



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO. NPF-3

TOLEDO EDISON COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By application dated March 4, 1988 as supplemented by letters dated May 4 and December 6, 1988, the Toledo Edison Company and the Cleveland Electric Illuminating Company requested that the Technical Specifications for the Davis-Besse Nuclear Power Station, Unit 1 be revised. The portion of the amendment request related to the main steam safety valve setpoints and ASME Code requirements was issued as Amendment No. 117 on August 24, 1988 (TAC Number 67394). The remaining portion related to the main steam safety valve relief capacity, the high flux trip setpoint, and elimination of Technical Specification (TS) Tables 3.7-1 and 4.7-1 is the subject of the current review under TAC Number 68250.

2.0 DISCUSSION

The proposed changes would: (1) delete TS Table 4.7-1, "Main Steam Line Safety Valve Lift Settings"; (2) remove the reference to Table 4.7-1 from the TS Surveillance Requirement 4.7.1.1; (3) revise TS 3.7.1.1 to specify that the High Flux Trip Setpoint is reduced per Equation 3.7-1; (4) delete TS Table 3.7-1, "Maximum Allowable High Flux Trip Setpoint with Inoperable Steam Line Safety Valves"; (5) revise the Basis to TS 3/4.7.1.1 to incorporate Equation 3.7-1 and its graphic representation for the Reduced High Flux Trip Setpoint.

Table 4.7-1 specifies the number of main steam safety valves (MSSVs) with corresponding lift settings. These valve settings are not allowed to deviate more than  $\pm 1\%$  from the values in Table 4.7-1 for the overpressure protection of the steam generators. These settings are actually in excess of the requirements of the ASME Boiler and Pressure Vessel Code. The steam generator overpressure protection can also be achieved by incorporating

into Action Items of LCO 3.7.1.1, the specification of MSSV valve settings which satisfy the ASME Boiler and Pressure Vessel Code. This was accomplished by Amendment No. 117 on August 24, 1988.

Table 3.7-1 provides a maximum allowable High Flux Trip Setpoint versus the maximum number of inoperable main steam safety valves (MSSV) on any steam generator. The reactor trip setpoint reductions in Table 3.7-1 are calculated based on maximum number of inoperable MSSVs and the maximum relief capability of any safety valve. Therefore, Table 3.7-1 imposes a greater reduction in reactor power than is required for MS system overpressure protection with one or both lower relief capacity MSSVs inoperable. Further, potential future replacement of the existing MSSVs with new safety valves to enhance system operability and reliability is limited to an individual valve relief capacity which does not exceed the 845,759 lb/hr assumed for Table 3.7-1. The proposed TS revisions include deletion of Table 3.7-1 and addition of Equation 3.7-1 which utilizes the total operable MSSV relief capability per steam generator in its calculations.

### 3.0 EVALUATION

The licensee proposes to eliminate Table 4.7-1, "Main Steam Line Safety Valve Lift Settings," and also to remove the reference to Table 4.7-1 from TS Surveillance Requirement 4.7.1.1. The licensee states that this proposed change will provide greater flexibility in valve set pressure and replacement while maintaining required overpressure protection for the steam generators. It would allow the licensee to change the setpoints of some of the MSSVs without requiring a change to the associated TS.

The TS bases for the MSSVs are to ensure secondary system pressure be limited to within 110% of its design pressure of 1050 psig and the specified valve lift settings are in accordance with requirements of Section III of the ASME Boiler and Pressure Vessel (B&PV) Code. The staff has determined that Table 4.7-1 may not necessarily be the only means to assure proper MSSV setpoints. The requirements of Section III of the ASME B&PV Code, 1971 Edition, are met since: (1) the existing MSSV relief capacity is adequate and unchanged by this revision, and (2) provisions of operability are incorporated into the proposed revisions to LCO 3.7.1.1 requiring a minimum of two operable MSSVs per steam generator (SG), at least one with a setpoint not greater than MS system design pressure, and the other MSSVs with a maximum setpoint of 1100 psig ( $\pm 1\%$ ). Consequently, SG overpressure protection is assured for all anticipated transients. Other administrative controls will also require that two MSSVs per SG shall be set at 1050 psig ( $\pm 1\%$ ). The ASME Code requirements for MS system design pressure protection is, therefore, satisfied even with one MSSV set at 1050 psig per SG inoperable.

Therefore, the staff finds that the deletion of Table 4.7-1 and its reference in Surveillance Requirement 4.7-1.1 are acceptable.

The licensee also proposes to delete TS Table 3.7-1 and incorporate Equation 3.7-1 into the Limiting Condition for Operation (LCO) to redefine the relationship between the total operable MSSV relieving capacity and the reduced high flux trip setpoint.

Each of the two steam generators in Davis-Besse Unit 1 has nine MSSVs, two with relief capacity of 583,574 lbs/hr each, and the remaining seven with relief capacity of 845,759 lbs/hr each. The operability of these MSSVs is to ensure that the secondary system pressure will be limited to 110 percent of the design pressure of 1050 psig during anticipated operational transients. The maximum relieving capacity is associated with turbine trip from 100 percent rated thermal power coincident with an assumed loss of condenser heat sink and, therefore, no steam bypass to the condenser. If there are inoperable MSSVs, the maximum allowable reactor power would be reduced by using a reduced high flux trip setpoint in the reactor protection system to ensure that the relieving capacity of the remaining operable MSSVs can maintain the secondary system pressure within 110 percent design limit during transients.

The maximum allowable high flux trip setpoint versus the maximum number of inoperable valves on any steam generator is currently specified in TS Table 3.7.1. The reduced setpoints in Table 3.7-1 were derived based on the ratio of the total relief capacity of operable MSSVs to the required total relieving capacity. In the calculation, the total relieving capacity of the operable MSSVs is calculated by subtracting from the total relieving capacity of the nine MSSVs, the total relieving capacity of the inoperable MSSVs which were assumed to be of the higher relieving capacity (845,759 lbs/hr). This is an unnecessary conservatism in the current trip setpoint if the inoperable MSSVs are of the lower capacity. The proposed change of using Equation 3.7.1, in lieu of Table 3.7-1, uses the same relationship that the reduced flux trip setpoint is proportional to the ratio of the total relief capacity of the operable MSSVs to the required total relief capacity, except that the operable MSSV relief capacity is the simple summation of the individual operable MSSV rated capacities. Therefore, the only difference between the current reduced high flux trip setpoint in Table 3.7-1 and the proposed value of Equation 3.7-1 is the removal of the conservatism of assuming the inoperable MSSVs to be of the larger capacity. This revised formula removes the unnecessary conservatism and does not impact any analyzed events of Chapter 15, and is therefore acceptable.

The staff finds that the use of Equation 3.7-1 in lieu of Table 3.7-1 in LCO 3.7.1.1 to redefine the relationship of the reduced high flux trip setpoint and the inoperable MSSVs is acceptable.

#### 4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact has been prepared and published in the Federal Register on September 26, 1990 (55 FR 39329). Accordingly, based upon the environmental assessment, the Commission has determined that the issuance of this amendment will not have a significant effect on the quality of the human environment.

#### 5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: February 8, 1991