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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-73

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

BEAVER VALLEY POWER STATION, UNIT 2

DOCKET NO. 50-412

1.0 INTRODUCTION

By letter dated October 9, 1991, the Duquesne Light Company (DLC) submitted a proposed change to the Beaver Valley Power Station, Unit 2 Technical Specifications (TS). The change would revise Table 2.2-1 (Note 1) for TS 2.2.1, "Reactor Trip System Instrumentation Setpoints." Specifically, it would revise a constant (K_2) in the equation used to determine the overtemperature delta temperature (OTDT) trip setpoint.

2.0 BACKGROUND

Protection against departure-from-nucleate-boiling (DNB) is provided by the OTDT trip. This trip is intended to provide protection for all combinations of pressure, coolant temperature, and axial power distribution. The setpoint for this trip is determined continuously for each reactor coolant loop during operation.

The equation for determining the OTDT setpoint includes three terms. The first term is a preset bias value which is independent of process variables. The second term compensates for the effect of temperature upon the design limit and includes compensation for piping and instrument time delays. The third term accounts for the effect of pressure and power distribution upon the design limit. The second term of the equation includes K_2, which is proposed to be changed.

In June 1991, it was discovered that the current OTDT setpoint did not provide protection against a low DNB ratio (DNBR) at high pressure over a small range of temperatures. An analysis was prepared to determine if the DNBR would remain above the design minimum with the current setpoint if credit was taken for lowering the reactor coolant system (RCS) flow uncertainty and increasing

the minimum RCS required flow rate. That analysis, which formed the basis for a justification for continued operation, concluded that core limits would not be violated provided a RCS flow of at least 276,225 gpm is available. Current flow measurements assure a minimum flow of 276,391 gpm.

The October 9, 1991, application proposes to change the value of K_2 in the second term of the OTDT setpoint equation to provide protection against low DNBR for all pressures and temperatures of concern with the current Technical Specification 3.2.5 requirements for RCS flow rate.

3.0 EVALUATION

The proposed value of K_2 (0.0183/degree F) will ensure that the OTDT trip will protect the core against a low DNBR by tripping the reactor at the desired setpoint. The OTDT setpoint constants, that protect the core limits, were calculated using the methodology of WCAP-8745. Westinghouse submitted WCAP-8745, "Design Bases for the Thermal Overpower and Thermal Overtemperature Delta T Trip Functions," to the NRC, and in a letter dated April 17, 1986, the NRC approved its use. The staff stated that the methodology of WCAP-8745 was acceptable for referencing by Westinghouse in licensing documents for plants that operate under constant axial offset control. The staff also stated that the NRC did not intend to repeat its review of the matters described in the report as long as the material presented is applicable to the specific plant involved. DLC uses "Axial Flux Difference - Constant Axial Offset Control" in determining core operating limits at Beaver Valley Unit 2 and, therefore, satisfies the conditions of the April 17, 1986, Safety Evaluation for referencing WCAP-8745. Based on the above, the NRC staff finds the methodology used in calculating a revised K_2 value acceptable.

The non-loss-of-coolant accident (LOCA) analyses of transients that trip on OTDT and model the plant specific trip setpoint are limiting when Tavg is greater than 576.2 F. Above a Tavg value of 576.2 F, increasing the K_2 value will result in a lowering of the OTDT setpoint. Therefore, the increase in K_2 will provide an earlier trip for the non-LOCA analysis. Below a Tavg value of 576.2 F, increasing the K_2 value will result in a higher OTDT setpoint providing margin between the DNB limits and the setpoint in this region; thus, the protection that the OTDT trip is required to provide is not compromised.

Technical Specification Limiting Condition of Operation requirement 3.2.5, which requires the RCS flow to be greater than or equal to 274,800 gpm (includes 3.5% flow uncertainty), will remain valid with the proposed K_2 value.

Based on the discussion above, the NRC staff has concluded that the change to the OTDT equation is acceptable and will provide an OTDT trip setpoint which will protect the core against a low DNBR with a RCS flow of greater than or equal to 274,800 gpm.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (57 FR 2592). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: James Andersen

Date: March 2, 1992

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10CFR2.790. Correspondence with respect to the proprietary aspects of the Application for Withholding should reference CAW-92-269 or the supporting Westinghouse affidavit, CAW-92-269 and be addressed to R. P. DiPiazza, Manager of Nuclear Safety Licensing, Westinghouse Electric Corporation, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Sincerely,

William J. Cahill, Jr.

CEJ/gj
Enclosures

c - Mr. M. B. Fields, NRR - w/encl
Mr. R. D. Martin, Region IV w/o encl
Resident Inspectors, (CPSES) (2) w/o encl