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**Washington Public Power Supply System**

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Docket No. 50-397

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February 25, 1983  
G02-83-174

Mr. R. H. Engelken  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
1450 Maria Lane, Suite 210  
Walnut Creek, California 94596

Subject : NUCLEAR PROJECT 2  
10CFR50.55(e) REPORTABLE CONDITIONS: #208 - REMOTE  
SHUTDOWN PANEL, #209 - HPCS & LPCS PUMP DISCHARGE  
PRESSURE SWITCHES, #223 - STANDBY LIQUID CONTROL  
SYSTEM (SLCS), AND #229 - HANGERS NOT INSTALLED IN  
TURNED OVER SYSTEM 7.1 (HPCS)

- Reference : (1) Letter #G02-82-945, dated 11/23/82, R.G. Matlock  
to R.H. Engelken
- (2) Telecon #QA2-83-029, dated 1/27/83, L.C. Floyd  
to R.C. Dodds

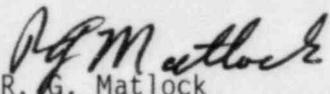
In accordance with the provisions of 10CFR50.55(e), your office was informed, by telephone, of the above subject conditions on August 19, 1982, August 20, 1982, January 27, 1983, and January 27, 1983, respectively.

Attachments A and B provide the Project's final reports on conditions #208, Remote Shutdown Panel, and #209, HPCS & LPCS Pump Discharge Pressure Switches. Attachments C and D provide interim reports on conditions #223, Standby Liquid Control System, and #229, Hangers Not Installed in Turned Over System 7.1 (HPCS). We will continue to provide your office with quarterly updates on conditions #223 and #229. The next report will be submitted on or before May 23, 1983.

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If there are any questions, please contact Roger Johnson, Project  
QA Manager, WNP-2, at (509) 377-2501, extension 2712.

  
R. G. Matlock  
Program Director, WNP-2

LCF/fl

Attachments: A. Final Report - 10CFR50.55(e) #208  
B. Final Report - 10CFR50.55(e) #209  
C. Interim Report - 10CFR50.55(e) #223  
D. Interim Report - 10CFR50.55(e) #229

cc: Mr. W. S. Chin, BPA (901A)  
Mr. J. A. Forrest, BRI (HAPO)  
Mr. N. D. Lewis, NRC  
Mr. J. Plunkett, NUS Corp.  
Mr. R. E. Snaith, BRI - NY  
Mr. A. Toth, NRC Resident Inspector - 917Q  
Document Control, NRC

## ATTACHMENT A

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397  
LICENSE NO. CPPR-93  
REMOTE SHUTDOWN PANEL  
10CFR50.55(e) #208

### FINAL REPORT

#### Description of Deficiency

GE design criteria (22A3085, Sec. 4.1) states that "the remote shutdown system shall be designed to control the required shutdown systems from outside the control room irrespective of shorts, opens, or grounds in control circuits (in the control room)" which we have committed to in the FSAR (Sec. 7.4.1.4.1).

The remote shutdown panel controls loop B of the standby service water system (SSW). During a Human Factors Engineering Review, it was discovered that there did not exist any controls on the remote shutdown panel to operate valve SW-PCV-38B. During a subsequent review, it was further discovered that the Supervisory Control Panel CS-2, which controls valves SW-V-2B, SW-V-12B and SW-V-69B, received its power from the control room.

#### Analysis of Safety Implication

If the control room is evacuated and it becomes necessary to bring the reactor to cold shutdown, the spray ponds may not be available. Reactor decay heat would be dumped to the suppression pool which ultimately would lead to overpressurization of the primary containment.

This condition is considered reportable under 10CFR50.55(e).

#### Corrective Action

The design of the remote shutdown panel has been reviewed and no other deficiencies have been identified. Project Engineering Directive (PED) 218-E-A889 has been issued to locate the control switches for SW-PCV-38B on the remote shutdown panel. PED 218-E-A551 has been issued to change the power supply to supervisory panel CS-2 to a power supply outside the control room.

ATTACHMENT B

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT 2  
DOCKET NO. 50-397  
LICENSE NO. CPPR-93  
RHR PUMP DISCHARGE PRESSURE SWITCH  
10CFR50.55(e) CONDITION #209

FINAL REPORT

Description of Defect

On the discharge side of the Residual Heat Removal (RHR) and Low Pressure Core Spray (LPCS) pumps are redundant pressure switches (RHR-PS-16A, B & C, RHR-PS-19A, B & C, LPCS-PS-1 and LPCS-PS-9) with nominal setpoints of 100 psig for RHR; 150 psig for LPCS. Their function is to "tell" the Automatic Depressurization System (ADS) that the low pressure ECCS pumps are running. This permissiveness is needed before the ADS depressurizes the reactor vessel in a post-LOCA situation. On the discharge side of the HPCS pump is pressure switch HPCS-PS-12 with a nominal setting of 120 psig. Its function is to "tell" the HPCS minimum flow valve, HPCS-V-12, that the HPCS pump is running. This signal, in series with a low flow signal from HPCS-FIS-6, will open the minimum flow valve. The present-installed locations for all these pressure switches may subject them to water hammer and disable them such that they cannot meet their safety function.

These pressure switches all have sensing points upstream of their respective pump discharge check valves at about El. 422'. During normal plant operation, with the ECCS pumps in standby mode (not running), they will "see" the static head of the suppression pool, whose minimum elevation is 466'-0 3/4". All the pressure switches are located on racks whose elevation is greater than suppression pool water level. They are as follows:

| <u>PRESSURE SWITCH</u> | <u>INSTRUMENT RACK</u> | <u>FLOOR ELEVATION OF RACK</u> |
|------------------------|------------------------|--------------------------------|
| RHR-PS-16A             | H22-P018               | 501'                           |
| RHR-PS-16B             | H22-P021               | 501'                           |
| RHR-PS-16C             | H22-P021               | 501'                           |
| RHR-PS-19A             | H22-P018               | 501'                           |
| RHR-PS-19B             | H22-P021               | 501'                           |
| RHR-PS-19C             | H22-P021               | 501'                           |
| HPCS-PS-12             | H22-P024               | 471'                           |
| LPCS-PS-1              | H22-P001               | 471'                           |
| LPCS-PS-9              | H22-P001               | 471'                           |

For the instrument racks on El. 501', the instrument tubing is approximately 250' long and runs up to El. 516' before hooking into the pressure switch at approximately El. 505' (see attached sketch).

For the instrument racks on El. 471', the instrument tubing is approximately 200' long and runs up to approximately El. 490' before hooking into the pressure switch at approximately El. 475'.

During normal plant operation, the sensing lines cannot be completely filled with water because the suppression pool can only fill it to El. 466'. With an air pocket in the sensing line, the pressure switch will not actuate at the required setpoint if it had been compensated for the static head difference between the sensing point and the pressure switch. This in itself is not a significant safety issue because the switch will trip early, although how early has not been determined. It would be difficult to accurately compensate for the air pocket due to the sensing line's tortuous routing and intermediate high point. However, there is a potential for water hammer in the sensing lines which could damage the pressure switches and not allow the ADS to function or the HPCS minimum flow valve to open.

### Analysis of Safety Implications

If water hammer disables the pressure switches, then a substantial safety hazard could be created during a small break LOCA scenario. Using design basis accident assumptions, the HPCS is assumed to fail after a small break. The reactor remains pressurized so that the low pressure systems (RHR and LPCS) cannot inject. At reactor water Level 1 (just above the active fuel), the ADS two-minute timer is started and waits for water level to recover. Because HPCS is assumed to fail, water level continues to drop until the timer times out. The ADS logic then verifies that the RHR and LPCS pumps are running before it depressurizes the reactor. If the pressure switches are disabled at the start of the accident due to water hammer during pump start, no verification will occur and the reactor will not automatically depressurize. Manual depressurization can still occur, but using design basis accident assumptions, it cannot be taken credit for at least 10 minutes. With no automatic depressurization, we would be outside the safety analysis of FSAR Chapter 6 for a small break accident.

Failure of the HPCS pressure switch due to water hammer could cause a significant hazard in a small break scenario in which HPCS maintains reactor water level up to Level 8 trip. At level 8, the HPCS injection valve closes and the pump is supposed to go into minimum flow recirculation. However, with HPCS-PS-12 damaged and unable to verify "pump running", the minimum flow valve will not open. The HPCS pump can damage itself such that no high pressure makeup is available. Now the plant is in the same situation described in the previous paragraph.

### Corrective Action

The instrument sensing line root valves will be relocated to points downstream of the ECCS pump discharge line check valves. Those portions of the lines are maintained under pressure by a water-leg pump. Project Engineering Directive (PED) 220-I-0950 was issued on October 27, 1982, to relocate the root valves downstream as stated above. PED 220-I-0950 has been implemented and all necessary work by the contractor (JCI) has been accomplished, including "N" stamping of the modifications. All related documentation is available for review by your office at the site.

## ATTACHMENT C

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397  
LICENSE NO. CPPR-93  
STANDBY LIQUID CONTROL SYSTEM (SLCS)  
10CFR50.55(e) CONDITION #223

### INTERIM REPORT

#### Description of Deficiency

The Standby Liquid Control System (SLCS) is a backup system for safe shutdown which receives supply power from AC and DC safety--related buses. General Electric electrical elementary diagrams have one loop of SLCS equipment powered and controlled from safety-related (Class IE) electrical buses, while the other loop of equipment is not. Power supplies which are not safety-related are connected to safety--related buses without isolators and control circuits within various panels are not separated; both of which are requirements of the WNP-2 electrical separation criteria.

#### Safety Implication

The system, as designed, does not meet single failure criteria per current FSAR statements, either mechanically or electrically. Electrical separation criteria has been violated concerning prime circuits, which degrades the reliability of a safety-related electrical division. These conditions may preclude the SLCS from performing its intended function and, electrically, could cause failure of safety--related circuits through interfaces with non-safety-related circuits.

#### Corrective Action

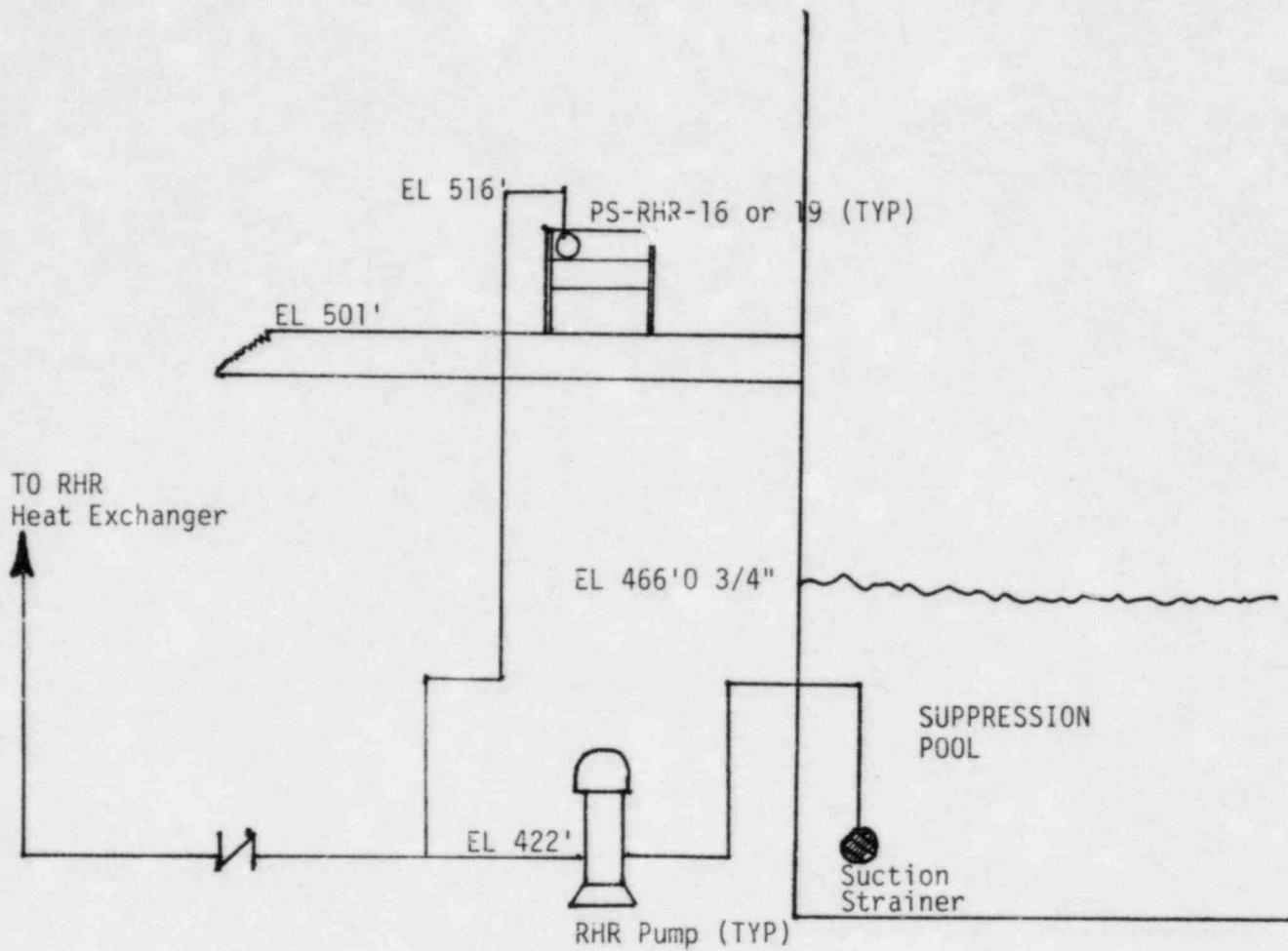
General Electric has clarified the design requirements of the SLCS and submitted recommended document changes to preclude misinterpretation of the system's function and the licensing commitments. These clarifications are:

- The SLCS, by design, is not required to perform a "safety function"; nor is it required as a safety backup system to the Reactor Protection System (RPS) or Control Rod Drive System (CRDS). The system, by design, is not required or intended to meet single failure criteria. The SLCS is a backup to the CRDS for plant shutdown for a non-transient event. All SLCS components required for boron injection shall be Seismic Category I.
- A safety-related Class IE power source is not required for boron injection; however, the redundant pumps, explosive valves and motor operated storage tank outlet valves shall be powered from two separate buses so that a single electrical failure will not prevent the systems operation. The SLCS buses shall be connectable to a standby power source to ensure boron injection in the event of a station power failure.

Corrective action is proceeding in accordance with this clarification as follows:

- System mechanical design will remain unchanged;
- System electrical design shall be corrected to be in compliance with electrical separation criteria;
- Loop A electrical shall be fully qualified to meet safety--related Class IE requirements, including Quality Class I and Seismic Category I requirements;
- Loop B electrical shall be non-safety-related, Quality Class II and Seismic Category I;
- The existing design and documentation shall be brought in compliance with the above.

Design documents are scheduled to be initiated in March and the work completed prior to fuel load. We will continue to provide your office with quarterly updates. The next report will be submitted on or before May 25, 1983.



ATTACHMENT D

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397  
LICENSE NO. CPPR-93  
HANGERS NOT INSTALLED IN TURNED OVER SYSTEM 7.1 (HPCS)  
10CFR50.55(e) #229

INTERIM REPORT

Description of Deficiency

System 7.1 (High Pressure Core Spray [HPCS]) was turned over to Supply System Test and Startup with two (2) snubber hangers not installed as required by engineering direction. The two missing hangers are HPCS-924N and HPCS-925N.

Safety Implication

The project has established criteria for the acceptable configuration of hangers and snubbers for provisional acceptance of the system to allow initiation of system functional testing. Seismic snubbers/sway braces are, by this criteria, not required for initial testing and normal system operations. The absence of the 2 snubbers during current activities, therefore, does not create a condition that has a potential to damage or preclude the system from functioning as intended. Based on a conservative evaluation that the snubbers are necessary to maintain design conditions within the piping system during an earthquake, the absence of the two snubbers could result in conditions which could damage and/or preclude the HPCS system from performing its safety-related function. This is considered to be a reportable condition under 10CFR50.55(e).

Corrective Action

Snubber hangers HPCS-924N and HPCS-925N have been identified on the Master Work List (MWL) as an outstanding discrepancy.

The A/E, Burns and Roe, Inc., is in the process of reviewing and updating the Hanger Drawing Control List (HDCL) to ensure that the HDCL reflects all current design. Upon completion of the Burns and Roe review, the CM, Bechtel Power Corporation, will review the updated HDCL against other construction documents to ensure that construction documents, such as the latest isometric drawings, MCL and the turnover package System Component Control List (SCCL) are up to date.

We will continue to provide your office with quarterly updates. The next report will be submitted on or before May 25, 1983.