

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/85032(DRS)

Docket No. 50-346

License No. NPF-3

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

Facility Name: Davis-Besse 1

Inspection At: Oak Harbor, Ohio

Inspection Conducted: October 8-10, 1985

Inspector: *Cordell C. Williams for*
J. F. Norton

10-28-85
Date

Approved By: *Cordell C. Williams*
C. C. Williams, Chief
Plant Systems Section

10-28-85
Date

Inspection Summary

Inspection on October 8-10, 1985 (Report No. 50-346/85032(DRS))

Areas Inspected: Licensee action on IE Bulletin 80-11 "Masonry Wall Design," and ground water seepage problem in the Auxiliary Building. The inspection involved a total of 29 inspector-hours by one NRC inspector.

Results: No violations or deviations were identified during this inspection.

DETAILS

1. Persons Contacted

Toledo Edison Company

- *S. Wideman, Senior Licensing Specialist
- *M. Tewers, Senior Assistant Nuclear Engineer
- *G. Ferguson, Associate Nuclear Engineer
- *S. Saunders, Assistant Engineer
- C. Mekbel, Civil/Structural Engineering Supervisor
- D. Breese, Modification Coordinator, Facility Modifications

Nuclear Regulatory Commission

- *W. Rogers, Senior Resident Inspector
- *D. Kosloff, Resident Inspector
- B. Burgess, Reactor Inspector, Division of Reactor Projects

*Denotes those who attended the exit meeting conducted October 10, 1985.

2. Licensee Action on IE Bulletin 80-11

- a. IE Bulletin 80-11 required licensees to identify plant masonry walls and their intended functions. Licensees were also required to present reevaluation criteria for the masonry walls with the analyses to justify those criteria. If modifications were proposed, licensees were to state the methods and schedules for the modifications.
- b. In response to IE Bulletin 80-11, Toledo Edison Company provided the NRC with documents describing the status of masonry walls at Davis-Besse. The information in these documents was reviewed, and a request for additional information was sent to the licensee on March 8, 1982, to which the licensee responded June 16, 1982, and July 14, 1982 (letters, Crouse to Stolz). As the result of a meeting between Toledo Edison and members of the NRC staff on May 27, 1982, and a combined technical meeting and site visit held June 21-23, 1983, additional questions were sent to the licensee to which it responded June 23, 1982 (letter, Ray to DeAgazio), and August, 1982 (Harris and Hamid Report, "Applicability of Energy Balance Technique to Reinforced Masonry Walls").
- c. There are 169 safety-related masonry walls at Davis-Besse. The main functions of these walls include fire and flood barriers, radiation shielding, and negative pressure boundaries. Also, the walls support minor platforms, piping, conduit, and instrumentation. None of the walls were designed to act as shear walls.
- d. The masonry walls are typically hollow unit construction, laid in stacked bond, single or double wythe, partially or fully grouted, and are vertically reinforced.

- e. The licensee relied on the energy balance technique to qualify 75 of the safety-related masonry walls to resist out-of-plane forces. The NRC staff position on the use of the energy balance (or any other nonlinear analysis) technique was that it is not acceptable without further confirmation by an appropriate test program. The licensee subsequently reanalyzed the 75 walls by the linear elastic working stress method. Several conservatisms had been incorporated in the energy balance analyses. Reduction factors were applied to several of these conservatisms when they were reanalyzed by the working stress method, and all but one of the walls (wall No. 5367) were qualified.
- f. The licensee committed to modify 28 safety-related walls on which overstressing was indicated under full loading conditions. The modification included addition external steel bracing and the reinforcing of boundary connections with bolted angles. The modifications have been completed.
- g. Wall No. 5367 adjoining the control room is pending design and construction of modifications.
- h. Approximately one-half of the 28 walls were individually examined by the Region III inspector. This was accomplished in the company of the Senior Assistant Civil/Structural Engineer and the Facility Modification Engineer. Detailed individual review was accomplished to assure that construction modifications were in accordance with design. Structural design drawings, and contractor procedures and QA/QC documentation relative to the construction were reviewed and found to be appropriate. No conflicts were discerned between design drawings and construction.
- i. Based on the above findings, with the exception of wall No. 5367 which the licensee plans to strengthen in the near future, IE Bulletin 80-11 requirements have been fully implemented at Davis-Besse. There is reasonable assurance that the safety-related masonry walls will withstand the specified design loading conditions without impairment of wall integrity or the performance of the required safety functions. When modifications on wall 5367 have been satisfactorily completed, IE Bulletin 80-11 can be closed.

3. Groundwater Seepage (Open Item 64028-03)

The inspector reviewed and observed the groundwater seepage problem based on a previous open item as follows:

- a. Groundwater seepage is entering the Miscellaneous Waste Monitor Tank Room (Room 114) of the Auxiliary Building. The entrance of the main seepage is along a horizontal construction joint at elevation 545'-0", is approximately three feet in width, and is directly above six electrical penetrations and associated conduit hangers. Although the quantity of the seepage was relatively small at the time of the inspection it was causing a continual wet environment for the rigid

steel conduits, couplings, and hangers below the seepage entrance area and could potentially affect the integrity and safety of the Class 1E electrical cables and appurtenances. Hangers CS-733-114-07-1 and CS-7634-114-08-1 are involved along with conduit penetrations 1-36006B, 1-46014C, and 1-36008B (all two inch diameter conduits) and 1-36007B, 1-46013C, and 1-36009B which are four inch diameter conduits. The power cables connect the number one train's high pressure injection, low pressure injection, and containment spray pumps. Setscrew type couplings, which permit moisture ingress into the rigid steel conduits, are in the line of seepage.

- b. A buildup of what appears to be a hard brownish-white brittle caliche material exists on the affected seepage area. This residue appears to be a result of evaporation.
- c. Although the seepage creates an unsightly condition on the affected area, the primary concern is the potential of electrical short circuit and material intergranular attack on the support hangers, conduits, and couplings.

This item remains open, pending review to assess the safety of electrical components.

4. Exit Meeting

The inspector met with licensee representatives (denoted under Persons Contacted) at the conclusion of the inspection on October 10, 1985. The inspector summarized the purpose and findings as reported herein. The inspector also discussed the likely informational content of the inspector's report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.