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 SCHWENCER, A. Licensing Branch 2

SUBJECT: Forwards "Rept of Audit 2 of WPPSS Plant Verification  
 Program for WPPSS Unit 2."

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NRR/DSI/AEB	26	1	1	NRR/DSI/ASB		1	1
NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
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NRR/DSI/RSB	23	1	1	<u>REG FILE</u>	04	1	1
RGN5		3	3	RM/DDAMI/MIB		1	0
EXTERNAL: ACRS	41	6	6	BNL (AMDTs ONLY)		1	1
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100-443887-1000

SUBJECT: Forwarded "Report of Audit S of 1982 Plant Verification Program for WY82 Unit 5."

TITLE: Legending Submittal; PSAR\PSAR Data & Related Correspondence  
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44-1121

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## Washington Public Power Supply System

P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

Docket No. 50-397  
April 15, 1983  
G02-83-338

Director of Nuclear Reactor Regulation  
Attention: Mr. A. Schwencer, Chief  
Licensing Branch No. 2  
Division of Licensing  
US Nuclear Regulatory Commission  
Washington, DC 20555

Subject: INDEPENDENT AUDIT OF WNP-2  
PLANT VERIFICATION PROGRAM

Enclosed for your information is a copy of the second TAA Report prepared during their Phase II activity and the Supply System's response to the TAA findings. If you have questions related to the TAA Report or the Supply System's response, contact John R. Honekamp (509: 372-5359).

Very truly yours,



G. D. Bouchey  
Manager, Nuclear Safety and Regulatory Programs

Enclosures: 1. TAA Report  
2. Supply System Response

cc: R Auluck, NRC  
RT Dodds, NRC  
JL Crews, NRC  
NS Reynolds, D&L  
A Toth, 917Q

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PDR ADOCK 05000397  
A PDR

THE UNITED STATES OF AMERICA  
DO hereby certify that

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RESPONSE TO TAA AUDIT REPORT  
DATED FEBRUARY 15, 1983

TAA Finding No. 9

The Panel believes that the Supply System should take additional steps to inform reverification team members of the importance of deciding and indicating on the report whether a Potential Finding is or is not a reportable event.

Supply System Response

TAA noted that the reportability box (10CFR50.55(e)) had not been filled out by the reviewer for several Potential Finding Reports (PFRs) as required by the procedure. The reportability reviews have been performed and none of these PFRs are reportable. The incomplete lead sheets have been corrected. The importance of documenting the reportability evaluation has been re-emphasized in meetings and via a memorandum to all reviewers (Enclosure 1).

TAA Finding No. 10

TAA does not agree with the present plan for the RFW system in which no piping or support/restraints are being reverified. We believe that a sample should be included, using design level information, if necessary, to avoid the schedule delay which would result from awaiting as-built verification.

Supply System Response

In the Plant Verification Report and the early draft design reverification plans, the scope of the engineering mechanics reviews were intended to be distributed among the three systems (HPCS, RHR and RFW). However, when it became apparent that the final reconciled stress analysis for the RFW piping would be significantly delayed, the Supply System redistributed the engineering mechanics reviews originally planned for the RFW systems to the RHR and HPCS reviews. The redistribution, which is shown in Enclosure 2, is reflected in the issued design review plans (page 10 of TAA Audit Report). This change was justified on the basis that equivalent scope involving the same design organizations was being reviewed. While in our judgment the scope of the engineering mechanics review is adequate, we understand the TAA concern and, therefore, will review several significant items in the modified RFW design. Items to be reviewed will include revised loads on the RFW pump and RFW-HX-6A and 6B heater nozzles and revised loads on a selected support. The review will be based on the design package rather than the final reconciled stress analysis.

TAA Finding No. 11

The Requirements Reverification Report requires additional review and improvement to ensure that the relationship between commitments and requirements are more thoroughly analyzed and more clearly presented.

#### Supply System Response

The TAA Panel made several specific comments on the Requirements Reverification Report. The Supply System has taken these comments and will resolve them by the following process:

1. Resolution by individual team members;
2. Review by Discipline Supervisor for correctness in terms of area of specialization; and
3. An interdiscipline review by each team member.

Resolution will follow these guidelines:

1. Correction of specific errors such as the error of copying or transposition identified by TAA;
2. Resolution and clarification of areas where the backup information does not fully support the comparison statement; and
3. Clarification of wording where necessary.

We agree that not all commitments are covered in the Reverification Report. The purpose as stated to the NRC at the November 10, 1982 review was to sample FSAR commitments to ensure they are carried out in the implementing documents. The commitments presented in the report represent a substantial sample but not all commitments as pointed out by the Panel.

#### TAA Finding No. 12

The RFW design reverification team is behind schedule and requires strengthening in order to complete on schedule.

#### Supply System Response

The Supply System had recognized the schedule problem and agrees with the TAA finding. The actions taken to resolve the issue are:

1. Review of detailed schedules to evaluate the areas behind schedule and the cause of delay (e.g., construction not complete, inadequate review resources, other priority).
2. Where schedule problems were caused by priority, specific tasks were reassigned to provide design reverification team personnel additional time to support reverification activities.
3. Where inadequate integration occurred, individual team meetings with program supervisor were held to resolve interdiscipline requirements.
4. Where resources were inadequate, the following action was taken:
  - a. Qualified analysts from other Systems Engineering Departments were added to address the system analytical reviews.
  - b. Added Supply System help from other projects.
  - c. Added outside contract help (S&W) in the mechanical discipline area.
  - d. Reviewed all work tasks assigned to the team lead and established firm priorities for reverification tasks.

### TAA Finding No. 13

We believe that the pipe stress/nozzle problem should be investigated by the Supply System to determine the root causes of it, and whether the root causes have any implications for other Supply System work done by the architect-engineer.

### Supply System Response

Both the Supply System and Burns & Roe (BRI) have investigated the cause of the late identification of a significant number of nozzle load reconciliation problems at WNP-2. The conclusions from the two evaluations are consistent and are supported by the engineering record. It is clear from project documentation that reconciliation of nozzle loads has been a requirement since the earliest stages of the project and that considerable correspondence took place between BRI and various vendors to resolve specific nozzle load problems starting as early as 1972 and continuing to the present. However, a formal program for case-by-case reconciliation of nozzle loads was not implemented until late in the project. The delay in initiation of the case-by-case reconciliation was the result of several factors, primarily:

1. Problems with the piping and mechanical contractor (C-215) which led to the July 1980 stop work and changes in the piping design and installation contracts.
2. The need to perform a status as-built program as a result of item 1. to define the construction status of the C-215 piping and supports and identify and resolve areas where this construction was not in conformance with the design.
3. A conscious decision by BRI and the Supply System to wait until final hydrodynamic loads were available before performing the final reconciliation of nozzle loads.

The causes of the nozzle load problems identified during the status as-built stress evaluation are new/increased loads; as-built deviations from design; changes in configuration; application of a uniform, more conservative design criteria identifying as potential overloads previously accepted loads; the existence of excessively conservative vendor allowable loads; and the discovery of previous errors or omissions.

The Design Reverification Program management has reviewed these evaluations and concluded that the late identification of a significant number of nozzle load reconciliation problems is not the result of a design process breakdown. In addition, the Design Reverification Program already includes the review of several Class I nozzles to determine if the applied loads have been adequately reconciled with the acceptance criteria. Furthermore, in response to TAA's request to restore some structural mechanics checks in the RFW System Review, we will also be checking a non-Class I nozzle. Based on the high visibility being given to the Burns & Roe nozzle load program and the independent checks already planned to be performed, it is our conclusion that no further changes to the design reverification plans are needed in this area.





#### TAA Observation No. 5

For the purpose of deciding whether or not to extend the sample size, tray and conduit supports which do not conform to design plans, but are found acceptable as is, should be analyzed. It is important to determine if the same deviations might be unacceptable in other tray and conduit support situations. If so, such "acceptable as is" items should be counted as deviations for sample size analysis.

#### Supply System Response

In the ATI review of Contract 218 conduit and tray supports, deviations in generic designs were traced to all affected supports. As discussed below, every individual support reviewed was shown to be satisfactory, hence, it was not necessary to increase the sample size.

#### ● Cable Tray Supports

Cable tray supports were individually designed, but utilized generic calculations which formed the basis for the original support designs. Both the detailed individual tray support and the associated generic calculations were reviewed by ATI in the design verification process.

The tray support designs were found, in all 59 cases in the sample, to be satisfactory for the loading conditions specified and resulted in no rework. Since no failures in the cable tray supports were found, the initial sample size of 59 was sufficient to provide a 95 percent confidence level that there would be 5 percent or fewer structurally inadequate cable tray supports in the population.

#### ● Conduit Supports

Fischbach/Lord utilized generic conduit support designs, rather than individually designed conduit supports. In the sample selected by ATI for design verification, no two supports utilized the same generic conduit support design. Therefore, 59 separate generic conduit support designs were evaluated. In some cases, errors were found in the generic support design which would have resulted in an overloaded condition if the as-built conduit support had been loaded up to the theoretical capacity of the support. These were identified by ATI to Fischbach/Lord with a recommended reduced load-carrying capacity. Each of the deficient generic conduit support designs identified by ATI were traced to all the individual as-built supports utilizing that generic design, and it was found that in no case did the actual loading on the individual conduit support exceed the recommended reduced load-carrying capacity of the generic support. Thus, no rework was required on these supports, and the generic conduit design was revised to reflect the reduced load-carrying capacity.

Even though some deficiencies were found in the initial sample of generic conduit support designs, all of the individual conduit supports which utilized these designs were satisfactory.



This is because the theoretical generic conduit support capacity is an upper limit, and the actual loading on a given support will generally be less than the theoretical capacity. Since the objective of the design verification effort was to provide 95 percent confidence level that 5 percent or fewer supports (i.e., not generic designs) in the population are structurally inadequate, this was accomplished in the initial sample size of 59.



# INTEROFFICE MEMORANDUM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

ENCLOSURE 1

Date: January 28, 1983

To: Distribution

From: D. L. Whitcomb (420)

*D. L. Whitcomb*

Subject: COMPLETION OF PFR TRANSMITTAL FORMS  
CLASSIFICATION OF PFRS

Reference: None.

## Distribution:

<input type="checkbox"/> EDC WNP-1/4	
<input type="checkbox"/> EDC WNP-2	
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<input type="checkbox"/> Admin File	
M Basu	420
DM Bosi	440
GL Gelhaus	440
JR Honekamp	387
DM Myers	420
DW Porter <i>cur</i>	420
DC Timmins	901A
DL Whitcomb	420
JM Yatabe	410
Chrono	--
DLW/lb	

SDE Instruction 3.5, Section 3.11 requires that each System Engineer determine if a PFR is potentially reportable and directs that the top section of the PFR transmittal form be completed. Please be advised that the line stating "Potentially Reportable-Transmitted to PQAM (Form Attached) Yes No" is for the purpose of documenting this determination and shall be completed for each PFR. The next revision of SDE Inst. 3.5 will clarify any confusion that exists.

SDE Inst. 3.5, Section 5.7.1(5) advises that the Findings Review Committee procedure for processing PFRs be used to assist in establishing the recommended classification of the PFRs. Attached is a copy of CPP 4.3.7, WNP-2 Finding Review Committee. This CPP provides the guidance discussed in SDE Inst. 3.5.

DLW/arg

Attachments: 1. Potential Finding Report Transmittal  
2. CPP 4.3.7, WNP-2 Findings Review Committee

ENCLOSURE 2

REVERIFICATION PROGRAM SUBSTITUTIONS

(Engineering Mechanics)

<u>Item</u>	<u>Subtracted From RFW Components</u>	<u>Added to RHR or HPCS Components</u>
Small Bore Pipe	M200-341	RHR-2289-1
Small Bore Hanger	None included in original scope	RHR-2289-11
Pipe Whip Restraint	PWS-27-2	PWS-2-1
Large Bore Hanger	COND-28	HPCS-901N
Large Bore Hanger	RFW-186	HPCS-52
Large Bore Stress Analysis	M200-27 (Class I)	HPCS-100A (Class II)*

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\*Class I already being reverified in HPCS.

