



A Centenor Energy Company

DONALD C. SHELTON

Vice President - Nuclear  
(419) 249-2300

Docket No. 50-346

License No. NPF-3

Serial No. 1538

June 7, 1988

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

Subject: Additional Information Regarding Changes to Setpoints for  
Anticipatory Reactor Trip System Arming, Reactor Protection System  
High Pressure Trip and Pilot Operated Relief Valve Trip (TAC No.  
66727)

Gentlemen:

In response to your letter dated May 4, 1988 (Log No. 2572), Toledo Edison (TED) provides the following responses to questions regarding the License Amendment Application submitted by Serial No. 1464, dated February 1, 1988.

Question 1:

Considering the turbine bypass capabilities and other plant specific features, will raising the reactor trip on high pressure to 2355 psig and raising the arming threshold for the anticipatory reactor trip (ART) on the turbine trip to 45% result in more frequent lifting of the first bank or additional banks of the main steam safety valves (MSSVs)? If so, then discuss whether the more frequent MSSV lifts or the lifting of additional MSSVs could increase the probability of an accident for the plant (example, stuck open MSSV).

Response:

At thermal power levels greater than 25%, the present design initiates an Anticipatory Reactor Trip System (ARTS) trip of the reactor following a turbine trip. The anticipatory trip of the reactor on a turbine trip was initially installed, at NRC direction, to reduce challenges to the PORV which could occur following a high pressure trip. The current proposal is to:

1. Raise the turbine trip arming threshold for the ARTS to allow the reactor to runback, following a turbine trip, at power levels up to 45% without tripping.

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2. Return the Reactor Protection System (RPS) high pressure trip setpoint to its original value of 2355 psig.

The intent is to reduce the number of reactor trips and, at the same time, not increase challenges to the PORV.

Raising the ARTS turbine trip arming level to 45% will not significantly increase challenges to the MSSVs for the power range from 25% to 45% of full power, as noted below:

1. As stated in Babcock and Wilcox (B&W) Topical Report BAW-1893, "Basis for Raising The Arming Threshold for the Anticipatory Reactor Trip on Turbine Trip" (reference 2 of the Toledo Edison safety evaluation submitted to the NRC under Serial No. 1464, dated February 1, 1988), at the current 2300 psig high pressure reactor trip setpoint, all 177-fuel assembly B&W plants should be capable of runback from 30% power, with 15% turbine bypass capacity, without challenging the MSSVs. The Davis-Besse turbine bypass valves (TBVs) are designed to relieve 25% of rated steam flow. This bypass capacity is 10% more than was taken credit for in the B&W analysis. Therefore, it is expected that the plant can successfully runback from approximately a 10% higher reactor power level, approaching 40%, without challenging the first bank of MSSVs.
2. An anticipatory reactor trip on a turbine trip does not provide assurance that turbine trips between 25% and 45% of full power will not lift the MSSVs. This is because the TBVs have a setpoint of 920 psig during a normal plant runback and a setpoint of 1015 psig (a result of Integrated Control System biasing) following a reactor trip. The time to full open for the TBVs is 5 seconds in either case. The setpoint of the first bank of MSSVs is 1050 psig. Following a turbine trip without an ARTS trip of the reactor, the TBVs begin to ramp open almost immediately. However, following a turbine trip with ARTS, the TBVs remain closed until the higher setpoint is reached, thereby pressurizing the secondary side. The TBVs begin to ramp open when the secondary side pressure is only 35 psi below the setpoint of the first bank of MSSVs. A review of past plant trips at Davis-Besse indicates that challenges to the MSSVs have occurred for power levels of 40% following an ARTS trip and may occur after a reactor trip from any reactor power greater than 30%.

Based on the reasons given above, TED believes that raising the ARTS turbine trip arming level to 45% will not increase the challenges to the MSSVs.

Question 2:

Confirm that credit was not taken for the ART on turbine trip in the accident analyses of Chapter of the Final Safety Evaluation Report (FSAR) to ensure that the increase to 45% reactor power is bounded by these analyses. If credit was taken for the ART in the FSAR analyses, then discuss how the safety implications of raising the arming threshold to 45% were evaluated.

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Response:

ARTS was not taken credit for in any accident analysis in Chapter 15 of the Updated Safety Analysis Report.

Question 3:

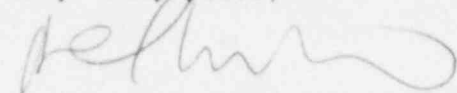
In the analysis of the rod withdrawal at start-up accident provided in Toledo Edison's letter dated February 1988 the hot leg pressure was used to trip the reactor on high pressure instead of the pressurizer pressure as in the original FSAR analysis. Please clarify this discrepancy and justify if different.

Response:

The original Final Safety Analysis Report (FSAR) analysis conservatively delayed the reactor trip until the pressure in the pressurizer reached the high pressure trip setpoint. Since the instrument taps for the reactor coolant system (RCS) pressure transmitters that initiate the Reactor Protection System (RPS) high pressure trip are located on the hot leg and not the pressurizer, this approach was considered to be overly conservative. Therefore, the reanalysis for the rod withdrawal accident at zero power initiated the reactor trip when the RCS pressure at the hot leg tap reached the high pressure trip setpoint. This change in the analysis was noted and justified in Section 6.3 of the safety evaluation submitted under Serial No. 1464, dated February 1, 1988.

If you have any further questions, please contact Mr. R. W. Schrauder, Nuclear Licensing Manager, at (419) 249-2366.

Very truly yours,



RMC:tlt

cc: A. B. Davis, Region III, Regional Administrator  
DB-1 Resident Inspector  
A. W. DeAgazio, NRC DB-1 Project Manager