U.S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/83-37

Docket No. 50-397

Licensee: Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Facility Name: Washington Nuclear Project No. 2 (WNP-2)

Inspection at: WNP-2 Site, Benton County, Washington

Inspection conducted: July 18-22 and 25-29, 1983

Inspectors: R T Dodds for — 8/25/83
D. P. Haist, Reactor Inspector — Date Signed

W J Wagner — 8/25/83
W. J. Wagner, Reactor Inspector — Date Signed

Approved By: R T Dodds — 8/25/83
R. T. Dodds, Chief — Date Signed
Reactor Projects Section No. 1
Reactor Projects Branch No. 1

Summary:

Inspection from July 18-22 and 25-29, 1983 (Inspection Report No. 50-397/83-37)

Areas Inspected: Routine, unannounced inspection by regional-based inspectors of licensee identified construction deficiencies (10 CFR 50.55(e) reports). The inspections involved 58 inspection hours onsite and 10 inspection hours in the regional office by two NRC inspectors.

Results: One item of noncompliance was identified (failure to take adequate corrective action - paragraph 2e).

DETAILS

1. Persons Contacted

a. Washington Public Power Supply System

+*R. T. Johnson, Project Quality Assurance Manager
+*L. C. Floyd, Senior Quality Assurance Engineer
*R. B. Glasscock, Director, Licensing and Assurance

b. Bechtel Power Corporation

H. Boarder, Quality Assurance Engineer

c. Burns and Roe Inc.

W. T. Murphy, Lead Hanger Engineer
J. B. Mahoney, Resident Group Supervisor, Pipe & Pipe Supports
L. A. Rodgers, Senior Mechanical Engineer

*Denotes persons present at exit meeting on July 22, 1983.
+Denotes persons present at exit meeting on July 29, 1983.

2. Licensee Action on 10 CFR 50.55(e) Construction Deficiencies

a. Rayproof 8-H Special Doors (No. 82-09-B; Licensee No. 212)

The licensee reported that special interior watertight doors failed leak tests when they were subjected to hydrostatic pressure applied in a direction which unseats the door from the frame. These doors are required to provide watertight compartments for safety-related pumps located in the basement of the reactor building. Corrective actions included the addition of five doors installed on the opposite side of the door opening as counterparts to existing doors. The licensee's analysis of the deficiency and draft interim report concluded that doors R4, R5, R8, R12, and R13 were acceptable as installed since they are located in the stairwells and there are no pipes in the stairwell to break and cause excessive leakage. However, the inspector had questioned the presence of fire protection and condensate lines in the stairwell adjacent to the low pressure core spray and residual heat removal 2C pump rooms.

The licensee examined the affect of these lines on their flooding analysis and concluded that in the event of a 24-inch condensate line break and subsequent flooding of RHR-C and LPCS, the following emergency core cooling and shutdown cooling systems would remain available:

Emergency Core Cooling Systems

HPCS (Div. III)
ADS/RHR A (Div. I)
ADS/RHR B (Div. II)

Shutdown Cooling Systems

RHR A (Div. I)
RHR B (Div. II)

A worst case single failure in Div. I, II, or III would therefore leave the system for shutdown cooling and two systems for emergency core cooling following a flooding of both rooms adjacent to the stairwell. The licensee has thus concluded that the stairwell lines will have no adverse affects on the conclusions in the flooding analysis. The licensee plans to modify the final report on this deficiency to reflect this information.

This item is considered closed.

b. Potential Missile Hazard Near Reactor Protective System Motor Generator Sets (No. 80-02-B; Licensee No. 24)

On October 3, 1978, the licensee noted that a possibility existed for missile damage to Class IE safety-related switchgear from non-qualified reactor protective system (RPS) motor generator (MG) sets located in common switchgear rooms of the radwaste and control building. The licensee notified the NRC Region V Office on February 18, 1980, upon completion of the evaluation that this was a reportable condition under the requirements of 10 CFR 50.55(e):

The design of the missile shields has been completed and installation has begun. A missile study followed the identification of this item to confirm that there were no other instances of unshielded potential missiles which could damage safety related equipment.

This item is considered closed.

c. (Closed) Defects in Pipe Whip Support Brackets (No. 79-02-A; Licensee No. 34)

This item dealt with defective welds identified in 45 pipe whip support brackets. Initial corrective action called for replacement of 20 brackets, repair of 14 and the remaining 11 were acceptable. Subsequently, the licensee has reviewed all document packages received from Contract 90 for pipe whip restraints. In conjunction with this review, the licensee's reinspection of installed pipe whip restraints determined that prior inspection documentation to be unreliable, and that unacceptable pipe whip restraint weld deficiencies exist. This resulted in issuance of PMI 5-14 "Pipe Whip Restraints Rework Program," which required a 100 percent reinspection of all pipe whip restraints by ultrasonic, magnetic particle and visual methods. All discrepancies identified in the reinspection and documentation review were documented by a Nonconformance Report (NCR). Evaluation of the NCR determined that 59 pipe whip restraints would be refabricated by Huico, Inc., and the remaining 119 repaired by Bechtel.

The inspector reviewed the following documents in order to assure that the refabrication by Huico, Inc., and the repairs by Bechtel were made in accordance with the original quality requirements:

(1) WBG Purchase Order No. 215-20295Q of June 1981 to Huico, Inc. The purchase order description included quality assurance program and contract specification requirements.

(2) Huico, Inc., Document Package List for pipe whip restraint numbers PWS 27-1, PWS 27-2, PWS 28-1, and PWS 28-2. Documentation reviewed by the inspector include Huico's certificate of compliance, the as-built manufacturing drawings, and certified material test reports.

(3) Burns & Roe Specification Division 5, Section 5E, "Pipe Whip Restraints." This document addresses all inspection and repair activities associated with pipe whip restraints, and the refabrication of the rejected pipe whip restraints.

(4) Burns & Roe Specifiction Division 5, Section 17E, "Welding and Nondestructive Examination for Pipe Whip Restraint Refabrication." This document includes requirements for:

- Welding Qualification for Personnel and Procedures
- Special Procedure Qualification for High Strength Low Alloy Steels
- Welding Process Controls
- Filler Material
- Welding Requirements
- Post Weld Heat Treatment
- Weld Inspection

(5) Bechtel Material Receiving Reports for pipe whip restraints numbers PWS 27-9, 28-9, 30-4, and 31-2B.

(6) Licensee Site Quality Assurance Surveillance Reports of Bechtel. Reports reviewed by the inspector of Bechtel pipe whip restraint activities include receiving inspection of materials, quality assurance program requirements, and document control.

(7) Licensee Surveillance Report No. 81-038-BCM of June 2-14, 1981. This surveillance was conducted similar to a formal audit in that an audit checklist was used to determine Huico's compliance with WPPSS contract specifications and the Huico Quality Assurance Manual. Audit items addressed the quality assurance program, indoctrination and training, procurement, document control, supplier/vendor evaluation selection,

receiving inspection, welder qualification, post weld heat treatment, weld rod control, and control of nonconforming items. Deficiencies were identified, and satisfactory responses were received on each item.

(8) WPPSS Surveillance Report Numbers 82-205-SS (12/14/82) and 82-206-SS (12/15/82). These surveillance reports list the committed corrective actions made to the NRC to satisfy the requirements of 10 CFR 50.55(e) for fabrication of pipe whip restraints.

The corrective actions taken by the licensee to correct the defective pipe whip support brackets appear to be satisfactory. This item is closed.

d. Defective GE Type CR2940 Control Switches (No. 81-06-C; Licensee No. 159)

The licensee notified the NRC on June 17, 1981, of this deficiency following issuance of a 10 CFR Part 21 report by General Electric on May 28, 1981. The deficiency involved possible loosening of the bolts that hold contact blocks on these tandem block control switches.

Corrective actions included an inspection program by General Electric of all CR2940 switches in their scope of supply and an inspection program by the licensee's startup organization for remaining switches used in safety-related applications. The inspector verified completion of these inspections and correction of switches with loose blocks.

This item is closed.

e. Emergency Diesel Generators DG-1 and DG-2 Airstart Circuits No. 82-09-A; Licensee No. 210)

The licensee informed the NRC on September 8, 1982, of a deficiency in the diesel generator air start circuit that selects one of two air receiver tanks to provide air to start the diesel generators. The failure of the air start circuitry to transfer from one air receiver to the other air receiver will result in less than the design basis availability of starting air for the diesel generators.

The licensee diagnosed this deficiency as being attributable to oxidization of the silver-plated relay contacts and low coil current to the relay coil which is wired in series with the relay contacts. Corrective actions included discussions with the relay manufacturer and a decision to have the relay contacts gold-plated or replaced with gold contacts.

The inspector verified that the contacts had been replaced but found that action had not been taken to modify the spare parts relays or to revise the diesel generator maintenance/instruction

manual or other tracking document to indicate that the original relays had been modified. The only programmed review of project engineering directives and spare parts requirements that had taken place occurred during the release of systems for operations. This review does not appear to be directed to assuring that design changes which affect spare parts or equipment instruction/ maintenance manuals are properly incorporated into those manuals. The failure to take effective corrective actions regarding spare diesel generator relays is considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action. Noncompliance 50-397/83-37/01.

f. Annulus Pressurization Effect on Piping Systems (No. 80-12-B, Licensee No. 130)

This item was reported under the provisions of 10 CFR 50.55(e) on January 22, 1981. Communications with the licensee on this subject and responsibility for resolution of this item now rest with the Office of Nuclear Reactor Regulation. This issue is being addressed under FSAR Question No. 110.019 and is considered closed for regional inspection purposes.

3. Items Determined Non-Reportable

a. Bechtel Undersized Skewed Welds

This item was initially reported to the NRC by the licensee as a potential 10 CFR 50.55(e) reportable deficiency but was subsequently determined by the licensee to be not reportable. In order to substantiate the licensee's evaluation of this item the inspector reviewed the following records of the actions taken to resolve the undersized skewed weld problem.

(1) Project Engineering Directives (PEDs) Numbers PED 216-W-0995, PED 218-W-A790 and PED 220-W-1010. The purpose for these PEDs was to assure that contractor personnel were trained in the use of the skewed weld joint evaluation manual issued with these PEDs. The inspector verified that this was satisfactorily accomplished.

(2) Skewed Weld Evaluation by Burns and Roe. The inspector reviewed the calculations performed on the undersized skewed weld joints to determine the integrity of the structure to withstand design loads. The calculations were made using worst case conditions. A typical example is a beam being joined at a 45 degree angle to an embedded plate where the beam is welded to the plate by two side-filled welds and two side-skewed welds. The worst case calculation assumes that the two skewed welds do not exist; calculations are then made to determine the minimum weld size of the remaining two fillet welds required to withstand the design loads (moments, shear, and tensile forces). The inspector reviewed the calculations for skewed weld joints BS-151, AS-173, and CAC-110. In each analysis, the calculated fillet weld sizes were less than the existing

fillet weld sizes, indicating that the existing skewed weld joints are more than adequate to withstand the design loads.

The records indicate that proper evaluation of the deficiencies in regards to reportability were performed. In addition, the licensee has taken corrective action to assure that all skewed welds in the future will have the additional leg length as required by AWS D1.1. This item is not reportable under 10 CFR 50.55(e) requirements and is closed.

b. IRM-E and IRM-H Channels Reversed (No. 83-07-B; Licensee No. 267)

The inspector examined the evaluation of this deficiency for reportability and corrective actions taken. The evaluation appeared to adequately justify the conclusion of nonreportability. The cause of the deficiency was attributed to an isolated drafting error during the translation of information from General Electric to Burns and Roe drawings. The remaining cable installation drawings were checked during issuance of the SRM/IRM drive motor installation instructions. A project engineering directive was issued to correct the wiring.

This item is closed.

4. Licensee Audit of 10 CFR 50.55(e) Construction Deficiency Reports

In partial response to NRC concern over inadequate consideration of the cause and action to prevent recurrence of significant construction deficiencies, the licensee requested a corporate audit of construction deficiency reports previously considered resolved by the licensee. This audit disclosed that a significant number of reports (over 20 of 28) lacked either an identification of the root cause of the deficiency, identification of the action to prevent recurrence, or identification of corrective actions sufficient to correct the deficiency to prevent future identical or similar occurrences. Following completion of this audit, instructions were sent to principal project organizations involved in evaluation of 50.55(e) items concerning the proper evaluation criteria; those reports lacking information were returned to engineering for additional evaluation. The licensee's response to NRC concerns in this area has been prompt. The inspector will continue to monitor the adequacy of evaluation of significant construction deficiencies.

5. Management Meeting

The inspectors met with the licensee and management personnel denoted in paragraph 1 at the conclusion of the inspections on July 22 and 29. The inspectors discussed the scope and findings of the inspections. The findings were acknowledged by the licensee.