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Docket No. 50-346

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Mr. Richard P. Crouse
Vice President, Nuclear
Toledo Edison Company
Edison Plaza - Stop 712
300 Madison Avenue
Toledo, Ohio 43652

Dear Mr. Crouse:

SUBJECT: NUREG 0737 ITEM II.D.1. - REQUEST FOR ADDITIONAL INFORMATION

We have reviewed the information contained in Toledo Edison Company submittals dated March 31, 1982, July 1, 1982, December 17, 1982, and February 1, 1983 related to Item II.D.1. of NUREG 0737. We find that we require additional information as identified in the attachment to this letter. Please provide your response no later than July 19, 1985.

The information request affects fewer than ten respondents; therefore, OMB clearance under P. L. 96-511 is not required.

Sincerely,

*ORIGINAL SIGNED BY
JOHN F. STOLZ*

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

cc: See next page

ORB#4:DL	ORB#4:DL
ADeAgazio;cr	JStolz
6/6/85	6/7/85

Questions related to the selection of transients and valve inlet conditions:

1. The Crosby $4M_16$ safety valve was not tested by EPRI. A spare Davis-Besse safety valve was tested by Crosby to gain additional test data to demonstrate operability. The Teledyne Engineering Services (TES) Report (TR-5639-2) stated that the inlet conditions used by Crosby (Reference 5 of Appendix A TES report) in testing the $4M_16$ were not identical to the Davis-Besse inlet fluid conditions. Full pressure, full flow testing was not performed by Crosby on the $4M_16$ safety valve. The TES report further stated that the inlet conditions used by Crosby could be justified by parametric studies. Crosby concluded that the as supplied ring settings were adequate for the Davis-Besse inlet fluid conditions and inlet piping configuration. The Crosby test report results (Reference 5 of TR-5639-2 Appendix A) were not available to EG&G Idaho for review. No other discussion or detailed results were provided on the Crosby test. Provide a copy of Reference 5 of TR-5639-2 Appendix A, and additional discussion justifying the applicability of the Crosby test results to the Davis-Besse plant.

2. Results from the EPRI tests on the Crosby 3K6 and 6M6 safety valves indicated that test blowdowns exceeded the 5% value given in the valve specifications. If the plant-specific expected blowdowns also exceed 5%, the pressure might be sufficiently decreased such that adequate core cooling might not be achieved for decay heat removal. Expected blowdowns for the Davis-Besse plant at their current ring settings were not provided. Discuss the consequences of potentially higher blowdowns. Discuss the adequacy of decay heat core cooling at the expected reduced pressures.

3. The B&W Inlet Fluid Conditions Report analyzes the generic 177-FA plant for a feedline break accident. In their analysis the PORV was assumed not to operate. The transient data tables and plots were presented in the report for times of less than 40 sec. Liquid discharge was not predicted during these time spans.

   The Davis-Besse submittal states that the safety valves will pass only steam with the exception of the feedwater line break event where transition to liquid could occur. Provide additional information discussing the potential case of safety valve liquid discharge, and discuss the effects on safety valve operability.

Questions Related to Valve operability:

4. EPRI testing of the Crosby 3K6 and 6M6 safety valves was performed at various ring settings. The submittal did not provide the present Davis-Besse safety valve ring settings. If the plant current ring settings were not used in the EPRI tests, the results may not be directly applicable to the Davis-Besse safety valves. The submittal did state that Crosby conducted testing on a spare Davis-Besse $4M_16$ safety valve and concluded the ring settings were adequate (see related question 1). No documentation of the Crosby tests were provided. Identify the Davis-Besse safety valve ring settings. Explain how the expected values for flow capacity, blowdown, and stability corresponding to the plant-specific ring settings were extrapolated or calculated from the EPRI test data. Identify these values so determined and evaluate the effects of these values on the behavior of the safety valves.

5. EPRI testing of the Crosby PORV during pre-evaluation tests at Marshall failed to open on demand after several actuations and failed to seat properly. The Crosby PORV was disassembled and inspected, revealing a fractured weld on the bellows and an improperly machined surface on the bellows flange. A second Crosby PORV was used for the Wyle phase II and III tests. Prior

to testing the PORV was disassembled and again an improperly machined bellows was found. What measures have been taken by Davis-Besse to assure reliable PORV operability and that the plant PORV meets vendor specifications.

6. The TES report (TR-5639-2) stated that the Davis-Besse block valve was a 2 1/2 in. Velan B9-354B-13MS gate valve with a Limitorque SMB-00-10 actuator. The EPRI Block Valve Information Report stated that the Davis-Besse block valve was a 2 1/2 in. Velan F9-454-B-13MS gate valve with a Limitorque SMB-00-10 actuator. Neither of the above block valves nor the actuators were tested by the EPRI block valve test program. Clarify which model block valve is used at Davis-Besse. Provide additional information discussing the extrapolation of EPRI test data and its application.

7. The B&W Valve Inlet Fluid Conditions Report stated that liquid flows could exist through the PORV for the FSAR feedline break and the extended high pressure injection events. These same flow conditions will also exist for the block valve. The EPRI/Marshall block valve test program only tested the block valves with steam flow. Since it is conceivable that the PORV block valve could be expected to operate with liquid flow, provide a justification as to how the results of the Marshall tests or other tests can be used to demonstrate operability of the block valves for liquid conditions. Also, evaluate applicability of the test results to the Davis-Besse block valve since the plant valve has a Limitorque SMB-00-10 actuator while a SMB-000-10 and SB-00-15 were tested.

8. NUREG-0737 Item II.D.1 requires that the plant-specific PORV control circuitry be qualified for design-basis transients and accidents. Please provide information which demonstrates that this requirement has been fulfilled.

Questions related to the thermal hydraulic and structural analysis of the inlet and discharge piping:

9. Bending moments are induced on the relief valves during the time they are required to operate because of discharge loads and thermal expansion of the pressurizer vessel and inlet piping. The TES report TR-5639-2 did not provide bending moments applied to the PORV. Make a comparison of the predicted Davis-Besse PORV valve bending moments to the tested valve bending moments to demonstrate that operability of the valve is not impaired.

10. The submittal provides a list of loads that were considered in the structural analysis and states that the analysis was performed to criteria of ASME Code Section III, Subsections NB, ND, and NF. It does not, however, identify the load combinations considered in the analysis or the stress limits used for each combination. A list of recommended load combinations and stress limits is contained in the EPRI PWR Safety and Relief Valve Test Program Guide (by MPR Associates, Inc.). Provide a list of load combinations and respective stress limits used in the analysis of the inlet piping, discharge piping, and supports so as to show how these compare with the recommended combinations and limits of the EPRI Guide.

11. The submittal on structural analysis states that the nozzle-to-flange weld of the safety valve and the flange below the safety valve have acceptable stress values. Provide results from the analysis that support this statement.

12. The submittal identified three supports which were overloaded and stated that considerations were being made concerning modifications to these supports to meet the higher loads. Provide final assessment and/or modifications performed concerning the three overstressed piping supports.

13. The submittal stated that the safety valves are directly mounted to the Pressurizer nozzles. No piping supports are used on the safety valves or inlet piping. The safety valves discharge directly into tees with their ends closed by rupture discs. The blowdown loads due to a safety valve lift do not appear to be included with the other considered piping loads. Provide additional information addressing the dynamic effects of the blowdown discharge (torsional moment on nozzle if rupture disc burst pressures not equal) and the effects of valve discharge impingement on the tee wall (inducing of a bending moment on the nozzle) to verify nozzle structural integrity.

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