U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-412/85-02

Docket No. 50-412

License No. CPPR-105 Priority -- Category A

Licensee: Duquesne Light Company

435 Sixth Avenue

Pittsburgh, Pennsylvania 15219

Facility Name: Beaver Valley Power Station, Unit 2

Inspection At: Shippingport, Pennsylvania

Inspection Conducted: January 21-25, 1985

Inspectors: E. H. Gray, Lead Reactor Engineer — 3/8/85 date

J. J. Kortas, Reactor Engineer — 3/11/85 date

J. H. Raval, Reactor Engineer — 3/11/85 date

Approved by: J. P. Durr, Chief, Materials and Processes Section, DRS — 3/11/85 date

Inspection Summary:

Areas Inspected: Routine unannounced safety inspection by three region based inspectors. The inspection scope included SIS piping, pipe supports, reactor vessel internals, pre-service inspection and review of certain open items. The inspection involved 95 hours on site.

Results: Two violations were identified in the four areas inspected:

A. Failure to issue controlling documents for valve disassembly.

B. Penetrant Indication on RPV Internals Assembly.

DETAILS

1.0 Persons Contacted

Duquesne Light Company (DLC)

L. Arch, Senior Projects Engineer
J. Bajuszik, Director Construction Engineering
R. Coupland, Director QC
D. Denning, Assistant Director, QC
G. Kaloz, QC, Senior Mechanical Engineer
C. Kirschner, Senior, QA Engineer
A. Mosso, QA
T. Noonan, BV-2, Stat. Supt.
R. Perry, NDE Specialist
D. Rohm, Assistant Director, QC
W. Sikorski, Director, ISI
J. Stabb, Compliance Engineer
D. Weakland, QC/ISI Engineer

Stone and Webster Engineering Corporation (SWEC)

A. Dasenbrock, Senior Construction Manager
D. Lessard, Assistant Supt. SEG.
R. Wittschen, Licensing Engineer

The above listed personnel, and the NRC Senior Resident Inspector attended the exit interview on January 25, 1985. Other managers, supervisors, craftsmen and technicians were contacted during the course of the inspection as activities interfaced with their areas.

2.0 Licensee Action on Previous Inspection Findings

(Closed) Violation (412/83-01-01). Cracking at inconel to stainless steel weld on steam generator lower head nozzles. The inspector reviewed the response (2NRC-3-024) violation, dated May 4, 1983, including the cause and corrective action. During inspection 85-02, the traveler packages and corresponding nonconformance and disposition reports (N&D) were reviewed.

WELD NUMBER	(N&D)
FW-002-RI	6604
FW-008-RI	6598
FW-005-RI	6624

The above documentation indicates that repairs were made to ASME Code requirements and that adequate corrective actions including evaluations of potentially similar weld conditions were initiated or performed.

This item is closed.

(Closed) Unresolved Item (412/83-01-03). NSSS Technical Manuals, Accuracy and Adequacy.

The response dated May 4, 1983 states that equipment documentation for Units 1 and 2 of BVPS are considered separately, therefore, a list of specific differences between similar components on both stations need not be developed. In inspection 85-02, the response of May 4, 1983 and the letter dated March 15, 1983 by J. Hoebel to R. Washabaugh were reviewed. The letter (DMW-D3326) states that "No other detail in (the Steam Generator Technical) manual requires clarification or revision."

This item is closed.

(Closed) Unresolved Item (412/83-01-04). Program to assure that other Safety Related Technical Manuals clearly and accurately portray important hardware details.

Response 2NRC-3-024 outlines the sequence of initially requiring technical manuals and the subsequent review and approval of these manuals by SWEC prior to turnover to DLC. The inspector reviewed portions of the DLC Audit No. DC-2-84-03 where the review and approval of supplier technical documents at SWEC, Boston was reported. Also, the SWEC Engineering Assurance Review plan number 1104-1 dated June 14, 1982 for the audit of September 15, 1983 was reviewed indicating the system to review and control Supplier Documents is established and is being implemented.

This item is closed.

(Closed) Unresolved Item (412/83-01-05). Revision of Steam Generator Technical Manual to show inconel weld metal band at the stainless weld buildup to nozzle fusion area.

During inspection 85-02 it was noted that detail "A", figure 1-1 of the Steam Generator Technical Manual (TM 1440-C278) was revised to include reference to the recessed inconel material.

This item is closed.

(Open) Unresolved Item (412/84-15-01)

Identification of examination reference points. Review of this open item ascertained that a system is currently being developed to identify ultrasonic examination starting points with reference to the original radiographic layout. This item remains open pending the incorporation of an appropriate procedure into the Inservice Inspection program.

(Open) Unresolved Item (412/83-02-01) Electrical Cable Tray-to-Tray Connections

The licensee provided adequate responses for the items identified under the Inspection Report Item No. 50-412/84-02 which are summarized below:

1. 2BVS-316 ultimate strength compliance for A570 material was demonstrated per the T. J. Cope compliance letter and typical certified Material Test Reports (CMTRs).

2. The Pittsburgh Testing Laboratory (PTL) report consisted of testing A570 material splice plates furnished by T. J. Cope, Inc.

3. 2BVS-316 ultimate strength requirement for the side rails was downgraded from 32000 psi to 31,210 psi per test reports review by T. J. Cope which indicated that one of the test results had below minimum yield strength.

4. Engineering evaluation of the PTL test results, calculation 12241-NS(B)-134, determined the splice plates with oversized holes would perform their intended functions of supporting the cable trays without failure.

5. E&DCR No. 285-3309 applies to A570 material splice plates only, based on PTL test results.

6. 2BVS-931 was revised to reflect the new bolt hole criteria for installation of the splice plates by Sargent Electric. 2BVS-316 does not need to be revised since its tolerance criteria are within the 2BVS-931 requirements. 2BVS-931 was revised again to include ±1/32 inch tolerance for the bolt hole location dimensions.

7. SWEC File No. 280176 2931420 C (SECO Drawing No. SECO-M-D-58) was revised on January 23, 1985 to include the bolt hole location dimension tolerance. It was previously revised to include the bolt hole tolerance. The SWEC file Nos. 20013 36316001A/2A need not be revised since these are in compliance with 2BVS-931.

8. 2BVS-316 does not identify any procurement control requirements, however, typical CMTRs, obtained from T. J. Cope, conform to the ultimate strength requirements.

9. Request for Information (RIs) documents are not used as design documents. The design changes resulting from RIs are processed through the normal design change procedures.

The above information was abstracted from the SWEC Letter No. 2DLS-21520, dated May 22, 1984 to the Licensee.

The NRC-RI, on its own independent efforts, tested A569 material splice plates through Franklin Research Center and found their yield strength in

the range of 40,000 psi to 41,500 psi and the minimum tensile strength 51,900 psi. The inspector reviewed the PTL test report and engineering calculation 12241-NS(B)-134 for the tested A570 material splice plates and concurred with the adequacy of the tolerance criteria for the bolt holes.

The Inspection Report Item No. 50-412/84-18 addresses the update on use of a commercial grade ASTM-A569 stock material for splice plate material. The licensee intends to replace all existing connections of the A-569 material with the A-606, type 4 material because the furnished splice plate material was not identified with the specific chemistry requirements or minimum yields.

This item remains open until all the splice plates in question (ASTM A-569) are replaced by plates fabricated from ASTM A-606, Type 4 material as proposed by the licensee.

(Open) Violation (412/82-01-01) Inadequate Taper

This violation deals with ASME Code Section III, Class 3 butt welded valves and pipe to fitting butt welds surface profile requirements. Initially, on April 5, 1982, NRC requirements were cited, per 10 CFR 50, Appendix B, Criterion IX, on field weld number 2SWS-066-F08, line SWS-66-9A, Class 3 piping for not fairing to the required 3 to 1 taper over the width of the finished weld. The licensee responded to the above by their letter No. 2DLC-4611, dated May 7, 1982, regarding NB-4232 compliance for the identified field weld. The licensee supplemented the above response on June 17, 1982 and concurred with the existence of a possible "notch" condition. The licensee committed in the above supplemented response to correct the "Notch" condition by localized grinding and to revise specifications 2BVS-920 and 2BVS-58 including quality control inspection plans, by July 15, 1982.

The licensee stated their position, and described the actions to be taken concerning class 3 butt-welded valves and pipe to fitting butt welds in their Letter No. 2NRC-4-027, dated March 14, 1984. The licensee identified and summarized the ASME III, Class 3 pipe-to-fitting, fitting-to-valve, and pipe-to-valve welds requiring reinspection and provided a listing of inaccessible buried welds and unacceptable welds that did not meet the criteria outlined in their supplemental response. The licensee committed to address nonconforming weld surface profiles per criteria outlined in their supplemental response which included class 3 butt-welded accessible valves. These were to be reworked to meet revised 2BVS-920 specification requirements, while class 3 pipe-to-fitting butt welds were to be accepted as is. The stress intensification factors, required per ASME III ND/NC-3672, were to be applied to the existing class 3 piping design in support of the above assessment. The licensee also stated that their existing calculations will verify the adequacy of the offset weld surface conditions at the connecting butt welds due to the fittings. The eccentricity and excess base metal tend to increase with increasing diameter, along with the stress intensification factors for fittings. NRC-RI responded on March 30, 1984, stating that the acceptability of actions for

fitting was dependent on the results of an NRC review of the analysis and calculations referenced in the licensee's above letter (March 14, 1984).

A technical meeting, to review the licensee's corrective measures, was held on May 22, 1984 at the BVPS-2 site. The licensee agreed to amend their response dated March 14, 1984 (2NRC-4-027) to reflect the summary of total ASME III, class 3 welds identified by site review including inaccessible, unacceptable, "rework" and "accept as is" category welds. The licensee also agreed to provide (1) a listing of inaccessible and "accept as is" welds indicating their temperature range, system designations and thermal cycles; (2) local stress level data per ASME III, equations 9 and 10 for "rework" and "accept as is" welds to compare with the allowable stresses; and (3) other accessible welds, as identified on N&D-7380, with the above information. The inspector reviewed the calculations; they consisted of the thermal analysis of three pipe thicknesses subject to accelerated heat treatment histograms and verified that it complies with the code requirements.

During this inspection, the licensee acknowledged that completion of the following actions would close this violation:

1. Submittal of a revised summary of ASME III, Class 3 welds, as previously indicated on letter No. 2NRC-4-027, dated March 14, 1984, Paragraph 2, to the NRC in a formal response.

2. A sample audit of the 25 "rework" class 3 butt-welded valves by senior resident inspector and their compliance with the code requirements.

The licensee submitted a sample of the summarized "rework" weld data regarding its system designation, thermal cycles, temperature range and calculated weld stresses per ASME III, equations 9 and 10 during the inspection. The inspector determined its compliance with the code.

This violation remains open until the above-mentioned two items are completed.

3.0 Piping

The inspector performed a walkdown inspection of piping from inside the containment penetration, X-62, on Safety Injection System (SIS) line 2SIS-010-10-2 to the inlet nozzle "C" of loop No. 22 on the cold leg of the Reactor Coolant System (RCS), line 2SIS-006-15-1. The above SIS System loop was selected as a representative sample of the safety related piping systems and the Reactor Coolant Pressure boundary (RCPB) piping. The inspection verified conformance with the vendor isometrics, SWEC Flow diagrams, SWEC piping specifications, and vendor data packages. The inspector also reviewed the design commitments in the FSAR and compared them with the output design specifications and drawings to verify that they were consistent.

The piping spool ratings were compared with the vendor documents and found to be in conformance. The inspector made ovality checks at selected pipe spools and welds by caliper measurements and verified compliance with the ASME III Code requirements. The visual inspection of the piping revealed no creases, wrinkles, flat spots or any other defects that would have been induced by improper fitups and handling. The ovality was within the code requirements.

The inspector concurred that the installed piping was in compliance with the listed documents except the following FSAR error was identified. The SWEC flow diagram No. 12241-RM-87B-13 shows lines 2-SIS-006-12, 15 and 16 with flows to RCS loops No. 21, No. 22 and No. 23 cold legs while the BVPS-Unit 2 FSAR Figure 6.3-3, shows flows of the above lines to RCS Loops No. 21, No. 22 and No. 23 hot legs. The SWEC initiated a Licensing Document Change Request (LDCR) No. 1087 on January 24, 1985 to revise the three lines indicated above to state RC system "cold leg". The inspector verbally notified the NRR project manager so that the reviewer of this Section of the FSAR would be aware of these differences.

This item will remain unresolved pending issue of the FSAR change which shows at present the apparent erroneous Hot Leg flow designations and determination by DLC than no other project documents are affected by this FSAR error. (50-412/85-02-04)

4. Pipe Supports

The inspector reviewed the following QC inspected support installations to verify the compliance with applicable specifications and design drawing requirements on the safety injection system:

1. 2SIS-PSR044, ASME III, class 2 (BZ-107A-044-2A)

2. 2SIS-PSR038A, ASME III, class 2 (BZ-107A-038-3D)

3. 2SIS-PSR039, ASME III, class 2 (BZ-107A-039-2A)

4. 2SIS-PSR086, ASME III, class 1 (BZ-107A-086-3A)

5. 2SIS-PSR090, ASME III, class 1 (BZ-107A-090-0C)

6. 2SIS-PSR089, ASME III, class 1 (BZ-107A-089-0C)

The above pipe supports were in compliance with the clearance criteria requirements per 12241-STD-BZ-290A-2N, Pipe and Tube Support Field Erection Clearance and IP-7.3.1 Fabrication and Installation of Pipe Supports (January 17, 1985).

The pipe supports 2SIS-PSR038A and 2SIS-PSR086 had additional unfinished support installations attached to them but were not identified on their respective BZ-series drawings. The inspector verified that these supports were shown on Drawing SB-110-694-070-C03 (Issued on January 17, 1984) and

BZ-900AC-140-1 (Issued on November 29, 1983). The future revisions of above BZ-series drawings will identify the referenced additional pipe support installations.

The pipe support 2SIS-PSR039 had installed weld length of 4-1/4 inches on the support steel versus BZ - drawing which showed 3 inches. This was verified by inspector as acceptable per specification No. 2BVS-920 requirements.

The pipe support 2SIS-PSR038A had "0" clearance at the resting point, however, this was acceptable as verified by the inspector per 12241-STD-BZ-290A-2N, Note 9 requirements.

The pipe support 2SIS-PSR038A had 3'-2-3/16" installed linear dimension which exceeded the tolerance of ± 1 inch as identified in specification No. 2BVS-920, R.8 on page 1-82. The BZ-107A-038-3D shows the linear dimension of 3'-0". Specification No. BV-920 was revised to include the ± 1 inch tolerance criteria per E&DCR No. 2PS-3384, dated March 13, 1984.

DLC-SQC inspected all pipe support installations prior to the issuance of the above E&DCR using the requirements of ± 5° tolerance on the angular dimension. This is permitted provided the opposite linear dimension or attachment location was not exceeded by 3 inches. DLC-SQC addressed a request through an internal memorandum, DLC-SQCL-0994-Y, dated July 6, 1984, to site Engineering Group-SWEC, regarding backfit inspection program requirements to re-verify those supports which were not inspected to the revised 2BVS-920 criteria. The licensee has to address the compliance of the identified pipe support installation with the revised criteria per 2BVS-920 including other previously installed and signed off pipe supports.

This is an open item subject to compliance verification per identified specification requirements.

This is an unresolved item. (412/85-02-02)

5. Mechanical Equipment

During the Safety Injection System walkdown inspection, the following equipment was selected for review of the nameplate data, procurement specifications, vendor documents and design basis information:

1. VCW 150-X-2 (CV-115), 10" check valve on line 2-SIS-010-10-2

2. Two C88,6" check valves on line 2-SIS-006-270-1

These valves were installed by Schneider Power Corp. with inspection sign-off by DLC-SQC. The inspector verified the nameplate data with the vendor documents and applicable specifications and found them in agreement with the reviewed data.

The valve VCW-150-X-2 (V-115) was found with loose nuts including one missing nut on the shaft seal plates. The documentation for this valve has been signed-off by QC inspection as complete. It was determined that no Assembly/Disassembly Report was generated for the installation changes to the valve per FCP-302. This item violates the requirements of 10 CFR 50, Appendix B, Criterion V, BVPS-2 PSAR, Section 17.2.1.5A, and BVPS-2 procedure FCP-302 which requires that valve assembly/disassembly reports be issued to accomplish any changes in configuration on safety related valves. (412/85-02-1)

6. Reactor Vessel Internals (RPVI)

The reactor vessel internals including the core barrel assembly (lower core support), upper core support structure and upper head with Control Rod Drive Mechanism were examined for conformance to the FSAR, drawings and traveler requirements.

Traveler review included portions of the following:

DMW-003-Split Pins-Removal/Replacement
DMW-005-Upper Internals
DMW-009-RPV Head Assembly and Shroud
DMW-013-RV Head Guide Funnels
DMW-018-RV Alignment Pins

The travelers were noted to contain applicable procedures and were signed off for completed work and at hold points where indicated. The Lead Site Construction Services Engineer has performed review of completed travelers.

The recent change in the Quality Assurance procedure number 9.0, part 9.3.2 requires completion (and acceptance) of all work activities to be included as a final operation in each traveler. The inspector was assured that this additional formal step in the RPVI traveler completion process would be accomplished on a timely basis.

The lower and upper core support structure, Reactor Vessel Interior surfaces and the Vessel Head with attachments were observed in the field as separate components. Drawings 686J489 Rev 4, 883D683 Rev 5 and 6114E48 sheets 1 through 4 and the FSAR Figures 3.9N-7 and 3.9N-8 were compared to the components. The ASME Code Section IX and the SWEC FCP 5.1 were compared to the welding qualifications and condition of cleanliness respectively. Except as discussed below no violations were identified.

The NRC inspector detected a weld metal crater crack, approximately 1/2" long, in a shop weld on the secondary core support energy absorber assembly mark K468A02-2. Liquid penetrant (PT) examination of this area showed an indication in excess of that permitted the WPS 595139 acceptance standard, Quality Level B applicable to this weld.

This is a category V violation of Criteria IX, Control of Special Processes, 10 CFR 50 Appendix "B". (412/85-02-02)

Preliminary evaluation indicates that this crater crack may be functionally insignificant, however, the licensee should establish if this is an isolated case or not and evaluate the implications thereof.

7. Observation of Welding and Welding Activities

The inspector examined a sample of welding on piping, pipe hangers and Reactor Vessel Internals. Welding activities including weld material control, in process documentation and the use of ASME Code qualified welders were observed.

Welds

2RCS-84-F3 Pressurized Lowerhead Nozzle
2CHS-PSA578R-Hanger
2CH-500294-2 Weld 9A
2GNS-001-13-2 Weld 29
2SIS-68-1-A, Item 1-C-88

Welders or Weld Qualification Records

F145	W05
F045	W06
F169	W04
F658	W03
F050	W01

Additional welds on the SIS line including pipe hangers from penetration X62 to the cold leg Nozzle were examined.

No violations were identified.

8.0 Preservice Inspection (PSI) Program

The inspector walked-down Safety Injection System field and shop welds on isometric drawings No. 1107129-1B and No. 1107130-2A and reviewed subsequent documentation. Welds identified for PSI and Inservice Inspection (ISI) were inspected for accessibility and for surface preparation completeness including proper weld profile, examination reference markings and examination clearance envelope. Traveler packages of construction modified welds were reviewed for accuracy of weld profile completeness. Schnieder Quality Control In-Process Check Lists (IPCL's) for ISI profiles were examined for hold point signatures and acceptance. The inspector observed Quality Control personnel inspecting and evaluating ISI profiled shop welds in accordance with applicable IPCL's.

PSI program Class 2 welds are being reselected for surface preparation and PSI examination to meet the Winter 1980 Edition of the ASME Code. The PSI/ISI program procedures are being developed by Westinghouse and reviewed

by Duquesne Light Company. The inspector reviewed typical program areas of concern with the Director of ISI.

No violations were identified.

9.0 QA/QC Activities

In the area of Reactor Vessel Internals, the DLC QC group has one QC inspector assigned to monitor activities and documentation required in RVI installation. This QC inspector demonstrated a thorough knowledge of procedures and requirements of this work scope and does regularly interface with contractor personnel. The DLC QC group is evident in its representation in principle activities at the site.

QA/QC Documentation as reviewed was found to be current with the work status and completion in both the RVI piping, mechanical equipment, and pipe support areas.

No violations were identified.

10.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs -2, 3, and 4.

11.0 Exit Interview

An exit interview was held on January 25, 1985 with members of the licensee's staff and contractors as denoted in Paragraph 1. The inspector discussed the scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspectors.