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AUTH.NAME AUTHOR AFFILIATION
[redacted]MIS,P.R. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
GWYNN,T.P. Region 4 (Post 820201)

SUBJECT: Submits supplemental info & corrective actions to insp rept 50-397/96-18.

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CATEGORY 1 DOCUMENT

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
P.O. Box 968 • Richland, Washington 99352-0968

January 2, 1997
GO2-97-001

Docket No. 50-397

Mr. Thomas P. Gwynn, Director
Division of Reactor Safety
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive Suite 400
Arlington, Texas 76011-0864

Dear Mr. Gwynn:

Subject: **WNP-2, OPERATING LICENSE NO. NPF-21**
INSPECTION REPORT 96-18, SUPPLEMENTAL INFORMATION

The Supply System hereby submits additional information based upon the findings and discussions with the NRC Inspection Team pursuant to the subject inspection exit meeting held on November 22, 1996. During the exit meeting two (2) potential Notices of Violation (NOVs) and two general weaknesses were discussed. This letter transmits additional information and corrective actions that are in place to address the potential NOVs and weaknesses.

Five attachments are provided to discuss the corrective actions in each of the areas. The five attachments are summarized as follows:

1. **Failure to Link Probabilistic Safety Assessment (PSA) Results with Maintenance Rule Reliability Criteria;**

2. **Failure to Provide Unavailability Criteria for Three Systems;**

3. **Weaknesses Relative to Systems Engineers' Implementation Roles;**

4. **Procedural Weakness in Reflecting the 10 CFR 50.65 a(3) Process; and**

5. **Other Refinements to the Maintenance Rule Program**

This information is being transmitted to provide supplemental data that was not finalized at the time of the inspection exit, and represents our understanding of the findings presented.

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

Respectfully,

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

Attachments

1. Failure to Link PSA Results with Maintenance Rule Reliability Criteria
2. Failure to Provide Unavailability Criteria for Three Systems
3. Weaknesses Relative to Systems Engineers' Implementation Roles
4. Procedural Weakness in Reflecting the 10 CFR 50.65 a(3) Process
5. Other Refinements to the Maintenance Rule Program

cc: LJ Callan - NRC RIV
JE Dyer - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
DA Powers - NRC RIV
JT Whittemore - NRC RIV
TG Colburn - NRR
NS Reynolds - Winston & Strawn
DL Williams - BPA/399
RC Barr - NRC Sr. Resident Inspector, 927N
Document Control Desk

Failure to Link PSA Results with Maintenance Rule Reliability Criteria

ISSUE: The Maintenance Rule (MRule) criteria used for reliability did not provide adequate bases for linkage to the PSA in accordance with NUMARC 93-01 requirements. This was characterized as a generic industry issue.

Corrective Actions:

Problem Evaluation Report (PER) 296-0802 was generated to document and resolve this concern. WNP-2 is currently reviewing the various industry approaches to addressing this issue to determine those found to be acceptable. This review includes continued discussion with MRule personnel from other plants and participation in industry meetings and discussions. In support of this, WNP-2 looks forward to attending the January 9 meeting in Washington D.C. with the staff and the Nuclear Energy Institute (NEI). Once an acceptable approach has been determined, it will be implemented to close this issue and the associated PER.

If the methodology adopted and applied requires a change to the existing criteria, an Expert Panel meeting will be convened for approval prior to implementation. Once any changes are implemented the requisite a(1) or a(2) changes will be made to affected Structures, Systems, and Components (SSCs).

Failure to Provide Unavailability for Three Systems

ISSUE: Three (3) systems, Reactor Feedwater (RFW), Condensate (COND), and Uninterruptible Power (UPS) were identified as risk significant but did not have associated unavailability criteria.

Corrective Actions:

PER 296-0803 was generated to document and resolve this concern. The COND and RFW systems were identified as Risk Significant because the Power Conversion System (PCS), a PSA pseudo-system that is a recognized relic of the era of BWR PSA modeling used to address Generic Letter 88-20, appears with risk significant risk measures within the PSA. The PCS was comprised of the main turbine and its auxiliaries, the circulating water system, the RFW system and the COND system. When the RFW and COND systems are risk-ranked alone, their risk measures do not meet the criteria for risk significance in NUMARC 93-01. Additionally, the RFW and COND systems are tracked at the plant level for unplanned loss of capability. Since all COND, COND booster, and RFW pumps (trains) are required for operation at 100% power, any unavailability is reflected in capability losses. Therefore, unavailability has and will continue to be tracked for these systems.

The vital 120 VAC buses are risk significant; however, their respective inverters are not because inverter trouble or failure is not synonymous with bus failure. The Risk Achievement Worths (RAWs) of the inverters is less than 1.7 and they fail to meet 90% Core Damage Frequency (CDF) contribution. Both values are below the limits for risk significance in NUMARC 93-01. This was not clear in the MRule documentation. Inverter functional failures are tracked to monitor their reliability.

MRule information will be clarified to indicate that the RFW, and COND system unavailabilities are tracked at the plant level by unplanned loss of capability and that reliability is also effectively monitored at the plant level by monitoring plant trips. MRule documentation will be revised to provide system level unavailabilities for UPS. The inverters will be tracked separately for reliability to avoid shadowing.

Weaknesses Relative to Systems Engineers' Understanding Their Implementation Roles

ISSUE: Some Systems Engineers displayed uncertainty in knowing MRule in scope system functions and responsibilities for those functions; understanding performance criteria for their systems; and assessing Maintenance Preventable Functional Failures (MPFFs). Inadequate training was cited as the most probable cause.

Corrective Actions:

Although no specific examples were found of the program not capturing functional failures and MPFFs, this was attributed to Engineering Programs involvement and not always due to the Systems Engineer's actions. As explained during the inspection, the MRule Program is transitioning from Engineering Programs to Systems Engineering for many implementation activities. The inspection, as well as our previously conducted self-assessment, noted several weaknesses that need to be addressed for successful transition to Systems Engineering. Corrective actions being taken are summarized below.

MPFF Recognition - Several measures have already been implemented to assist Systems Engineers in the proper identification and evaluation of potential functional failures.

The scoping matrices are being revised to eliminate confusing, non-essential information to concentrate on the MRule scoping functions that place them within MRule scope. The new database is being designed for ease of use by Systems Engineers and other personnel outside of the immediate MRule program staff to more effectively enable MRule decision making. This database is easily sorted by SSC, function, in scope/not in scope, risk significance, standby/on-line, and many other parameters.

Presently, Engineering Programs takes part in the daily Systems Engineering status meeting. Prior to the meeting a review of the Control Room logs, emergent work, and new PERs is conducted. At the meeting, potential MRule functional failures that have occurred since the last meeting are discussed. Following these discussions, if a functional failure is not already being adequately pursued, a specific Systems Engineer is assigned to disposition each potential functional failure. Additionally, Engineering Programs periodically submits a report on the status of potential functional failures to Systems Engineering managers, supervisors, and impacted Systems Engineers (see example on Page 3 of this attachment). The report identifies potential functional failure assignments to specific Systems Engineers for disposition and tracking to completion. Systems Engineering Management is taking a proactive role in this process to challenge the Systems Engineering staff to become self-reliant in identifying and correctly dispositioning functional failures within the MRule. This is being accomplished by the implementation of a periodic indicator that monitors the success of Systems Engineering in capturing and dispositioning functional failures and MPFFs. The process will continue until an effective transition to Systems Engineering is implemented.

Specific Training and Procedural Enhancements - In response to findings from a MRule self assessment that was concluded just prior to the baseline inspection and discussions with the NRC inspection team, a formal MRule training module was developed and included in the mandatory Engineering support staff personnel training that began on December 5, 1996. This module included detailed information on functional failures, MPFFs, and repetitive failures. Examples of identification and disposition of potential functional failures were provided.

WNP-2 Administrative Procedure PPM 1.3.12, *Problem Evaluation Requests*, will be revised to facilitate the identification and tracking of potential functional failures. This procedure will require that a PER be initiated for SSC failures and/or conditions that are identified as potential MRule functional failures.

Other Actions - In addition to the measures described above, Engineering Programs has begun a re-review of PERs for the past eight quarters (1995 - 1996) to ensure that potential MRule functional failures were properly identified and dispositioned. This review will revise the database that captures and tracks all functional failures/MPFFs, as necessary. It is accessible to Systems Engineers on the Local Area Network (LAN) and is periodically distributed in hardcopy.

Shutdown Criteria Visibility - The performance criteria table (Table 3-1) in Technical Instruction (TI) 4.22 currently has a column labeled *Shutdown Criteria* in which all tracked SSCs are identified as either *Yes* or *No*. The heading of this column will be changed to *Track Failures In Modes 4 / 5?* to more accurately reflect its intended function. In addition, Section 3.5.4.2 of TI 4.22 will be changed to read:

> MPFFs shall be tracked for all SSCs whose operation is required in Modes 4 and 5. Any MPFFs occurring in one of these SSCs during Modes 4 and 5 shall be added to the SSC's MPFFs in Modes 1, 2 and 3. In addition, a plant level criteria of two random MPFFs or one repetitive MPFF (2/1) per two year period during Modes 4 and 5 shall also be monitored.

These actions will assist Systems Engineering in recognizing pertinent criteria and pre-existing data in dispositioning functional failures.

WEEKLY STATUS REPORT

Date	EPN	Tracked Under	Reference	Engineer	Date Assigned
1/24/95	E-BU-DG441/6	EL-SYS-DC/R	296-0618	Weber	12/10/96
1/27/95	E-BU-DG441/1X	EL-SYS-DC/R	296-0618	Weber	12/10/96
8/31/95	E-BU-C120/441/1X	EL-SYS-DC/R	296-0618	Weber	12/10/96
10/8/95	E-BU-SWA7/5	EL-SYS-DC/R	296-0618	Weber	12/10/96
11/9/95	E-BU-SWA7/6	EL-SYS-DC/R	296-0618	Weber	12/10/96
11/9/95	E-BU-SWA7/7	EL-SYS-DC/R	296-0618	Weber	12/10/96
11/9/95	E-BU-SWA7/4	EL-SYS-DC/R	296-0618	Weber	12/10/96
11/9/95	E-BU-SWA7/2X	EL-SYS-DC/R	296-0618	Weber	12/10/96
5/23/96	E-BU-W467/17	EL-SYS-DC/R	296-0618	Weber	12/10/96
7/25/96	E-BU-W467/4X	EL-SYS-DC/R	296-0618	Weber	12/10/96
7/25/96	E-BU-W467/1X	EL-SYS-DC/R	296-0618	Weber	12/10/96
7/25/96	E-BU-W467/16	EL-SYS-DC/R	296-0618	Weber	12/10/96
8/6/96	E-BU-W501/1	EL-SYS-DC/R	296-0618	Weber	12/10/96
8/6/96	E-BU-W501/2	EL-SYS-DC/R	296-0618	Weber	12/10/96
8/6/96	E-BU-W525/1	EL-SYS-DC/R	296-0618	Weber	12/10/96
8/6/96	E-BU-W501/3	EL-SYS-DC/R	296-0618	Weber	12/10/96
10/2/96	PRM-RE-1C	PRM	296-0703	Icayan	12/10/96
10/3/96	WRM-LR-1	WRM	296-0705	Droppo	12/10/96
10/9/96	GY-CI-10A2	PLANT	296-0714	Burk	12/10/96
10/9/96	PI-VX-269	PCISO	296-0712	Rychlyk	12/10/96
10/23/96	PRM-RE-1B	PRM	296-0730	Icayan	12/10/96
10/23/96	GY-CI-10A2	PLANT	296-0732	Burk	12/10/96
10/25/96	E-BU-SWA7/3	EL-SYS-DC/R	10.25.156	Weber	12/10/96
11/15/96	LD-TM-621B	LD	296-0781	Ramos	12/10/96
11/15/96	TEA-SR-38	TEA	296-0783	Rychlyk	12/10/96
11/17/96	SRM-DET-1B	SRM	296-0785	Parker	12/10/96
11/19/96	LPRM-DET-24/25B	LPRM	296-0792	Droppo	12/10/96
11/21/96	CMS-O2H2R-2	CMS-SYS-B	297-0797	Ramos	12/10/96
11/22/96	RCIC-FI-1R	RCIC-SYS-1	296-0799	Hancock	12/10/96
11/24/96	TEA-SR-26	TEA	LCO-1998	Rychlyk	12/10/96
12/4/96	WEA-FIC-1	WEA-SR-25	296-0832	Rychlyk	12/10/96
12/6/96	MS-PS-47A, B, C, D	HPCS-SYS-1	296-0837	Strong	12/10/96
12/7/96	ANN-E/S-A/A2/FHA &	ANN-ANN-601/A2	296-0856	Hermann	12/10/96
12/9/96	E-TR-7BC	E120-SYS-1	296-0843	Weber	12/10/96
12/9/96	ARM-E/S-603A	ARM	296-0858	Icayan	12/17/96

Procedural Weakness in Reflecting the 10 CFR 50.65 a(3) Process

ISSUE: Although no specific deficiencies were identified in this area, it was noted that the processes inspected to assure the adequacy of balancing availability and reliability were not fully documented in plant procedures.

Corrective Actions:

Administrative Procedures PPM 1.3.7E, *Work Scheduling*, and PPM 1.16.6B, *Voluntary Entry Into Technical Specifications Action Statements*, will be revised to enhance procedural guidance on assessments currently being conducted to meet the requirements of 10 CFR 50.65 a(3). In particular, guidance will be revised to include not only Technical Specification equipment, but also PSA Risk Significant MRule equipment when assessing the plant impact or balancing availability/reliability for emergent work.

PPM 1.3.7E - PSA evaluations will be performed by a PSA engineer at weeks X-11, X-3 and X-1. At X-11, a scoping analysis will be performed; at X-3 a detailed analysis will be performed; and, at X-1 a final PSA analysis utilizing the latest schedule modifications will be performed. The PSA engineer will communicate the results of the X-11 and X-3 week analyses to the Work Week Leader. The final PSA evaluation results for the X-1 analysis will be provided to the Work Week Leader at the regularly scheduled X-1 meeting.

PPM 1.16.6B - This procedure will be expanded from requiring evaluation of the risk impact of emergent work involving equipment covered under Technical Specifications to requiring evaluation of the risk impact of emergent work involving risk significant SSCs. The list of risk significant SSCs will be based on the selection criteria from NUMARC 93-01 used by the WNP-2 MRule program. The Production Scheduling Shift Manager (PSSM) in the WNP-2 Work Control Center will have responsibility for identifying emergent work involving risk significant SSCs based on a listing of risk significant SSCs which will be included with the procedure revision. A PSA engineer will provide a timely PSA analysis for appropriate emergent work upon request by the PSSM.

These revisions reflect the plant's current practice while SENTINEL, WNP-2s on-line Risk and Safety Monitor, is being tested prior to implementation. The subject procedures will be revised again when SENTINEL is incorporated into the process.

Other Refinements to the Maintenance Rule Program

ISSUE: Other potential weaknesses were noted either by NRC or WNP-2 staff members during the course of the inspection.

Corrective Actions:

Measures are being taken to resolve the conditions described below. These measures will be presented to the WNP-2 Expert Panel in the near future.

PSA/MRule Unavailability Bases - The unavailability bases have been expanded to consider system importance, actual plant specific data, and PSA unavailability values for each MRule SSC unavailability criterion. A comparison of this data resulted in most of the existing MRule criteria remaining unchanged; however, a few criteria have been recommended for change. These changes will be presented to the Expert Panel for adoption. The proposed changes will not modify the current a(2) or a(1) status of SSCs.

A summary of this comparison is as follows:

The total out-of-service (OOS) hours per 14,000 hrs of operation criteria is derived directly from the PSA unavailability values. The unavailability data is collected based on all causes, including: functional failures, other unplanned out-of-service time, and planned out-of-service time. The determination of whether or not a functional failure is maintenance preventable is then applied to this data. Therefore, tracking the system OOS hours against PSA based values provides direct information of the adequacy of the PSA overall data assumptions. It will be clear on a system/train level if the PSA values appear to be too high or too low. Industry operating experience and other data can then be introduced for additional comparison information. The instructions for maintaining the PSA current accounts for this feedback and adjustment.

The analysis to establish unavailability criteria from a PSA and experience perspective has been updated using current PSA models. The final criteria are established, with Expert Panel review and concurrence, based on three criteria:

a) Convert PSA mean unavailability value for an SSC into allowable OOS hours,

b) Convert PSA RAW importance measure for an SSC into allowable outage time (AOT) hours utilizing NEI/EPRI PSA Guideline limit for temporary modification AOT, and

c) Examine and evaluate actual plant specific data for an SSC's OOS hours.

The use of PSA mean unavailability values at the train or system level is the sum of the unavailabilities of that SSC's components. The component failure rates may be generic or plant specific, the maintenance and test intervals are plant specific, and other factors such as Beta for common cause failure analysis are generic. The train or system unavailability is a mean value from a large database and is a reasonable first step in determining the performance criteria for a train or system. Using this method for trains or systems that have historically had high availability will result in a low number of allowable OOS hours for performance criteria. It does not explicitly differentiate the importance of the system or train. Each of these three methods provides a different perspective in arriving at a performance unavailability criteria for a given train or system.

a) The first method results in low OOS performance criteria hours for highly available systems or trains and may be appropriate for systems or trains of high risk significance. For lower risk significant systems or trains that still require individual versus plant level criteria, this approach may be unduly or unnecessarily restrictive. This could result in non-beneficial, cost and/or safety, attention to these systems or trains.

b) The second method incorporates the system or train importance and is performed utilizing the NEI/EPRI PSA Applications Guidelines methodology for temporary modifications. The resultant AOT per reactor-year is derived from the change in CDF with the system or train out of service. This change in CDF in turn can be expressed in terms of RAW and an AOT calculated from the RAW.

c) The third method is performed by examination of actual plant data for the system or train to determine plant practice and experience in having or taking the system or train out of service. If the PSA utilized only plant specific data, and the data was statistically significant, the results of using PSA unavailabilities and an examination of plant data would yield identical results. However, for systems or trains that have very high reliability and are infrequently taken out of service at power, the analytical limits from the PSA will differ and need to be adjusted based on plant experience.

In summary, utilization of all three factors results in MRule unavailability criteria that are linked to the PSA by a combination of importance, actual plant history, industry experience, and actual PSA unavailability factors. Enhancements will be made to TI 4.22 to document the utilization of all three factors.

Cyclic Report Guidance - TI 4.22 is being revised to provide more detailed guidance for the creation and issuance of the Cyclic Report.

PSA Truncation Level - Revising the PSA to reflect 1E-10 truncation levels was in progress at the time of the inspection. The results of this task found that the RAW obtained from the 1E-10 cutoff are consistently lower than those from the 1E-9 cutoff. It has, therefore, been concluded that the lower truncation level does not provide different MRule risk significance results.

PSA Revisions - Engineering Department Procedure (EDP) 2.43, for maintaining the PSA current with respect to plant modifications, procedure changes, operating practices, and specific SSC data is being revised. The revised procedure will meet the requirements of the BWROG Peer Review Guidelines for maintaining the PSA and conducting periodic assessments.

Main Steam Tunnel Cooling Fans - A line item will be added to the current Reactor Building Recirculating Air (RRA) scoping matrix items to clarify the scoping of the RRA steam tunnel fan coolers. This item will be as follows:

System:	RRA
System Name:	Reactor Building Recirculating Air
Function:	Steam Tunnel Fan Cooling Units RRA-FC-8, 9 and 21
Classification:	Non-safety related
Safety Related?	No
Mitigates DBA?	No
Prevents SF?	No
Used in EOPs?	No
Could cause SCRAM?	Yes
In Scope?	Yes
Standby / On-Line?	On-Line
Key safety function:	Reactor Building Environmental Control
Risk Significant?	No
Tracked Under:	PLANT

Radwaste Building Mixed Air - A second line item identical to the present safety-related line item for WMA will be added. The new line item will be shown as Standby. The words *Normally operating* will be added to the description of the original line item, and the word *Standby* will be added to the description of the new line item. Unavailability will be tracked for the new, standby line item.