

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/83-19

Docket No. 50-397

License No. CPPR-93

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: April 25-29 and June 1-2, 1983

Inspectors:

*R. J. Dodds*

A. D. Johnson, Enforcement Officer

*7/26/83*

Date Signed

*R. T. Dodds*

R. T. Dodds, Chief, Reactor Project Section 1

*7/26/83*

Date Signed

Approved by:

*R. T. Dodds*

R. T. Dodds, Chief, Reactor Project Section 1

*7/26/83*

Date Signed

Summary:

Inspection on April 25-29 and June 1-2, 1983 (Report No. 50-397/83-19)

Areas Inspected: Unannounced inspection of construction quality verification activities, allegations, and follow-up on construction deficiency reports. The inspection involved 78 inspection-hours on site, and 24 inspection-hours in the regional office by two NRC inspectors.

Findings: No deviations or items of noncompliance were identified.

## DETAILS

### 1. Persons Contacted

#### Washington Public Power Supply System (WPPSS)

- \*C. Carlisle, Program Director
- \*R. Johnson, Project Quality Assurance Manager
- \*L. Floyd, Senior Quality Assurance Engineer
- \*L. Garvin, Manager, Construction Quality Assurance
- \*R. Glasscock, Director, Licensing and Assurance
- \*B. Holmberg, Engineering Manager
- \*R. Knawa, Quality Verification Program Manager
- \*H. Crisp, Construction Manager
- K. Dubois, Quality Assurance Engineer
- W. Waddell, Manager, Equipment Qualification
- J. Stidel, Quality Assurance Engineer
- P. Inera, Welding Engineer
- A. Sharma, Electrical Engineer

#### Burns and Roe (B&R)

- \*T. Newman, Quality Assurance Engineer
- N. Carter, Welding Engineering Supervisor
- R. Sanan, Civil Engineering Group Supervisor

#### Bechtel Power Corporation (BPC)

- \*T. Mangelndorf, Project Manager
- \*M. Leach, Reverification Lead Engineer
- \*P. Johnson, Manager of Quality
- J. Gatewood, Quality Assurance Manager
- D. Culver, Systems Completion Superintendent
- N. Powell, Project Engineering Manager
- B. McGillicuddy, Senior Project Supplier Quality Supervisor
- J. Peltier, Senior Quality Control Engineer
- A. Meyers, Engineering Specialist

\*Denotes those present at the exit management meeting.

In addition to the personnel noted above, the inspectors interviewed various other construction, engineering, and quality control personnel from the licensee and construction management organizations.

### 2. Reverification Program for Pittsburgh-Des Moines Steel Company (PDM) - Contract 213A

In response to the June 17, 1980 NRC inquiry under 10 CFR 50.54(f), the Supply System, Bechtel, and site contractors have been engaged in a reverification program which includes review of records and reinspections of hardware installed prior to July 1980. The final reverification report for PDM, Contract 213A, was issued and recommended for acceptance as evidence that the safety-related work performance under Contract 213A is adequate by Bechtel on March 18, 1982. The final report was accepted

by Bechtel and the Supply System on April 10, 1982. PDM performed structural and mechanical work within the reactor building primary containment under Contract 213A.

The PDM report presents a breakdown of PDM's work scope and the status of that work at the time of the stop work order in July 1980. PDM performed an extensive documentation review during the restart process and also performed some field inspections to verify welder identification and material traceability. Following these inspections, a number of systems were found to require a significant amount of rework. These systems were designated to be "still under construction" and were, therefore, not part of the reverification program. They were documented on a Corrective Action Request (CAR No. 28250), reworked as necessary, and completely reinspected after July 1980.

The only items that had been installed and accepted prior to July 1980, that were not reworked or reinspected in accordance with the CAR were (1) weld pads, (2) pedestal connections, (3) downcomers, and (4) electrical penetrations.

Initially, 25 of the weld pads were reinspected during the restart by the Supply System. Because of the number of deficiencies found during the reinspections, all of the remaining weld pads were reinspected by PDM during reverification. The deficiencies were documented on a nonconformance report (NCR No. 9198) and were reworked as necessary.

Two of the 17 pedestal connections were reinspected by PDM. A number of weld deficiencies were identified, resulting in increasing the sample size to four. The deficiencies were submitted to Burns and Roe on NCR No. 9198. They were all dispositioned accept-as-is. All pedestal connections were inspected for surface discontinuities by D. B. Cannon (painting contractor) after sandblasting and prior to coating. Unacceptable arc strikes on the pedestal connections were dispositioned repair.

The responsibility for inspecting the remaining items, the downcomers, and the electrical penetrations was assumed by Bechtel. The inspection of the electrical penetrations did not disclose any nonconforming conditions.

The reinspections of the downcomers indicated a number of discrepancies in the condition of the welds. The welds were dispositioned accept-as-is by the Architect Engineer on Burns and Roe NCRs 8085 to 8095. The deficiencies were determined to be nonrelevant and required no further inspection. The Bechtel reverification group concluded that the nature and number of these conditions, combined with the absence of weld defects requiring repairs, indicates that PDM's QA program was not fully effective but did successfully identify and correct weld defects affecting the final acceptability of the item.

The inspector examined the final report in detail. The report includes a Summary of Findings, Review and Approval Record, Bechtel and PDM Reverification Reports, related correspondence, personnel certification, Generic Problem Areas, status report, inspection records, field check

lists, quality assurance finding reports, audits of the QVP effort, sampling procedure, noncompliance reports (NCRs), Project Engineering Directives, minutes of Task Team meetings, welder identification and material traceability, re-radiography program, documentation survey analysis, presentation outlines by PDM in meetings with Owner and Construction Management, etc.

In addition to the above, the inspectors also examined NCRs 8085, 8094, 9209, 8758, 8985, and 9198, Corrective Action Request 28250, Work Procedures WP-5.6, 11-205R, 28, 30, and 34, documentation packages for pedestal connections 5 and 8, weld pads 5,6, 28, 30, and 34, and electrical penetrations X-100-A, B, C, and D and X-103-A, B, C and D.

Physical inspection by the inspectors and subsequently by the Senior Resident Inspector included weld pads on the containment vessel wall and the four 18-inches electrical penetrations (X-103-A, B, C and D). Inspection of the downcomer bracing and pedestal connections was not possible since they were under water in the wet well.

The inspection also included an investigation of allegations related to work performed by PDM, results of which are included subsequently in the report.

Results of the inspection indicate that the licensee has been complying with the Quality Verification Program requirements. Nonconformance Reports appear to have been properly dispositioned.

No significant deviations, deficiencies or items of noncompliance were identified.

### 3. Employee Concerns/Allegations

An employee's concerns related to work performed by PDM were examined. The employee had previously been interviewed by the Office of Investigations.

The inspectors obtained additional clarifying information by telephone from the employee, who now believes, "most things have gotten cured." The allegations were examined by review of documentation, discussed with licensee and contractor personnel, and inspection of hardware. The allegations/concerns were either not substantiated or were not safety significant.\*

The items examined were as follows:

#### a. Allegation

Engineering Corrective Action Requests (ECAR) and NCRs were not reviewed by the Authorized Nuclear Inspector (ANI) until after the ASME survey. This was a possible violation of QA procedures.

\*Additional allegations/concerns are discussed in Inspection Report No. 50-397/83-22, paragraph 4.

Finding

The ANI is not required by procedure to review ECARs and NCRs. Specific areas of interest are to be designated after the survey.

b. Allegation

The Document Deficiency Lists were remove from the Field Check Lists so as not to reveal deficient PDM weld procedures. Condition was identified in May 1981.

Finding

The allegation was not substantiated.

The employee examined Field Check Lists in March 1983 and found that the Document Deficiency Lists had been returned and were located in appropriate Field Check List files. The inspector found this to be the case also during the review of PDM files in conjunction with the QVP inspection.

c. Allegation

An audit of PDM's weld records revealed deficiencies in approximately 40 to 50 percent of the weld records.

Finding

The allegation of weld record deficiencies was substantiated but had been identified by the contractor and licensee. Under the purview of the Construction Manager (Bechtel), PDM performed an extensive documentation review during the restart process in 1980 and 1981 and also performed field inspections to verify welder identification and material traceability. Discrepancies were documented and properly dispositioned as noted in the PDM Final Reverification Report.

d. Allegation

The containment vessel mid-spray header was reclassified from ASME III Class II to Class MC, a less stringent code. It could not be determine if radiography had been performed.

Finding

The allegation was not substantiated. Drawing D-21 shows the Code classification for non-ASME component welds only to be Class MC. The spray header was ASME III, Class NC which requires full penetration radiography. The performance of radiography was satisfactorily verified by selecting and examining the radiography reports for welds MSP-1 and 16.

e. Allegation

The mid-spray header should be tested for up to 600 pounds of pressure, but PDM only conducted a 52-pound test. The integrity of the fillet welds on the branch connections were also questioned.

Finding

The allegation was not substantiated. Hydrostatic Testing Procedure HT-5 required the pressure test on the three ASME III Class 2 spray headers to be conducted at 750 psig +4% -0%. The test record shows that the test was performed on the middle spray header on April 21, 1976, at a test pressure of 760 psig. The test included the branch connections. The test was accepted by PDM, B/R, and the ANI on April 21, 1976.

f. Concern

PDM was welding the mid-spray header pipe directly to the containment wall, allowing no movement for expansion.

Finding

The concern is factual but not technically significant. The pipe supports are indeed welded directly to the containment vessel wall. However, only 176 degrees of the header piping is welded to the pipe supports. The stress analysis report was examined and found to recognize the as-built configuration.

g. Concern

Base metal repairs were made by welding patch plates over holes on the mid-spray header piping. The repairs were not indicated on drawings or other appropriate records.

Finding

The concern was partially substantiated but is not considered significant. Spray header nozzles were specifically relocated at 17 locations in accordance with Engineering Change Notices (ECNs). The changes were made to accommodate support locations. The "patches" were installed as designed in accordance with the ECNs prior to the code pressure test of the header. Appropriate records were available for the installation of the patches. While the specific nozzle relocations are not shown on Drawing D-21, note number 13 on the design drawing requires the nozzles to be relocated, "...if the nozzles and supports are spaced closer than 3 inches..." The licensee has requested the Engineer to update D-21 or attach the ECNs.

h. Allegation

The original 1976 data report on the upper spray header indicates that PDM's work on the containment vessel was completed prior to the audit.

### Finding

The allegation was not substantiated.

The ASME survey of PDM was conducted on December 13, 1973, and the code certification stamp was issued on January 7, 1974. The containment vessel was "N" stamped and the code date report certified on August 26, 1976, National Board No. 790. The upper spray header was specifically not accepted in this certification.

It was subsequently certified on September 27, 1982, after substantial modification of the pipe supports. ASME Certificate of Authorization No. N-1493-9 was in effect at the time of certification.

#### i. Concern

The pressure tests on the four 18-inch electrical penetrations did not have the appropriate code stamp.

### Finding

The concern was not substantiated. The penetration welds have an a Code plate showing ASME NA CII designation. The penetrations have not yet been pressure tested, but have been included on the Master Work List. The required pressure test should be at 1.25 of design pressure for ASME Class II components.

#### j. Concern

Penetration spares had their permanent caps cut off in order to string welding leads. PDM's Corrective Action Requests did not indicate that the original permanent caps had been cut off and that the spares were to be accepted-as-is. The welds on the replacement caps appeared to be acceptable.

### Finding

The concern was not found to be significant.

The end caps of some spare penetrations were cut off 12 inches from the cover plate by PDM at the request of the Engineer (BR PDM-213A-F-78-027). The engineering for the work was performed by PDM and the end caps removed in accordance with specific Fabrication Checklists. The engineering drawing for the work was approved for use on April 6, 1978. The end caps were to be saved for replacement; however, the end caps for penetrations X-57 and 68 were lost. The replacement of the end caps was dispositioned in accordance with ECAR No. 2.1714. The as-built lengths of the penetrations were judged to be acceptable and placed on erection drawings. The completed welds were visual and magnetic particle inspected.

k. Concern

A nontechnical concern of a financial nature was expressed. This was not examined but was provided to the licensee, since it did not relate to the quality of construction.

4. Construction Deficiency Reports (10 CFR 50.55(e))

a. (Closed) Debris and Foreign Material in Safety-Related Systems (NRC No. 81-06-C, Licensee's No. 170)

The licensee reported on October 24, 1981 (letter G02-81-414) that during provisional acceptance checks, foreign material and debris had been found in the turbocharger suction line to the standby diesel generator; also, nails and wood were found in a RHR pump. The inspectors verified from an examination of the licensee records and results of licensee audits that the materials had been removed and that the corrective action to preclude recurrence reported by the licensee had been implemented and found by the licensee to have been effective.

b. (Closed) 4.16 KV Breakers for No.1 and 2 Diesel Generators Subject to Failure to Close after Fault Trip (NRC No. 82-08-C, Licensee's No.205)

The licensee reported on September 30, 1982 (letter G02-82-819) that the breaker closing circuit availability white indicating lamp provides a "seal in" circuit patch for the (anti-pump) "Y" relay in the breaker close circuit. This situation prohibits future closing of the breaker after a fault trip without removal of the 125V DC control power and thereby would jeopardize power availability at safety busses SM-7 and SM-8. The inspectors confirmed from the licensee's records that the circuit configuration for Breakers DG1-7 and DG2-8 had been changed to utilize a normally closed stationary auxiliary switch contact (52/b) in series with the breaker availability, white indicating light, thereby producing a reset function in the antipump relay "Y" coil as reported by the licensee.

c. (Closed) Improper Location of Sensing Lines for HPCS and LPCS Pump Discharge Pressure Switches (NRC No. 82-08-B, Licensee's No.209)

The licensee reported on February 25, 1983 (letter G02-83-174) that pressure sensing devices monitoring ECCS pump discharge pressures were subject to water hammer damage upon starting of the pumps. The inspector verified from an examination of the licensee's records that the sensing lines had been appropriately relocated to points down stream of the check valves in the ECCS pump discharge lines as reported by the licensee.

d. (Closed) Incorrect Wiring of Low Reactor Water Level Sensing Devices (NRC No. 83-03-B, Licensee's No.243)

The licensee reported on April 6, 1983 (letter G02-83-313) that the reactor vessel water level indicating switches MS-LIS-37A and

MS-LIS-37C, which provide system initiation on low reactor water level for LPCS, RCIC, RHR(A), and ADS(A) were found to be incorrectly wired. The inspectors confirmed from the licensee's records that the wiring had been corrected to conform to the General Electric Company's design documents as reported by the licensee.

## 5. Reverification of Quality of Prepurchased Materials

### a. Program

In addition to the licensee's documentation review performed under the QVI-06 procedure and to provide additional assurance that prepurchased materials were quality products by letters dated April 4 and April 19, 1983, the licensee directed the Bechtel Power Corporation to develop, with assistance by the licensee's project engineering group, a program to examine the quality of prepurchase materials and activities of inactive site contractors.

The April 4 letter stated that the licensee was committed to perform the following actions:

- ° Review a significant sample of procedures for 62 prepurchased and inactive site contracts for technical adequacy.
- ° Review a significant sample of quality records against installed hardware to verify record accuracy.
- ° Analyze the 62 contracts for problem areas and determine the need for reinspection or provide justification why it is not necessary.

The instructions also provide that Bechtel develop a program description document which shall include program objectives and a brief description of all the elements necessary to implement the program. The program description shall include definitions of responsibility, the engineering actions, and how the interfaces will be administered. The Program Description shall also include a schedule for completion of all activities. The concept of "fitness for use" may be considered for application into the program.

The objectives of the program were stated to be:

- ° To evaluate installations/components against a set of criteria to determine need for procedure review and/or reinspection.
- ° To assure that prepurchase and inactive contract procedures are technically adequate by sample review for selected requirements.
- ° Determine by contract/component review whether reinspection is required.
- ° Evaluate previous project actions for justifying adequacy of hardware and records.

The licensee's April 19, 1983 letter provided, in part, the following program direction to Bechtel Power Corporation:

#### SCOPE

The scope of the program activity was limited to those components or installations provided under the 62 prepurchase and inactive site contracts (PPIA). Components or installations provided under other contracts were specifically excluded.

#### BASIC APPROACH

The basic approach was to focus attention on the components or unique installation provided under PPIA contracts that are essential to:

- ° limit radiation exposure to the public under normal and off-normal conditions, and
- ° preserve fuel cladding integrity.

In general, the approach was stated to result in priority attention to engineering safeguards, radiation control, cooling systems, and equipment used to move fuel to and from storage facilities.

#### CRITERIA FOR SELECTION OF COMPONENTS AND UNIQUE INSTALLATIONS SUBJECT TO CONSIDERATION FOR PPIA REVIEW PROCESS

The criteria was stated to be:

- ° Components should be Quality Class 1.
- ° Installations should pertain to Quality Class 1 equipment/structures.
- ° Unique components or installations of any Quality classification important to the functions outlined below should be considered, using engineering judgement.
- ° Components or installations selected should be essential for either;
  - ° direct mitigation of accident,
  - ° prevention of release of radioactive material to the environment, or
  - ° preservation of cladding integrity.
- ° If redundant functions exist to satisfy the above items, equipment for only one of the redundant functions need be considered.

- ° Components or installations considered should be within scope of the 62 prepurchased and inactive contracts.
- ° Selections of unique items for verification of quality (as opposed to technical) characteristics shall be random sample where sufficient multiples exist.

#### COMPONENTS OR INSTALLATIONS TO BE CONSIDERED FOR PPIA REVIEW PROCESS

Application of the above criteria resulted in selection of the following:

Reactor Vessel Support Ledge and Vessel Installation  
 In-Containment Pressure Relief Valves  
 Containment Isolation and Vacuum Breaker Valves  
 Containment Airlocks  
 Critical HVAC Systems  
 Low Pressure Core Spray  
 Residual Heat Removal System  
 High Pressure Core Spray System  
 Reactor Core Isolation Cooling System  
 Standby Liquid Control System  
 Control Rod Hydraulic System  
 Standby Gas Treatment System  
 Offgas System  
 Containment Atmosphere Control System  
 Standby Service Water System  
 Material Handling Equipment

Most of the above were more fully described in Appendices to the letters.

#### CRITERIA FOR SELECTION OF CHARACTERISTICS FOR VERIFICATION

##### Criteria

The criteria used to select the specific characteristics subject to verification were outlined as follows:

- ° Characteristics selected shall be essential to mission of component/installation.
- ° Characteristics selected shall be limited to those resulting from implementation of a procedure, and shall be technical in nature.
- ° Characteristics selected shall include known problem areas as identified in IE Bulletins, Circulars, and information notices.

##### Specific Characteristics

The following characteristics were to be investigated:

- ° Welding of of pressure bounday or essential structures.

- ° Bolting and torquing of mechanical connections.
- ° Compliance with installation procedures and requirements including evaluation of technical adequacy of specified requirements.
- ° Compliance with testing requirements including evaluation of technical adequacy of specified requirements.

The responsible representative of Bechtel advised that the program development should be completed no later than early May and that a final report documenting the results of the program was expected to be completed in June 1983.

b. Program Implementation

The inspector examined the Bechtel procedures developed and approved by the licensee to implement the licensee approved program. The procedures addressed the three portions of the program for review of vendor qualifications, vendor procedures, and vendor documents.

On June 1 and 2, 1983, the inspectors met with individual assigned to complete the special program to discuss the manner and detail of the reviews being performed. Discussions were held with individuals reviewing vendor qualifications, procedures, documents, and field verifications. The inspector found that the reviews were being performed by experienced personnel and that appropriate items were being examined in adequate detail to assure that the installed products were of required quality. In addition, the inspector accompanied the individual performing field verification. Five items (pumps and valves) were examined and were found to be consistent with vendor and design documents.

No violations or deviations were identified.

c. Prepurchased Material Quality

The inspector selected seven data packages for prepurchased quality Class I items to verify that the items conformed to design specifications, and that the items were located in the plant systems as designated in the approved drawings. The selected items were:

- (1) Piping, fittings and weld filler metal used in the control and service air system shown on drawing TP-RB-113.
- (2) Piping, fittings and weld filler metal used in the reactor building floor drain system shown on drawing TP-RB-86.
- (3) RHR-V-4B: A 24-inch valve supplied by Velan Engineering, LTD, and installed in the residual heat removal system.
- (4) RCIC-V-66: A 6-inch valve supplied by the Anchor/Darling Company and installed in the reactor core isolation cooling system.

- (5) CSP-V-3: A 24-inch valve supplied by Basic In Flow, a unit of General Signal Corporation, and installed in the containment purge system.
- (6) SLC-V-4B: A three-inch valve supplied by Conax Corporation through General Electric Company and installed in the standby liquid control system.
- (7) HY-V-20B: A one-inch valve supplied by Marotta Scientific Controls, Inc., and installed in the reactor recirculation system.

During the examination of the data packages, the inspector verified that appropriate documentation was available to establish the quality of the above listed items. Serial numbers and other identifying markings on the valves mentioned above were compared to those shown on the document in the data package. The following types of documents were found in the data package that established the quality of the items.

- (1) Mill test reports for the pipes and fittings and for the valve bodies, bonnets, wedges, stems, and weld rod,
- (2) Wall thickness measurements,
- (3) Heat treating charts,
- (4) Seismic reports,
- (5) Certificates of compliance,
- (6) Code data reports (Form NPV-1),
- (7) Leak test reports,
- (8) Hydrostatic test reports,
- (9) Nondestructive examination reports,
- (10) Weld repair records,
- (11) Specifications,
- (12) Calibration, and
- (13) Drawings.

Information contained on selected documents was compared with applicable specification and code requirements.

No violations of regulatory requirements or deviations were identified.

6. Exit Interview

The results of inspection were discussed with licensee's management representative denoted in paragraph 1 at the conclusion of the inspection on April 29 and June 2, 1983.