

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

Report of Construction Inspection

CO Report No. 346/71-1

Licensee: Toledo Edison Company (Davis-Besse)
Construction Permit (CPFR not issued)
Category A

Dates of Inspection: February 18 and 19, 1971

Dates of Previous Inspection: November 5 and 6, 1970

Inspected By: *George C. Gower*
G. C. Gower
Principal Reactor Inspector 3-3-71

R. E. Oller
R. E. Oller
Metallurgical Engineer 3-3-71

Reviewed By: *W. E. Vetter*
W. E. Vetter
Senior Reactor Inspector 3-3-71

Proprietary Information: None

SCOPE

Type of Facility: Pressurized Water Reactor
Power Level: 872 Mwe
Location: Southwest shore of Lake Erie, Ottawa
County, Ohio
Type of Inspection: Routine - Announced

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SUMMARY

Safety Items - None.

Noncompliance Items - None.

Unusual Occurrences - None.

Status of Previously Reported Problems

1. Regarding Toledo Edison Company's (TECO) implementation of AEC Criterion XI^{1/} Test Control, since the previous inspection TECO has prepared draft implementing procedures to assure proper coordination, testing review and acceptance of completed systems, etc. on the part of the applicant. Current construction status does not require utilization of the requirements of Criterion XI. TECO plans to have the required procedures completed at the time of the next routine CO inspection and in time for use when required. This item is to receive follow-up attention.
2. The applicant has endeavored to establish a tagging procedure to meet the requirements of Criterion XIV. During the current inspection, it was learned that the desirability of having a universal tagging system imposed upon all contractors at the site was still under discussion with Bechtel (the A-E and construction manager). Implementation of a tagging system^{2/} is to be worked out in the near future and in advance of any need, according to Jim Lenardson, the Davis-Besse (D-B) QA Engineer. This item will require followup.
3. TECO's efforts to recruit a Mechanical Engineer as an addition to the TECO QA site staff have been unsuccessful. Discussions with L. E. Roe, the TECO Chief Mechanical Engineer and D-B Project Engineer, said that finding a qualified person to fit their requirement has been very difficult. Efforts will continue in this area, Roe said, until a qualified man is found. Mr. Roe said that a welding technician from within TECO will be assigned to the site QA staff when Chicago Bridge and Iron (CB&I) starts the containment vessel work. Site QA staffing will continue to receive follow-up attention.

^{1/} CO Report No. 346/70-3, Section K-2.

^{2/} CO Report No. 346/70-3, Section N-2.

4. Regarding the lack of specifications, etc. for pumping concrete^{3/} TECO has now learned that concrete is to be pumped for certain portions of the plant and has taken action to have the concrete specifications include the appropriate ACI-301 references to pumped concrete.

Other Significant Items - The previous inspection report stated that the applicant's report to DRL on the plant bedrock "Verification and Remedial Treatment Program" would be submitted in January 1971. Contrary to this statement, TECO informed the inspector that this report is now being finalized and should be sent to DRL by April 15, 1971.

Management Interview

Personnel in Attendance

E. F. Doerr - Acting General Superintendent, TECO
G. W. Eichenauer - QA Representative (Civil), TECO
M. R. Stephens - Project Construction Manager, Bechtel
A. S. Martin - QA Engineer, Bechtel
D. P. Eisenhardt - QA Engineer, Bechtel
D. L. Reddick - Project Field Engineer, Bechtel

The following items were discussed at the conclusion of the inspection and later (by phone) with Mr. L. E. Roe, TECO Chief Mechanical Engineer and D-B Project Engineer, who was unable to attend the management interview.

1. The TECO and Bechtel representatives were informed that, during the concrete pour of the turbine building slab, the inspectors observed concrete handling practices which appeared to be questionable. Specifically, the flexible drop chute (located at the end of the belt conveyor) was, at times, observed to be too high and concrete was allowed to pile up excessively beneath the chute. Leveling of the resulting piles may have led to horizontal flow of the concrete and other conditions not conducive to proper consolidation of concrete.

Both Bechtel and TECO acknowledged the above criticism ... admitting that there was room for improvement in this area and said that action would be taken as required. Bechtel pointed out that the turbine building slab was not a Q-list item but that they were treating the pour as a Q-list item so that A. Bentley & Sons (AB&S) would gain additional experience with respect to concrete placement practices.
(II-A-3)

^{3/} CO Report No. 346/70-4, Section II.B.5.c.

2. Regarding the inspector's review of Fegles-Power Service, Inc. (Fegles) Quality Assurance and Construction Procedures for the reactor shield building, it was observed that the appropriate aspects of the AEC QA Criteria appeared to have been included. However, the specific duties of Fegles QC inspectors did not appear to be sufficiently identified. Moreover, it was not apparent that the inspectors were separated from the construction work supervision function.

Bechtel and TECO stated that they had previously recognized the possibility that the Fegles QA Manual may be criticized in the above described areas. Consequently, the applicant and Bechtel plan to meet with Fegles to discuss an appropriate supplement to the manual which would clarify the above points. According to M. R. Stephens, Bechtel Construction Manager, corrective action is to be completed prior to resumption of concrete work on the shield building. (II-C)

3. TECO and Bechtel personnel were informed that the inspectors had reviewed a total of 52 batch plant concrete tickets, for a recent concrete pour, and had noted the omission of a dumping time on one ticket and the countersign signature by Pittsburgh Testing Laboratory (PTL) on another. It was explained that the undocumented dumping time had been resolved by reference to other data. The inspectors pointed out that the omissions noted represented approximately 4% of the total ticket sample and, consequently, could be significant if the omissions were of a more serious nature. In conjunction with this observation, it was pointed out that an earlier and more thorough QC review of the concrete batch plant tickets appeared to be in order.

Both TECO and Bechtel agreed that a more timely and thorough QC review should be made of the batch plant tickets and stated that improvements are to be made in this respect. (II-B)

4. It was brought to the attention of those present during the management interview and to the attention of L. E. Roe, later by telephone, that TECO had not met a commitment made during the previous inspection to augment the site QA staff by January 1971 with the addition of a Mechanical Engineer. A further comment was that Compliance had, from the beginning, considered TECO's site staffing to be marginally acceptable with respect to total numbers and disciplines. This concern has, in the past, been tempered by consideration of the status of the project and lack of an apparent need.

TECO representatives and, in particular, Mr. L. E. Roe, were urged to consider the need for augmenting their site QA staff in the very near future in view of the impending start of an extensive construction effort. Mr. Roe stated that TECO is and has been recruiting for a

Mechanical Engineer but has not been successful in finding the right man for the job. He added that additional steps will be taken to expedite the hiring of a Mechanical Engineer.

5. Regarding the development and implementation of a suitable tagging procedure to meet the requirement of the AEC Criterion XIV, the applicant said that work will continue on this item and a workable system will be implemented by the time it is needed.

I. Persons Contacted

In addition to those listed above, the following persons were contacted:

- T. (NMI) Lysons - Civil Superintendent, Bechtel
- G. N. Blackham - Field Engineer, Bechtel
- R. J. Segar - Construction Supervisor, AB&S
- E. J. Subleski - QC Engineer, AB&S
- G. R. Barnes - Senior Technician, PTL
- V. L. Smith - Supervisor, Nicholson Concrete & Supply Company
- D. (NMI) Ponke - Technician, Michigan Testing

II. Results of Inspection

A. Attachment C - Followup Observation of Work (4605.06)

Compliance requested, during a previous inspection, to be notified when a significant concrete pour was to be made at the D-B plant. Such a pour was made on February 18 and 19, 1971, and Compliance inspectors were at the site to observe. The pour under observation was the turbine building base slab, consisting of a single nine foot thick pour requiring about 2650 cubic yards of concrete. The turbine base slab is not a Q-list item. However, TECO had previously informed CO that the base slab would be treated as if it were a Q-list item for training purposes.

1. Preplacement QC Inspection, a.3.

An AB&S field inspection report (Form 10) had been prepared and signed off. This aspect of the pour appeared satisfactory.

2. Slump, Strength Entrainment and Tests, a.5.

Slump and entrainment tests were observed being made at the pour site. Records of the same type of tests made at the batch plant were reviewed and found to be within the specifications. Strength cylinders were also taken at the pour site and at the batch plant.

Results of Inspection (continued)

3. Placement Made Properly, a.6.

Observations of concrete placement indicated acceptable practices with the following exception: The flexible drop chute (through which the concrete was dropped to the placement location) was observed to have been lifted too high during periods of adjustment. Also, on occasion, the concrete was permitted to pile up beneath the drop chute which required subsequent leveling. Both of the above practices, it was pointed out to the applicant, would produce aggregate segregations.

Bechtel acknowledged the criticisms and stated that with respect to the occasional excessive drop chute height, concern should be resolved after more experience has been gained through operation of the new conveyor equipment. Regarding the excessive pileup of concrete, the applicant indicated that steps will be taken to watch for, and correct, any deficiencies noted.

4. Rebar Splices Made Properly, a.8.

Rebar splices were not being made during this inspection. Followup is required on this item.

5. Proper Delivery of Concrete, b.5.

QC activities associated with the delivery of concrete were reviewed and found to be acceptable.

6. Proper QC Inspections, b.8.

Quality control inspection of the concrete pour observed appeared to be adequate.

B. Attachment C - Followup Record Review, b.2.

During the review of 52 batch plant concrete tickets for a previous Q-list pour, the inspectors noted the omission of a PTL counter-sign signature on one ticket and the omission of a dump time on another. These discrepancies were brought to TECO and Bechtel's attention ... not so much because the omissions were of a serious nature but because the omissions represented about 4% of the audit sample and, as such, it appeared appropriate for those responsible for the QC review of the tickets to make a more timely review and to be more thorough.

Results of Inspection (continued)

The omitted dump time was obtained later and found to be within the time limits by reference to other records. No discrepancies were noted during the ticket review other than those noted above.

C. Review of QA Manual for Fegles-Power Service, Inc. (Fegles)

The inspectors reviewed the QA Manual and work performance procedures for Fegles, the contractor responsible for slip forming the D-B shield building. The manual appeared to contain the appropriate requirements for a workable QC system with the following exception. Although it appeared that Fegles had provided for adequate QC inspection and documentation, the manual did not appear to sufficiently identify personnel responsible for the inspection effort. Moreover, it was not apparent that those assigned to do the QC work were separated from the supervision of the construction effort. TECO and Bechtel were informed of the above apparent shortcoming. They acknowledged the problem and said that Fegles will be requested to clarify the manual in the above mentioned area by way of a supplement. This supplement is to be completed and approved, according to TECO, before work resumes on the shield building.

D. Review of QA Audit Programs

Discussions were held with Bechtel and TECO regarding their plans and procedures for auditing the contractor's QC activities at the site. Both TECO and Bechtel provided the inspectors with audit schedules, documentation of audits performed and the procedures and check sheets utilized in the performance of the audits. No discrepancies were noted during this review.

E. Results of Inquiry Into Aircraft Overflights

Mr. Lenardson and other D-B site personnel were questioned regarding the possibility of frequent or periodic aircraft flights over, or near, the D-B site. Mr. Lenardson was acquainted with the overflights at Big Rock Point and stated with confidence that a similar problem did not exist at the D-B site.

III. Construction Status

The turbine building foundation slab was poured during the inspection. A section of the auxiliary building foundation has been poured. Reinforcing steel for one of the auxiliary building support structures has been placed. Fegles has set up a slip forming rig for the shield wall and made concrete placements of the wall up to grade level (583'-6"). Overall construction is estimated to be less than 5%.

8. Pumped Concrete

Mr. Lenardson informed the inspectors that the pumping of concrete would be employed at the Davis-Besse site in the near future and that Bechtel had initiated the preparation of the specification and placement procedures. This item will continue to be followed.

9. Shield Building Tolerances

Bechtel Specification No. 7749-C-38, Revision 1, listed, among other requirements, various construction tolerances. Section 10.3.2, Plumbness, states that "the cylindrical wall of the completed Shield Building shall be plumb within 4 inches (four inches) from top to bottom and shall be not more than 1 inch (one inch) out of plumb in any 25 feet (twenty-five feet)". Bechtel and Fegeles Construction Company are in the process of settling a dispute regarding the later specification on plumbness. Bechtel has stated their belief that the out-of-plumbness specification has been exceeded by 1/8 inch between elevations 109'-0" and 129'-6". Fegeles Construction Company does not agree with this interpretation of the specification.

The dimensions of the shield building have been transmitted to Bechtel's Gaithersburg, Maryland office for an engineering evaluation. The inspector asked that the engineering evaluation be made available for review during his next routine visit. No other deficiencies were noted.