

U. S. ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Construction Inspection

RO Inspection Report No. 050-346/74-04

Licensee: Toledo Edison Company  
Edison Plaza  
300 Madison Avenue  
Toledo, Ohio 43652

Davis-Besse Unit 1  
Oak Harbor, Ohio

License No. CPPR-80  
Category: A

Type of Licensee: PWR (B&W) - 872 Mwe

Type of Inspection: Routine - Announced

Dates of Inspection: June 4 and 5, 1974

Date of Previous Inspection: May 14, 1974 (Second Management Meeting)

Principal Inspector: *for* *D M Skennicutt*  
M. W. Dickerson

6/24/74  
(Date)

Accompanying Inspector: *for* *D M Skennicutt*  
J. W. Sutton

6/24/74  
(Date)

Other Accompanying Personnel: None

Reviewed By: *for* *D M Skennicutt*  
D. W. Hayes, Senior Reactor Inspector  
Reactor Construction Branch

6/24/74  
(Date)

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## SUMMARY OF FINDINGS

### Enforcement Action

#### A. Violations

One of the activities at the Davis-Besse site appear to be in violation of AEC regulations and in nonconformance with the Babcock and Wilcox Company (B&W) welding procedure, as identified below, and is considered to be of Category II severity.

10 CFR Part 50, Appendix B, Criterion V, states, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, . . . and shall be accomplished in accordance with those instructions, procedures, or drawings."

B&W welding instruction sheet WIN-120-2, Revision 0, indicated that the maximum size weld rod to be used for the main coolant pump groove weld would be 1/8" diameter.

Contrary to the above, a 3/16" weld rod was used prior to being approved by Bechtel Corporation (Bechtel) engineers for use on the designated coolant pump weld. (Paragraph 2)

#### B. Safety Matters

No safety matters were identified.

### Licensee Action on Previously Identified Enforcement Matters

#### A. Lack of Weld Inspection Procedure for Class 1E Welds (RO Inspection Reports No. 050-346/74-01 and No. 050-346/74-02)

During the inspection of January 8 - 10, 1974, it was established that support and seismic welds, associated with Class 1E equipment, were being inspected without benefit of written procedures or instructions. Moreover, no documentation was available to establish that all the subject welds were being inspected.

During this inspection, the steps taken to correct this noncompliance, as stated in the Toledo Edison Company (TECO) letter dated March 22, 1974, were reviewed by the inspector and determined to be acceptable. Included was a review of detailed inspection procedures. An extensive review of records by the inspector, was also completed during the previous inspection. This matter is considered resolved.

B. Failure to Follow Class 1E Weld Control Procedures (RO Inspection Reports No. 050-346/74-01 and No. 050-346/74-02)

During the inspection of January 8-10, 1974, documentation was not available to establish that welding operation, associated with Class 1E electrical equipment, was being controlled in accordance with applicable procedures.

During this inspection, the steps taken to correct this nonconformance, as stated in TECO letter dated March 22, 1974, were reviewed by the inspector and determined to be acceptable. Included was a review of detailed instructions relative to welding operations and the attendant inspection requirements. This matter is considered resolved.

C. Decay Heat Removal Cooler Installed Without Proper Documentation Available at the Site (RO Inspection Report No. 050-346/74-02)

During the previous inspection, it was established that the data package for decay heat removal cooler DH-HX1B did not include a manufacturer's data report (U-1) nor did the quality assurance release specify that a manufacturer's data report was available for this vessel.

During this inspection, the steps taken to correct this matter, as stated in TECO letter dated April 19, 1974, were reviewed by the inspector and determined to be acceptable. Included was a review of the manufacturer's data report dated November 9, 1971. This matter is considered resolved.

Design Changes

No new design changes were identified.

Unusual Occurrences

No unusual occurrences were identified.

Other Significant Findings

A. Current Findings

1. The licensee indicated that, as of June 1, 1974:  
(1) Construction was 64% complete, and (2) engineering was 91% complete.
2. The TECO quality assurance organization was augmented on May 20, 1974, by the addition of Mr. C. J. Greer as a Field Quality Assurance Specialist.

B. Unresolved Matters

1. Class 1E Electrical Weld Acceptability

Nonconformance Reports (NCR's) No. BC-048, dated January 28, 1974, and No. BC-052, dated February 18, 1974, were issued by Fischback and Moore (F&M) relative to the possible use of damaged and/or wet electrodes in the production welding of Class 1E welds prior to the 'Stop Work Order' of January 8, 1974. Resolution of the NCR's was based upon the opinion of the Bechtel construction manager's representative that failure of a number of welds tested was not due to the use of damaged and/or wet electrodes. However, this conclusion does not appear to be based on a sound engineering evaluation. Moreover, of the 25 welds examined by penetrant testing, seven were rejected, and it appears that the acceptability of the welds completed prior to the 'Stop Work Order' are questionable. These matters remain open pending the results of additional review by the licensee. (Paragraph 1)

2. Reactor Coolant Pumps Suction Weldment Linear Indications

The above matter was reported by TECO to RO:III in conformance with 10 CFR Part 50.55(e) requirements. A final report on the detailed findings was not available for review during the current inspection. (Paragraph 3, Report Details)

3. Incomplete Welding Records, Reactor Coolant Pump - Primary Piping

Weld material and weld documentation records do not reflect the exact record of work in progress. This matter will be reviewed during the next scheduled inspection.

C. Status of Previously Reported Unresolved Matters

1. Class 1E Electrical Cable Trays (RO Inspection Report No. 050-346/74-02)

During the previous inspection, it was learned that procurement and receipt of electrical cable trays for Class 1E electrical cable was no longer considered Q-listed (Class 1E). (The tray installation was still considered as Q-listed). No information, verbal or documented, was made available in regard to the basis for this decision.

During this inspection, it was learned that the installation of trays for Class 1E cable was also not considered Q-listed.

Relative to justification for removal of the trays from the Q-list, Bechtel letter Anas to Novak, dated March 7, 1974, states that there is no requirement that the trays be Q-listed. This is apparently based on the statement that, if the tray fails during a seismic event, the cable would be capable of supporting itself between the supports.

Since the rationale that the tray, supported by and supporting Class 1E equipment, does not have to be treated accordingly, appears to be inconsistent, this matter has been referred to Headquarters for resolution.

2. Westinghouse Electric Corporation (W) High Pressure Injection Pump Motors (RO Inspection Reports No. 050-346/74-01 and No. 050-346/74-02

During the referenced inspections, it was reported that: (1) the subject motor acceleration time was 6.46 seconds at 70% rated supply voltage, whereas the specification requires the motors to accelerate their drives to normal operating speed within six (6) second at this voltage, and (2) a resolution of the pump motor deficiency was underway by W.

During this inspection, it was determined that the two motors, No. HP-PlB and No HP-PlA, were shipped by B&W to W on March 29, 1974, and April 11, 1974, respectively. This matter remains open pending a satisfactory resolution of the deficiency.

#### Management Interview

- A. The following persons attended the management interview at the conclusion of the inspection.

##### Toledo Edison Company (TECO)

J. D. Lenardson, Quality Assurance Engineer  
G. W. Eichenauer, Quality Assurance Field Representative  
E. C. Novak, Chief Mechanical Engineer

##### Bechtel Corporation (Bechtel)

H. A. Ablondi, Project Quality Assurance Engineer

- B. Matters discussed and comments, on the part of management personnel, were as follows.

1. The inspector reviewed the status of previously unresolved matters described in the Summary Section of this report. During this review, the satisfactory resolution of previous violations for: (1) lack of a weld inspection procedure for Class 1E welds, (2) failure to follow Class 1E weld control procedures, and (3) the installation of decay heat removal cooler, DH-HX1B, without proper documentation available at the site, were also discussed.
2. The inspector stated that, based on his review of NCR's No. BC-048 and No. BC-052, it appeared that they had been resolved on the basis of opinion, rather than a sound engineering decision. Moreover, that of the 25 welds randomly selected for penetrant testing, seven had been rejected for excessive porosity, slag, or linear indications and that, with this high rejection rate, all of the welds made prior to January 8, 1974,

appeared to be suspect. A representative of the licensee indicated that these matters would receive additional review.

3. The inspector stated that, during his review of documentation pertaining to the main coolant pump welds, it appeared that weld material was used without a formal review and approval by Bechtel. The licensee was informed that this appeared to be in violation of 10 CFR Part 50, Appendix B, Criterion V.
4. The inspector stated that it appeared that the main coolant pump weld material and weld documents reviewed did not reflect the exact record of the work in progress. The results indicate that an in-depth audit of the welding records would be advisable and that RO would review the results during the next scheduled inspection. The licensee indicated that this matter would be discussed and be resolved.

## REPORT DETAILS

### Persons Contacted

The following persons, in addition to individuals listed under the Management Interview Section of this report, were contacted during the inspection.

#### Toledo Edison Company (TECO)

E. A. Wilcox, Quality Assurance Field Specialist

#### Bechtel Corporation (Bechtel)

J. G. Grover, Quality Control Engineer - Electrical  
W. B. Daly, Senior Field Welding Engineer

#### Fischback and Moore, Incorporated (F-M)

D. M. Moeller, Quality Control Manager  
H. J. Harris, Lead Inspector (Acting)

#### Babcock and Wilcox Company (B&W)

W. R. Klinger, Site Project Manager  
J. W. Marshall, Quality Control Supervisor  
D. E. Kinsala, Project Engineer

### Results of Inspection

#### 1. Class 1E Electrical Weld Acceptability

Review of F-M NCR's No. BC-048, dated January 28, 1974, and No. BC-052, dated February 18, 1974, established that: (1) they had been resolved by Bechtel based upon opinion, and (2) welds completed prior to the 'Stop Work Order' of January 8, 1974, were being accepted, based upon visual inspection in spite of the rejection of seven of 25 randomly selected welds subjected to liquid penetrant examination.

NCR No. BC-048 had been issued as a result of a Bechtel audit (No. 115) dated January 7, 1974, which resulted in the 'Stop Work Order' of January 8, 1974. The NCR was issued because uncontrolled weld rod was found "cold" and "unused" in the F-M fabrication shop. As a satisfactory condition for resolution, Bechtel field engineering recommended that: (1) 25 of the Q-listed welds, completed prior to January 8, 1974, be ground and liquid penetrant examined in accordance with ASME Section VIII, Division I, to verify that the welds meet the requirements of AWS D1.0-69 and do

not contain defects caused by use of wet or damaged electrodes. The welds were to be chosen at random and, if found satisfactory, the remaining welds would be considered satisfactory upon visual examination in accordance with AWS D1.0-69. In the event any of the 25 welds were found unsatisfactory due to wet or damaged electrodes in the opinion of the construction manager's representative, another sample of 25 welds would be chosen.

As a result of the liquid penetrant examination, seven welds were rejected, and NCR No. BC-052 was issued. Resolution was by repair and reinspection of the seven welds, plus a statement that, in the opinion of the construction manager's representative, the initial rejects (porosity, slag, and linear indications) were not caused by wet or damaged weld rods. No technical assessment or engineering evaluation was available to substantiate this decision (other than the reports of inspection by Testmaster dated February 12, 1974, and February 26, 1974). Moreover, no engineering evaluation was available which would substantiate the apparent decision to accept all welds made prior to January 8, 1974, based on a visual examination in spite of the relatively high failure rate of those which were examined by the liquid penetrant method. As a result of this review, the inspector requested that the licensee provide additional justification for the acceptance of NCR's No. BC-0484 and No. BC-052 and acceptance of welds made prior to January 8, 1974, based upon visual examination. This matter remains open pending this additional justification.

2. Welding Procedure No. WIN-120-2, Revision 0

During the inspector's review of records pertaining to the Inconel reactor coolant pump weldment, No. WJ-2-1, it is noted that welding procedure No. WIN-120-2, Revision 0, was in use for only one day, October 1, 1973. The procedure allowed a maximum of 1/8" weld rod to be used for this weldment. On October 2, 1973, the weld rod size was changed to 5/32". A revision to the procedure was submitted for Bechtel approval on October 8, 1973. Formal Bechtel approval to use this size rod was made on November 6, 1973, as Revision 1 to WIN-120-2. Welding operations, using 5/32" weld rod was carried on during the period October 2, 1973, to November 6, 1973, without formal approval.

3. Reactor Coolant Pump Weldments

The inspector reviewed available documentation pertaining to the discovery, by RT, of microfissures in the suction weldment (WJ-2-1) of reactor coolant pump P1A2. This matter was reported to RO:III under 10 CFR Part 50:55(e) requirements. Two B&W letters to Bechtel, dated March 22, 1974, and April 19, 1974, were reviewed. The March 22 letter indicated the steps to be taken to determine the origin of the ceramic constituents found during study of the weldment sample taken from weld WJ-2-1. The letter of April 19 indicated the progress and additional investigation being made to resolve this matter.



The examination of a sample from the stainless steel pump discharge weldment, which had shown similar radiographic indications as the Inconel weldment, indicated that the indications in the stainless welds resulted from slag inclusion and that microfissuring was not present. In regard to the Inconel weldment, the studies indicated chemical constituents that were foreign to the weld materials. Further studies are being made. Procedures for repairs of all coolant pump suction welds are being developed. This matter will be reviewed during a subsequent inspection.

4. File of Nuclear Energy Property Insurance Association Reports

The inspector reviewed five letters containing recommendations relative to fire protection matters which were on file at the site. The letters were dated February 24, 1971, July 20, 1971, February 14, 1972, February 13, 1973, and April 25, 1974. An updating, contained in each subsequent report (following the initial report) indicated that recommendations were being followed.

5. Reactor Vessel

a. Review of Quality Control System

The B&W QC system, for the reactor vessel receipt, handling, storage, and installation, was determined to be acceptable relative to: (1) installation specifications and procedures, (2) use of experienced personnel in the installation, and (3) installation inspection. Acceptability was established by selective examination of the following:

(1) B&W Specifications

- (a) No. FS111-1a-14, Receipt, Off-Loading, Handling, Storage and Installation of the Reactor Vessel, Revision 1, dated April 25, 1973.
- (b) No. FS111-1a, Attachment No. 2, dated July 1, 1971 (Aligning and Leveling Requirements and Preparation of Foundations).
- (c) No. FS-111-1a, Attachment No. 3, dated November 1, 1969 (Water Type Leveling).

(2) Field Construction Procedures

- (a) No. 03, Unloading Reactor Vessel, Revision 3, dated December 1, 1972.
- (b) No. 04, Unloading of Reactor Vessel Head, Revision 1, dated November 9, 1972.

- (c) No. 06, Unloading of Reactor Vessel for Storage, Revision 1, dated December 18, 1972.
- (d) No. 08, Reload, Upend, and Prepare to Set Reactor, Revision 2, dated August 13, 1973.
- (e) No. 10, Final Setting of Reactor Vessel, Revision 1, dated August 13, 1973.
- (f) No. 11, Set Reactor Vessel MK-191, Revision 1, dated August 13, 1973.
- (g) No. 12, Attach Support Plates MK-193 to Reactor, Revision 2, dated August 13, 1973.
- (h) No. 16, Move Closure Head to Containment Building Revision 2, dated October 8, 1973.
- (i) No. 47, Set Head Storage Stand, Revision 2, dated December 17, 1973.
- (j) No. 48, Move Closure Head to 603' Level, Revision 0, dated December 12, 1973.
- (k) No. 56, Install Closure Head on Storage Stand, Revision 0, dated January 31, 1974.

b. Records Review

An examination of the QC records for the reactor vessel established that the vessel had been satisfactorily received, handled, stored, and installed. Records relative to each of the field construction procedures, enumerated above, were included in the review.

c. Observation of Work

Observation of the reactor vessel, as it is stored in place, indicated that the installation had been completed in a satisfactory manner and that appropriate protective measures were in effect.

6. Reactor Vessel Internals

a. Implementation of Quality Assurance Program

A review of the TECO, Bechtel, and B&W organizations and their functional relationships indicated that applicable quality requirements were being met relative to the reactor vessel internals receipt, handling and installation.

b. Review of Quality Control System

The B&W QC system for the reactor vessel internals receipt, handling, storage, and installation was determined to be acceptable including:

- (1) Quarantine of nonconforming components.
- (2) Installation specifications and procedures.
- (3) The use of experienced personnel.
- (4) Installation inspections.

Acceptability was established by selective examination of the following:

- (1) B&W Specification No. FS-111-1c, Receipt, Inspection, Handling, Storage, and Installation of the Reactor Vessel Internals, dated January 5, 1971.
- (2) Field Construction Procedures
  - (a) No. 58, Unload and Store Reactor Vessel Internals, Revision 3, dated May 2, 1974.
  - (b) No. 61, Remove Internals From Shipping Rig and Assemble, Revision 1, dated May 1, 1974.
  - (c) No. 64, Install Bolts MK-380 - Reactor Internals, Revision 0, dated May 15, 1974.
  - (d) No. 65, Install Thermal Shield Upper Restraints - Internals, Revision 0, dated May 15, 1974.

7. Primary Piping - Welding

Record Review

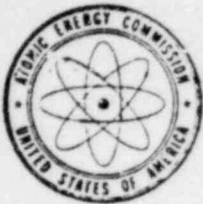
The following quality records for primary piping weld No. WJ-4-4 were examined by the inspector:

- a. QA inspector's records.
- b. Welders' qualification records and list of current qualified welders.

The records were found to be in order and signed by designated personnel. Ninety-eight percent of the primary piping has been installed, and review of radiographs by B&W is in progress.

8. Main Steam Piping

Installation of main steam piping has started. Piping is in the process of fitup and being tack welded. Further review of this item is planned for subsequent inspections.



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A. RO Inspection Report No. 050-346/74-04

Transmittal Date : June 25, 1974

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