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U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

Report of Inspection

CO Report No. 286/71-1

Licensee: Consolidated Edison Company
(Indian Point 3)
License No. CPPR-62
Category A

Date of Inspection: January 26, 27, and 28, 1971

Date of Previous Inspection: November 16 and 17, 1971

Inspected by: R. F. Heishman, Reactor Inspector (Principal) — 2-24-71 Date

R. L. Brown, Reactor Inspector (Construction) — 2/25/71 Date

Reviewed by: for E. M. Howard, Senior Reactor Inspector — 2/26/71 Date

Proprietary Information: None

SCOPE

A routine announced inspection of the 3023 MWt pressurized water reactor (W) under construction at Buchanan, New York, was made on January 26, 27, and 28, 1971. The inspection was directed toward the appraisal of the licensee-contractor efforts in selected elements of PI 3800/2. These areas included Attachment F, "Reactor Coolant Pressure Boundary Piping"; Attachment G, "Other Class I Piping"; and Attachment L, "Other Class I Components". In addition, the reactor vessel lifting incident and other outstanding inspection items were inspected.

SUMMARY

Safety Items - None

Nonconformance Items

Criterion VII, Appendix B, 10 CFR 50, entitled, "Control of Purchased Material, Equipment, and Services", states in part:

"Documentary evidence that material and equipment conform to the procurement requirements shall be available at the nuclear powerplant

site prior to installation or use of such material and equipment. This documentary evidence shall be sufficient to identify the specific requirements, such as codes, standards or specifications, met by the purchased material and equipment . . ."

Contrary to the above, the inspectors found that two of the steam generators and four accumulators have been set in place, and no documentation relative to the quality of these components was on site.

Unusual Occurrences

On January 12, 1971, WEDCO personnel were in the process of lifting the reactor vessel in preparation for removing the vessel shipping skid. During this operation, failure occurred in the lifting equipment causing the reactor vessel to be lowered from a vertical or near vertical position to a horizontal position at a "faster than intended rate". Preliminary investigations indicate the incident was caused by the failure of welds on the drive gear support structure and severance of the crane lifting cable. Visual inspection of the reactor vessel and containment structures indicate no apparent damage; however, detailed examinations are being conducted by Combustion Engineering and United Engineers and Constructors, respectively. (Section C)

Status of Previously Reported Problems

1. Refueling Canal Liner Welding Procedure (CO Report No. 286/70-4)

   Welding procedure WD-P8-TM6A-(52) has been developed and qualified in accordance with Section IX, ASME B&PV Code. This procedure appears adequate to perform the P-1 to P-8 welding required under the specification. Use of SA-298, Type 309 and 308 ELC welding rod on the refueling canal liner has been approved by the designer. This item is considered resolved.

2. NDT Procedure for Refueling Canal Liner (CO Report No. 286/70-4)

   The test procedure for vacuum box testing of the welds in the refueling canal liner was approved for use by WEDCO on October 9, 1970. This item is considered resolved.

3. WEDCO Disposal of Unused Weld Material Procedure (CO Report No. 286/70-4) and WEDCO Weld Material Control Procedure (CO Report No. 286/70-4)

   WEDCO electrode control procedure WD-WECD-(60) has been approved and implemented. All material is verified for compliance with purchase documents by receiving inspection prior to release for storage in welding material warehouse. Issuance of material is controlled by withdrawal forms specifying type, size, and amount authorized by the welding foreman. Included, also, are disposal of unused weld material instructions. This item is considered resolved.

4. Welding Procedure Nos. 1 and 20, Not IAW ASME, Section IX (CO Report No. 286/70-4)

Welding procedures Nos. 1 and 20, Addendum 2, specify the inert gas flow rate for shielding and purge. Addendum 3, specifies the preheat temperature for various thicknesses of material. In addition, the procedure specifies a stress relief temperature of 1100°F to 1200°F. This item is considered resolved.

5. Acceptance Standards for NDT procedures (CO Report No. 286/70-4) and Cleaning Agents Authorized for Use by NDT Procedures (CO Report No. 286/70-4)

Branch Laboratory NDT procedures for PT and MT have been revised to establish acceptance standards to IAW, USAS B31.1.0-67. In addition, the PT procedure restricts the use of cleaning agents to acetone only. These items are considered resolved.

Other Significant Items

1. Reactor Coolant Pressure Boundary Piping

The inspector performed a review of the QC system in accordance with Attachment F, "Reactor Coolant Pressure Boundary Piping", PI 3800/2. The inspection covered items 4805.04.a.1, a.3, e.4; 4805.04.g.3 and g.5.

Those items inspected appeared to be in agreement with commitments in the FSAR.

2. Main Steam Piping

The inspector performed a review of the QC system in accordance with Attachment G, "Other Class I Piping" (main steam piping) PI 3800/2. The inspection covered items 4805.04.a.1, a.3, e.3, e.4, and g.5.

Those items inspected appeared to be in agreement with commitments in the FSAR.

3. Safety Injection Piping

The inspector performed a QC record review in accordance with Attachment G, "Other Class I Piping" (safety injection piping), PI 3800/2. The inspection covered items 5005.05.a.1, Material Certification, and 5005.05.a.2, Materials.

Those items inspected appeared to be in agreement with commitments in the FSAR. Fourteen spool pieces having weld end preparations not in conformance with the purchase specifications (9321-05-248-32) were returned to the fabricator (Tubeco) for rework.

4. Steam Generators and Accumulators

The inspector performed a review of the QC system and QC record review in accordance with Attachment L, "Other Class I Components" (steam generators and accumulators), PI 3800/2. The inspection covered items 4905.04.a; 4905.04.b.1 through and including 4905.04.b.8; 4905.05.a.1 through a.3; and 4905.05.b.

Those items inspected appeared to be in agreement with the PSAR commitments; however, no evidence of material conformance to purchase documents was available on the construction site as required by Criterion VII, Appendix B, 10 CFR 50. (See Nonconformance item)

Management Interview

A management exit interview was held on January 28, 1971, at the construction site. The following personnel were in attendance.

Mr. J. A. Corcoran, Site Superintendent, Con Ed
Mr. E. J. Dadson, QA Engineer, Con Ed
Mr. F. M. Matra, IP-3 Project Superintendent, Con Ed
Mr. W. Diebler, WEDEO Quality Control Manager

The following significant items were discussed:

The inspector stated purchase documents for the steam generators and accumulators were not available at the construction site for use by the receiving inspection group. In addition, documentary evidence of material as required by Criterion VII, Appendix B, 10 CFR 50.

Messrs. Corcoran and Diebler stated the contractual arrangements between Con Ed and Westinghouse did not require this information to be available on the construction site until the plant was completed. Mr. Corcoran stated further consideration of this arrangement would be undertaken by Con Ed with Westinghouse. The inspector stated a CDN would be considered for this matter.

The inspector stated the investigation of the reactor pressure vessel lifting incident appeared adequate.

Mr. Corcoran stated the results of the investigation and subsequent reports of findings would be made available to the inspector.

DETAILS

A. Persons Contacted

The following personnel were contacted during the course of the inspection.

Con Ed

Mr. J. A. Corcoran, Site Superintendent
Mr. E. J. Dadson, QA Engineer
Mr. F. M. Matra, IP-3 Project Superintendent
Mr. R. M. Schuster, QC Engineer (NDT)

WEDCO

Mr. M. Snow, Manager, Reliability and QA
Mr. W. Diebler, Manager, Site QC
Mr. S. M. Roberts, Reliability Engineer
Mr. F. Hazard, QC Engineer, Piping
Mr. J. McLaughlin, Field Welding Engineer
Mr. W. Seeley, Receiving and Storage Inspector
Mr. C. Bliesener, Quality Planning Engineer

B. Status of Construction

The licensee reported the construction to be approximately 48% complete at the time of the inspection.

C. Reactor Vessel Lifting Incident

The previously reported* reactor vessel lifting incident was investigated during this inspection. On January 12, 1971, the reactor vessel was being lifted in preparation for removing the vessel shipping skid. During this lifting operation, failure occurred in the lifting equipment causing the vessel to be lowered from a vertical position to a horizontal position at a "faster than intended" rate. Observations by personnel at the scene of the incident are not consistent. Reports indicate the vessel was in the upright (vertical) position and may have been a maximum of three inches above the deck at the start of the incident. The consensus of the observers appears to be that the crane was supporting the full weight (441 tons) of the vessel and shipping skid but it had not been lifted completely clear of the deck.

Immediately prior to the incident, Mr. M. C. Stattler, Service Engineer of the Whiting Company (crane manufacturer), who was on the bridge of the crane, heard an unusual noise described as a "loud pop". At this time, Mr. Stattler halted the lift and initiated a visual inspection of the mechanical equipment

*Inquiry Memorandum 286/71-A

on the bridge, including the cable. No abnormalities were evident. Mr. Stattler started to descend to an elevation where the lower portion of the crane drum could be visually inspected when the vessel started to descend. The estimated elapsed time for the vessel to reach the horizontal position was 15 to 30 seconds. A photograph taken when the vessel was approximately 30° from the horizontal position shows all cables (16 pair) to be taut with no coiling or wrapping evident. After the vessel and skid were in the horizontal position, the crane cables were found to be frayed and severed in at least two places and the free ends of the cables were coiled and wrapped around the remaining cable.

Subsequent visual inspection of the crane revealed weld failures and a distorted support plate in the gear support assembly. With the support plate in the distorted condition, the reduction gear assembly was allowed to disengage from the drum drive gear. Under these conditions, the system becomes "free wheeling."

The cause of the lifting equipment failure has not been determined. The cable manufacturer has obtained a sample of the cable for analysis and the gear support assembly failure is being investigated by the crane manufacturer.

Combustion Engineering, Westinghouse, and Oak Ridge National Laboratory (Con Ed agents) have conducted preliminary visual inspections of the reactor vessel and structures below the point of impact. No evidence of damage was apparent.

Combustion Engineering has prepared a detailed inspection procedure for evaluating the servicability of the reactor vessel. This has been approved by both Westinghouse and Con Ed. The essential elements are as follows:

MT of vessel exterior in the impact areas and surfaces extending approximately six inches in all directions will be accomplished.

PT of vessel interior cladding for these same locations is also planned.

Dimensional inspections will be conducted and compared to data entered on CE shop inspection records.

Functional inspections of vessel flange stud holes and bottom head instrument tubes will be accomplished using go-no-go plug gages.

United Engineers and Constructors will perform a detailed stress analysis of the containment structures below the point of impact.

The results of the detailed analysis will be reviewed by CO:I when completed.

Consolidated Edison Company
Indian Point 3

Feeder Report
CO Report No. 286/71-1

Date of Inspection: January 26, 27, and 28, 1971

Feeder Report By: Ross L. Brown — 2/25/71

Ross L. Brown, Reactor Inspector — Date

SCOPE

The inspection consisted of a detailed review of those inspection points outlined in Provisional Instructions 4805.04.a.1, 4805.04.a.3, 4805.04.e.3, 4805.04.e.4, 4805.04.g.3 and 4805.04.g.5 of Attachment F - Reactor Coolant Piping; 4805.04.a.1, 4805.04.a.3, 4805.04.e.3, 4805.04.e.4, 4805.04.g.3, 4805.04.g.5, 5005.05.a.1, a.2 and 2.3 of Attachment G - Main Steam Piping; 4905.04.a through 4905.04.b, 4905.05.a.1, 4905.05.a.3 and 4905.05.b of Attachment L - Steam Generators and Accumulators; 4905.04.a of Attachment L - Main Steam Isolation Valves and 5005.05.a.1 and 5005.05.a.2 of Attachment G - Safety Injection System Piping.

SUMMARY

The inspector reviewed the available purchase orders, specifications, procedures, and records pertinent to the above components and found the following outstanding items:

1. The Westinghouse purchasing documents for the steam generators and accumulators, were not available at the construction site for review by the inspector or to assist WEDCO, receiving inspection department. (See Attachment L - 4905.04.a and 4905.04.b.2).

2. Manufacturers certification records for the steam generators and accumulators were not at the job site for review to determine acceptability of these components. (See Attachment L - 4905.05.b).

Persons Contacted:

Ed Dadson, Con Ed QA Engineer
R. Schuster, Con Ed QC Engineer (NDT)
W. Diebler, WEDCO QC Manager
F. Hazard, WEDCO QC Engineer (pipe Welding)
J. McLaughlin, WEDCO Field Welding Engineer
W. Seeley, WEDCO Receiving and Storage Inspector

DETAILS

Attachment F - Reactor Coolant Piping

This report covers PI 4805.04.a.1, 4805.04.a.3, 4805.04.e.3, 4805.04.e.4, 4805.04.g.3 and 4805.04.g.5 only.

Welding (4800)

Review of QC Systems (4805.04)

1. Qualifications (4805.04.a)

   a. Weld Procedures (4805.04.a.1)

      Courter's Welding Procedure No. 8, Addendum 2, specifies the shielding gas flow rate which is the same flow rate as that used during the successful qualification of the procedure.

   b. NDT Techniques (4805.04.a.3)

      WEDCO does not require qualification of the NDT procedures (RT, MT, PT and UT) because the system is fabricated in accordance with USAS - B31.1.0 - 1967, Power Piping Code which does not require procedure qualification.

2. Nondestructive Testing (4805.04.e)

   Dye Penetrant Examination (4805.04.e.4)

   Branch Procedure Examination No. LP has been revised to include:

   a. Cleaning agent to be used shall be Acitone only.

   b. Acceptance criteria has been established in accordance with USAS - B31.1.0 - 1967, Power Piping Code.

3. Welding Material Control (4805.04.g)

   Issue Control (4805.04.g.3) and Disposition of Unused Material (4805.04.g.5)

   WEDCO Electrode Control Procedure WD-WECP-(60), specifies the control of issuance and return of unused welding materials. All welding material is verified for compliance with purchase documents by receiving

inspection prior to release for storage in welding materials warehouse. Issuance of material is by a withdrawal request form, stating the type, size, amount, and signed by the welding foreman.

Attachment G - Main Steam Piping

This report covers PI 4805.04.a.1, 4805.04.a.3, 4805.04.e.3, 4805.04.e.4, 4805.04.g.3, and 4805.04.g.5.

Welding (4800)

1. Qualifications (4805.04)

   a. Welding Procedures (4805.04.a.1)

      Courter's Welding Procedure No. 1 and 20, Addendum 2, specifies the inert gas flow rate for shielding and purge. Addendum 3 to this procedure specifies the preheat temperatures for various thicknesses of material, e.g., 1 to 1-1/4 inch 200° F min., over 1-1/4 inch 300° F min., and interpass temperature of 500° F maximum. The procedure has been revised to specify a stress relief temperature of between 1100° and 1200° F.

   b. NDT Techniques (4805.04.a.3)

      Covered in Attachment F.

2. Nondestructive Testing (4805.04.e)

   a. Magnetic Particle Examination (4805.04.e.3)

      Branch Procedure MP has been revised to establish the acceptance criteria which is in accordance with USAS B31.1.0 - 1967, Power Piping Code.

   b. Dye Penetrant Examination (4805.04.e.4)

      Covered in Attachment F.

3. Welding Material Control (4805.04.g)

   Issue Control (4805.05.g.3) and Disposition of Unused Materials (4805.04.g.5)

   Covered in Attachment F.

Attachment G - Safety Injection Piping

This report covers 5005.05.a.1 and 5005.05.a.2 only.

Piping (5000)

Record Review (5005.05)

1. Material Certifications (5005.05.a.1),

   Chemical Composition (5005.05.a.1.a),

   Physical Characteristics (5005.05.a.1.b),

   Nondestructive Testing (5005.05.a.1.c), and

   Wall Thickness (5005.05.a.1.d)

   The subassemblies for this piping system were fabricated by the Tubeco Co. Their quality certification package contains the following information. No discrepancies were noted during the review of these documents.

   a. Spool piece sketches (Tubeco).

   b. Material identification (Tubeco).

   c. Nondestructive testing procedures and results (Tubeco).

   d. Dimensional inspection acceptance (Tubeco).

   e. Cameron Iron Co. material certifications for straight pipe lengths which includes heat number, chemicals, physicals, heat treatment, hydrostatic test results and flattening tests in accordance with ASTM-A376, Type 316 and supplements S-2, S-4 and S-6.

   f. Taylor Forge Co. material certifications for fittings (tees and elbows), includes heat numbers, chemicals, physicals, heat treatment, nondestructive test results in accordance with ASTM-A403, Type 316.

2. Records of Received Material Indicating Disposition and Quarantine of Nonconforming Materials (5005.05.a.2)

WEDCO receiving inspection identified 14 Tubeco spool pieces as having weld end preparations that were not in conformance with the UE&C Specification 9321-05-248-32 requirements. The discrepancies were identified in WEDCO "Nonconformance Report No. 3-86" dated December 15, 1970, and signed by F. L. Hazard.

The disposition of these spools was to return all spools to Tubeco for necessary rework and inspection.

This condition had been reported in WEDCO-QC-Representatives Vendor Inspection Report, but a WEDCO upper management decision was made to ship the items to the site for evaluation and the inspector was instructed to release these spool pieces for shipment.

Attachment L - Steam Generators and Accumulators

This report covers PI 4905.04.a, 4905.04.b.1 through 4905.04.b.8, 4905.05.a.1, a.2, a.3 and 4905.05.b only.

Mechanical Components (4900)

1. Review of Quality Control System (4905.04)

a. Procurement (4905.04.a)

The steam generators and accumulators were purchased by Westinghouse (W) and none of the purchasing documents (purchase order, specification, drawing, etc.) were available at the construction site for review to determine if the inspection points of this section of the PI were adequately satisfied.

b. Receipt and Storage (4905.04.b)

(1) Definition of Responsibility for Receipt Inspection and Storage (4905.04.b.1)

WEDCO Procedure WQA-4-0 assigns and designates these responsibilities.

(2) Adequate Information Available at the Construction Site to Guide Inspection (4905.04.b.2)

WEDCO receiving inspection department does not have the W purchasing document (see 4905.04.a, above) available to assist them during inspection.

WEDCO did not receive a W "Quality Control Release" for these items. They reviewed information available on the name plate attached to these units and assumed since it contained a Code Stamp and National Board Number, the units were acceptable for installation. Receiving inspection performed a visual inspection for quantity, identification, and damage only.

(3) Adequate Storage Provided for Components Requiring Controlled Storage (4905.04.b.3), Adequate Provisions and Instructions are Available for Periodic Inspections of Stored Components (4905.04.b.4) and Provisions for Monitoring and Replenishment of Desiccant Inert Gases, Plugs and Seals (4905.04.b.5)

WEDCO Storage Inspection Instructions No. S-1 and Storage of Rotating Equipment No. EM-1, specifies these requirements, assigns the responsibility for their implementation and requires a record of results where applicable.

(4) Provision to Accomodate Special Handling and Storage Requirements, and Procedures to Identify these Special Precautions (4905.04.b.6)

WEDCO Storage Inspection Instructions S-1 specifies storage conditions for items requiring special storage, but since WEDCO does not have the W specification to identify these special requirements, they are forced to use their judgement as to the requirements and also the adequacy of the storage conditions.

(5) Identification and Quarantine of Nonconforming Components (4905.04.b.7)

WEDCO Procedure No. WQA-4-1 "Control of Nonconforming Materials at Site.", provides for hold tags, discrepancy reports and disposition, but does not require isolation by physical separation from acceptable components.

(6) Record Keeping Requirements (4905.04.b.8)

The above WEDCO procedures that govern their activities at the Construction site do require a record of the inspection results.

2. Record Review (4905.05)

a. Each Component (4905.05.a)

(1) Nameplate Information and Condition of Component upon Receipt 4905.05.a.1)

WEDCO - QC Inspection Report (Receiving) records the condition of the component as received and all the information on the nameplate. In many cases they make a rubbing reproduction of the nameplate.

(2) Records of a Stored Component (4905.05.a.2) and Records of Installed Components (4905.05.a.3)

A sample audio of these WEDCO records indicate the components are being periodically inspected in accordance with the WEDCO procedural requirements.

b. Review of Manufacturing Records to Assure Material Identification, Certification, and Conformance to Requirements (4905.05.b)

Manufacturers records for these units were not available for audio. Mr. Diebler stated these records are maintained by W in Pittsburgh, Pennsylvania and will not be delivered to the construction site for review.

Attachment L - Main Steam Isolation Valves

This report covers PI 4905.04.a.1 through 4905.04.a.

Mechanical Components (4900)

Review of Quality Control System (4905.04)

Procurement (4905.04.a)

1. Design, Testing and QC Specifications (4905.04.a.1), Responsibility for Packaging and Shipment (4905.04.a.2), Special Provisions (4905.04.a.5), Cleanliness Requirements (4905.04.a.7) and Requirements for Special Packaging and Shipping (4905.04.a.6)

   The WEDCO Purchase Order No. 4758-9321-05-248-1A to the Atwood and Morrill Company and these attached documents UE&C "Specification for Main Steam Stop and Non-Return Valves" No. 9321-05-248-1, UE&C "Quality Assurance Specification for Class I Valves" No. QCV-1, Addendum 1, Drawing No. 5000-LL-1147, and Seismic Criteria for system materials, equipment, etc., consisting of instructions and sketches No. 9321-05A and 9321-05B. These documents establishes requirements for the design, material specifications, quality assurance (inspection and testing), cleaning, packaging, and documentation to be furnished to WEDCO for all Class I valves.

2. Purchaser Review and Approval of Packaging and Shipping (4905.04.a.3) and Provisions for Factory Technical Assistance (4905.04.a.4)

   WEDCO does not consider these PI sections as applicable to these components.