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Docket Number 50-346

License Number NPF-3

Serial Number 2396

August 5, 1996

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555-0001

Subject: Supplemental Information for the License Amendment Application to Revise Technical Specifications and Associated Bases for Pressurizer Code Safety Valve Lift Setpoint Tolerances

Ladies and Gentlemen:

An application for an amendment to the Davis-Besse Nuclear Power Station (DBNPS), Unit Number 1 Operating License NPF-3, Appendix A, Technical Specifications (TS) to change TS 3/4.4.3, Safety Valves and Pilot Operated Relief Valve-Operating, and associated Bases 3/4.4.2 and 3/4.4.3 was submitted to the Nuclear Regulatory Commission (NRC) on September 29, 1995, (Serial Number 2325).

Since submittal of the application, further justification with regard to the requested change to the Pressurizer Code Safety Valve (PCSV) tolerance has been discussed between the NRC Staff and DBNPS personnel. As a result, Toledo Edison (TE) is submitting the attached information in support of the amendment application and to resolve questions with regard to the acceptability of a minus three percent tolerance for as-found PCSV setpoints in relationship to the Pilot Operated Relief Valve (PORV) setpoint.

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This information does not affect the conclusions previously provided to the NRC in the subject application's Safety Assessment and Significant Hazards Consideration. Should you have any questions or require additional information, please contact Mr. James L. Freels, Manager - Regulatory Affairs, at (419) 321-8466.

Very truly yours,

TJ — for JK Wood

J. K. Wood
Vice President - Nuclear
Davis-Besse Nuclear Power Station

DLM:tam

Attachment

cc: L. L. Gundrum, NRC Project Manager
A. B. Beach, Regional Administrator, NRC Region III
S. Stasek, DB-1 Senior Resident Inspector
J. R. Williams, Chief of Staff, Ohio Emergency Management Agency, State of Ohio (NRC Liaison)
Utility Radiological Safety Board

Supplemental Information Regarding License Amendment Request Number 94-10

License Amendment Request (LAR) Number 94-10 (TE Serial Number 2325) requested an increase to the TS 3.4.3 PCSV lift setting from ≤ 2525 psig to ≤ 2575 psig, which corr ponds to a lift setting tolerance change from plus one percent to plus three percent. The LAR does not change the pressure (2500 psig) or tolerance (± one percent) at which the PCSVs are set prior to being placed in service. The three percent tolerance applies only to the as-found condition of the valve when being tested in accordance with TS Surveillance Requirements.

During initial review of the LAR, the NRC Staff requested information regarding the impact of an assumed minus three percent drift of the PCSV setpoint on the frequency of a Small Break Loss of Coolant Accident (SBLOCA). A minus three percent drift of the PCSV setpoint from 2500 psig to 2425 psig would result in the PCSV opening before the PORV on an overpressure transient. The minimum allowable value for the PORV setpoint is 2435 psig in accordance with TS 3.4.3. The NRC requested that TE determine if the drift of the PCSV setpoint to less than the minimum PORV setpoint would impact the frequency of a SBLOCA resulting from overpressure transients.

In response to NUREG-0737, Section II.K.3.2, Clarification of Three Mile Island Action Plan Requirements, the Babcock and Wilcox Company (B&W) determined the impact of a stuck open PORV on the SBLOCA frequency. In NUREG-0737, Section II.K.3.2, the NRC established an acceptance criteria for the probability of a SBLOCA, caused by a stuck open PORV, of less than $10^{-3}$ per reactor-year, based on the acceptance criteria for a SBLOCA found in WASH-1400. The analysis supporting TE's response to NUREG-0737, Section II.K.3.2, is documented in BAW-1890A, Justification for Raising Setpoint for Reactor Trip on High Pressure. The basis for the DBNPS minimum PORV setpoint of 2435 psig, based on BAW-1890A, is documented in the NRC Staff's Safety Evaluation Report (SER) for Amendment Number 128 to the facility operating license dated January 17, 1989. The PORV opening probability on high pressure transients and the failure probability of the PORV to reclose after opening were used to determine the PORV contribution to the overall SBLOCA frequency. Toledo Edison reviewed the BAW-1890A analysis and the SER for Amendment Number 128. The same methology was applied to determine the PCSV contribution to the SBLOCA frequency assuming that the PCSV setpoint has drifted to less than the minimum allowed PORV setpoint. In this case, TE concludes that the SBLOCA frequency would not be impacted by PCSV setpoint drift to less than the PORV setpoint, as described below.

Report BAW-1890A used Monte Carlo simulations to determine the opening probability for the PORV with a setpoint of 2450 psig. This analysis was extended to a PORV setpoint of 2435 psig as discussed in the SER for Amendment Number 128. Figure 4.4-1 of BAW-1890A, which is also included in the Technical Evaluation Report EGG-NTA-8152 dated June, 1988 prepared in support of Amendment Number 128, shows the results of the Monte Carlo simulations. The information presented on Figure 4.4-1 can be conservatively extrapolated to a condition when the PCSV lift pressure has drifted to 2425 psig.

Based on extrapolation from Figure 4.4-1, the probability of the PCSV opening on an overpressure event is $2.365 \times 10^{-2}$ openings/event. For an estimated annual high pressure trip frequency of 1.86 /year, $4.4 \times 10^{-2}$ PCSV openings/year would be expected.

To determine the SBLOCA annual frequency, the PCSV opening frequency determined above must be combined with the expected PCSV probability for failure to close per demand. From generic data used for the DBNPS Individual Plant Examination (IPE), this probability is $7.45 \times 10^{-3}$ failures/opening. Therefore, the SBLOCA frequency from this opening of the PCSV is calculated as follows:

$(4.4 \times 10^{-2}$ PCSV openings/year) $(7.45 \times 10^{-3}$ failures/opening) $= 3.3 \times 10^{-4}$ failures/year

This SBLOCA frequency is less than the NUREG-0737, Section II.K.3.2 criteria of $10^{-3}$ per year. The SBLOCA frequency from opening of the PCSV calculated above is conservative. This calculation does not take credit for the probability of PCSV setpoint drift to 2425 psig over an operating cycle. Although drifts of this magnitude are considered unlikely, if a drift probability of 0.2 over an operating cycle is assumed, the SBLOCA frequency will be further reduced to $6.6 \times 10^{-5}$ failures per year.

This analysis, which is based on data previously evaluated by the NRC, shows that drift of a PCSV setpoint will not significantly contribute to the SBLOCA frequency. The Bases as proposed in the LAR 94-10 clarify that the PCSVs will be set at 2500 psig ± one percent to be in compliance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The ASME Code, written to ensure reliable operation of safety valves, recognizes that an as-found PCSV setpoint tolerance of ± three percent is acceptable for safety and relief valves, and provides specific requirements to be followed if the setpoint drifts beyond ± three percent.

In conclusion, a PCSV setpoint drift as much as minus three percent satisfies the NRC SBLOCA frequency acceptance criteria and satisfies ASME Code requirements.