

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

Report No. 50-508/79-10
50-509/79-08

Docket No. 50-508, 50-509 Licensee No. CPPR-154, CPPR-155 Safeguards Group _____

Licensee: Washington Public Power Supply System
P. O. Box 468
Richland, Washington 99352

Facility Name: WNP-3 and WNP-5

Inspection at: WNP-3 and WNP-5 Site (Satsop)

Inspection Conducted: November 6-9, 1979

Inspectors: *D. F. Kipsch* for 12/12/79
D. F. Kipsch, Reactor Inspector Date Signed

T. W. Bishop for 12/12/79
T. W. Bishop, Reactor Inspector Date Signed

_____ Date Signed

Approved by: *R. T. Dodds* 12/13/79
R. T. Dodds, Chief, Engineering Support Section Date Signed
Reactor Construction and Engineering Support Branch

Summary:

Inspection during period of November 6-9, 1979 (Report Nos. 50-508/79-10 and 50-509/79-08)

Areas Inspected: Routine, unannounced inspection by regional based inspectors of construction activities including: licensee action on previous inspection findings; licensee action on 50.55(e) reports; independent NRC consultant radiography of a Unit 3 containment vessel weld; investigation of a record signature falsification occurrence; investigation of alleged improper NCR disposition; and containment structural steel welding activities including work observation, QA procedure review and quality record review. The inspectors also performed plant tour inspections. The inspection involved 51 inspector hours onsite by 2 NRC inspectors.

Results: Of the six areas inspected, no items of noncompliance or deviations were identified in five areas and three apparent items of noncompliance were identified in the area of containment structural steel welding (failure to control weld filler metal as required by procedures, paragraph 8.c; failure to properly prepare weld surface prior to welding, paragraph 8.c; failure to properly qualify welding procedures, paragraph 8.b).

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DETAILS

1. Individuals Contacted

a. Washington Public Power Supply System (WPPSS)

- *W. J. Talbott, Division Manager
- *J. C. Lockhart, QA Manager
- *O. E. Trapp, Project Engineering Manager
- *R. R. Quimby, Lead Project Quality Engineer
- R. M. Simons, Senior Project Quality Engineer
- C. H. Tewksbury, Lead Project Quality Engineer
- R. H. Haight, Health Physicist
- R. Romanelli, Public Information Officer

b. Ebasco Services, Inc.

- *J. P. Sluka, Manager of Engineering
- *A. M. Cutrona, Deputy QA Manager
- *T. E. Cottrell, Resident Engineer
- *W. J. Lear, Level III NDE Examiner
- *L. F. Adams, Senior Project Quality Engineer
- *C. M. McClaskey, QA Engineer
- *L. A. Bast, QA Engineer
- T. W. Borger, QA Engineer
- D. C. Zappia, Project Safety Supervisor
- J. D. May, Level II NDE Examiner

c. Morrison-Knudsen (M&K)

- D. A. Dow, Level III QC Inspector
- M. D. Jorgenson, QC Inspector
- G. Rogstad, QC Inspector
- F. C. Edler, Project Quality Manager

d. Chicago Bridge and Iron (CBI)

- J. W. Cain, Project Welding and QA Superintendent
- R. E. Nelson, Level II NDE Examiner

e. Peter Kiewit, Services (PKS)

- J. Hendron, Level III NDE Examiner
- V. Shappell, NDE Trainee

f. State of Washington

- *G. Hansen, Engineer (EFSEC)
- R. H. Warner, Radiological Control Specialist
Department of Social and Health Services

g. Other Personnel

G. Mc Manus, NRC Consultant, Parameter, Inc.
K. Ristau, NRC Consultant, Parameter, Inc.

2. Plant Tour

Shortly after arrival onsite, the inspectors toured various areas of the plant to observe work activities in progress, completed work and construction status for obvious defects or noncompliance with PSAR commitments and regulatory requirements.

The inspectors observed that Unit 3 Reciprocating Charging Pumps 1, 2 and 3, which had been placed on foundation mounts, had sand lying on the motor to reduction gear shaft and the reduction gear to pump shaft. In addition, sand was generally lying on the motor and pump housings. The pumps were covered with a visquene sheet and enclosed in a visquene covered wood frame structure. The licensee had performed periodic surveillance during the morning of November 6, 1979 and identified that the storage conditions of the pumps did not meet ANSI N45.2.2 requirements for Level B components. In addition, cleanliness problems had been identified in early October, 1979, by periodic licensee surveillance and a corrective action request written to the contractor. The inspectors noted that class 1 equipment placement had just begun and emphasized the importance of equipment storage and cleanliness conditions. The licensee's corrective actions and action to prevent recurrence will be examined during a future inspection. (508/79-10-01)

The inspector observed that the temporary bolts, attaching the structural steel column baseplate "T-shoe" to Unit 3 column P4U, appeared to have been torqued without having sufficient shim plates installed. The inspector expressed concern that a bending moment had been applied to the shop weld attaching the "T-shoe" to the column baseplate. At the inspector's request, the licensee cleaned and examined the weld by magnetic particle method in the presence of the inspector. Magnetic particle indications were observed in three locations at the baseplate to weld transition. Due to irregularities and geometrical conditions, it was not possible to ascertain the relevance of the observed indications. The licensee committed to further examination of the observed indications to determine relevance by first surface conditioning the weld to baseplate transition zone and additional nondestructive examination. This is an unresolved item and will be examined during a future inspection. (508/79-10-02)

3. Licensee Action on Previously Identified Enforcement Items

(Closed) (79-07-01) Infraction: Failure to store and identify reinforcing steel as required by procedure.

The licensee's response to the item of noncompliance was submitted by letter No. G03-79-1892 dated October 31, 1979.

The licensee undertook a research of reinforcing steel storage conditions required by industry standards, PSAR commitments and regulatory requirements to determine if the specified site procedural requirements had basis or precedent. It was concluded that the requirements of the site specifications and procedures were in excess of industry standards, PSAR commitments and regulatory requirements. The licensee changed the rebar storage requirements specified by specification 3240-263 to be consistent with applicable standards and regulatory requirements. The Morrison-Knudsen procedures were in the process of revision to reflect the specification revisions.

The licensee's system of reinforcing steel purchase, storage, and placement assures that only QA acceptable reinforcing steel would be allowed inside the reactor plant construction perimeter. The inspector examined reinforcing steel storage conditions and observed that significant improvement had been achieved.

4. Licensee Action on 50.55(e) Items

Omission of reinforcing steel in a Unit 3 Fuel Handling Building Wall

On November 2, 1979, the licensee's QA Manager made a telephone report to the NRC Region V office concerning a construction deficiency reportable under the criteria of 10CFR50 paragraph 50.55(e). The licensee stated that 196 pieces of No. 11 reinforcing steel had been left out of a Unit 3 Fuel Handling Building wall at elevation 362.5 feet, location 3FH006 (concrete wall placement No. FHW-006-362.5). The licensee reported that the placement occurred on October 24, 1979 and the deficiency was identified on October 25, 1979 by Morrison-Knudsen (M&K) engineering. M&K wrote nonconformance report No. 2510 on October 30, 1979 documenting this fact. The NCR was received by the QA department on November 1, 1979 and determined to be 50.55(e) applicable on November 2, 1979.

The licensee directed M&K, by letter of November 6, 1979, to suspend all work operations on concrete placement FHW-006-376 (the placement immediately above FHW-006-362.5) pending evaluation and disposition of Nonconformance Report 2510. On November 7, 1979, an Immediate Action Letter was issued by Region 5 directing the licensee to halt work on further concrete placement for the wall in question with the understanding that:

- a. An engineering evaluation will be made of the proposed repair.
- b. An approved repair will be made prior to any further placement of concrete in the wall.
- c. This office will be provided with a written report of the omission of the reinforcing steel, the corrective action taken and the engineering evaluation of the corrective action taken.
- d. The Region V office will be contacted prior to the resumption of placement of concrete in the affected Unit 3 Fuel Handling Building Wall.

The NCR identifies that 194 pieces of No. 11 reinforcing steel were omitted instead of the 196 pieces reported: 12 Pc. F581-third row front face, 88 Pc. F581-third row each face and 6 Pc. F581-third row front face. The F581 identifies an 11 foot long dowel. The reinforcing steel placement requirements are identified on drawing No. G2456, Revision 2.

The omission of the reinforcing steel was not identified by the pre-placement QC Inspector during the performance of inspections required by M&K procedure CP-11 (Reinforcing Steel Installation and Inspection Procedure) on inspection report form QC-19, nor was the omission identified by the rebar placement crew. The inspector reviewed the concrete placement checklist for the placement in question. The QC Inspector had not signed the signature blank for Reinforcing Steel Inspection (required by M&K) but had signed the Ebasco Placement Checkout form indicating that the required inspection had been made. Discussions with the QC Inspector assigned that inspection work indicated that the required inspection had been performed but that the omission of rebar had not been identified and the signature omission had been inadvertent.

The inspector examined the placement in question and verified the omission of rebar and the implementation of the stop work instructions.

This item will be examined during a future inspection. (508/79-10-03)

5. Independent Radiography of a Unit 3 Containment Vessel Weld
(See also IE Inspection Report 50-508/79-07 and IE Investigation Report 50-508/79-09)

a. Background

During a routine inspection of the WNP 3/5 project on August 27-30, 1979, the licensee notified the inspector that an allegation had been received to the effect that a radiograph made before repair of the Unit 3 containment vessel weld seam T20c increment 11-12 did not depict the same weld volume as did the radiograph purported to be of seam T20c increment 11-12 after repair. The NRC inspector examined the licensee's actions to evaluate and resolve the allegation and

examined the radiographs in question. The inspector found that the allegation was not substantiated and concluded that the radiographs made before and after repair of the weld appeared to be of the same weld. These examinations and findings were documented in IE Inspection Report 50-508/79-07.

Subsequently, on September 28, 1979, RV was notified by IE:HQ that a similar allegation had been forwarded to the Headquarters staff by several members of Congress. A regional based NRC inspector was dispatched to the site on October 3, 1979 with instructions to examine the circumstances surrounding the allegation, examine the radiographic film in question again and seal the questioned radiographic film. The inspector again found that the allegation was not substantiated and concluded that the radiographs made before and after repair of the weld appeared to be of the same weld. On October 10, 1979, a regional based inspector and investigator interviewed the alleged in Portland, Oregon and obtained a written statement of his concerns. The inspector notified the alleged of the NRC investigation results to that date and the alleged stated that his concerns had been satisfied. These examinations and findings were documented in IE Investigation Report 50-508/79-09 and forwarded to the IE:HQ staff for review and evaluation.

An independent consultant (Parameter, Inc.) was retained by IE:HQ, as a result of continued interest in the allegation, to perform independent radiography and evaluation of the Unit 3 containment vessel weld seam T20c, increment 11-12. The results of this independent radiography are presented below.

b. Independent Radiography - Work Observation and Record Review

On November 8, 1979, the inspector observed the activities of the independent radiographic consultant (Parameter, Inc.) including equipment setup, penetrometer selection and placement, radiographic weld identifier placement, film selection and placement, personnel barrier placement and monitoring, and the conduct of radiography using an X-Ray tube and equipment. All of the above activities appeared to comply with code requirements.

Two double film exposures were taken. The first exposure was a twenty minute exposure to establish technique adequacy. After processing by the consultant, using the CBI automatic film processor, the first exposure density was in excess of ASME B&PV code requirements. The second exposure was a thirteen minute exposure and resulted in a radiograph, processed as with the first, meeting code requirements. The licensee's densitometer was calibrated by the consultant using a National Bureau of Standards Calibration Strip. The results of the consultant's evaluation and interpretation were stated to be as follows:

- (1) Film Density
 - (a) Film density in weld area = 2.79
 - (b) Film density in penetrometer area = 3.0
 - (c) Film density on parent metal = 3.27
- (2) Radiographic Sensitivity level attained = 2-1T (a better sensitivity level than is required by Code)
- (3) A base metal indentation (surface blemish) is visible on the film at about 2 inches from the center of weld T20c increment mark 11.
- (4) Broken porosity, within code specified acceptance criteria, noted at approximately 3/4 inch from the center of weld T20c increment mark 11.

The consultant (Parameter, Inc.) examined the radiographic film, titled seam T20c increment 11-12 R1, taken by CBI of the weld area in question after repair. The consultant stated that broken porosity and a surface blemish existed at the same location as shown in the radiographic film taken by them and further stated that their film and the CBI film appeared to depict the same weld area. The radiographic sensitivity of the CBI film was stated by the consultant to be 2-2T, within code specified acceptance criteria.

The consultant examined the original, before repair, radiographic film, titled T20c increment 11-12, taken by CBI of the weld area in question. The consultant stated a surface blemish existed at the same location as shown in the radiographic film taken by them and further stated that their film and the CBI film appeared to depict the same area. The radiographic sensitivity level of the CBI film taken of the weld before repair was stated by the consultant to be 2-2T, within code specified acceptance criteria.

The consultant stated that, by deduction, the radiographs taken by CBI, titled T20c increment 11-12 and T20c increment 11-12 R1, appeared to depict the same weld area and further stated that the radiograph of the weld taken by CBI, titled T20c increment 11-12 R1, depicted a weld meeting code specified acceptance criteria.

No items of noncompliance or deviations were identified.

6. Investigation of a Record Signature Falsification

On October 5, 1979, a Morrison-Knudsen (M&K) QC Inspector discovered an apparent forgery of his signature on a Class G weld braze data card and subsequently reported this condition to the M&K site QA Manager. The M&K QA Manager reported the discrepancy to the licensee, whose QA Manager notified IE:RV of that condition by telephone on October 5, 1979. Subsequently, interest in this occurrence was expressed by the Office of the Commission. The results of the IE:RV investigation of this matter are presented below.

The signature forged was on a documentation of QC acceptance of fitup inspection for a 2" class G socket weld (weld no. 6) attaching Pc. Nos. A-106 and A-105 for line 7 CC A2-107 of Isometirc No. CSP-517, a temporary construction service air line. The weld had not yet been performed when the QC inspector made the observation that his signature had been forged. This construction service air line is not a permanent plant appurtenance and was intended merely to supply compressed air to crafts personnel to operate pneumatic tools and equipment used during construction activities. Therefore, the line and weld in question are not nuclear safety related in any way, as indicated by the class G designation, and are not subject to the criteria of 10CFR 50, Appendix B. Morrison-Knudsen immediately initiated corrective actions which were observed by a licensee QA engineer. These steps were:

- a. Stop work on all welding until it was determined no class 1 work was involved. Each weld braze data card was to be reviewed and signatures verified by the respective inspector.
- b. A warning was issued to all M&K personnel that falsification of records was ground for immediate dismissal and/or civil action.
- c. All future weld braze data cards will be verified by the respective inspector prior to final audit by the M&K QA Supervisor.

The licensee and contractor were not able to determine who had falsified the QC inspector's signature. The M&K corrective actions determined that no Class 1 welding was involved.

On November 7, 1979, an NRC inspector examined the corrective actions to independently establish validity of the conclusion that no Class 1 welding was involved. The licensee and contractor stated that the only Class 1 piping welding, performed by M&K, is on the half-round service drain piping established on the perimeter of the Units 3 and 5 excavations for ground water control. The inspector examined all Class 1 weld braze data cards (Form QF-6) and all Class 1 structural steel welding inspection reports (Form QC-19). The inspector interviewed two M&K welding inspectors and the QA Manager who stated that the specified corrective actions had been accomplished as indicated.

The interviews established that each inspector had verified his signatures on the Class 1 documents identified above. In the case of two inspectors who had previously terminated employment, those signatures were verified by the M&K Level III inspector and/or the QA Manager. The inspector's examination of Class 1 welding records (Forms QF-6 and QC-19) and personnel interviews established that Class 1 welding record signatures appeared to be valid.

On October 8, 1979, the M&K QA Manager issued an instruction stating that the QC inspector will place his inspection stamp by his signature in the margin of the original record copy of all Class 1 pipe welding. The inspector's review of records indicated that this instruction was being complied with. The inspection stamp control procedure (No. AI-02) and inspection stamp control logs indicate that the stamps are issued and controlled adequately to preclude their use by unauthorized personnel.

No items of noncompliance or deviations were identified.

7. Allegation of Improper Disposition of Nonconformance

The licensee informed the inspectors during the entrance meeting that an allegation had been received to the effect that a welding-related NCR had been improperly dispositioned. The licensee stated that on October 30, 1979, an anonymous telephone call had been received by the Supply System Managing Director's secretary in Richland, Washington. The alleger had complained that a technically unjustifiable disposition had been made by the Ebasco Site Support Engineering (ESSE) Welding Engineer to an identified nonconformance involving a surface defect of undetermined depth on structural column MK 419A. The inspector examined the allegation basis and licensee actions to date. The results are presented below.

On June 11, 1979, nonconformance report No. 0441 was written identifying that structural column MK 419A has a surface defect of undetermined depth extending under the spliceplate on the column flange. The column in question is designated B7X. A recommended disposition was accepted by the ESSE Welding Engineer on June 13, 1979. That assigned disposition was rejected by the Ebasco Level III NDE Examiner, assigned to the QA Department, on June 20, 1979. On June 20, 1979, NCR No. 10858 was written by the Ebasco Level III Examiner and resubmitted for technical disposition. The ESSE Welding Engineer assigned and approved a disposition on June 28, 1979. This disposition was again rejected by the Ebasco Level III Examiner. On October 30, 1979, NCR No. 11296 was written by the Ebasco Level III Examiner specifying necessary actions to resolve and disposition the NCR. The specified actions appear adequate to establish the extent of the nonconforming condition and effect resolution. The licensee's QA program appears to have functioned adequately in this area since the QA specified reviews had prevented inadequate NCR disposition. The licensee's corrective actions will be examined during a future inspection. (508/79-10-04)

8. Containment Structural Steel (Welding)

a. Review of Quality Assurance Implementing Procedures

The site erection of the Unit 5 containment pressure vessel is performed principally in accordance with the applicable sections of CBI's "Nuclear Quality Assurance Manual for ASME Section III Products", and supplemental instructions. During the current inspection those portions of this manual, supplemental instructions, and parent specifications relating to SMA welding, welding procedure qualification, welding filler material control, NDE inspector qualification, and visual weld inspection were reviewed. These documents, tabulated below, were examined for compliance with the requirements of 10CFR 50 Appendix B; the ASME B&PV Code Section III-S74; and the PSAR:

- (1) CBI "Nuclear Quality Assurance Manual for ASME Section III Products", Issue No. 8, March 22, 1978.
- (2) EBASCO Specification No. 3240-213, "Steel Containment Vessel".
- (3) EBASCO Specification No. 360W, "Contractor Quality Assurance Requirements".
- (4) EBASCO Specification No. 873-73a, "Nondestructive Testing Procedures".
- (5) CBI Special Instruction No. SI-2, Rev. 0, "Field 4-Hour Coated Weld Electrode Control".
- (6) CBI "Nondestructive Examination Personnel Training, Qualification, and Certification Program" (No revision).
- (7) CBI General WPS No. GWPS-SMN 74-3431, Rev. 1, "General Welding Procedure Specification for the Shielded Metal Arc Process".
- (8) CBI WPS No. WPS-E7018/3431, Rev. 2, "Welding Procedure Specification".

b. Review and Evaluation Results

Pursuant to the review and evaluation of the above listed documents, the inspector identified the following:

- (1) The CBI WPS No. WPS-E7018/3431, Rev. 2 specifies ranges of amperages and voltages for performing shielded metal arc welding as a function of weld rod diameter. This welding procedure is used in applying the root pass joining containment vessel plates. Contrary to the requirements of the

ASME B&PV Code Section IX the maximum amperages allowed in the WPS are higher than those specified in the applicable welding procedure qualification records (PQR Nos. 2631 and 3250) which changes a supplementary essential variable. The welding procedure specification had not been requalified at the higher amperages. The failure to qualify welding procedures in accordance with specified procedures is an apparent item of noncompliance. (508/79-10-06 and 509/79-08-03)

- (2) Ebasco specification No. 3240-213, Sect. 2A, paragraph 2.8 specifies that the minimum charpy impact test energies for weld metal shall be 5 ft-lbs higher than that required by the Code for base metal. No CBI procedures could be identified which implemented this specification requirement. The CBI procedures did implement the Code-specified requirements.
- (3) Ebasco specification No. 3240-213, Sec. 2A, paragraph 5.4.d, requires paint to be removed for a distance of two inches from a weld seam prior to welding. No CBI procedures could be identified which implement this specification requirement. Observations in the CBI shop area revealed that paint is not always removed for a distance of two inches from the weld seam (e.g. plate section V86).
- (4) Ebasco specification No. 3240-213, Sect. 2A, paragraph 5.8, specifies that the depth of weld metal deposits shall not exceed 1/8 inch and the width of SMA weld passes shall be limited to a maximum width of four times the electrode core wire diameter. CBI, in their contract bid, had taken exception to this paragraph of the specification, stating they will meet the intent of the paragraph. Their procedures, however, allow the depth of weld deposits to be 1/4" (LOPS-E7018/74-3431, rev. 2). Field observations revealed pass widths in excess of six rod diameters (e.g. plate section V86).
- (5) Ebasco specification No. 873-73, section V5, requires visual inspection of welds for porosity before other specified non-destructive tests. No CBI procedures could be identified which implement the specification requirement.

Items (2) through (5) above reflect inconsistencies between contract specifications and the implementing CBI procedures. Licensee representatives stated that this situation would be examined and appropriate action taken. This item will be examined further during a subsequent inspection (509/79-08-02).

No items of noncompliance or deviations, except as noted in paragraph 8b(1) above, were identified.

c. Observations of Work and Work Activities

Inprocess welding activities, three completed welds, and control and issuance of welding filler material were examined for compliance to the requirements of the ASME B&PV Code Section III, the PSAR, and the specifications and procedures identified in paragraph 8a, above.

The inprocess welding observations of Unit 5 root pass weld no. B3B included inspection of joint preparation, fit-up, maintenance of preheat, welding technique, position, and equipment condition. The welding was being performed in the on-site CBI fabrication shop using the manual shielded metal arc process. During the initial examination of the activity the inspector observed the welder to be welding through an area (approximately 12 inches in diameter at the 15 foot mark) contaminated by oil. The failure to properly clean surfaces prior to welding is contrary to the requirements of CBI procedure GWPS-SMA 74-3431 and the ASME B&PV Code. This is an apparent item of noncompliance (509/79-08-01). Other aspects of the welding were in compliance with procedures.

Completed weld Nos. B5B-5, B5C-5, and B5A-5 were examined for location, size, shape, appearance, and surface condition. All conditions observed were satisfactory.

No items of noncompliance or deviations were identified.

The inspector observed the storage and issuance of welding filler material (E7018 welding electrodes) at the two issue stations at the fabrication shop and the one issue station outside Unit 3 containment. The inspector found that electrode "Hold Oven" No. 5 at the fab shop had become unplugged allowing the rod inside the oven to cool below required temperatures. Contractor representatives removed and destroyed all of the cold rod, reenergized the oven, and attached a label to the oven cord indicating it is not to be unplugged. At the issue station outside the Unit 3 containment the inspector observed the rod attendant receiving and issuing low hydrogen electrode from the same oven (oven No. 13). This action is contrary to the requirements of CBI Special Instruction No. SI-2, which specifies rod shall be received and placed in the "Hold Oven" for drying and issued from the "Issue Oven".

This is an apparent item of noncompliance (508/79-10-05).

d. Review of Quality Records

The quality records associated with Unit 5 containment welds Nos. B3B, B5B-5, B5C-5, and B5A-5 were examined. The examination

included a review of SMA welding procedure qualification records, inprocess weld inspection records, completed inspection records, weld history records, magnetic particle examination (MT) records, repair records, and qualification records for three NDE inspectors who performed MT on the welds. The inspector found one MT record which erroneously indicated that the MT examiner was qualified to SNT-TC-1A Level II, whereas his qualification records indicated his qualification as level I. This record was corrected prior to the completion of the inspection. Other records were found to be in order.

No items of noncompliance or deviation were identified (except as noted for procedure qualification, paragraph 8b(1), above).

10. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of non-compliance or deviations. One unresolved item was identified during this inspection and is discussed in Paragraph 2.

11. Exit Interview

The inspectors met with licensee and AE representatives (listed in paragraph 1) at the conclusion of the inspection on November 9, 1979 and summarized the inspection scope and findings. The licensee acknowledged the two apparent items of noncompliance identified in paragraphs 8c. Subsequent to the inspection, on November 21, 1979 the licensee was advised by telephone of the apparent item of noncompliance identified in paragraph 8b(1).