## U.S. NUCLEAR REGULATORY COMMISSION

# REGION III

Report No. 50-346/83-17(DE)

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: Davis-Besse Site, Oak Harbor, OH

Inspection Conducted: August 23-25, 1983

1. tim Inspector: I. T. Yin

9/19/83

DAdlawith Approved By: D. H. Danielson, Chief Materials and Processes Section

### Inspection Summary

Inspection on August 23-25, 1983 (Report No. 50-346/83-17(DE))

Areas Inspected: Review of relocation of pressurizer relief valves; followup on previously identified items; inspection of installed snubbers and restraints on large and small bore piping systems. The inspection involved a total of 18 inspector-hours onsite.

Results: No items of noncompliance or deviations were identified.

### DETAILS

### 1. Persons Contacted

Toledo Edison Company (TECO)

\*C. L. Merbel, Civil and Structural Systems Engineer

- \*M. E. Nitzel, Stress Analysis Engineer
- \*S. G. Wideman, Licensing
- \*J. Faris, Administration Coordinator
- M. G. Foust, Plant Process Systems Engineer
- J. J. O'Neill, Maintenance Staff

Bechtel Power Corporation, Gaithersbury, MD (Bechtel)

R. Kies, Plant Design Supervisor

Teledyne Engineering Services (TES)

G. O'Connor, Senior Engineer

\*Denotes those attending the management exit meeting on August 25, 1983.

#### 2. Followup on Previously Identified Items

(Closed) Unresolved Item (346/79-11-01): Safety related special supports for small bore piping that were without backup calculation documentation. This item is closed, see Paragraph 5.a for details.

(Open) Unresolved Item (346/79-11-05): Snubber pin connections that should not be greased, had been greased. The inspector reviewed the ITT-Grinnell Corporation position stated in a site memorandum, dated October 23, 1983, where it stated, that ". . . once a bushing has been greased, the impregnated lubrication of the bushing is broken down, and it must then be regreased at regular intervals . . . " The licensee plans to replace all affected ball bushings installed on an estimated 280 snubbers. The grease fittings on the present units will be removed, or plagged, or have the ends clipped off. The licensee's program and completion schedules will be further reviewed by the inspector.

(Closed) Unresolved Item (346/82-22-01): Retrieval of ITT-Grinnell hanger calculation records. In responding to the inspector's concern, the licensee conducted a QA and technical audit at ITT-G on December 2-3, 1982. The audit was observed by the inspector. During this visit, the inspector reviewed the licensee's QA Audit Report #967, and considered the licensee measures including technical review of the selected sample hanger calculations to be adequate and effective. (Closed) Open Item (346/82-22-02): Review of pressurizer relief valve backup design considerations. The inspector's review of TES design documentation is discussed in Paragraph 5.b.

# 3. Licensee Action on IE Bulletins

(Closed) IE Bulletin 81-01 (346/81-01-BB): "Surveillance of Mechanical Snubbers," Revision 1, dated January 27, 1981. As a result of the previous RIII inspection conducted at the site in July and August, 1982, (Paragraph 4 of RIII Inspection Report 50-346/82-22), review of the licensee's letter to RIII, (Serial No. 1-295) dated September 14, 1982, and observation of mechanical snubber conditions during this inspection, this bulletin is considered to be closed.

# 4. License Action on Licensee Event Reports (LERs)

(Closed) LER (346/82-033-LL): Two upper concrete expansion anchor bolts on restraint PSU-H1 were pulled away from the wall. The RIII followup on the matter was documented in Paragraph 1 of RIII Inspection Report No. 50-346/82-22. A review of the licensee's audit of ITT-G relative to document retrievability and adequacy of support calculations is discussed in Paragraph 2 of this report.

## 5. Functional or Program Areas Inspected

### a. Design of Special Small Bore Pipe Supports

During a previous inspection (50-346/79-11) it was identified that the design of piping suspension systems for small pore piping was based on standardized methods. However, observation of installations revealed many which appeared to be interconnected, and were not per standardized design criteria. In review of the situation, it was identified that there were approximately 200 of these types of restraint and support installations. The 200 number was revised by Bechtel during this inspection to 397. Of these, 20 were evaluated as part of the IE Bulletin 79-14 requirements and were determined to be acceptable. Also, 6 others installed on the Component Cooling Supply to the Decay Heat Pump Seals were evaluated by the licensee. The Bechtel Calculations SP-209-1 to 6, dated August 19 and 22, 1982 showed the support stresses were within Code allowables.

### Unresolved Items:

 Relative to the remaining 371 special designed small bore restraints and supports, the licensee will develop a program to:

 (a) determine support loads based on standardized or computer methods,
 (b) evaluate restraint assembly physical conditions, and
 (c) develop acceptance bounding criteria based on both the highest design loading and weakest structural configurations.
 (346/83-17-01).

 (2) During the inspector's observation of small bore piping suspension systems, unusual arrangement conditions were identified. The licensee stated that they will evaluate the generic effects of small bore support/restraint interactions between snubbers, loose guides, tight guides, rigid straints, and rigid supports. (346/83-17-02).

# b. Modification of Pressurizer Relief Systems

As a followup on Open Item 346/82-22-02, the inspector discussed this item with TECO and TES engineers and reviewed: (1) pertinent portions of TES Technical Report, TR-5639-2, "Davis-Besse Analysis and Evaluation of the Safety/Relief Valve Discharge System per NRC NUREG-0737," Revision 0, dated January 1983, and (2) NUREG-0737," clarification of TMI Action Plan Requirements," dated November 1980, Section II D.1., "Performance Test of BWR and PWR Relief and Safety Valves (NUREG-0578, Section 2.1.2).

Subsequent to the review, the inspector received the following information in response to his questions:

(1) Had piping analyses and support calculations been completed prior to system modification?

The modification involved relocation of the two existing Crosby 4M16 Safety Valves (SVs) to the top of the pressurizer. The SVs will discharge directly into the containment instead of the quench tank. The SV thrust loades were balanced by a T-configuration discharge fitting. Jet impingement forces and effects had been evaluated to be acceptable. The modification resulted from a TES analyses showing that the approximate 30 feet of SV inlet pipe line could increase the probability of having valve chatter and the condensate blowdown thrust could create excessive loading on the nozzles. The elimination of the inlet piping connecting to the SVs affected the piping stress analysis for the existing Relief Valve (RV), Crosby HPV-SN, and the one Power Operated Relief Valve (PORV), Velan B9-354B-13MS Gate, that were previously interconnected as one discharge piping system. In disucssion with TES and TECO staff, the inspector was informed that conservative loading assumptions were input into the piping analyses prior to system modification which was initiated and completed during the last plant refueling outage which ended in September 1982. The reason why actual forcing functions were not imput was because the testing of the SV, RV, and PORVs and the verification of full scale blowdown tests had not been completed at that time. The TECO program was forwarded to NRC-NRR by letters: (1) Serial No. 800, dated March 31, 1982, (2) Serial No. 834, dated July 1, 1982, (3) Serial No. 886, dated December 17, 1982, and (4) Serial No. 905, dated February 1, 1983.

(2) Were there any supports that had exceeded code stress allowables during plant operation?

The modification of restraints in this refueling outage resulted from actual blowdown loads that had exceeded the previous conservative load estimates. The modification did not effect the Class 1 portion of the piping system from the pressurizer to the RV and FORV. However, three restraints installed on the discharge line required modification as follows:

- \* 30-GCC-8-H2: relocation to PORV discharge nozzle with a modified pipe attachment
- \* 30-GCC-8-H5: modification of snubber attachment base plate

\* 30-GCC-8-H17: modification of the struts to provide additional pinned connections.

(3) The calculation, "Pressurizer Nozzles and Safe Ends," dated December 14, 1982, contained in TES Report TR-5639-2 applied stress indices of  $B_1 = 0.5$  to the internal pressure stress calculation. In view of the 6x4 reducers that were installed on both the pressurizer nozzle and the SV inlet nozzle, why didn't they use a stress indices of  $B_1 = 1.0$  as required by the ASME Section III Code?

Further review of the new SV connection to the pressurizer configuration revealed that the SV connecting reducers were deleted and the SV was attached directly to the nozzle safe end. The safe end was fabricated from a steel stock, bored through in the center, with matching ODs for both the pressurizer nozzle and SV welding flange connection. The inspector concurred with the TES interpretation that the  $B_1 = 0.5$  used for internal pressure stress calculation for "girth butt weld between straight pipe or between pipe and butt-welding components" could be considered applicable for the present installation.

c. Observation of Piping Suspension System Conditions

The inspector observed approximately 50 large and small bore piping snubber and rigid restraint installations. The mechanical and hydraulic snubbers appeared to be in good physical condition.

In addition to the comments made in Paragraph 5.a.(2), the licensee was requested to address the following unresolved items:

(i) A snubber 30-GCC-8-H8 and a rigid strut 30-GCC-8-H7 were observered installed on the pressurizer PORV discharge to the quench tank riser at the same pipe location but approximately 120° apart. Whether or not the functionability of the snubber will be affected by the rigid strut was questioned by the inspector. (346/83-17-03).

(2) Several new vintage ITT-G hydraulic snubbers with Miller cylinders, including PSP-1-H4 and PSP-1-H6 installed on Pressurizer Spray Piping System, were observed without fluid reservoir breather and filter units. The requirement and need for each of these devices and any possible adverse effects from them not being installed will be reviewed by the inspector during a future inspection. (346/83-17-04).

## 6. 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. The unresolved items disclosed during this inspection are discussed in Paragraphs 5.a.(1), 5.a.(2), 5.c.(1), and 5.c.(2).

# 7. Exit Interview

The inspector met with licensee representatives at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection. The licensee representatives acknowledged the findings reported herein.