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Docket Number 50-346

License Number NPF-3

Serial Number 1873

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United States Nuclear Regulatory Commission  
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Subject: Extension of the Justification for Continued Operation (JCO) and  
Response Date for Part 1-d: NRC Bulletin 88-11, Pressurizer Surge  
Line Thermal Stratification (TAC Number 72128)

Gentlemen:

On December 20, 1988, the NRC issued Bulletin 88-11, Pressurizer Surge Line Thermal Stratification. The bulletin specifically addressed the phenomenon of thermal stratification and striping and its effects on the Pressurizer Surge Line (PSL). The concern was that thermal stratification causes the PSL to deflect in ways which were not assumed in the original design basis thereby invalidating the existing fatigue analysis. The bulletin as it applies to Davis-Besse required four actions.

- a. Conduct a visual inspection to determine any gross discernible distress or structural damage.
- b. Perform a conservative (bounding) fatigue analysis considering both thermal stratification and striping for the duration of the operating license. If this analysis does not equal or exceed the duration of the license then also submit a Justification for Continued Operation (JCO) for the period bounded by the analysis.
- c. If the aforementioned analysis does not equal or exceed the license duration, then obtain specific stratification and deflection data.
- d. Utilizing data from (c) above, submit an updated stress and fatigue analysis that ensures compliance with all applicable code requirements and regulatory commitments within two years after receipt of this bulletin (January 2, 1991). If unable to show compliance, submit a JCO and description of the proposed corrective actions for a long term resolution.

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In accordance with (a), Toledo Edison submitted a letter (Serial Number 1633) dated March 3, 1989. The letter reported the initial results of the Toledo Edison program to assess the integrity of the surge line, which included a visual inspection. The visual inspection detected no gross discernible distress or structural damage to the surge line, piping supports or restraints.

In accordance with (b), Toledo Edison in conjunction with the B&W Owners Group (BWOOG) submitted a letter (Serial Number 1671) dated June 2, 1989. The letter transmitted the results of the BWOOG and Davis-Besse specific analysis, as well as the Davis-Besse JCO. The Davis-Besse JCO was submitted as a result of the conservative analysis, justifying a total of 57 heatup/cooldown cycles for a fatigue usage factor of 1.0. This was less than the design basis of 240 allowable cycles, but a sufficient margin of 17 full cycles was still available to ensure safe plant operation well beyond the end of the 7th Fuel Cycle. By a letter dated August 7, 1990 (NRC Bulletin Number 88-11, "Pressurizer Surge Line Thermal Stratification-Evaluation of Babcock and Wilcox Owners Group (B&WOG) Bounding Analysis" (TAC Number M72128)), the NRC submitted the results of its review of the B&WOG bounding analysis (BAW-2085) and found that sufficient information had been provided to justify continued plant operation until Toledo Edison completed its final report by January 2, 1991 (as committed by Serial letter number 1671).

Toledo Edison, in conjunction with other B&W plant owners, initiated the BWOOG PSL Thermal Stratification Program. In accordance with (c), this program intended to take advantage of the bulletin's provision to allow collective efforts in data acquisition. The bulletin stipulated the acceptability of this approach provided the similarity of the PSL design, geometry and plant operation could be demonstrated. The BWOOG PSL program recognized the difference in the geometry of the Davis-Besse PSL with respect to the other B&W plants and was tailored to reconcile those differences. The program provided for the instrumentation of the Oconee-1 (O-1) PSL for both temperature and deflection. The intention was to account for the geometric differences between Davis-Besse and Oconee Unit 1 through use of thermal-hydraulic analytical modeling of the surge line. Verification of the model against the thermal measurements at Oconee 1 would permit confident prediction of the Davis-Besse Unit 1 thermal stratification conditions based upon a similar model adjusted to account for Davis-Besse geometry. The output of the program would be the updated stress and fatigue analysis in accordance with requirement (d) of the Bulletin.

Toledo Edison was subsequently informed by Babcock and Wilcox Nuclear Services that the correlation of the thermal-hydraulic model against Oconee Unit 1 data proved inadequate for reliable use in characterizing thermal stratification conditions at Davis-Besse. Babcock and Wilcox Nuclear Services recommended that Toledo Edison install special instrumentation on the surge line to gather the necessary information on thermal stratification and the related piping deflections. Toledo Edison promptly began preparations for the installation of a temperature and deflection data acquisition system on the Davis-Besse PSL. This system was installed during

the Davis-Besse Sixth Refueling outage (6RFO), (February through July 1990). The data acquisition system was in place to monitor the PSL during restart from 6RFO (heatup for 7th Fuel Cycle) to acquire Davis-Besse plant specific data.

During the heatup for the 7th Fuel Cycle (July 1990), data were gathered to characterize both the thermal stratification conditions and the resulting deflection of the surge line. Both the thermal and deflection conditions were to be quantified to provide the necessary information to revise the ASME Code Stress Report in compliance with Part 1-d of the NRC Bulletin 88-11; by January 2, 1991. The analysis of data from the heatup for the 7th Fuel Cycle by Toledo Edison and the B&W Nuclear Service Company is actively continuing. However, due to the extent of the effort required, this analysis will not be complete for Davis-Besse Unit 1 by January 2, 1991.

Toledo Edison will complete and submit the final fatigue analysis for Davis-Besse by restart from the 7th Refueling Outage as an addendum following the B&W Owners Group submittal to NRC Bulletin 88-11. Since the 7th Refueling Outage is scheduled to start on September 1, 1991, this extension represents approximately eight months of power operations. Although the plant specific fatigue analysis will not be completed by January 2, 1991, sufficient fatigue margin remains justifying continued safe operation beyond the expected completion of the 7th Fuel Cycle. The following provides the basis for Toledo Edison's conclusion:

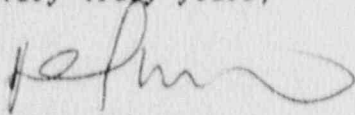
- a. Review of the instrumentation data from the heatup for the 7th Fuel Cycle indicates a maximum stress level supportive of the conclusions of the original JCO.
- b. The magnitude of the largest thermal stratification transient observed during the 7th Fuel Cycle heatup remains bounded by the maximum reported in the JCO.
- c. The non-destructive examinations performed during the 6th Refueling Outage for the 10-year Inservice Inspection Interval revealed no reportable indications for the pressurizer surge line.

Although Serial Letter Number 1671, originally justified continued operation through January 2, 1991, sufficient margin is available to ensure safe plant operation well beyond the 7th Fuel Cycle. While efforts to complete the final fatigue analysis by restart from the 7th Refueling Outage are ongoing, sufficient technical basis exists to extend the JCO for Davis-Besse until restart from the 7th Refueling Outage. Therefore, Toledo Edison will submit the final fatigue analysis to ensure compliance with applicable code requirements and regulatory commitments or submit a future JCO and a description of proposed corrective actions to effect a long term resolution by the restart from the 7th Refueling Outage.

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If you have any questions concerning this matter, please contact  
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Very truly yours,



RAS/mmb

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