

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 7 TO LICENSE NO. NPF-3

TOLEDO EDISON COMPANY

AND

CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DUCKET NO. 50-346

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INTRODUCTION

Our Safety Evaluation supporting Amendment No. 7 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit 1 addresses six different items. As delineated below, Items (1), (2), (3) and (4) refer to licensing conditions 2.C.(3)(k), 2.C.(3)(l), 2.C.(3)(m), and 2.C.(3)(q) respectively, as stipulated in NPF-3. Items (5) and (6) address changes to the Technical Specifications, Appendix A, to NPF-3 as requested by the Toledo Edison Company.

(1) Paragraph 2.C.(3)(k) stipulates as a condition to NPF-3 that:

"Prior to startup following the first (1st) regularly scheduled refueling outage or no later than 26 months from the issuance of this license, whichever comes first, Toledo Edison Company shall complete tests and obtain test results as required by the Commission to verify that faults on non-Class IE circuits would not propagate to the Class IE circuits in the Reactor Protection System and the Engineered Safety Features Actuation System. In addition, within four (4) months from the issuance of this license Toledo Edison Company shall provide acceptable noise test procedures in accordance with Mil. Standard 19900, Section 4.6.11 (or equivalent) for tests to be conducted on the non-Class IE circuits that interface with the Reactor Protection System, in order to satisfy the objectives of Section 4.6 of IEEE Standard 279.1968."

(2) Paragraph 2.C.(3)(l) stipulates as a condition to NPF-3 that:

"Within six (6) months from the issuance of this license, Toledo Edison Company shall provide additional supporting analyses for the large break spectrum to document the exact margins within the ECCS acceptance criteria of 10 CFR 50.46; and shall provide operating reactor coolant system flow data for the facility which can be used to document reactor coolant system total pressure drops."

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"Prior to startup following the first (1st) regularly scheduled refueling outage of no later than 26 months from the issuance of this license, whichever comes first, Toledo Edison Company shall complete tests and obtain test results as required by the Commission to verify that faults on non-Class IE circuits would not propagate to the Class IE circuits in the Reactor Protection System and the Engineered Safety Features Actuation System."

- (2) The Toledo Edison Company met with the NRC staff on June 29, 1977 at which time the staff specified the large break analyses required to meet the stipulations of license condition 2.C.(3)(i). The analyses required were specified to be: (1) a split at the pump discharge, (2) a double ended break at the pump discharge, and (3) a double ended break at the pump suction, with all three cases specified for a 6.55 square foot break and a discharge coefficient of 1.0. The above analyses required for license condition 2.C.(3)(i) were specified in our letter of August 25, 1977 to the Toledo Edison Company

by letter, dated October 21, 1977, the Toledo Edison Company provided the analyses for the reactor coolant piping large break spectrum as specified in our letter of August 25, 1977.

because of delays in plant operation not anticipated when license NPF-3 was issued, a power level has not yet been obtained which will provide adequate operating reactor coolant system flow data which can be used to document reactor coolant system total pressure drops which is in part a requirement of license condition 2.C.(3)(i).

In their letter of October 21, 1977, the Toledo Edison Company stated that they will provide the reactor coolant system flow data within 30 days following reactor operation at a power level of 90 percent or greater of rated thermal power.

Based upon the Toledo Edison Company's submittal of the required large break spectrum analyses, we conclude that the stipulations of license condition 2.C.(3)(i) for the submittal of large break spectrum analyses is no longer necessary. Therefore, condition 2.C.(3)(i) of Facility Operating License NPF-3 is amended to read:

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(3) Paragraph 2.C.(3)(m) stipulates as a condition to NPF-3 that:

"within six (6) months from the issuance of this license, Toledo Edison Company shall modify the existing low pressure and high pressure injection flow indication system to one which has been seismically qualified and powered from essential power sources with flow indication in the main control room."

(4) Paragraph 2.C.(3)(q) stipulates as a condition to NPF-3 that:

"within four (4) months from the issuance of this license, Toledo Edison Company shall submit an evaluation and proposed modifications, if required, so that the facility design will assure adequate breaker coordination and isolation of its onsite system in sufficient time to permit the required Class IE equipment to operate in the event of offsite grid degradation. Prior to the Commission approval of the modification, Toledo Edison Company shall maintain the normal operating range for the grid system voltage between 98.3 percent to 102.3 percent of rated voltage (with corresponding safety-related bus voltage as defined in Attachment 1 of Toledo Edison Company's letter to the Commission dated November 13, 1976). In the event the system conditions exceed these values, Toledo Edison Company shall proceed in an orderly manner to reduce load to 5 percent of rated power and take corrective action to stabilize the system to within the values stated above prior to return to higher power levels."

(5) by letter, dated October 27, 1977, the Toledo Edison Company requested a change in the Technical Specifications, Appendix A, due to recent changes made in the facility design to assure that a degraded grid voltage condition does not result in failure of safety systems, or components. These design modifications are discussed in Item (4) of this Safety Evaluation.

Specifically, the Toledo Edison Company has requested that in Table 3.3-4, page 3/4 3-13, the Trip Setpoint and Allowable Values for the Sequence Logic Channels, Item a, be changed from 10 ± 1.5 seconds to 7 ± 1.5 seconds.

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- (6) By letter dated July 29, 1977, the Toledo Edison Company requested that the Reactor Protection System surveillance requirements contained in the Technical Specifications be revised to reflect replacement of reactor coolant system pressure transmitters with transmitters which minimize drift effects associated with the replaced transmitters and allow Channel Calibration frequency to be changed from once every four months to once every eighteen months.

DISCUSSION AND EVALUATION

- (1) By letter, dated May 25, 1977, the Toledo Edison Company submitted noise test procedures for tests that will be conducted on the non-Class 1E circuits that interface with one complete reactor protection channel. We have reviewed the submitted test procedures and have determined that the test procedures are in accordance with NRC Standard 19900, Section 4.8.11.

In the submitted noise test procedures, the Toledo Edison Company stated that during the noise tests the reactor protection system channel will be observed for any off normal operation of its Class 1E function.

By letter dated August 4, 1977, the Toledo Edison Company, at our request, provided documentation to assure that appropriate instrumentation will be provided with the required accuracy and sensitivity to monitor by way of bistables any off normal operation of the Class 1E functions.

Based upon our review of the noise test procedures for any off normal operation of the Class 1E functions, we find that the Toledo Edison company has met our requirements as stated in Section 7.2 of Supplement 1 to our Safety Evaluation Report.

Also, the Toledo Edison Company has met the stipulations of license condition 2.C.(3)(k) requiring that acceptable noise test procedures be provided within four (4) months from the date of issuance of license NPF-3. Therefore, condition 2.C.(3)(k) of Facility Operating License NPF-3 is amended to read:

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Within thirty (30) days following two (2) weeks of sustained reactor power operation at a power level of 90 percent or greater of rated thermal power, the Toledo Edison Company shall provide operating reactor coolant system flow data for the facility which can be used to document reactor coolant system total pressure drops.

- (3) In Section 6.3.2 of our Safety Evaluation Report we discussed the design of the facility emergency core cooling system design. As originally designed, the low pressure injection and high pressure injection flow indication in the main control room was non-safety grade. During the course of our review, we discussed this matter with the Toledo Edison Company with respect to operator action required to open the crosstie between the two low pressure injection lines and operator action required to open the low pressure injection to high pressure injection crosstie valves.

The Toledo Edison Company evaluated operator actions with respect to the non-safety grade flow indication and determined that both the low pressure injection and high pressure injection flow indication should be modified from non-safety grade to safety grade for the following reasons:

- (a) An operator is required to open the low pressure injection to low pressure injection crosstie if the two (2) low pressure injection flows are different by more than 500 gallons per minute. Also, after the low pressure injection to low pressure injection crosstie is opened the operator is required to equalize the two low pressure injection flows by throttling valves DH 14 A and B or DH 1 A and B.
- (b) An operator is required to open the low pressure injection to high pressure crosstie valves if the low pressure injection flow is not greater than 600 gallon per minute before the borated water storage tank low level trip places the emergency core cooling system in the containment emergency sump recirculation mode.

Also, the high pressure flow indication was evaluated as being essential to provide the operator an indication that the high pressure injection flow is maintained after the low pressure injection to high pressure injection crosstie valves are opened and the emergency core cooling system has gone to the containment emergency sump recirculation mode.

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On July 30, 1976, the Toledo Edison Company submitted Amendment No. 36 consisting of Revision No. 20 to the Final Safety Analysis Report. Revision No. 20 included proposed modifications which would provide low pressure injection and high pressure injection flow indication in the main control room which was seismically qualified and powered from essential power sources. Immediately thereafter, the Toledo Edison Company ordered the necessary flow transmitters, isolation devices and power supplies required to make the modifications.

by letter, dated March 29, 1977, the Toledo Edison Company informed us that they had recently been notified by their vendor that the properly qualified flow transmitters required to complete the installation of the modifications discussed above could not be supplied before July 1977. Also, the Toledo Edison Company stated that the new flow transmitters would be installed as quickly as possible upon site delivery.

Prior to issuance of Facility Operating License No. NPF-3, and based upon the then uncertainty in site delivery of the new flow transmitters, we determined that within six months from issuance of said license was a reasonable period of time for the Toledo Edison Company to complete the installation of the modified valve position indication in the control room.

On July 18, 1977, the Toledo Edison Company informed us that the modified system had been installed and completed and was in conformance with the conditions of Paragraph 2.C.(3)(a).

by memorandum dated July 22, 1977, the Office of Inspection and Enforcement informed us that the modified low pressure and high pressure injection flow indication system was installed in accordance with Paragraph 2.C.(3)(a).

based upon installation by the Toledo Edison Company of the modified low pressure and high pressure injection flow indications system, which has been verified by the Office of Inspection and Enforcement to be in accordance with Paragraph 2.C.(3)(a), we find that the condition stipulated in Paragraph 2.C.(3)(a) has been fully satisfied and, therefore, is no longer necessary. Therefore, we conclude that Facility Operating License No. NPF-3 can be amended by removing the license condition as stated in Paragraph 2.C.(3)(a).

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(4) On July 18, 1977 the Toledo Edison Company submitted a summary of the detailed analysis conducted on their Class IE system and provided a description of the proposed modification on the system to assure that, in the event of an offsite power degradation, the design will detect and isolate the Class IE systems from the degraded offsite power source in sufficient time without adversely affecting the operability of the safety systems. Based on their analysis the Toledo Edison Company identified the following modifications to the facility design.

- (a) Incorporate an additional Class IE undervoltage relay on each 4.16KV safety bus (set at 90% of nominal voltage) to isolate the safety buses from their offsite source. These relays will provide primary protection and isolation for the existing instantaneous undervoltage relays set at 59% of nominal grid voltage.
- (b) Provide additional alarms on the essential 4.16KV buses.
- (c) Modify the existing one ampere fuses for the motor control center control power to 2.5 ampere slow blow fuses.
- (d) Revise overcurrent relay setpoints for the essential 4.16KV motors.

Based on our review of the Toledo Edison Company's response submitted on July 18, 1977 and the facility modifications described above, we conclude that the Toledo Edison Company's response and modifications to the facility design meet our requirements as stated in Supplement No. 1 to our Safety Evaluation Report and are acceptable, and fully meet the stipulations of license condition 2.C.(3)(q).

By memorandum dated October 31, 1977, the Office of Inspection and Enforcement informed us that the modifications in the facility design, as described above, have been installed and completed.

Based upon our conclusions as stated above and upon the installation of the modifications to the facility design which have been verified to be completed by the Office of Inspection and Enforcement, we find that license condition 2.C.(3)(q) is no longer necessary. Therefore, Facility Operating License NPF-3 is hereby amended by removing license condition 2.C.(3)(q).

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- (5) As stated in Item (4) above, the Toledo Edison Company submitted their detailed analysis on July 18, 1977 which we evaluated and found acceptable.

In that analysis the Toledo Edison Company stated that additional undervoltage relaying had been added to the 4.16 kilovolt essential switch gear and that the relays functioned on 90 percent voltage and a ten second time delay to trip incoming 4.16 kilovolt source breakers.

To increase the margin in the response time of the emergency core cooling system, the Toledo Edison Company stated that the ten second time delay setting to trip the incoming 4.16 kilovolt source breakers would be changed to 9 seconds to assure that emergency core cooling system low pressure injection was assured within the 30 seconds required by accident analysis.

To assure that trip time will occur in 9 seconds, the Toledo Edison Company stated that 0.5 second should be deducted from the 9 second time delay setting to account for inaccuracies and drift in the timer and an additional 1.5 seconds should be deducted from the 9 second time delay setting for a dead band setting. The inaccuracies and drift plus the dead band setting result in an allowable trip setpoint of 7.0 ± 1.5 sec and are in conformance with the requirements of Regulatory Guide 1.105, "Instrument Setpoints," Revision 1, November 1976.

Since this change involves an increase in a safety margin, there is no significant hazards consideration involved. Therefore, based upon our review and acceptance of the Toledo Edison Company's submittal of July 18, 1977 as stated in Item (4) above, and the conformance of the revised trip setpoint with Regulatory Guide 1.105, we find acceptable the Toledo Edison Company's request for specifying an allowable trip setpoint of 7.0 ± 1.5 seconds in Table 3.3-4, page 3/4 3-13 Sequence Logic Channel (a) of the Technical Specifications.

- (6) On December 30, 1976, the Toledo Edison Company submitted Amendment No. 43 (Revision No. 26 to the Final Safety Analysis Report). In Revision No. 26 the Toledo Edison Company stated that the narrow range Motorola reactor coolant pressure transmitters would be replaced with Rosemont transmitters. The Rosemont 1152 transmitters are specified to have no more drift than 2 pounds per square inch gauge over an eighteen month period (one-quarter of one percent of full scale range - 1700 to 2500 pounds per square inch gauge).

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By comparison, the Motorola transmitters were known to have drift greater than 2 pounds per square inch gauge for various time intervals of less than eighteen months. It was for this reason that we stated in our Safety Evaluation Report (Section 7.2) that the surveillance interval included in the Technical Specifications be reduced from 18 months to 4 months until an acceptable drift was demonstrated. The use of the Rosemont 1152 transmitters eliminates the need for that reduced interval.

The Rosemont 1152 transmitters are seismically and environmentally qualified and meet the guidelines of the Institute of Electrical and Electronic Engineers 279-1971 and are acceptable. Also, the Rosemont transmitters do not require recalibration more frequent than once every eighteen months to meet the guidelines of the Institute of Electrical and Electronic Engineers 279-1971.

Therefore, we find the Toledo Edison Company's request to revise the Technical Specifications, Appendix A, on page 3/4 3-7, Table 4.3.-1 for increasing the Channel Calibration Surveillance Frequencies for Functional Units 5, 6, and 7 from once every 120 days to once every eighteen months to be acceptable.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact, and pursuant to 10 CFR 51.5(d)(4), that an environmental impact statement, negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered or a significant decrease in any safety margin, it does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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. Also, we reaffirm our conclusions as otherwise stated in our Safety Evaluation Report.

Dated: November 29, 1977

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The Rosemont 1152 transmitters are seismically and environmentally qualified and meet the guidelines of the Institute of Electrical and Electronic Engineers 279-1971 and are acceptable. Also, the Rosemont transmitters do not require recalibration more frequent than once every eighteen months to meet the guidelines of the Institute of Electrical and Electronic Engineers 279-1971.

Therefore, we find the Toledo Edison Company's request to revise the Technical Specifications, Appendix A, on page 3/4 3-7, Table 4.3.-1 for increasing the Channel Calibration Surveillance Frequencies for Functional Units 5, 6, and 7 from once every 120 days to once every eighteen months to be acceptable.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact, and pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered or a significant decrease in any safety margin, it does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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. Also, we reaffirm our conclusions as otherwise stated in our Safety Evaluation report.

Dated:

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GW F - see correction p. 5