

Testimony on Facility Construction - Quality Assurance Programs

Midland Units 1 and 2

By

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I. INTRODUCTION

My present position is that of Reactor Inspector in the Reactor Construction Branch, Directorate of Regulatory Operations, Region III. In this position, I assist in the inspection of nuclear facilities that are being constructed under an AEC construction permit or authorization, to ascertain whether the facility, as built, conforms to the provisions of the construction permit or authorization and application and whether it can be operated safely. Within the Region III geographical area, I have (among other duties) principal responsibility for in-service inspection and nondestructive examination. I have been in my present position since 1970. From 1968 to 1970, I was employed by the State of California Department of Water Resources, Equipment, and Materials Department as a Quality Assurance/Nondestructive Examination Specialist. My duties included providing technical assistance to field inspection (civil-mechanical) methods for the construction of large hydroelectric projects, provide assistance in the production of quality assurance/quality control and nondestructive examination requirements, and performing vendor inspections. From 1960 to 1968, I was employed by the San Francisco Bay Naval Shipyard (Hunters Point, Mare Island) wherein my work involved the construction and repair of nuclear and conventional naval vessels. I worked in various capacities in the Quality Assurance/Quality Control

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Department as a Quality Control/Nondestructive Examination Inspector, Quality Assurance Inspector, Training Supervisor (quality control/nondestructive examination) and my last position, prior to resignation, was Nondestructive Examination Supervisor.

With respect to the Midland facility, I have participated in four inspections at the construction site. This testimony will describe the scope of my participation and the results of these regulatory inspections of the Midland Nuclear Power Plant authorized by the Atomic Energy Commission under Construction Permits No. CPPR-81 and No. CPPR-82.

## II. MIDLAND INSPECTION ACTIVITIES

During a routine inspection at the Midland construction site on November 6 - 8, 1973, I observed significant deficiencies in Cadwelding activities. In the course of a routine site tour, I noted that Cadwelds purported to be finished and acceptable showed remnants of slag and asbestos at the Cadweld ends to an extent which appeared to preclude adequate visual inspection of joint ends. Further observation of several Cadwelds indicated that excessive void areas existed, and some recently completed Cadwelds did not appear to meet cleanliness requirements for rebar ends. Discussion at this time, with site field engineers and licensee representatives regarding the above concerns, indicated that they were not fully familiar with Cadwelding requirements in that they indicated that the observed deficiencies and questionable items were considered by them to be adequate. Subsequently, I identified at least four finished and installed Cadwelds which displayed what appeared to be marginally acceptable voiding. At my

request, these Cadwelds were reinspected by Bechtel Corporation Field Engineers (who had principal inspection responsibility) and this inspection established the observed voiding to be acceptable. Two days later, I requested that these same Cadwelds be reevaluated by Bechtel Corporation Quality Control Engineers (who examined the work of the Field Engineers) This inspection resulted in the rejection of the same, previously accepted Cadwelds. One of these Cadwelds was in place in the Cadweld makeup area, and the other was installed in Unit 2.

On the basis of the above observations and findings, a thorough review of all quality assurance/quality control and technical requirements of site Cadwelding was initiated. The results of this effort were as follows:

1. Procedures covering Cadwelding activities did not provide adequate instructions for performing Cadwelding splicing, nor for inspection of completed splices.
2. Instructions and procedures were not being implemented to assure that Cadweld preheating requirements were properly accomplished.
3. The current inspection procedures, nor instructions, could not be made available to demonstrate that measures had been established to adequately control handling and issuance of Cadwelding splicing material.
4. An unwrapped and spot-rusted Cadweld sleeve was noted to be stored with a supply of wrapped Cadweld sleeves.
5. A procedure to adequately provide for identification and control of Cadwelding material was not made available for review.

6. Procedures, providing for segregation of nonconforming Cadweld materials, was not available for review.
7. Procedures, to adequately assure that unused Cadwelding material would be returned from job location to proper storage and issuance locations, were not available for review.
8. Records were not maintained to furnish evidence that Cadwelding splicing in-process production control activities were actually performed as required, and records to provide evidence that issuance control measures for Cadwelding material were properly accomplished were not maintained.
9. Inconsistencies between the Midland PSAR, Bechtel Corporation Specification No. C-231, Bechtel Corporation Master Inspection Plan for Cadwelding, and the manufacturer's recommendation were noted in regard to Cadweld preheat requirements.
10. The Cadweld personnel qualification requirements in Specification No. 231 appeared incomplete in that it did not provide for circumstances under which Cadwelders will be disqualified for inadequate performance or requalified when performance indicates a need for such action.
11. A Field Engineer making void area inspections did not demonstrate knowledge of acceptance criteria when questioned.
12. The Field Engineer's measuring tools appeared to compromise void determination. As a result of the above findings, the licensee took the following action prior to and/or at the end of this inspection:

The licensee acknowledged the inspector's findings and indicated that corrective action for some of the above matters has been initiated as follows:

- a. Retraining of inspection personnel has started in that inspection personnel examined a previously accepted and subsequently rejected Cadweld which had been cut out and used for this purpose.
- b. Cadweld inspection requirements have been rereviewed.
- c. Additional quality control personnel are to be made available for this work.
- d. The Erico Products Company representative (Cadweld manufacturer) has been requested to come to the site for further training.
- e. A representative of the licensee stated that all Cadwelding operations at the site were temporarily stopped.
- f. In regard to the total finding, the licensee stated that additional review would be necessary prior to further corrective action.

Subsequently, in a telephone conversation with RO:III, the licensee agreed to reinspect all site Cadwelds.

I participated in a subsequent inspection on November 20 and 21, 1973, for the purpose of determining the adequacy of the licensee's corrective action relative to: (1) Cadwelding and Cadwelding inspection violations and deficiencies, and (2) an apparent lack of management involvement in the implementation of the Midland Quality Assurance Program.

I was directly involved with the following areas of this inspection:

1. Review of Bechtel Corporation procedures, including draft forms for quality activity performance accounting covering the performance of and inspection of Cadwelds.
2. Review and discussion relative to the need for Consumers Power Company to provide procedures designed to specifically provide assurance that specifications covering Class I work properly reference and deal with all applicable criteria (PSAR, manufacturer's specifications, regulatory guides, etc.).
3. Review of Bechtel Corporation nonconformance report covering the rejected Cadwelds found by the inspection performed by quality control engineers.
4. Review of new instructions and procedures, written to cover both Cadwelding and Cadweld inspection, and new forms, designed to demonstrate conformance to quality requirements (checklist, etc.). Some of these forms were in rough draft, unapproved and/or lacking in one or more respects at the time of this inspection.

On December 6 and 7, 1973, I participated in a special, announced inspection at the site in the company of W. E. Vetter, R. A. Rohrbacher, and D. E. Whitesell. This effort involved a special inspection to determine the status of the licensee's corrective action, relative to quality assurance/quality control program deficiencies and specific, apparent violations identified in conjunction with site Cadwelding activities.

The results of this inspection led to a conclusion, by RO:III inspection personnel, that corrective action has been taken such that continued Cadwelding at the construction site could now be accomplished with proper attention to quality criteria.

I was directly involved, in part, with the following areas of review:

1. Cadweld personnel qualification relative to the provisions established in the governing Bechtel Corporation specification (No. 231).
2. Review of corrective action relative to identified inconsistencies between design documents and the PSAR.
3. Review of the status of corrective action on the part of Consumers Power Company management to identify and deal with generic quality assurance program deficiencies (participated in first management interview discussion).
4. Participated in the second management interview wherein each inspector identified areas of inspection coverage and commented, in detail, with respect to the scope of inspection coverage. At this time, the licensee was informed, by Mr. Vetter, that the results of the inspection would be thoroughly reviewed and made available to the Director of Regulatory Operations and that an authorization to continue Cadwelding activities can only be initiated by the Director of Regulation.
5. Review of corrective action, relative to specific violations and deficiencies, as reported in RO Inspection Reports No. 050-329/73-10 and No. 050-330/73-10, as follows:
  - a. Procedures for Cadwelding and Cadweld inspection.
  - b. Instructions and procedures for preheating (I participated, in part, in this review).
  - c. Inspection personnel did not demonstrate knowledge and proper implementation of Cadweld acceptance criteria (I participated, in part, in review of this matter).

- d. Measures to control handling and issuance of Cadweld splicing material.
- e. Procedures to control nonconforming Cadweld Material.
- f. Review of records to furnish evidence of conformance to quality requirements.
- g. Participated in evaluation of Consumers Power Company reinspection of Unit 1 Cadwelds.
- h. Participated in evaluation of provisions for Cadwelder qualifications and provisions to preclude inconsistencies between design documents (Bechtel Corporation Specifications, manufacturer's instructions, and the PSAR) relative to Cadwelding activities.

I participated in the inspection performed on January 10 and 11, 1974, with Messrs. Vetter, Rohrbacher, and Whitesell. This inspection report, in addition to other matters, covered a special inspection to determine the adequacy of implementation of the corrective action previously committed to by the licensee relative to quality assurance/quality control program deficiencies.

Relative to matters concerning Cadwelding corrective action, I participated in the following areas.

1. Completion of (Bechtel Corporation) procedure revisions for Cadwelding and records (Cadweld Inspection Form).
2. Provide further clarification regarding Cadwelder personnel retraining and maintenance of qualification.
3. Provide visibility of Cadweld inspection results.
4. Provide adequate instructions and procedures for storage and handling of Cadweld materials.



5. Provide adequate procedures and records relative to the control of nonconforming Cadweld material.
6. Provide instructions and procedures regarding Cadwelding preheat requirements and provide verification that the requirements have been met.
7. Adequate procedures for Cadwelding.
8. Procedures for Cadweld splice inspection.
9. Cadweld inspection records to provide evidence that Cadwelds conform to quality requirements.

I conducted a special, announced inspection on January 29, 1974, at the Midland site. The purpose of this inspection was to review the scope of a problem, and the Consumers Power Company/Bechtel Corporation corrective action relative to errors in Cadweld void area computations. These errors were found in previously submitted and accepted Cadweld reinspection data. The results of this inspection are documented in RO Inspection Report No. 050-329/74-02.

In summary, as a result of this inspection, it is apparent that correction of these small and random errors will not change the original reinspection acceptance status of any of the 936 splice ends reinspected in Units 1 and 2. Subsequent to the above inspection, a final report of this matter was submitted to RO:III. This report confirms that accept/reject status of the subject Cadwelds did not change as a result of correcting the computation errors.

Attachment:

Attachment A