

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V

SUITE 202, WALNUT CREEK PLAZA  
1990 N. CALIFORNIA BOULEVARD  
WALNUT CREEK, CALIFORNIA 94596

JAN 27 1977

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

TIC  
Docket No. 50-513-127

Attention: D. L. Renberger, Assistant Director  
Generation and Technology

Gentlemen:

This refers to the inspection conducted by Mr. Garvin and Mr. Albert of this office on January 12-14, 1977 of activities authorized by NRC Construction Permit No. LWA-2, and to the discussion of our findings held by Mr. Garvin with Mr. Renberger and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you submit a written application to this office, within 20 days of the date of this letter, requesting that such information be withheld from public disclosure. The application must include a full statement of the reasons why it is claimed that the information is proprietary. The application should be prepared so that any proprietary information identified is contained in an enclosure to the application, since the application without the enclosure will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.



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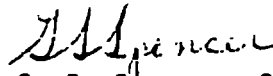
Washington Public  
Power Supply System

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50-513/77-01

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,



G. S. Spencer, Chief  
Reactor Construction and  
Engineering Support Branch

Enclosure:  
IE Inspection Report  
No. 50-513/77-01

cc w/o enclosure:  
L. L. Grumme, WPPSS  
J. P. Thomas, WPPSS

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

IE Inspection Report No. 50-513/77-01

Licensee Washington Public Power Supply System Docket No. 50-513  
P. O. Box 968 License No. LWA-2  
Richland, Washington 99352 Priority \_\_\_\_\_

Facility WNP-4 Category A

Location Benton County, Washington

Type of Facility PWR, 1250 MWe, B&W

Type of Inspection Routine, Construction, Unannounced

Dates of Inspection January 12-14, 1977

Dates of Previous Inspection September 7-10, 1976

Principal Inspector L. J. Garvin Jan 27, 77  
L. J. Garvin, Reactor Inspector Date

Accompanying Inspectors W. G. Albert Jan 27, 77  
W. G. Albert, Reactor Inspector Date

\_\_\_\_\_ Date

Other Accompanying Personnel: None

Reviewed by G. S. Spencer 1/27/77  
G. S. Spencer, Chief, Reactor Construction & Date  
Engineering Support Branch

## Summary

### Enforcement Action

None

### Licensee Action on Previously Identified Enforcement Items

Not applicable

### Design Changes

A recent report on deficiencies in seismic response characteristics for interior walls and floors of the General Services Building (GSB) was reviewed. It was found that the report did not fully address corrective action. (Paragraph 4 of Details)

### Other Significant Findings

#### A. Project Status

Site construction has progressed to 1.07% completion. (No reference in details)

#### B. Statistical Concrete Quality

An examination of records indicated that concrete production has a relatively high statistical variation. (Paragraph 2.c of Details)

### Management Interview

At the conclusion of the inspection a meeting was held with D. L. Renberger and other members of the WPPSS staff to review the inspection results. The following items were included in that discussion:

- A. The inspector stated that his examination of concrete records indicated that data tended to be more variable than experienced at most reactor construction sites. WPPSS was informed that the variation was greater than generally considered acceptable. (Paragraph 2.c of Details)
- B. Cadweld testing frequency and test results were discussed. The inspector stated that while the testing met the code test frequency requirements the sampling method used did not seem to give representative results for each cadweld crew. (Paragraph 3.b of Details)

## Details

### 1. Individuals Contacted

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

M. E. Witherspoon, Project Engineering Manager  
N. S. Porter, Design Engineering Supervisor  
J. M. Young, Supervisor Quality Systems  
D. H. Walker, Project QA Manager, WNP-1/4  
T. J. Houchins, Lead QA Engineer

#### United Engineers & Constructors (UE&C)

K. L. Murphy, Quality Assurance Engineer  
D. K. Sakers, Quality Assurance Engineer

#### Pacific Testing Laboratory (PTL)

K. Bledsoe, Concrete Inspector  
K. Johnson, Manager

#### Pittsburgh DesMoines Steel (PDM)

C. Bauer, QA Manager

#### Hoffman Construction

H. Tietzel, QA Manager

#### Livermore Rebar

J. Herrera, QA Inspector

### 2. Concrete

#### a. Placement Records

The records associated with concrete lift number CV-4-9L, the last lift in the lower section of the Unit 4 containment base slab, were examined. Concrete in the lift had been placed on January 7, 1977. The records examined included the preplacement checklist, concrete cure record, field inspection report and the batch plant printouts. The printouts included the results of the concrete Laboratory's field tests conducted prior to placement. The records indicated that concrete had been placed in temperatures less than 40°F, thus cold weather concrete practices had been required. Curing was being accomplished in accordance with ACI 306 (cold weather concreting). No anomalies were noted during the record review.

b. Concrete Inspector's Qualifications

The ASME Section III Division 2 qualifications of the Hoffman inspectors were examined. At the time of certification of the concrete inspectors the Hoffman Company had no certified level III inspector. In order to comply with the code, UE&C's level III inspector reviewed the work experience of the Hoffman inspectors and administered the required tests. The results of the tests and experience review were forwarded to Hoffman. As required by the code, Hoffman Company certified their inspectors to the appropriate level. No anomalies were noted during the record review.

c. Statistical Concrete Quality

The results of all concrete strength tests for the three principal mix designs utilized in the containment foundation were examined. These results had been plotted chronologically by the AE/CM. The inspector selected a recent set of data from a 3/4" aggregate mix, which had been prepared with one particular grind of cement and a constant water-to-cement ratio, as a check on the statistical concrete quality. The 42 item sample appeared to be representative of the general variability of the data. From this result and inspection of other data it appeared that the variation was generally between 10 and 15% for the 3000 psi mixes.

Use of another concrete mix had been halted by the licensee when the average of three successive tests dropped below design strength by a small amount. Investigation of the cause of the strength reduction was continuing at the time of the inspection.

3. Reinforcing Steel

a. Placement Records

The reinforcement steel placement records for lift CV-4-91 were reviewed. The records consisted of a sign-off on the concrete preplacement checklist and a letter stating that placement was as shown in the drawings except as described in the NCR's and the drawings. Livermore Rebar's inspectors were only qualified to level I as defined in ASME Section III Division 2, so Hoffman's level II inspectors were counter-signing the preplacement checklist. No anomalies were noted during the examination of the above-mentioned records. However, due to the limited records and lack of qualification of the

Livermore inspectors, the procedures for reinforcing steel placement inspection by both Hoffman and Livermore were examined. The Livermore procedure adequately described the inspections required for the placement of rebar. However, since the Livermore inspectors were not performing the Level II function, their procedure did not seem to be the controlling document for the inspection of rebar. Hoffman's procedure, in turn, did not adequately define the required level II inspection requirements. The inspection of reinforcing steel placement will remain an open item until the level II inspection definition is resolved.

b. Cadwelds

Records of cadwelding were examined. These records included the qualification of the inspectors (Livermore) and craftsmen, cadweld inspection reports and the records of testing of finished welds. Livermore Rebar/Hoffman maintained the records for the above activities, however they were unable to provide evidence that the cadwelds had been tested at the frequency required by the Code (ASME Section III Division 2). The cadwelds had been sampled by Livermore, then sent to the Testing Laboratory (PTL). PTL is under contract to the owner to provide the onsite testing facility, so the test results were sent to UE&C. No copies of the test results were provided to the contractor (Livermore). The inspector was unable to determine if UE&C or some other agency was assuring that the code testing requirements were being met. The possibility exists that cadwelds that were selected for testing could have been mislaid and never tested. Cadweld testing will remain an open item until assurance is provided that the code testing requirement is being met.

The code requires that each cadweld crew for each weld position and size bar welded be tested at the frequency below:

If production welds are tested  
One weld from the first 10 welds  
One weld from the next 90 welds  
Two welds from each 100 welds thereafter.

Livermore Rebar is usually following a sampling frequency that is similar to the following:

10th weld  
11th weld  
181st weld  
182nd weld

While that sampling frequency does meet the code requirements it does not spread the testing to give a representative sample of each crew's work in each 100 production welds. The sampling frequency will remain an open item until the next inspection.

4. Report on Seismic Response Characteristics

On December 17, 1976 the licensee submitted a report in accordance with 10 CFR 50.55(e). This report described certain changes which had been found necessary due to changed assumptions in the calculations of design that had been released. While describing the effect of the changes and the disposition of the design deficiencies, the inspector found that the report did not fully address the cause of these deficiencies and the corrective action to prevent recurrence of such design deficiencies.

During the inspection the inspector met with WPPSS engineering management in order to discuss the NRC concern and request additional information. The licensee's representatives stated that the additional data would be provided. The inspector stated that a letter from the regional office would be sent to confirm the request for additional information.

5. Facility Tour

An extensive tour of the facility was conducted. Due to the cold weather few activities were ongoing. No anomalies were noted during the tour.

6. Followup Items

a. Spray Pond Surface

(Reference Inspection Report No. 50-513/76-02)

During previous inspections it was noted that the surface texture of the Unit No. 4 spray pond was fluffy compared to that of Unit No. 1. Attempts were made to determine the reason for the different textures and actions needed to correct the surface of Unit No. 4. The Unit No. 1 surface seems to have been compacted using more water and more rolling than the surface of Unit No. 4. The result is that the No. 1 spray pond surface did not fluff as much as Unit No. 4. The licensee assured the inspector that Unit No. 4 spray pond surface would be brought into conformance with design requirements before concrete placement. The inspector expressed his concern that the depth of fluffing should be determined so that proper recompaction could be planned. This item will remain open pending the determination of the depth of fluffing.



b. Pre-award/post-award Vendor Surveys

(Reference Inspection Report No. 50-460/76-06)

This item was opened when the inspector questioned the licensee about the qualification of vendors by UE&C. The licensee audit of UE&C disclosed that no preaward/post-award survey had been conducted by UE&C as required by the controlling UE&C procedure. The UE&C response to the audit finding was questioned by the licensee. This item will remain open pending an acceptable answer to the audit finding.

7. Nonconforming Material Reports (NCR)

The nonconformance reports related to civil contract number 205 were reviewed. The reports seemed to have been processed in accordance with the procedural requirements. However, concern was expressed that excessive time had elapsed since the initiation of several minor reinforcing steel NCR's. The NCR system will remain an open inspection item to assure that NCR responses are timely.

8. Audits

The WPPSS audit of B&W (number 76-30) was reviewed. No anomalies were noted during the audit review.

**END**

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