

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

Report of Inspection

CO Report No. 247/69-3

Licensee: CONSOLIDATED EDISON COMPANY
Indian Point No. 2
License No. CPRR-21
Category A

Dates of Inspection: March 4 and 5, 1969

Dates of Previous Inspection: January 20 and 24, 1969

Inspected by: N. C. Moseley for 3/25/69
G. L. Madsen, Reactor Inspector Date

Reviewed by: N. C. Moseley 3/25/69
N. C. Moseley, Senior Reactor Inspector Date

Proprietary Information: None

SUMMARY

The reactor vessel, steam generators, primary pumps, pressure relief tanks, and safety injection accumulator tanks have been positioned. The pressurizer has not been received from the vendor.

A deviation from the retest requirement of the cadweld procedure is considered resolved by an after the fact evaluation; however, the condition was indicative of a failure to adhere to established procedures.

The field welding of 20 reactor coolant system joints is in progress. An audit of the quality assurance program revealed generally acceptable conditions; however, the substitution of 308 for 316 electrode material is another indication of failure to follow approved procedures. This topic will require additional resolution.

Progress toward determining the cause and general significance of a previously identified safety injection pipe deficiency has been stagnant.

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The repair and final license analysis of quality deficiencies in the conventional piping procured from Dravo is nearing completion.

The final fitup of the four steam generators is complete and formation of two girth welds is in progress. An addendum to the welding procedure is to be provided to define stress relieving limitations. Records and observation indicated to the inspector that the girth welding of the steam generators is being properly controlled.

An inspection of component storage revealed some stainless steel safety injection piping in temporary storage in contact with carbon steel components.

The inspectors noted nonconcentric machining, with respect to outside diameter of two reactor nozzle end weld prep areas. These conditions were questioned with respect to wall thickness and notch stress concentration.

UE&C has subcontracted the pipe welding to the J. Courter Company. The need for requalification of welders is a subject to be resolved.

DETAILS

I. Scope of Visit

The Consolidated Edison Company (Con Ed), Indian Point No. 2, IP-2 site was inspected by Messrs. G. L. Madsen and A. Varela, Reactor Inspectors, Region I, Division of Compliance, on March 4, and 5, 1969.

The following persons were contacted during the visit:

Con Ed

Mr. A. Corcoran, Site Construction Engineer
Mr. P. Leo, Assistant Site Construction Engineer
Mr. J. Dragosits, Welding Inspector

Westinghouse

Mr. G. Waldrop, Quality Assurance Engineer
Mr. T. Lawson, APED, Welding Engineer
Mr. B. Thompson, WHTD, Field Service Engineer
Mr. W. Loyal, APED, Metallurgical Engineer

United Engineers and Contractors (UE&C)

Mr. J. Fant, Quality Control Supervisor
Mr. R. Phelps, Mechanical Quality Control

U. S. Testing

Mr. E. Dadson, Quality Control Inspector
Mr. C. McDonnell, Quality Control Inspector

II. Results of Visit

A. Status of Construction

1. Containment Building

Concrete has been placed to the 158 foot elevation. The reactor vessel, primary pumps, steam generators, pressure relief tank and safety injection accumulator tanks have been positioned. The pressurizer has not been received from the vendor shop.

2. Turbine Building

The installation of the turbine condenser tubes continues. The majority of the piping has been erected and application of insulation material to the pipes and tanks was in progress.

3. Fuel Handling and Storage Building

As reported previously,* the problem with the floor section of the pit liner has been repaired. Further testing revealed gap areas between the side liner plates and the concrete. These conditions are presently being reviewed by Westinghouse.

4. Primary Auxiliary Building

Most of the major components are installed. Final fitup and pipe erection is in progress. External painting of components and pipes has been started.

*CO Report No. 247/69-2, Paragraph II.B.3.

5. River Intake Building

The installation of pumps and motors is complete. The motors have been checked for proper rotation.

B. Cadweld Splicing

The results, of a previous inspection*, indicated a deviation from the retest requirements of the cadweld procedure and the FSAR. As a result of these findings, Con Ed instructed UST to perform a detailed investigation of this subject. A report to Con Ed states that UST feels that the failed cadweld (No. 40-1099) should not be considered as a destructive test of a production splice for a cadweld crew. Some of the reasons given for this conclusion are as follows:

1. The fractured surface of the reinforcement bar, which separated from the cadweld sleeve, was microscopically examined. The fractured surface revealed a failure locus at the edge of the specimen with the remaining fracture presenting a condition indicative of failure through the crystals and not along the grain boundaries; whereas, in true tension load failures, free of structural or mechanical flaws, failure occurs by separation at the center followed by a shearing action on the remaining area.
2. Gripping jaw marks indented in the test specimen indicated that the tension machine jaws were 168° apart rather than the normal 180°. In this orientation when the force is applied a torsional force is exerted.
3. The section examined was slightly bowed. In this condition the specimen would be subject to a shear force in addition to the tension force.
4. The point of initial failure was located at a point where a surface depression was present. The depression was identified as caused by the mill handling equipment and was classified as not unusual. The indentation was located between the 168° gripper marks. This condition would result in a stress riser and a mechanical fault for testing.

*CO Report No. 247/69-2, Paragraph II.D.

For the above reasons, UST stated that the reported results were not representative of the true physical strength of the specimen. UST then evaluated the performance record of crew No. 40 and the results of the substituted specimen (cadweld No. 40-1177) and concluded that the required 1% sample of the crews had been removed and tested.

Available correspondence indicated to the inspector that the UE&C Design Engineering group approved the variance from the cadweld test procedure for this particular situation based on the marginal nature of failure with reference to cadweld workmanship.

Based on the findings of UE&C and UST, Con Ed feels that the intended requirements of the cadweld procedure have been met.

The inspector indicated that the UST findings provided evidence that the testing results of cadweld No. 40-1099 should be discarded. The inspector stated that this condition was indicative of failure to adhere to procedures and then explain away the condition after the fact. Con Ed generally agreed with this conclusion.

The inspector considers this subject resolved by the after the fact evaluation.

C. Reactor Coolant System

Records indicate that field welding of 20 of the 32 reactor coolant system welds is in progress. Two welds have been completed and accepted by Westinghouse and UE&C (FW 21-1 and FW 21-8). The inspectors review of records and field observations of these two welds, indicated the following:

1. Records are available that provide welder identification, fitup approval, material identification, and acceptability of liquid penetrant testing of the root pass, radiographic interpretation, and visual conditions.
2. The inspector viewed 10 radiographic films and found them to be of acceptable quality and that adequate identification was included on each film. Records indicate utilization of penetrometer shims to allow for weld reinforcements.

3. Records indicate that the material to be welded is type 316 stainless steel and the weld material to be ER-308 and E-308-15 and 16. The inspector pointed out that a previous procedure evaluation* indicated that the electrode to be used for welding type 316 material should be ER-316 and E-316-15 and 16. An amendment to welding procedure No. 8 was not immediately available; however, on the second day of the inspection a letter dated November 4, 1968 from J. M. McLaughlin, Manager, Welding and Pipe Installation, Nuclear Power Services, Westinghouse, was made available to the inspectors. This letter authorized substitution of 308 electrodes for 316 electrodes, as specified in welding procedure No. 8. The inspector stated that the authorized change appears to be acceptable; however, the lack of an available amendment to the procedure was another indication of failure to follow approved procedures and may be in conflict with the requirements of the FSAR. Mr. Corcoran agreed to pursue this matter with the intent of arriving at a Con Ed position.
4. Observation in the field indicated that the holding ovens are properly controlled and contained only 308 electrodes. No arc strikes were observed and the finished condition of FW 21-1 and FW 21-8 showed no evidence of undercutting, over-reinforcement, or undesirable contours.
5. UST made a surveillance inspection of the reactor coolant system welding, welding procedures and qualifications, fitup, level of cleanliness, and dye penetrant testing of root passes. This inspection was conducted during the period January 6 through 9, 1969. No deficiencies were identified.

Based on the above, the inspector considers FW 21-1 and FW 21-8 to be of acceptable quality; except that a procedure change is required to allow using 308 electrodes. The records are considered to be adequate and traceable.

*CO Report No. 247/69-2, Paragraph I.1.

As previously reported,* a wavey condition on the interior surface of the reactor coolant pipe was of sufficient magnitude to prompt checking of the wall thickness by ultrasonic testing. During additional investigations, Con Ed and UST identified additional wavey areas. Mr. Corcoran indicated that Westinghouse has been questioned relative to the acceptability of this condition.

During the field inspection, the inspector noted evidence of non-concentric, with respect to outside diameter, machining of the ends of the main coolant reactor vessel nozzle, next to field welds 21-1 and 21-8. The inspector asked if this machined condition presented a problem relative to wall thickness or concern about notch stress concentration because of the 45 degree machining angle. Mr. Corcoran was not aware of the condition, but volunteered to seek answers to these questions.

D. Safety Injection Pipe

The status of the evaluations relative to the previously reported** defective section (SI-108) of safety injection pipe was discussed. Mr. Corcoran indicated that no additional information is available on this subject. He also stated that Westinghouse has been asked to provide information relative to the cause of the condition and potential relationship to the remainder of the stainless pipe procured from Dravo. The inspector indicated that information on this subject seemed to be extremely slow in becoming available and that this problem would require continuing followup by Compliance.

Field observations of safety injection field welds revealed a condition where considerably more weld reinforcement was evident on one side of the pipe than was evident on the other. The inspector classified this as improper grinding of the completed welds. Upon inquiry, Mr. Dragosits agreed with the inspector's observation and stated that several conditions of a comparable nature exist; however, these welds are still classified as needing repair.

A review of these records indicated to the inspector that the required information on an individual field weld is available but the records do not permit easy evaluation of a system. Mr. Corcoran

*CO Report No. 247/69-2, Appendix I, Item A.9.

**CO Report No. 247/69-2, Paragraph II.G.

indicated that he was aware of the condition and hoped to see an improvement on this score with the recent employment of J. Courter Company as the pipe subcontractor.

E. Conventional System Piping

As previously reported,* quality deficiencies were identified in the conventional system piping procured from Dravo. A UST report to Con Ed indicates that UE&C and Westinghouse have essentially completed their quality assurance audit in the field and at the Dravo plant. Westinghouse submitted a report to the Con Ed Engineering office which, Mr. Corcoran states, includes a description of corrective actions taken in order to eliminate the identified deficiencies and to assure that the fabricated pipe meets the requirements of the purchase specifications. Mr. Corcoran indicated the the Con Ed engineering people are presently finalizing their evaluation of this problem and Con Ed is nearly prepared to take a final official position on this matter.

F. Steam Generator

As previously reported,** the Westinghouse welding procedure for the steam generator girth welds does not include temperature and holding times for local stress relieving. These conditions instead are included in a field erection instruction. The inspector pointed out that if stress relieving temperatures varied appreciably from those specified in the procedure for furnace stress relieving, that a requalification of the procedure would be required. Mr. Loyal stated that the point was indeed valid and that the stress relieving temperatures will be the same as specified for furnace treatment ($1125 \pm 25^{\circ}$ F and one hour soaking per inch thickness of material). He also indicated that an addendum to the procedure would be provided on this subject. The inspector indicated that this action would satisfactorily resolve this matter.

The four steam generators have been positioned and the final fitup of the tube and steam separator sections is complete. The maximum overlap observed was 1/4 inch. Welding of two girth welds was in progress. Observations of the work by the inspector,

*CO Report No. 247/69-2, Paragraph II.H.

**CO Report No. 247/69-2, Paragraph II.I.

indicated that the welding was being performed to the previously reviewed procedures; except, the minimum preheat temperature observed was 250° F. The welding procedure specified a minimum preheat temperature of 300° F. Upon inquiry, Mr. Loyal provided a document from the Manager of Metallurgy, WHTD, which authorized the use of a 225° F minimum preheat temperature. The inspector's evaluation of this change indicated that the code requirements were still attained.

Records indicate approval for final fitup, cleanliness, and preheat temperatures. The identification of weld materials used and welders performing the work is also included. The inspector audited the records relative to the weld activities in progress on steam generators Nos. 23 and 24. The records indicated that the girth welding was being performed according to procedure. Magnetic particle checks were performed on the inside and outside surfaces of the root pass and were found to be acceptable to the Magnaflux Corporation and Westinghouse.

G. Reactor Vessel

The machining of the lower internal core supports has been completed on five of the six supports.

H. Electrical

The status of cable placement between the control room, containment, and auxiliary building was essentially the same as observed during the last visit* to the site. Mr. Corcoran indicated that Westinghouse and Con Ed are presently making a re-evaluation of the cable routing paths and the construction activities have been halted in this area.

I. Storage

An audit of the externally stored components revealed the following:

1. Many large components for IP-2 and IP-3 were partially covered with snow. The components are generally wrapped in plastic or tarps. The existing condition is considered to be marginally acceptable.

*CO Report No. 247/69-2, Paragraph II.K.

2. The primary pump internals are presently stored out-of-doors. Observation around the storage location revealed the absence of recent tracks in the snow and could be an indication of lack of surveillance for these items. The inspector observed that the internals were enclosed in a "can"; the total housing is enclosed in a tarp, and heat lamps were in operation within the enclosure. The existing conditions were considered acceptable.
3. Several sections of safety injection piping had been unloaded near the auxiliary building and were awaiting installation within the building. The pipe was observed to be in direct contact with some reinforcement bars and grating. The inspector pointed out that this condition was considered to be a bad practice. Mr. Waldrop agreed and indicated the steps would be initiated to prevent a recurrence of a similar nature.

J. Pipe Contractor

Mr. Corcoran indicated that the J. Courter Company became the pipe welding subcontractor to UE&C effective February 19, 1969. The inspector asked if this change would necessitate requalification of the welders. Con Ed's initial position is that the piping is being erected to the requirements of the Code for Pressure Piping, ASA-B31.1 which permits a paper transfer of welder qualifications between companies. The inspector indicated that this subject would be audited during the next inspection.

III. Management Interview

An exit interview was held with Mr. Corcoran at the conclusion of the visit. The following items were discussed.

A. Reactor Coolant System

The inspector indicated generally acceptable findings with respect to the reactor coolant system audit; however, the subject of substitution of 308 for 316 electrodes must be resolved and is considered indicative of failure to follow procedures. Mr. Corcoran agreed to pursue this matter. The inspector stated that Compliance will be interested in reviewing the results relative to the wavy condition on the interior surface of the pipe pieces and significance of the identified spool piece machining condition.

B. Cadweld Splicing

The inspector indicated that evidence was provided which indicates that the testing results of cadweld 40-1099 should be discarded; however, this subject is also indicative of a failure to follow procedures in that the explanation was provided after the fact. Con Ed generally agrees with this conclusion.

C. Safety Injection System

The inspector indicated that the explanation relative to the significance of the previously identified defective section of safety injection pipe appeared unnecessarily slow in coming. Mr. Corcoran stated that he has been pressing Westinghouse on this subject and is also desirous of bringing this matter to a prompt conclusion. During subsequent telephone conversations with Messrs. Corcoran and J. Grob*. The inspector was informed that Con Ed will endeavor to bring this subject to a conclusion during the next month.

D. Conventional Piping

The subject of status of repair and evaluation of the conventional pipe quality problem was discussed. Mr. Corcoran indicated that Con Ed is nearly prepared to present a final position on this subject.

E. Steam Generator

The inspector indicated that the proposed addendum to the welding procedure for the steam generator girth welds would satisfactorily resolve this question and that observation and records indicated that work to date, has been performed according to procedures.

F. Storage

The inspector stated his observations of improper storage of stainless steel safety injection piping and evidence of the absence of surveillance for the stored primary pump internals. Mr. Corcoran stated that Westinghouse had been contacted on this matter.

*Assistant Mechanical Plant Engineer, Mechanical Engineering Department, Con Ed.

G. Pipe Subcontractor

The subject of employment of a new pipe welding subcontractor was discussed. Mr. Corcoran stated that the subject of welder qualifications requirements will be evaluated and appropriate actions will be taken.