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United States Nuclear Regulatory Commission
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Subject: Revision of Technical Specifications Safety Features Actuation System and Steam and Feedwater Rupture Control System Instrumentation Trip Setpoints

Gentlemen:

Toledo Edison (TE) submitted an application (TE letter Serial Number 2025, dated February 17, 1993) for an amendment to the Davis-Besse Nuclear Power Station (DBNPS), Unit 1, Operating License NPF-3, Appendix A Technical Specifications (TS) regarding revision of the Safety Features Actuation System (SFAS) and the Steam and Feedwater Rupture Control System (SFRCS) trip setpoints. During the review of this submittal, the NRC staff requested additional information which was provided by Toledo Edison representatives during a telephone conference call with the NRC staff on January 19, 1994. The NRC staff also requested that Toledo Edison provide this information by letter. Enclosed is the information requested by the NRC staff.

Should you require further information regarding this amendment application, please contact Mr. William T. O'Connor, Manager - Regulatory Affairs, at (419) 249-2366.

Very truly yours,

Louis F. Storz

DRW/amb

Enclosure

cc: J. B. Martin, Regional Administrator, NRC Region III
S. Stasek, NRC Region III, DB-1 Senior Resident Inspector
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ADDITIONAL INFORMATION TO SUPPORT REVISION OF SAFETY FEATURES ACTUATION SYSTEM AND STEAM AND FEEDWATER RUPTURE CONTROL SYSTEM INSTRUMENTATION TRIP SETPOINTS

The following information is provided to support NRC approval of Toledo Edison's February 17, 1993, application for an amendment to the Davis-Besse Nuclear Power Station (DBNPS), Unit 1, Operating License Number NPF-3, Appendix A Technical Specifications (TS). This amendment application proposed changes to some of the instrumentation trip setpoints in TS 3/4.3.2.1, Safety Features Actuation System Instrumentation, and TS 3/4.3.2.2, Steam and Feedwater Rupture Control System Instrumentation.

1. NRC Question:

   From the submittal it was not clear:

   A. How environmental effects on the instrument accuracy and drift are accounted for.

   B. How response times of the instrument loop and that of the equipment activated by the trip setpoint are accounted for in computation of setpoint(s).

   C. If the plant has a program in place to track the various assumptions the calculation consists of, and verify them before the new setpoints are implemented.

   Toledo Edison Response:

   A. The environmental effects are considered in two different categories, the normal environmental changes and the accident environmental changes. The normal environmental changes, i.e. temperature changes, humidity changes, etc., are factored into the calculation as part of the instrument error based upon vendor specified error percentages. The accident environmental changes are factored into the calculation as part of the instrument error based upon vendor specified error percentages if the environmental changes are applicable to the instrument. For example, a high energy line break outside of containment will not be factored into the containment pressure-high setpoint calculation since the instrument is not used to mitigate that accident.

B. The response times are not factored into the calculations generated to produce the Technical Specification instrument trip setpoint values. Rather, the response times of the instruments are included in the response time for the equipment actuation in the Technical Specifications. The total response time for sensor, trip circuitry, and equipment actuation is verified to be within the Technical Specification response time requirement for the equipment. The acceptable value for total equipment response time is based upon the analytical value used in the accident analysis. If a component is replaced which affects the total equipment's response time, the component's response time is determined and summed with the remaining equipment in the string and verified to satisfy the Technical Specification value.

C. The assumptions in the calculations are primarily a restatement of existing design basis information. The reference to a certain section of the Updated Safety Analysis Report (USAR) provides where the information was retrieved. To facilitate easier traceability between the USAR and the calculations, these values are also restated in the assumptions to provide the exact values used in the development of the calculations.

The assumptions may also consist of actual assumptions. An example of this type of assumption would be the calibration temperature of an instrument. It may be assumed that the calibration of the instruments will occur at a conservative value of 68 degrees F.

The third type of assumption used is to declare the nonexistence of data from a vendor. For example, if no drift value is specified by the vendor, this would be stated in the assumptions.

There are several DBNPS proceduralized programs that require calculations to be reviewed for impact. For example, if there is a modification to the plant, a setpoint change to a piece of equipment, or a simple document correction, the engineer designing the change is required to verify if any calculations are affected. The calculation procedure would then require that the assumptions of the affected calculation be verified to remain accurate.

2. <u>NRC Question</u>:

The calculations do not use a consistent value for converting gauge pressure to absolute. The calculations use various values including 14.4, 14.7, and 15.0 psi.

Toledo Edison Response:

The gauge to absolute conversion values of 14.4 and 15.0 psi occur only in the "Historical Perspective" sections of the license amendment application's Safety Assessment and Significant Hazards Consideration (SASHC). As explained in the sections, these values were originally used by the Architect/Engineer (Bechtel) (e.g., SASHC Page 6, "Containment Pressure - High - High, Historical Perspective") and the Nuclear Steam System Supply vendor (Babcock and Wilcox) (e.g., SASHC page 7, "RCS Pressure-Low, Historical Perspective"), respectively, to arrive at the current Technical Specification trip setpoint values. This information was provided in the SASHC to establish the basis of the existing trip setpoints.

As stated in the first paragraph on page 6 of the Safety Assessment and Significant Hazards Consideration, the proposed setpoints in the license amendment application use 14.7 psi to convert between gauge and absolute pressure. This is a standard value which eliminates the inconsistencies which were introduced in the past by differing vendor input.

3. NRC Question:

Reference: Safety Assessment and Significant Hazards Consideration submittal page 2 last line and page 3 top paragraph:

Methodology - "Finally, all drift terms, including the sensor, would be set to zero within the radical and the computation performed a third time. This would define the TS allowable value for channel calibration..."

Page 2 "Containment Pressure - High" includes all drift terms to compute the TS allowable for channel calibration. This is contradictory to above statement.

Toledo Edison Response:

As stated in the last paragraph on page 2 of the Safety Assessment and Significant Hazards Consideration, the described general methodology is followed except for noted exceptions. The containment pressure-high trip setpoint is such an exception. The containment pressure-high trip setpoint is based on the expected maximum atmospheric pressure inside containment. To prevent spurious trips if the instrument string drifts downward, the proposed trip setpoint is raised an amount equal to the drift. (Note: the trip setpoint is also raised to prevent a spurious actuation if the measurement and test equipment (M&TE) was reading high during calibration). This established the proposed Technical Specification trip setpoint value of 19.08 psia. In order to ensure the trip does occur as early as possible, while accounting for instrumentation variations, upper limits on instrument string drift and transmitter drift are then established for the channel functional allowable and the channel calibration allowable values.

Additional calculations which were performed using a containment pressure-high trip setpoint of 5.1 psig (i.e., 19.8 psia which is even greater than the proposed Technical Specification value of 19.08 psia) showed that the containment pressure and temperature response following a Loss-of-Coolant Accident (LOCA) is unaffected by this change.

As discussed in the Safety Assessment and Significant Hazards Consideration section on "Containment Pressure-High, Historical Perspective", this trip setpoint calculation is atypical in that it is based on avoiding spurious trips rather than preventing reaching a safety limit. While unique in this respect, the methods used in calculations and combining the instrument string error, the string drift, the transmitter drift, and the calibration uncertainty are consistent with the methods used for other trip setpoint values.

4. NRC Question:

The methodology indicates that the CHANNEL CALIBRATION results acceptance criteria (TS allowable limit) does not include calibration tolerances as well as M&TE inaccuracies. The NRC believes that these factors would always be a part of any calibration. Sometimes these parameters may appear as a drift or part of drift. How are measurements taken without considering these factors?

Toledo Edison Response:

As stated in the first paragraph on page three of the Safety Assessment and Significant Hazards Consideration, "Effects on Safety," ...The calibration tolerances and the measurement and test equipment (M&TE) are not part of the TS but are combined separately to generate the field setpoints." Figure 1 provides a pictorial depiction of a typical analytical limit, a Technical Specification trip setpoint, the CHANNEL CALIBRATION and CHANNEL FUNCTIONAL allowables, and the field setpoint. Toledo Edison recognizes that M&TE tolerances and calibration uncertainty exists and factors them into the field setpoints. However, they are not included in the Technical Specification values so that License Amendments are not required each time the M&TE or calibration procedures change. The M&TE accuracy and maximum calibration tolerance are administratively controlled and are subject to the requirements of 10CFR50.59. By offsetting the field setpoint by the maximum calibration error (which includes M&TE tolerance), additional margin from the Technical Specification value and the safety limit is provided. This conservative operation further ensures protection of the public's health and safety.

5. NRC Question:

Does the calibration program at the plant record AS LEFT and AS FOUND values using a constant accuracy M&TE every time? Otherwise factors like M&TE accuracy may manifest itself as a part of drift.

Toledo Edison Response:

The As-Found value is documented each time the calibration of an instrument is performed. The As-Left value will be documented if the instrument is re-calibrated; otherwise the As-Left is the same as the As-Found. The minimum required M&TE accuracy, and many times the exact model of the test equipment, is defined in the equipment data package for each piece of equipment to be calibrated.

6. NRC Question:

Confirm that "'<2X background' at RATED THERMAL POWER" and "<4X background" discussed under the Containment Radiation-High section of the SASHC means "<2X background at RATED THERMAL POWER" and "<4X background at RATED THERMAL POWER," respectively.

Toledo Edison Response:

Toledo Edison confirms this to be correct.

Figure 1: Typical Relationship of Setpoint Values