UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 103 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 January 29, 1998, as supplemented by letters dated November 9, 1998, and June 14, 1999, the Duquesne Light Company (the licensee) submitted an amendment request to modify the Updated Final Safety Analysis Report (UFSAR) for the Beaver Valley Power Station, Unit 2 (BVPS-2). The amendment would authorize changes to the BVPS-2 UFSAR to reflect revisions of the radiological dose calculations for the locked rotor accident (LRA) analysis. These revisions of the calculations were performed in order to incorporate more conservative assumptions than those used in the previous analysis for a postulated locked rotor event. The November 9, 1998, and June 14, 1999, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination or expand the amendment beyond the scope of the original notice. The June 14, 1999, letter withdrew a portion of the request regarding a small-break loss-of-coolant accident (SBLOCA).

2.0 EVALUATION

2.1 Assessment of Radiological Consequences

The licensee performed an assessment of the radiological dose consequences of an LRA and an SBLOCA in support of its amendment request to modify the UFSAR. The assessment was based upon parameters given in Amendment Request Number 120, dated January 29, 1998, and the response to request for additional information, dated November 9, 1998. The subsequent partial withdrawal of the SBLOCA methodology portion of the amendment request was based upon a determination by the licensee that the SBLOCA doses are less limiting than the large-break (LBLOCA) doses. The LBLOCA analysis has previously been reviewed and approved; therefore, the review of this submittal is limited to a review of the LRA.

The staff calculated doses for individuals at the Exclusion Area Boundary (EAB) and at the Low-Population Zone (LPZ) for the LRA. The control room operator's thyroid dose was also calculated. The parameters used in the staff's assessment are presented in Table 1. Table 2

presents the radiological doses calculated by the staff using the parameters in Table 1 and compares them with the values proposed by the licensee.

The staff also reviewed the licensee's description of the revised LRA accident analysis and the postulated dose results. The results of the staff's independent calculations described above were used to confirm the acceptability of the licensee's analysis methodology. Based on comparisons of results, the staff found the licensee's analysis to be appropriate.

The radiological doses given in Table 2 were compared with the 10 CFR Part 100 limits and NUREG-0800 guidelines. For the Control Room and the LPZ, NUREG-0800 guidelines are met. For the EAB, although the NUREG-0800, Section 15.3.3 acceptance criteria of "a small fraction of the 10 CFR Part 100" limits is exceeded (36 Rem calculated versus the 30 Rem guideline), Part 100 guidelines are not exceeded. Previously, a safety evaluation was issued which accepted the EAB and LPZ doses for the LRA based upon an acceptance criterion of 25% of 10 CFR Part 100 limits or 75 Rem (References 1 and 2), even though this acceptance criterion deviated from the Standard Review Plan. Notwithstanding this deviation, because of the margin built into the Standard Review Plan, the staff has concluded that there is reasonable assurance of adequate protection of the public for this event.

2.2 Conclusion

The staff has concluded, based upon the considerations above, that the proposed change to the UFSAR is acceptable. The staff has determined that reasonable assurance exists, in the event of a postulated LRA that the doses to persons at the EAB and the LPZ would continue to be well within 10 CFR Part 100 dose guidelines, and that the postulated control room operator doses would continue to be less than the criteria of 10 CFR Part 50, Appendix A, GDC 19, and consistent with the guidelines in NUREG-0800 even if the accident should occur coincidently with an iodine spike.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact have been prepared and published in the Federal Register on November 16, 1999 (64 FR 62233). Accordingly, based upon the environmental assessment, the staff 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 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.

Attachments: 1. Table 1, Input Parameters for Beaver Valley Unit 2, Evaluation of A Locked Rotor Accident
2. Table 2, Calculated Thyroid Doses for Beaver Valley Unit 2, Locked Rotor Accident, 18% Failed Fuel

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Date: November 18, 1999

REFERENCES:

1. Letter from Albert W. De Agazio, Sr., NRC, to J. D. Sieber, Duquese Light Company, "Amendment No. 46: Vantage 5H Fuel - Change Request No. 57 (TAC No. M81758)," May 1, 1992.

2. Letter from Gordon E. Edison, NRC, to J. D. Sieber, Duquesne Light Company, "Issuance of Amendment No. 57 to Facility Operating LIcense NPF-73, Beaver Valley Power Station, Unit No. 2, in Response to Change Request No. 57 Vantage 5H (TAC No. M84411)," September 28, 1993.

TABLE 1
INPUT PARAMETERS FOR BEAVER VALLEY UNIT 2
EVALUATION OF A LOCKED ROTOR ACCIDENT

Parameter	Units	Value
Fraction of Control Rods Assumed Failed	percent	18
Primary to Secondary Leak Rate (total)	g.p.m.	1.0
Reactor Coolant Mass[1]	lbm.	3.51e+5
Steam Generator Liquid Mass (per Steam Generator)	lbm.	92000
Steam Generator Steam Release (0 - 2 hr)	lbm.	443,878
Steam Generator Steam Release (2-8 hr)	lbm.	793,644
Iodine Partition Coefficient		100
Control Room (CR) Normal Intake Flow Rate (Pre-Actuation)	$ft.^3/min.$	500
CR Pressurization Rate (Bottles)[2]	$ft.^3/min.$	0
CR Unfiltered Inleakage	$ft.^3/min.$	10
CR Intake Filter Efficiency	percent	95
CR Intake Pressurization Rate (Fans)	$ft.^3/min.$	1030
CR Purge Flow[3]	$ft.^3/min.$	16900
CR Occupancy Factor (0-24 hr)		1
CR Occupancy Factor (24 - 96 hr)		0.6
CR Occupancy Factor (96 - 720 hr)		0.4
EAB 0 - 2 hr Atmospheric Dispersion Factor	$sec./m.^3$	1.25e-3
LPZ 0 - 8 hr Atmospheric Dispersion Factor	$sec./m.^3$	6.04e-5
CR 0 - 8 hr Atmospheric Dispersion Factor	$sec./m.^3$	1.59e-4
CR Volume	$ft.^3$	1.73e+5

[1] 3.5e+5 is equivalent to 3.5×10^5

[2] Bottled air pressurization is assumed to maintain the required control room pressurization, but the exhaust flow due to this air is not credited in the control room model.

[3] Credited from 8 to 8.5 hours after the start of the accident.

TABLE 2
CALCULATED THYROID DOSES FOR BEAVER VALLEY UNIT 2
LOCKED ROTOR ACCIDENT

LOCATION	NRC Calculated Values (Rem)	Licensee Proposed Values (Rem)
EAB	36	37
LPZ	16	16
Control Room	1	1.7