to a number of personnel and management changes, this assessment was not completed until March 1996. This assessment resulted in identification of the mis-calibration of the mid-range monitor and the inadequate calibration of the high range monitor, and resultant declaration that the post-accident monitoring system had been inoperable since its original calibration in 1993.

Therefore, in summary, the apparent violation is the result of an inadequate test procedure which (1) did not explicitly invoke the requirements of RG 1.97 as acceptance criteria for the testing of the post-accident monitoring system, and (2) did not define the proper methodology for determination of the calibration factors from the test data. Contributing causes were an undetected personnel error in recording test data, possible effects of excessive overtime, and inadequate management involvement in assuring that appropriate personnel resources and schedule time were available to design, install, and test the new post-accident monitoring system.

CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

Upon discovery of the deficiencies outlined above, on March 6, 1996, the post-accident monitoring system was promptly declared inoperable, and appropriate compensatory measures were initiated as required by Technical Specification 3.3.7.5. NRC was notified at 1531 hours on March 6, 1996, per requirements of 10 CFR50.72(b)(1), of the discovery of the loss of emergency assessment capability. The offsite dose assessment software was changed on March 7, 1996, to incorporate calibration factors based on conservative vendor design data rather than the erroneous test data to re-establish the capability to perform emergency assessment in the event of an accident. Correct calibration factors were calculated and included as alarm setpoints and emergency dose assessment analysis factors on March 18, 1996. A comparison was completed on March 21, 1996 between vendor data and setpoint data for effluent monitors in the primary containment, Radwaste Building and the Turbine-Generator Building to determine if similar deficiencies were present. No deficiencies were noted. The Plant Manager counseled POC members in regard to schedule pressure and the necessity to perform detailed technical reviews.

It should be noted that this event occurred in 1993 and since then, a number of fundamental changes have been initiated at the Supply System. The individuals involved in the 1993 modification and startup testing are no longer employed by the Supply System and many management personnel changes have taken place, resulting in more effective plant management.

A better process is now in place to determine if a modification to the plant should be initiated to address a problem, or if a more appropriate method should be employed. All plant modifications must now be subjected to a preoperational review and acceptance by the Plant Operations Manager, who assumes cognizance only if the modification meets all requirements. Overtime is approved only for limited periods and specific justifications must be provided in cases where limitations are to be exceeded. Management involvement in all organizations has been substantially improved for all phases of plant operation, resulting in better support of on-going activities and provision of an appropriate level of personnel and schedule resources to complete planned activities. Proper allocation of resources continues to receive significant management attention at WNP-2.

CORRECTIVE STEPS TO BE TAKEN TO AVOID FUTURE VIOLATIONS

The Supply System is confident that the corrective steps outlined above will prevent violations of the type involved in this event.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The Supply System has been in full compliance since March 6, 1996 when preplanned alternative methods of measuring Reactor Building effluents were initiated per Technical Specification 3.3.7.5.

SAFETY ASSESSMENT

The calibration factors for the post-accident monitoring system are used in the Emergency Dose Projection System (EDPS) analyses performed to estimate potential radiation doses in the event of an emergency involving releases of radioactive gases. Emergency procedures for WNP-2 require issuance of a Protective Action Recommendation (PAR) to evacuate the public from zero to 2 miles in all directions and to evacuate downwind sectors from 2 to 10 miles if the projected dose is greater than 1 rem (total effective dose equivalent), or 5 rem (committed effective dose equivalent). These limits are consistent with actions recommended in EPA 400, "Manual of Protective Action Guides and Protective Actions For Nuclear Incidents," and are appropriately conservative with respect to the 10CFR100 limits of 25 rem (whole body) and 300 rem (thyroid).

The upper scale limit on the log scaled ratemeter for the intermediate range monitor is $1\text{x}10^{+6}$ cps, and the alarm setpoint for the intermediate range monitor is $1.8\text{x}10^{+5}$ cps. The setpoint corresponded to a calculated dose at the site boundary of 200 mrem/year ($2.3\text{x}10^{-5}$ rem/hour) when using the erroneous calibration. Using the 4.4 ratio between correct and incorrect calibration factors, the dose equivalent to the intermediate monitor alarm setpoint would have been an actual 880 mrem/year (10^{-4} rem/hour), and approximately 5000 mrem/year ($5.7\text{x}10^{-4}$ rem/hour) at the upper scale limit for this monitor. Since dose rates that may be anticipated during a significant release are well above these levels, the intermediate range monitor would be off-scale in a radiological emergency. If it had remained on scale, no PAR would have been issued because, even considering the mis-calibration, the dose rate could not have been projected to reach the 1.0 rem threshold unless the release lasted for a very long time. Consequently, the mis-calibration of the intermediate range monitor would not have been a significant safety problem if an accident had occurred in the July 1993-March 1996 time frame.

In an accident situation, the output of the high range monitor would be the primary input used in dose assessment activities. The calibration factor used between July 1993 and March 7, 1996, was such that a PAR for evacuation, triggered by a projected dose of 1.0 rem at the site boundary, could have been issued if the actual release rate from the elevated release duct had reached $2.2\text{x}10^{+6}$ Ci per hour under the specified weather conditions. Due to the calibration errors, the projected 1.0 rem whole body dose at the site boundary would actually have been approximately 8.1 rem. However, upon issuance of the PAR, evacuation from the affected area would have limited additional exposure to the affected public. The 8.1 rem dose would not have exceeded the limits of 10CFR100 but would have been a significant fraction of those limits.