

U. S. ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE

REGION I

INSPECTION REPORT

CO Report No.: 71-03

Subject: Metropolitan Edison Company

Three Mile Island Units 1 and 2

Location: On Susquehanna River, South of  
Harrisburg, Pennsylvania

050-00320

Docket No.(s): 050-00289

License No.(s): CPPR-40 & 66

Category A

Date of Inspection: June 24-25, 1971

Date of Previous Inspection: April 5-8, 1971

Type of Licensee: PWR, 2535 Mwt (B&W)

Type of Inspection: Routine, Announced

Principal Inspector: J. H. Tillou  
J. H. Tillou, Reactor Inspector

7-29-71  
Date

Accompanying Inspectors: A. V. J. Burzi  
A. V. J. Burzi, Reactor Inspector (Const.)

7-29-71  
Date

D. M. Hunnicutt, Sr. Reactor Inspector, CO:III

Other Accompanying Personnel: W. H. Baunack, Reactor Inspector (Operations)

Reviewed by: E. M. Howard  
E. M. Howard, Senior Reactor Inspector

7-29-71  
Date

Proprietary Information: NONE

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SECTION I

Enforcement Action

None

Licensee Actions on Previously Identified Enforcement Matters

A. CDN, Dated April 20, 1971 Regarding Cable Pull Slips and Lack of Separation In A Redundant 480 Volt Cable

A reply was received on June 23, 1971 from Mr. J. G. Miller. This was considered unsatisfactory by CO:I and a telecon was made to Mr. Miller explaining our concern. A revised copy was promised and was subsequently received on July 2, 1971, which acceptably stated the position and corrective action to be taken by the licensee. This item is now considered resolved.

B. Concrete Poured In Reactor Building Wall in Contact With Less Than 32° F Concrete

The CDN covering this subject was forwarded to the licensee on February 12, 1971. An answer was received on March 8, 1971 which was not considered acceptable nor to have established adequate corrective action for the entire problem. The subject was next brought up at an ACRS subcommittee meeting at the reactor site on May 26, 1971. This meeting was continued at Bethesda on May 27, 1971 at which time the subject was discussed in detail with the DRL and CO technical support groups who accepted the preliminary verbal statements and reports of the licensee, which were to be verified and documented in a formal report for DRL and CO files. This item is considered resolved.

C. Grinnell Company Failure to Provide Material Certificates for Engineered Safeguard Piping Systems In Accordance With Criterion VII, Appendix B, 10 CFR 50

The licensee has contacted the Grinnell Company at both their Kernersville, North Carolina and Warren, Ohio, plants and has scheduled audits for the first week in August, at which time they intend to resolve the deficiencies presented by this problem. This item will remain open and will be followed up on subsequent inspections. (Paragraph 8)

Unresolved Items

None

Status of Previously Reported Unresolved Items

A. Attachment Studs for Reflective Insulation

This item remains unresolved. (Paragraph 3)

B. Licensee's Failure to Require QA/QC Participation in Piping System Over-Pressure Hydro Tests (A Responsibility of the Met Ed Operations Group)

The CO inspector will audit implementation of this program during subsequent inspections. (Paragraph 4)

C. 100% UT of the Reactor Vessel Shell and Nozzle Welds

The CO inspector will followup this item during the next inspection. (Paragraph 5)

D. Disposition of Three Reactor Vessel Nozzle Weld Preparations, Damaged in Transit

This item is considered resolved. (Paragraph 6)

E. Core Flooding Tanks Fabricated Without NDTT Test Records

The CO inspector will continue to followup this item until resolved. (Paragraph 7)

Persons Contacted

Met Ed

- Mr. J. G. Miller, Vice President, Engineering
- Mr. George Bierman, Project Manager, Met Ed
- Mr. Matt Stromberg, Met Ed Senior Site QA Engineer
- Mr. Larry Lundstrom, QA Engineer, Structural and Piping
- Mr. Leroy Price, QA Engineer, Structure and Tendons
- Mr. Jack Wise, Operations Supervisor, Unit 1
- Mr. William Shepard, Site Resident Engineer
- Mr. Joe Stoudt, QA Engineer, Electrical
- Mr. Vern Stuebner, Site Electrical Engineer

UE&C

- Mr. J. Fant, Senior Site QA/QC Supervisor
- Mr. Carl Brooks, Piping Superintendent
- Mr. Robert Thomas, Site QA Engineer

1419 149

B&W

- Mr. Jack Uhle, Three Mile Island Site Manager

Management Exit Interview

The following persons attended a site exit interview held on the afternoon of June 25, 1971.

Mr. M. Stromberg, Met Ed QA Supervisor  
Mr. W. S. Shepard, Three Mile Island Resident Engineer  
Mr. N. Goodenough, Met Ed/GPU QA Specialist  
Mr. L. Lundstrom, Met Ed QA Engineer  
Mr. L. Price, Met Ed QA Specialist  
Mr. J. R. Stoudt, Met Ed Electrical Engineer  
Mr. V. Stuebner, Met Ed Resident Electrical Engineer

The following items were discussed.

A. Licensee's Failure to Require That Grinnell Supply Complete Material and Fabrication Records for Piping Spools in Class N-1 Systems

Mr. Stromberg stated that Met Ed had been concerned regarding the Grinnell failure to comply with the requirements of Criterion VII, Appendix B, 10 CFR 50 and has scheduled an audit at their facility the first week in August 1971, to both bring the records up to date for material received on site and arrange for simultaneous delivery of material and records in the future.

B. Placement of Concrete At Temperatures Below 32°F

The CO inspector expressed his concern that this nonconformance, which occurred in January of 1971, still had not been resolved.

Mr. Shepard produced a preliminary copy of the Gilbert Associates report, dated January 15, 1971, "Evaluation of Concrete Placed in the Fuel Handling Wall on January 8, 1971", which concluded that after tests of cores taken from the concrete, micro-inspection, and engineering evaluation by consultants that the concrete was "OK, as is, for service, durability, and safety". Mr. Shepard further stated that this report has not as yet been completely reviewed and approved by Met Ed but will be expedited in time for formal presentation to DRL at a meeting scheduled in Bethesda on June 29, 1971.

C. Subject of Welding Studs to the OD Surface of the Reactor Vessel, the Pressurizer and the Steam Generators for Installation of Reflective Insulation Blankets

Mr. Shepard produced evidence of an exchange of correspondence between Met Ed and B&W, Barbarton, which verified that prior to final stress

relieving each of the subject vessels had had one quarter inch thick pads welded to the exterior surface in the locations designated by the revised GAI drawing to provide an area for welding insulation studs. Mr. Shepard stated that B&W has not, to date, provided as-built drawings for these vessels but has agreed to expedite these and have them available in the very near future. He will continue to followup on this item and make the drawings available to the CO inspector in the near future.

D. Ultrasonic Inspection of the Seam and Nozzle Welds on the Reactor Vessel

Mr. Neil Goodenough reported that the UT is being conducted by a special CONAM research technician as insurance against the possible existence of rejectable defects such as were found in the Zion vessel. The work has been completed on the reactor vessel and is planned for the steam generators and pressurizers, although this is being delayed by the site work stoppage since the CONAM technicians are affiliated with the operating engineers union. Mr. Goodenough also stated that the work being done manually by the CONAM technicians is considered an insurance-type inspection. The results cannot be used for the in-service inspection baseline records, which will be accomplished by an automated technique being developed by Southwest Research Institute. Mr. Goodenough further stated that the results, when complete, will be made available to the CO inspector as part of the package of records for the reactor vessel, steam generators, and pressurizer.

E. Code Hydro Testing of Piping (Over-Pressure Tests)

Mr. Shepard stated that the responsibility for all hydro testing of completed piping systems has been delegated to the site operations group. They prepare procedures, test parameters, calibration of gages, establish water quality, venting requirements, valve check-off lists, and define the boundaries for each test. In addition, they provide color coded sign-off sheets for the testing technicians and QC representatives. The actual test work on site is delegated to the UE&C test and preoperational group under the supervision of the Met Ed operations personnel.

The special procedures used for the testing of the NSSS system are developed by B&W, approved by the Met Ed operations group, and implemented by the UE&C test and operational personnel, with all final tests witnessed by the B&W site representative. The CO inspector agreed that the planning appeared adequate and that preparations had been made to provide reliable information by these tests.

F. Core Flooding Tanks Without NDTT Tests

Mr. Shepard stated that the core flooding tanks manufactured by Stearns-Roger for B&W were not fabricated of material which had been NDTT tested. The tanks are presently in a "rejected" status. However, Met Ed has agreed that they will be acceptable, provided GAI develops a hot air heating system and a shroud which will maintain the core flooding tanks and the included water at all times above the critical 115° F NDTT. The core flooding tanks will also have to meet the other specification requirements for surveillance, testing, operation and general service.

G. Decay Heat Coolers

Mr. Shepard stated that the decay heat coolers, which had been cleaned in a chlorinated solvent, were returned to the fabricator, Whitlock Manufacturing Company, for recleaning and corrective action. They are scheduled for return to the site in July 1971. Met Ed has advised Whitlock Manufacturing to hold the coolers at their manufacturing facility until the present work stoppage on site has been settled.

SECTION II

Additional Subjects Inspected, Not Identified in Section I, Where No Deficiencies or Unresolved Items Were Found

1. Feedwater System

This system was selected for inspection, and the following areas relative to welding of this piping system were evaluated:

- a. Implementation of the QA program.
- b. Quality control procedures, work performance procedures, and/or record keeping for the following items applicable to this system.
  - (1) Qualification of weld procedures, welders, NDT techniques, and technicians.
  - (2) Identification of weld location, welders, NDT technicians, NDT procedures, and NDT results.
  - (3) QC inspector's procedures to specify performance of root inspection of joint preparation, environmental control, root gap, alignment, root pass, and completed welds.
  - (4) Verification of heat treat, interpass temperature, post-weld controlled cooling, and stress relieving.
  - (5) Evaluation of radiographic quality, weld quality, magnetic particle, dye penetrant, and ultrasonic evaluation.
  - (6) Correlation of records to welds.
  - (7) Defect removal techniques, removal verification, and acceptance.
  - (8) Material receiving and post-issue environmental control of electrodes.
- c. The following records were reviewed as applicable to this piping system.
  - (1) Visual inspection.
  - (2) Heat treat records.
  - (3) NDT records.
  - (4) Repair records.
  - (5) Materials control.

1419 153

d. No work practices were observed since there was no work being performed on the construction site as a result of the operating engineers work stoppage.

The following items were inspected to verify that the licensee had met construction requirements on materials, procurement, fabrication, and erection.

- a. Implementation of QA program.
- b. Quality control procedures and quarantine of nonconforming material.
  - (1) Materials certifications covering the chemical, physical and nondestructive requirements.
  - (2) Receiving procedures and quarantine of nonconforming material.
  - (3) Storage identification, control and protection requirements.
  - (4) Installation of hangers, bellows, snubbers and installation NDT.
  - (5) Cleanliness and hydrostatic testing.
- c. The following records were reviewed as applicable to this piping system.
  - (1) Material certificates covering chemical, physical and nondestructive testing, etc.
  - (2) Vendor's inspection report and site receiving records.
  - (3) No work practices could be observed since there was no piping activity on site due to the work stoppage by the operating engineers.

2. Electrical Components and Cables

The following areas of this subject were inspected:

- a. Implementation of QA program.
- b. Quality control procedures for work performance and record keeping applicable to this program.
  - (1) Handling and storage.
  - (2) Receiving and quarantine of nonconforming materials.
  - (3) Installation procedures and instructions.
  - (4) Inspection and preoperational testing.

1419 154



c. The following records were reviewed as applicable to these activities:

- (1) Cable pull cards for safeguards and nonsafeguards cables.
- (2) Color coding cables.
- (3) Electrical connections tests.
- (4) Cable receiving records.
- (5) Installation records for cable trays and conduit.
- (6) NDT records from cable vendors.

d. Work practices were observed within the limitations of the slow down in site activities created by the operating engineers work stoppage.

- (1) Installation techniques.
- (2) Storage protection of installed items.
- (3) Use of specified materials.
- (4) Cable routing.
- (5) Wireway loading.

Details of Subjects Discussed in Section I

3. Attachment Studs for Reflective Insulation

No procedures or inspection planning for the welding of attachment studs to the exterior of the reactor vessel, steam generators and pressurizers could be produced. Mr. William Shepard stated that he is following up B&W for up-to-date, as-built drawings of these vessels to verify that one quarter inch thick pads have been welded to the exterior of the vessels prior to its final stress relieving to accept the reflective insulation studs called out on the latest Gilbert Associates drawing. He agreed to have these as-built B&W drawings available for the inspector's review at the next inspection. This item remains unresolved.

4. Licensee's Failure to Require QA/QC Participation in Piping System Over-Pressure Hydro Tests

Discussions with Mr. J. Wise, Head of the Met Ed Site Operations Group, indicate that they will prepare the generic specifications for testing, including the pressures to be used, the venting, valve check-off list, the defined boundaries for each test, and will provide color coded sign-off sheets. Each specific system procedure will require review and approval by Met Ed site QA/QC representative. Specific procedures for the NSSS system are being developed by B&W to provide smooth interface and uniform testing procedures throughout all segments of each piping system. It appears that the licensee has revised his procedures to be in conformance with the PSAR commitments for testing of the piping. The CO inspector will audit implementation of this program during subsequent inspections.

5. 100% UT of RV Shell and Nozzle Welds

Based on the defects identified in the Zion vessel during UT baseline inspection, the licensee has elected to conduct a complete UT inspection of his reactor vessel seam and nozzle welds. This is being accomplished by the CONAM Inspection Agency. It is incomplete to date, since the CONAM technicians are affiliated with the operating engineers, who are on strike. The preliminary results indicate that the reactor vessel and pressurizer have no defects in excess of the code but the steam generator has not yet been scanned. The CO inspector will followup on this item during the next inspection.

6. Disposition of Three RV Nozzle Weld Preparations, Damaged in Transit

The B&W site representative prepared an "NSSS Component Deviation Report" on April 26, 1971, covering the damage to the "land" of the weld preparations. The repair was accomplished by machining one quarter inch off from the damaged lip of the weld prep utilizing special equipment forwarded by B&W from their Barbarton plant. The entire repaired area and nozzle to shell weld was dye penetrant inspected and found to be acceptable by the B&W site representative. This item is considered resolved.

7. Core Flooding Tanks Fabricated Without NDTT Test Records

1419 156

These items were rejected by B&W at the site; however a decision has been made and agreed to by Met Ed that the core flooding tanks can be used with the addition of a shroud and a hot air heating system to maintain all pressure restraining portions of the tank at a temperature above the 115° NDTT level. Mr. William Shepard, Met Ed Site Engineer, is working with GAI on this design and has agreed to keep the CO inspector current with developments as they occur.

8. Licensee's Failure to Require That The Piping Fabricator Provide Complete Documentation Records for Class N-1 Piping Spools

It was stated that the original purchase order to Grinnell had not required complete documentation with each shipment from Grinnell. Rather, it required that Grinnell forward required documentation to the site upon the completion of shipment of each system. It was further stated that the UE&C vendor inspection records showed that the documents had been reviewed at the Grinnell facility covering the materials, welding, finishing, the identification, workmanship, and nondestructive testing for each item prior to its shipment. It was finally pointed out that accompanying each shipment was a certificate of compliance from Grinnell stating "The items on this shipment meet the Grinnell standard specification and the individual shop fabrication sketches" and explained that the Grinnell specification and each shop fabrication sketch had been approved by Gilbert Associates prior to their use in fabrication. The inspector pointed out that the above did not meet the intent of Criterion VII which Met Ed stated will be backfitted to this facility.