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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Units 2 and 3
Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Subject: Main Steam Safety Valve Setpoint Tolerances and Tolerance Uncertainty Treatment Methodology

References:

1. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Request for Technical Specifications Changes Related to Main Steam Safety Valve Operability Requirements," dated October 10, 2002
2. Letter from M. Banerjee (U. S. NRC) to C. M. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3 – Issuance of Amendments for Main Steam Safety Valve Technical Specifications (TAC Nos. MB6537 and MB6538)," dated July 30, 2004
3. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Regarding Request for Technical Specifications Changes Related to Main Steam Safety Valve Operability Requirements," dated July 8, 2004

In Reference 1, Exelon Generation Company, LLC (EGC) requested changes to the Technical Specifications (TS) of Facility Operating License Nos. DPR-19 and DPR-25 for Dresden Nuclear Power Station (DNPS), Units 2 and 3. The proposed changes increased the number of main steam safety valves (MSSVs) required to be operable from eight to nine. The NRC approved the proposed changes in Reference 2.

As described in Reference 2, DNPS operating experience indicates that the as-found lift setpoints of the MSSVs and Target Rock safety/relief valves (S/RVs) have deviated from the TS tolerance limit of plus or minus one percent multiple times. As such, the NRC's approval of the proposed changes included additional conditions that were added to the license to affect resolution of the issue of valve lift setpoint drift beyond the TS tolerance value. One of the additional conditions stated "Exelon shall submit, for NRC approval, values for the safety valve and safety/relief valve setpoint tolerances and the tolerance uncertainty treatment methodology

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applied to the main steam safety valve and safety/relief valve setpoint test data by October 29, 2004." This letter provides the requested information.

Generally, safety valve drift is considered as a fixed percentage of the setpoint. In application in safety analysis codes, this drift allowance is generally used additively and uniformly to a valve or group of valves with the same setpoint. With groups of valves, assuming all of them drift to the highest possible setpoint is a very conservative approach.

However, to support approval of the Reference 1 amendment request, EGC used this approach in an American Society of Mechanical Engineers (ASME) overpressure analysis, and the results were submitted to the NRC in Reference 3. The ASME overpressure analysis was performed using valve setpoint tolerances that were determined using a 95/95 statistical analysis as described in NUREG-1475, "Applying Statistics." Using the 95/95 methodology, EGC determined that the setpoint tolerances based on actual valve performance were 2.2 percent for the MSSVs and 4.1 percent for the S/RVs. As stated above, assuming all of the valves drift to the highest possible setpoint is a very conservative approach.

EGC has performed a Monte Carlo statistical analysis of the MSSV networks to determine an upper tolerance limit that more accurately predicts the distribution of pressures that result in the valves opening. The intent of the analysis was to demonstrate a statistically based technically valid alternative to traditional deterministically applied setpoint drift, which assumes that all of the valves drift to the highest possible setpoint. The one-time Monte Carlo statistical analysis was performed using actual as-found MSSV and S/RV test data. The Monte Carlo analysis of the valve network shows that valve opening for a group of valves with the same setpoint will display a distribution, with some valves opening at lower pressures and some opening at higher pressures. The characterization of valve opening was selected such that the distribution bounds 95 percent of the actual as-found MSSV and S/RV test data to ensure that the result is conservative and bounds the majority of the data.

The results of the Monte Carlo analysis conclude that the actual MSSV setpoint drift data does not support the current TS upper tolerance limit of one percent on all valves. This conclusion is largely driven by the penalty associated with performing a statistical analysis on a small population of data points (i.e., each DNPS unit has only one S/RV that is tested once per cycle). However, the use of Monte Carlo based valve network response suggests that the anticipated valve network performance, based on 95 percentile criteria, is very close to the deterministic case with all valves drifted one percent high. Specifically, the analysis shows that the amount of main steam pressure/flow relieved through the valve network modeled for the Monte Carlo analysis (i.e., using actual MSSV and S/RV as-found test data) exceeds the amount of main steam pressure/flow relieved when an upper tolerance of 1.5 percent is applied to all valves. Although the analysis does not support the current TS upper tolerance limit of one percent on all valves, the anticipated transient without scram peak pressure and ASME overpressure analyses have been performed assuming upper tolerances greater than 1.5 percent for each DNPS unit.

EGC is currently evaluating potential design modifications that would increase the MSSV and S/RV relief capacity in order to regain margin that was lost as a result of implementing extended power uprate and more efficient reactor core designs. The MSSV and S/RV setpoint tolerances are also being evaluated in conjunction with the potential design modifications. Therefore, the setpoint tolerance selected for the planned TS amendment request may not be 1.5 percent.

However, in light of EGC's evaluations to date that are based on actual as-found test data, the upper limit setpoint tolerance requested in the future TS amendment request will be greater than or equal to 1.5 percent.

The license amendment request and supporting analyses will be performed in accordance with General Electric Nuclear Energy licensing topical report NEDC-31753P, "BWROG In-Service Pressure Relief Technical Specification Revision Licensing Topical Report," to support the future TS amendment request. This licensing topical report was previously reviewed and approved by the NRC as documented in a safety evaluation dated March 8, 1993, and provided the basis for NRC approval of TS amendments for several other boiling water reactors.

Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely, at (630) 657-2803.

Respectfully,

Patrick R. Simpson
Manager – Licensing

Attachment: Calculation MWMECH-04-004, "Monte Carlo Analysis of Dr 2&3 and QC 1&2 MSSV Network Using Pooled Data and Design Methodology Approach," Revision 0

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station