U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-346/80-22

Docket No. 50-346 License No. NPF-3

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

Facility Name: Davis-Besse Nuclear Power Station, Unit 1

Inspection At: Bechtel Power Corporation, Gaithersburg, Maryland;
Davis-Besse Site, Oak Harbor, Ohio and the Corporate Office

Inspection Conducted: July 22-24, 1980, at Bechtel office; July 31, 1980, at the site; and August 1, 1980, at the Corporate Office

Inspectors: I. T. Yin I. Yin 8/18/80

R. H. Brickley, RIV Inspector (July 22-24, 1980 only)

Approved By: D. H. Danielson, Chief D H Danielson 8/18/80
Engineering Support Section 2

Inspection Summary

Inspection on July 22-24, 31, and August 1, 1980 (Report No. 50-346/80-22)
Areas Inspected: Inspection of pipe whip restraint modification at Hot Leg risers; licensee implementation of IEB 79-02, IEB 79-04, and IEB 79-14; snubber installations. This inspection involved a total of 46 ins, r- hours onsite, at the licensee's A-E, and corporate office by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

Inspection at Bechtel Power Corporation, Gaithersburg, (Bechtel) on July 22-24, 1980

Toledo Edison Company (TECo) Employees

*C. L. Mekbel, Senior Engineer
*D. J. Mominee, QA Representative

Bechtel Employees

*J. C. Ventura, Assistant Project Engineer
*J. W. Fay, Project Engineer
C. M. Foltyn, Engineering Supervisor
N. Kalyanam, Staff Supervisor
W. R. Dilling, Jr., Stress-DB Project
N. Lee, Stress-DB Project
K. Lee, Staff
P. McMahon, Staff
J. T. Vogel, Engineering Supervisor
R. D. Kies, Group Leader, DB Project
*W. C. Lowery, Project QA Engineer
*T. I. Gillespie, Project QA Manager

NRC Personnel

*R. Brickley, IE:RIV Inspector

Inspection at Davis-Besse 1 Site on July 31, 1980

TECo Employees

T. Murray, Station Superintendent
C. L. Mekbel, Senior Engineer
E. M. Wilcox, Senior Field QA Specialist
D. Huffman, Administrative Coordinator
D. Mominee, QA Representative
J. O'Neill, Maintenance
M. C. Beier, QA Representative

NRC Personnel

L. Reyes, IE:RIII Resident Inspector

Inspection at TECo Office on August 1, 1980

TECo Employees

*C. R. Domeck, Manager, Nuclear Engineering
*C. Mekbel, Senior Engineer
J. K. Wood, Associate Engineer
*T. Murray, DB-1 Station Superintendent

*Denotes those attending the exit meetings on July 24, 1980, at Bechtel, Gaithersburg, and on August 1, 1980, at TECo Corporate office.

Licensee Action on Previously Identified Items

(Closed) Unresolved Items (346/79-33-03 and 346/79-11-03). Testing of large bore snubbers. During the plant outage the licensee removed all six 20" steam generator snubbers, and eight 8" primary coolant pump snubbers and sent them to ITT-Grinnel Company for overhaul. In addition, all control valve blocks and reservoirs were replaced with the latest design. The 20" snubbers are now equipped with reservoirs of their own, and the reservoirs are relocated at much higher elevation to provide equivalent pressurization effect. The inspector reviewed ITT-G Procedures PHD-5309/R-2T, Revision 4, "Functional Testing of 20" Bore Snubbers, D-B Nuclear Power Station", and PHD-5309/R-4F, Revision 1, "Filling, Purging, and Calibration of 8" Snubbers, TECo D-B1" and had no adverse comments. In reviewing the test records, although there appeared to be a lack of correlation between the lock up and bleed rate test settings and the actual installation settings, the inspector considered the overall measures to be adequate. The inspector observed the installation of two of the 20" snubbers at Steam Generator 1-2, and one 8" snubber at Coolant Pump 1-2, and had no adverse comments.

(Closed) Unresolved Item (346/79-33-02). Pipe restraint clearance measurements. As a result of IEB 79-14 review at Bechtel on July 22-24, 1980, and site observation on July 31, 1980, the inspector considered the requirements for field gap measurements had been implemented. The cable type pipe restraints had also been observed readjusted in accordance with the original design requirements during the site inspection on July 31, 1980.

(Closed) Unresolved Item (346/79-33-04). Leaking Snubbers. During the site visit on July 31, 1980, the inspector observed snubbers in the reactor coolant drain area and other areas inside the containment and observed no leaking hydraulic snubbers.

(Closed) Unresolved Item (346/79-33-01). Lubrication requirement for the wedge type concrete expansion anchor bolts. See report Paragraph 4 for details. This item is resolved.

(Closed) Unresolved Item (346/79-11-02). Lack of hanger design calculations. As a result of the problems identified during the previous inspection, the licensee selected 50 hangers for Bechtel to perform calculations to check the design adequacy. These calculations concluded that the original ITT-G design were adequate. The inspector selected Bechtel Hanger Nos. 3A-EBD-19-H149, 3A-EBB-2-H31, 30-CCA-8-H12, 33C-CCB-2-H47, 33B-CCB-6-H12, 34-HCB-4-H32, and

36-HBB-12-H9 for review and identified no problem areas. The review of hanger adequacy is a part of overall system evaluation per IEB 79-14 requirements.

(Closed) Unresolved Item (346/79-11-06). Snubber test result variations. The licensee presented to the inspector correspondence from ITT-G to TECo dated June 22, 1979, "Verification Calibration of Lock Up and Bleed Rate of Fig. 200 Suppressors." The subject letter stated that the variations were considered acceptable. This matter is resolved.

Functional or Program Areas Inspected

1. Work Performed at Bechtel Office Relative to Licensee Implementation of IEB-79-14 Requirements

   a. Work Status and Schedule

      Field inspection of accessible piping was completed on September 21, 1979, and inaccessible piping was completed on May 21, 1980. There were 67 inspection packages for accessible areas and 56 for the inaccessible areas. The inspection was performed based on latest design isometric drawings which were subsequently reviewed against the stress calculation isometric drawings by the Bechtel engineers.

      Bechtel evaluation of accessible areas piping was completed on June 16, 1980. Scheduled completion for inaccessible area piping evaluation is March 1, 1981.

      Support evaluation for accessible area piping is scheduled for completion by November 1, 1980 and all modification work requirements should be carried out by March 1, 1981. Support evaluation for inaccessible area piping is scheduled for completion by March 1, 1981 and modification work completion by the end of the 1981 refueling outage.

   b. Procedure Review

      The inspector reviewed the following work procedures:

      Bechtel Procedure PDP-2, "Inspection Procedure for As-Built Configuration of Nuclear Safety Related Piping Components, IEB 79-14", Revision 4, dated May 3, 1980.

      Bechtel Procedure PDP-3, "Evaluation Procedure for As-Built Configuration of Nuclear Safety Related Piping Components, IEB 79-14", Revision 1, dated July 22, 1980.

      The inspector commented that the inspection procedure did not require verification of pipe size, schedules, and materials. This was commented on in an earlier RIII Report, No. 50-346/79-24 as a result of site inspection on August 30-31, 1979. This is an unresolved item (346/80-22-01).

The inspector commented that the evaluation procedure did not address the use of actual mill test report stress values when primary pipe stress during SSE condition exceeds 2.4 S_h. Subsequently, during the inspection at TECo office on August 1, 1980, Revision 2 of PDP-3, dated July 28, 1980 was presented to the inspector, and such provision had been incorporated.

c. Review of Bechtel Evaluations

Two of the calculations for systems outside the containment were reviewed by the inspector:

(1) Calculation No. T-010A

The calculation included a portion of the 12" and 2-1/2" GCB-7 Decay Heat Removal System. Sample review showed that:

The coordination checked to be correct

The valve and operator weight used in the analysis checked to be in accordance with manufacturer's drawings

Maximum SSE stress at Node 65 was within 2.4 S_h for A 358 TP 304 material.

(2) Calculation No. 010A

The calculation included the Steam Generator 1-1 Main Steam relief valve header piping. The run pipe is 36" in diameter, and there are 10 - 8" relief valve assemblies installed on the header. A review indicated these findings:

The primary stress at Node point 855, where one of the relief valves is located, showed a stress level in between 2.4 S_h (Code) and 2.4 S_h (Actual). The primary stress consists of pipe stresses due to design pressure, dead weight, seismic and relief valve lift thrust, and according to Procedure PDP.3, the interim design criteria for the pipe material A 155 KCF 70 using 2.4 S_h, the stress allowable is determined to be 42,000 psi. In use of actual values obtained from pipe material test reports, the stress allowable is determined to be 50,179 psi. Since the stress level exceeded the procedure allowable, the licensee was requested to report the situation to RIII; however, in concurrence with NRR-MEB, the system is considered operable on the interim basis unless staff evaluation determines the condition otherwise.

In conjunction with the above review, the inspector questioned the use of a stress intensification factor (SIF) of 1.0 for the Weldolet branch connection. Per calculation based on ASME Section III formula, SIF was determined to be 1.0, but a SIF of 2.03 should have been used according to Bonny Forge, the

fitting manufacturer. Clarification was obtained subsequent to the discussions between Bechtel and the ASME Code Committee members, that wall thickness ratio of branch and run pipe should be a determining factor in use of the Bonny Forge formulas, and that SIF 1.0 was considered to be correct.

In discussion between the RIII inspector and NRR-MEB, clarification on interim operability criteria was made, i.e., (1) for temporary system operation, the primary stress for SSE condition should be less than 2.4 S_h, (2) the use of actual material test report results should be reviewed by NRC staff on a case-by-case basis, (3) any modification of existing piping suspension system should bring the pipe stress level within original code requirement, not interim operating requirement.

In conclusion, the inspector stated that further review of the system is planned during a subsequent inspection. This is considered an unresolved item (346/80-22-02).

Subsequent to the inspection, the inspector was informed that by using more accurate response spectra at various floor elevations, the SSE primary stress at Node 855 was brought down to within 2.4 S_h actual value; however, the restraints on the pipe system were overloaded beyond their design capacities. It was stated by the licensee on July 31, 1980, and August 1, 1980, that a modification will be made on the relief valve header, prior to plant startup. This condition was reported to RIII per Technical Specification requirement, and Bechtel was instructed to check for the support overloading conditions for similar situations. During the site inspection on July 31, 1980, the inspector observed the Auxiliary Building Area 8, M.S. Gallery relief valve header area proposed modification location, and had no adverse comment.

2. Work Performed at Bechtel Relative to Licensee Implementation of IEB 79-04

In conjunction with RIII Report No. 50-346/79-24, Paragraph 1.c, the inspector reviewed licensee response to RIII dated May 1, 1979 and the overall valve weight considerations required by IEB 79-14. As a result of the program and document review, the inspector considered the work to be adequate. IEB 79-04 is considered closed.

3. Work Performed at the Davis-Besse 1 Site

In conjunction with RIII Report No. 50-346/79-23, the licensee performed additional pipe whip analysis for the primary loop piping inside the containment. The analysis indicated that modification of the bolted half circular shape restraints on top of the hot legs

was required. The modification included replacement of existing 31 bolts on all 8 locations with A 564 material bolts, and to reduce the spacing between the pipe elbow and the restraint from 3-1/2" to 3/4" by rework of the shims. The inspector observed one of the primary loop 1-1 hot leg restraint modifications, including the new bolt installation, the clamp-on shimming assemblies, and the overall conditions of the restraint and structural condition, and considered the material and workmanship in order. The inspector further reviewed the A 564 bolt material test certification and had no adverse comments. The matters relating to this issue were considered resolved.

Documents reviewed included:

TECo Reportable Occurrence 80-010, Supplemental Information for LER NP-32-80-02, dated February 26, 1980

Catalytic Inc. Control Work Package No. 80-80-047-1805, dated May 20, 1980, Bolt Replacement for the Upper Hot Leg Pipe Whip Supports HLR-5 and HLR-6

REC Corporation material certification for the 1-1/2" - 8 UNC - 12-3/4" long A 564 Grade 630 studs, and same material heavy hex nuts; also A 325 washers. The inspector checked heat No. K6820 for the studs, and A2129 for the nuts, and determined that they had met Bechtel Specification 12501-C-84(Q), Revision 2 requirements. The inspector also checked the heat treatment records and considered the items had met the ASTM solution and age-hardening requirements.

CBI Company Shop Release for Shipment Checklist for Shim Material A299 thick plate material, dated May 29, 1980. The package included MTR from U.S. Steel Corporation dated September 29, 1978.

4. Work Performed at TECo Relative to Licensee Implementation of IEB 79-02

In conjunction with RIII Report Nos. 50-346/79-24, paragraphs 1.a, 2.a, and 3; and 50-346/79-33, paragraph 2, the inspector reviewed licensee report Serial No. 1-1-8, dated December 7, 1979, " A Report on Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts, Response to NRC IE Bulletin 79-02, Revision 2, DBI" and report Serial No. 1-147, dated July 11, 1980, same title, and had no adverse comment. During this visit, the inspector reviewed Bechtel Procedure PDP-1, Revision 4, dated July 10, 1980, "Inspection and Testing Produre for Concrete Expansion Anchors," and the records for inspection of those wedge type anchor bolts without available torque certification to verify the proper torque preload/lubrication, and considered the licensee measures taken to be adequate. In regard to some of the anchor bolts of Hanger No. 36-HBC-27-H45 installed on a block wall, the inspector considered the licensee response in Serial No. 1-108 paragraphs 5 and 6 to be acceptable. The IEB 79-02 is considered closed.

Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Unresolved items disclosed during this inspection are discussed in Paragraphs 1.b, and 1.c(2).

Exit Interview

The inspector met with licensee representatives at the conclusion of the inspections on July 24 and August 1, 1980. The inspector summarized the scope and findings of the inspections. The licensee acknowledged the findings reported herein.