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 SORESENSEN, G.C.    Washington Public Power Supply System  
 RECIPI. NAME    RECIPIENT AFFILIATION  
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SUBJECT: Responds to NRC 880527 request for addl info re violations noted in Insp Rept 50-397/88-02.

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# WASHINGTON PUBLIC POWER SUPPLY SYSTEM

*P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352*

June 2, 1988  
G02-88-131

Docket No. 50-397

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

**Gentlemen:**

Subject: NUCLEAR PLANT NO. 2  
LICENSE NO. NPF-21  
NRC INSPECTION REPORT 88-02

Reference:

- 1) Letter G02-88-117, same subject, G.C. Sorensen (SS) to NRC, dated May 18, 1988
- 2) Letter G02-88-025, "Response to NRC Inspection Report 87-19," D.M. Mazur (SS) to NRC, dated January 29, 1988

The Supply System responded to the Notice of Violation from the subject inspection report in reference 1) and committed to provide additional information with regard to previously installed modifications on May 27, 1988. Subsequently, in a phone conversation on May 27, 1988 between Mr. D. Kirsch (NRR-RV) and P.L. Powell (SS), that commitment was deferred until June 2, 1988. Accordingly, this letter provides the requested information.

The NRC's Safety System Functional Inspection (SSFI) which was conducted in August 1987, identified several weaknesses in our configuration management program. Our response to the SSFI report (reference 2) included an action plan for improving the configuration management program. The response to that portion of your April 18, 1988 letter which concerns previously installed designs includes the program commitments contained in our earlier response (reference 2 - primarily "Appendix C") and the attachment to this letter.

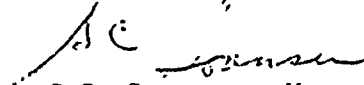
TEO!

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NRC INSPECTION REPORT 88-02

Details of our overall assessment of plant quality and program changes to improve the quality of design modifications will also provide the basis for our meeting with you and members of your staff on June 7, 1988.

The attachment to this letter contains the findings of our QA root cause assessment of design review inadequacies, corrective action, and our assessment of the quality of previously installed modifications.

Very truly yours,



G.C. Sorensen, Manager  
Regulatory Programs

GCS:dg  
Attachments

cc: JB Martin - NRC RV  
NS Reynolds - BCP&R  
RB Samworth - NRC  
DL Williams - BPA/399  
NRC Site Inspector - 901A



QA ROOT CAUSE ASSESSMENT

The Quality Assurance organization conducted an in-depth root cause evaluation of recent design errors in addition to those identified in the NRC Inspection Report. In summary, the root cause report recommends emphasis in the following areas:

1. Clearly defining, reviewing, and approving design criteria early in the process.
2. Providing full-size electrical drawings and elementary diagrams to reduce the number of drawing "8½ X 11" plates.
3. Taking appropriate management action necessary to reduce schedule pressure.

The complete Root Cause Analysis Report has been provided to the NRC Senior Resident Inspector. In addition to the Root Cause Analysis, Quality Assurance conducted a separate independent review of five recently issued design packages. Concerns identified in the review are currently being addressed by Engineering management. The identified concerns individually do not impact plant safety, but, collectively, increased our concern regarding design errors. In view of the above findings and concerns, Engineering and Quality Assurance organizations have undertaken a re-review of design modifications with a potential safety impact which are planned for installation during our current refueling outage. This review addresses not only the type of problem previously identified, but also other type errors which may have escaped earlier detection. An evaluation will be made to assess the safety significance of any errors found. The results of these re-reviews will be known and resolved prior to plant start-up from the current outage.

The Engineering Improvement Program is directed toward improving the design control program to maximize engineering quality in final design. This program, which is under development, will describe the actions proposed to correct the cause of the deficiencies noted in the Inspection Report and address the issues identified in the Root Cause Analysis. This program is being developed by a team of senior level engineering personnel with oversight by Engineering Management on a high priority basis. Development of this program will include inputs principally from working level engineers and, when completed and approved by Senior Corporate Management, will form the cornerstone for improving engineering performance. We intend to provide the NRC with a progress report on this effort in our management meeting scheduled for June 7, 1988.

CORRECTIVE ACTIONS

Problems identified in the Inspection Report received immediate attention by Supply System staff and management. Immediate corrective actions were taken to evaluate and improve the electrical checking process which had allowed wiring errors to go undetected in issued ATWS/ARI design, and a task force was established to ensure that the Supply System had properly identified and responded to all regulatory requirements and management self-imposed commitments during implementation of the ATWS mitigation program required by 10CFR50.62. The wiring error problem was identified to Engineering Management on February 26, 1988 and corrective action initiated within one week to address the problems. During this same time frame, management became aware that a Field Change Request (FCR) had been issued in March, 1987, correcting 26 design errors in ATWS/ARI design (BDC 86-0229-0B) which had been approved and issued to the plant in February, 1987. A field change of this magnitude, which corrected not only design errors but also interferences and other problems, should have been immediately surfaced to management's attention by the design control process, with an investigation being conducted at that time. However, because such a feedback loop did not exist in our design process, this action was not taken. As noted in the following paragraph, this is being corrected. It should be noted that the implementation improvements addressed in our SSFI action plan had not been implemented at the time the ATWS/ARI design package was prepared and reviewed.

Engineering management does not condone the issuance of design packages with errors. Our Engineering Improvement Program, which includes the recommendations from the independent Root Cause Analysis performed by Quality Assurance, is being structured to strive for error-free design and to strengthen the feedback from the implementation phase such that error trends will no longer go undetected or uncorrected. Engineering has initiated a practice to identify the reason for the change on all Field Change Requests to detect areas where program improvements need to be initiated. This process will provide a mechanism for immediate feedback to the cognizant manager at the time he approves the Field Change Request and will provide a cumulative data base for identifying performance trends to management. We are currently taking steps to formalize this process into our procedures and plan to complete an evaluation of Field Change Requests which have been issued during R-3 by mid-August, 1988.





IMPROVEMENTS IN PLANT IMPLEMENTATION

The plant implementation improvements identified in our "Appendix C" response to the NRC SSFI (reference 2) remain valid and applicable when applied to the specific aspects addressed in the N.O.V. with regard to design errors. The plant actions committed to in the SSFI response have all been completed and implemented. Additionally, in support of the initiatives implemented in response to the SSFI, a line management effectiveness review was conducted to identify the opportunities available to management to verify and review design modification efforts in progress. The review encompassed Generation Engineering, Plant Technical, Purchasing and Materials Management, Records Management, Plant Administration, Quality Assurance (receipt inspection, QC and QA processes) and Maintenance. As a result, changes have been and are being implemented in the design modification process to enhance the effectiveness of line management verification and review. Furthermore, additional recommendations are being evaluated for practicality of implementation. Since the NRC SSFI, the Supply System QA organization has performed an audit (#88-434) on the subject of design/implementation. The results of that audit, with regard to plant implementation, are very similar to those identified in the SSFI.

Reference 1 requested an assessment of the quality of modifications that have been previously installed in the plant. The total modification process consists of the design control process, Plant Technical Staff reviews of the design changes, installation/construction reviews, operational reviews during revisions to and preparation of operating, maintenance and surveillance testing procedures, and post modification and operability testing prior to return to operations. The testing activities are structured to assure proper intra and inter-system functional characteristics. As a result of a QA surveillance of R-2 outage design modification packages, errors in the modifications were identified. The corrective actions in response to the surveillance report included strengthening the process by enhancing the post modification and maintenance testing program. Additionally, the corrective actions identified in the SSFI action plan have made further improvements to the programs. QA audits and surveillances will continue to be conducted on a sample basis to determine the effectiveness of the corrective action programs. Therefore, we are confident that this defense in-depth concept identifies and provides processes for correcting design related problems before the modifications are placed in operation and provides opportunities to recognize and correct the entire design process. This is supported by the Supply System's discovery and correction efforts during the design implementation phase. The validity of the defense in-depth concept will continue to be measured by programmatic reviews. For example, the Supply System has committed to perform self-initiated SSFIs. These reviews will provide a check on our corrective action programs and through feedback from the SSFIs providing further improvements in our processes.

IMPROVEMENTS IN QUALITY ASSURANCE

The improvements in the quality assurance program described in our SSFI response are being implemented as described. In addition, we are initiating additional changes to verify the quality of the design process. One significant change is the formation of an Engineering Assurance Group reporting directly to the Director, Licensing and Assurance. This group is specifically chartered to provide oversight of the engineering functions and is presently being staffed with personnel knowledgeable in engineering concepts and design analysis. The Plant QA organization will continue its enhanced overview of modification implementation as described in our SSFI response. Additional Licensing and Assurance directorate improvements will be addressed in detail at the June 7, 1988, NRC/Supply System Management meeting.

In summary, the Supply System has implemented strong initiatives in improving the overall design control process and will continue to be self critical in recognizing areas for evaluation and improvement of the process. The reviews which have been completed for previously installed modifications, combined with the preoperational testing and other preoperational verifications, provide us with a high level of confidence in previously installed modifications, even though we did identify weaknesses in the design process.