

DETAILS

I. Persons Contacted

The inspector contacted engineering, management, inspection and construction personnel of the organizations listed below. Key personnel contacted included the following.

a. Washington Public Power Supply System (WPPSS)

- D. E. Dobson, Division Manager, WNP-3/5
- *C. E. Love, Deputy Division Manager, WNP-3/5
- *J. C. Lockhart, Project Quality Assurance Manager
- *O. E. Trapp, Project Engineering Manager
- *R. A. Davis, Sr. Project Quality Engineer
- R. Hicks, Sr. Project Quality Engineer
- *M. M. Monopoli, QA Staff Engineer
- *J. A. Vanni, Project Quality Engineer
- *E. L. Stephens, Asst. Civil Superintendent
- *J. J. Terpstra, Contract Admin. Supervisor

b. Ebasco Services, Inc. (Ebasco)

- *A. M. Cutrona, Deputy Project Quality Assurance Manager
- *C. E. Murpny, Project Superintendent
- *T. E. Cottrell, Sr. Resident Engineer
- *L. F. Adams, Sr. Project Quality Engineer
- *L. A. Bast, Project Quality Engineer
- C. M. McClaskey, Lead Project Quality Engineer
- F. E. Williamson, Lead Project Quality Engineer
- C. S. Kudla, 213 Contract Engineer

c. Morrison-Knudsen, Inc. (MK)

- F. Edler, Project Quality Manager
- H. Adkins, Unit 5 Area Superintendent
- D. Crawford, Unit 3 Area Superintendent

d. Peter Kiewit Sons (PKS)

- D. Paulson, QA Manager

e. Pittsburgh Testing Laboratory (PTL)

- J. Adachi, Site Technical & Administrative Manager
- T. Gibbs, Site Resident QA Representative

f. Associated Sand and Gravel (ASG)

- A. Demers, Project Manager
- B. Wabnitz, Corporate QA Manager
- J. Drake, QC Manager

g. Chicago Bridge & Iron (CBI)

J. Cain, Project Welding & QA Superintendent
D. Weinstein, QA Technician

*Denotes those present at the management meeting on September 26, 1980. In addition, G. Hansen, Sr. Project Engineer, State of Washington Energy Facility Site Evaluation Council, attended the meeting.

2. Licensee Action on Previous Inspection Finding

(Closed) Followup Item (50-503/509-80-08-02): Concrete consolidation practices of the prime civil contractor, Morrison-Knudsen (MK).

MK concrete consolidation practices were inspected during Unit 5 placement No. 5-FHW-203/208-349; 205-349 and Unit 3 placement No. 3-ABS-017-388 to 390. The inspector observed that for the Unit 3 placement lift thicknesses were at or slightly above the specified limit in one area; vibration of placed concrete was not always systematic (i.e., efforts were not made to follow as systematic pattern of vibration to insure all areas are fully consolidated; vibrators did not always penetrate the previous layer; vibrators were not always held in position for a sufficient period of time to insure excess entrapped air is removed. These conditions were identified to the Area Superintendent and the situation was improved for that placement. The inspector's concerns for proper consolidation were discussed with licensee representatives on September 11, 1980. On the same day the licensee issued Corrective Action Request No. CAR-E-002 to MK directing improvements in the contractor's consolidation practices. Action was taken to retrain contractor QC personnel, provide additional training for craft foremen regarding consolidation techniques and increase surveillance. The inspector verified the completion of the training. Subsequent to the training the inspector observed consolidation of Unit 5 placement No. 5-ABW-225-358. The consolidation practices were found to be in accordance with the ACI 309 and appeared to result in adequate consolidation. The inspector had no further questions on this matter at this time.

3. Concrete Testing (PTL)

a. Observations of Work Activities and Facilities/Equipment

Concrete testing and the site testing laboratory, operated by Pittsburgh Testing Laboratories (PTL) were examined for compliance to the pertinent requirements of ACI/ASTM, the contract specification and the PSAR. The examination included observations of field testing activities for placements 3ABS-017-388 to 390, 5-FHW-203/208-349, 205-349, and 5-ABW-225-358; laboratory housekeeping, equipment condition, operation, and calibration status; concrete cylinder curing facilities, and cylinder marking and storage.

It was observed that the field test cylinders of concrete were actually formed at the laboratory rather than in the field. The inspector requested and was provided the results of correlation testing which assures satisfactory results from this alternate testing method.

No items of noncompliance or deviations were identified.

b. Review of Quality Records

The inspector examined the field test documentation for the above mentioned placements, five equipment calibration records, and five QC personnel qualification record packages for compliance to contract, code, and PSAR requirements.

No items of noncompliance or deviations were identified.

4. Concrete Batch Plant Operations (AS&G)

a. Observations of Work Activities and Facilities/Equipment

The inspector examined the following aspects of Associated Sand and Gravel (AS&G) main and standby concrete batch plant operations: accuracy of material control, temperature control, generation and control of batch records, inspection, testing, equipment performance, aggregate/cement/water/admixture storage and handling, moisture control, and mix design adherence. The activities were examined for compliance to the contract specification, ASTM, PSAR, and pertinent contractor procedure requirements (ASG Inspection Procedure No. 4, Rev. 3; ASG Control of Measuring and Test Equipment Procedure No. 6, Rev. 1; and ASG Handling, Storage, and Shipping Procedure No. 7, Rev. 9).

The inspector observed that AS&G utilized aluminum tank trucks to ship cement. Aluminum was also found in cement handling hose fittings and in the admixture control system. The use of aluminum was questioned due to the possibility of chemical reactions between cement/water and aluminum resulting in the generation of hydrogen gas in the concrete. This concern was reviewed with Portland Cement Association representatives who suggested that a sample of concrete be tested immediately after mixing and again one hour later for air (gas) content. The inspector requested that such a test be performed to insure that detrimental amounts of hydrogen are not being generated. Test results (for concrete load No. 32855) identified a reduction of air (gas) content over the one hour period (5.3% to 4.6%), when tested in accordance with ASTM-C231, indicating excessive hydrogen is not being generated as a result of aluminum components in the cement/admixture handling systems. The inspector had no further questions on this matter.

It was found that the standby batch plant scales were not properly tagged to indicate calibration status. Other scales were found to be properly tagged. The inspector verified from other quality records that the standby scales were within the required calibration frequency and accuracy. The scales were subsequently properly tagged by contractor representatives. The tagging was verified by the inspector.

In reviewing the periodic plant inspection process with QC personnel, it was found that inspections of cement silo and bin integrity (weather tightness), and water tank contamination prevention are performed by indirect rather than direct means. Specifically, cement bin/silo integrity had been judged based on the absence of lumps in cement samples and cement lumps in concrete, rather than opening each bin/silo and inspecting actual conditions. Similarly, water tank contamination was inspected by visually examining water from the common hose used to fill truck mixer auxiliary tanks, rather than actually examining the water from each tank. The inspector questioned the validity of the AS&G inspection practices and requested management attention in this area. This item is unresolved (508/509-80-09-01). The inspector subsequently examined each of the six cement bins/silos and water supplies. While no problems were found with the cement storage, turbidity was detected in the water contained in the 8,000 gallon heated water storage tank. The inspector requested a turbidity test be performed on a sample of the water since the specification limits allowable turbidity to 1000 ppm. The results of the test were not available prior to the conclusion of current reporting period. This item is unresolved (508/509-80-09-02).

No items of noncompliance or deviations were identified.

b. Review of Quality Records

The quality records associated with batch plant/equipment inspections for the last four months, cement certification, aggregate quality, water quality, and three inspectors' qualifications were examined for compliance to the requirements of the contract specification, ANSI/ASTM and the PSAR. It was found that the water quality tests for the months of February and March 1980 indicate that there was a lower chloride level in the water samples extracted from the aggregate/admixture/water mix than from the mix water alone (e.g. for February 1980, mix water had 21 ppm CL, while extracted water had 10 and 13 ppm CL). Extracted water normally has the higher chloride count. The inspector requested that the licensee investigate the inconsistent data results. This item is unresolved (508/509-80-09-03). Other record reviews were satisfactory.

No items of noncompliance or deviations were identified.

5. Containment Structural Welding (CBI)

a. Observations of Work and Work Activities

Chicago Bridge and Iron (CBI) activities related to Unit 3 dome fitup welding, Unit 5 dome welding, and Unit 5 welding in containment was examined for compliance to approved CBI welding procedures, the contract specification, ASME and PSAR requirements. Observations were made of weld joint identification/location, joint preparation, use of specified weld filler material, NDE, welder technique, preheat and interpass temperature control, weld size, and QC coverage. The joints examined included various fitups on Unit 3 dome, and Unit 5 joints T30-31, 3-4 girth, W27-5, E24-5, D3-5, and 2-3 girth. All activities were found to be in accordance with specified requirements. No items of noncompliance or deviations were identified.

CBI control of welding filler material was examined. This included observations of material storage, temperature control, issuance, and handling for compliance to procedural requirements. No items of noncompliance or deviations were identified.

b. Review of Quality Records

Records pertaining to three CBI inspectors' qualifications, issuance of welding filler material, welder qualification status, and 11 nondestructive examination reports were examined for compliance to CBI procedure, Code and PSAR requirements. No items of noncompliance or deviations were identified.

6. Structural Steel Quality Records

Records pertaining to the quality of structural steel members supplied by Fought Steel Company were examined for compliance to the requirements of ASTM A-36, AWS 01.1, and the PSAR. The records examined included material chemical and physical test reports, contractor inspection reports, vendor quality assurance reports, material traceability records, and receiving inspection reports for five shipments of steel members. No items of noncompliance or deviations were identified from this review.

7. Equipment Quality Classification

On September 15, 1980, during a review of contract specification No. 3240-251 it was found that the contract specified the wrong quality classification for the emergency diesel generators for Units 3 and 5. The PSAR specifies that the emergency diesel generators shall be Quality Class I, whereas the contract specification identified these components as Quality Class II. Similarly, on September 22, 1980,

it was found that the contract specified that the boric acid makeup pumps are Quality Class II, whereas the PSAR specifies that these pumps shall be Quality Class I. Further investigation established that the components had actually been procured to Quality Class I requirements (under contract specifications 3240-02, and 3240-53) and that none of the components had yet been installed under contract 3240-251, indicating that the error in quality classification for these components had not resulted in any hardware problems at this time. However, the failure to properly specify the quality classification of this equipment in the 3240-251 contract specification is contrary to the requirements of 10 CFR 50, Appendix B, Criterion IV. This is an apparent item of noncompliance (503/509/80-09-04).

8. Site Tours

At various times during the inspection period the inspector made tours of the Unit 3 and 5 plant island and material storage areas, examining general housekeeping conditions, QC and craft supervisory coverage of work activities, availability for work documents, equipment calibration status, tagging and identification of materials, and protection of installed equipment.

On September 10, 1980 while touring the Unit 3 reactor auxiliary building, the inspector found inconsistencies and apparent visual defects on welds of the nine safety related gas decay tanks. (Serial Nos. 2320.10 - 2320.90). Specifically, it was found that support structure and nozzle welds on some tanks were significantly smaller than the corresponding welds on other tanks, some support structure welds were made across circumferential tank seam welds, and some welds were undercut and others exhibited extremely rough surfaces. The welding concerns were identified to licensee representatives on September 11, 1980. Subsequent inspection of the tanks by licensee representatives for compliance to drawing requirements revealed significant welding deficiencies on all tanks which included: undersized welds, missing welds, undercut, incomplete fusion, unequal leg fillet welds, and arc strikes. These conditions were documented on WPPSS/EBASCO site Nonconformance Reports Nos. 12240-12248. The tanks had been provided by the Richmond Engineering Company as a subcontractor to Combustion Engineering Contract No. 3240-02 and had been certified to be in accordance with pertinent requirements by the Richmond Engineering Co. in July 1977. The failure to fabricate the equipment in accordance with the drawing is contrary to the requirements of 10 CFR 50, Appendix B, Criterion V. This is an apparent item of noncompliance (503-80-09-05). Examination of other equipment provided by this contractor indicated that similar problems may exist, in that inconsistencies in weld sizes were noted on the Unit 3 and 5 equipment drain tanks and Unit 3 nitrogen recycle tank. Licensee representatives indicated that all equipment provided by the contractor would be examined. The results of the examination will be reviewed in conjunction with the followup to the item of noncompliance.

9. Unresolved Items

Unresolved items are matters about which information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Three unresolved items were identified during this inspection and are discussed in Paragraph 4.a and 4.b.

10. Management Meetings

Management meetings were held on September 11 and 18, 1980, with a summary meeting on September 26, 1980. Licensee and Ebasco representatives attending the September 26, 1980 meeting are denoted in paragraph 1. During the meetings the inspector summarized the scope and findings of the inspection identifying the unresolved items discussed in paragraphs 4a and b and the items of noncompliance discussed in paragraphs 7 and 8. In reference to the deficiencies found in the gas decay tanks, the inspector expressed concern with the effectiveness of the supply system's vendor surveillance program. At the WNP-3/5 site NRC inspectors had previously noted problems with vendor supplied piping (NRC Inspection Report 50-508/80-04) and licensee site representatives have detected vendor problems with the shutdown cooling heat exchangers, Ingersoll-Rand safety-related pumps, and ITT-Grinnell pipe supports. The inspector stated that additional licensee action in this area would be requested.