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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 202 TO FACILITY OPERATING LICENSE NO. NPF-3

TOLEDO EDISON COMPANY

CENTERIOR SERVICE COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated June 7, 1995, the Toledo Edison Company, Centerior Service Company, and the Cleveland Electric Illuminating Company (the licensees), submitted a request for changes to the Davis-Besse Nuclear Power Station (DBNPS) Technical Specifications (TS). The requested amendment would revise TS 3/4.9.4, Refueling Operations - Containment Penetrations, and associated Bases 3/4.9.4, Containment Penetrations. The proposed changes include revising the Limiting Condition for Operation (LCO) 3.9.4.b to allow both doors of the containment personnel air lock (PAL) to be open during core alterations or movement of irradiated fuel within the containment, provided that one containment PAL door is operable and a designated individual is available immediately outside the PAL to close at least one door, if required. Additional changes are proposed to revise or clarify TS LCO 3.9.4.c, TS Action 3.9.4.a, and TS Surveillance Requirement (SR) 4.9.4, and modify the Bases to reflect the requested changes.

2.0 EVALUATION

The first proposed change revises the LCO 3.9.4.b and Bases 3/4.9.4 to allow both doors of the containment PAL to be open during core alterations or movement of irradiated fuel within the containment, provided that at least one PAL door is capable of being closed and a designated individual is available immediately outside the PAL to close at least one door. This would reduce PAL door wear and facilitate personnel ingress and egress. DBNPS has used a temporary air lock during refueling operations (Mode 6) when core alterations or movement of irradiated fuel were performed within containment. The temporary doors were effective in precluding the potential damage to the PAL door latching mechanisms during periods of frequent openings and closings and provided the necessary barriers for mitigating the consequences of a fuel handling accident in Mode 6, when the potential for containment pressurization does not exist. However, to eliminate the restriction to egress in case

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evacuation of containment is required and to eliminate the costs associated with the installation, testing, and removal of the temporary doors, DBNPS evaluated the radiological release that would be expected based on the fuel handling accident described in the Updated Safety Analysis Report (USAR) 15.4.7.3.

The staff has completed its evaluation of the potential radiological consequences of a fuel handling accident at Davis-Besse, based upon the conditions of the proposed TS changes. In addition to reviewing the licensee's submittal, the staff performed an independent analysis to determine conformance with the requirements of 10 CFR Part 100 and General Design Criteria (GDC) 19 of Appendix A to 10 CFR Part 50. The staff's analysis utilized the accident source term given in Regulatory Guide 1.4, the assumptions contained in Regulatory Guide 1.25, and the review procedures specified in Standard Review Plan (SRP) Sections 15.7.4 and 6.4. The staff assumed an instantaneous puff release of noble gases and radioiodine from the gap and plenum of the broken fuel rods. These gas bubbles will pass through at least 23 feet of water covering the fuel prior to reaching the containment atmosphere. The guidance of NUREG/CR-5009 (The Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors) was utilized in the calculation of thyroid doses based on the licensees use of extended burnup fuel. All airborne activity reaching the containment atmosphere is assumed to exhaust to the environment within 2 hours. As stipulated in the proposed Technical Specification change, the gap activity is assumed to have decayed for a period of 72 hours.

The staff computed the offsite doses for Davis-Besse using the above assumptions and NRC computer code ACTICODE. Control room operator doses were determined using the methodology in SRP Section 6.4. The computed offsite doses and control room operator doses are within the acceptance criteria given in SRP Section 15.7.4 and GDC 19. The assumptions used in calculating those doses and the resulting calculated values are attached in Tables 1 and 2.

The staff has reviewed the licensee's analysis and has performed an independent assessment of the radiological consequences resulting from a fuel handling accident during refueling operations with the containment airlocks open. The staff concludes that the radiological consequences associated with this accident are within the acceptance criteria set forth in 10 CFR Part 100 and the control room operator dose criteria specified in GDC-19 of Appendix A to 10 CFR Part 50 and are acceptable.

Additional changes are proposed to revise or clarify TS LCO 3.9.4, TS Action 4.9.4 and Bases 3/4.9.4. One change clarifies the terminology "outside atmosphere" to "atmosphere outside of containment." This revision clarifies that the containment leakage addressed by the TS is from the containment to outside the containment whether or not the leakage is outside to the atmosphere or to another building. The staff agrees that this change provides clarification and has no adverse affect on safety.

The licensee proposes to change TS LCO 3.9.4.c.1, which requires that each penetration providing direct access from containment shall be "closed by an isolation valve, blind flange, or manual valve" to "closed by a manual or

automatic isolation valve, blind flange, or equivalent." The proposed change would clarify that it is acceptable to use equivalent means to a valve or blind flange in temporarily sealing a penetration. The licensee will control the type of equivalent changes approved for use by ensuring an engineering evaluation is performed prior to using any equivalent measures. The engineering evaluation will ensure that the closure mechanism is capable of restricting the release of radioactive releases from a fuel handling accident. The proposed revision to Bases 3/4.9.4 includes the requirement to perform an engineering evaluation. Since the fuel handling accident does not result in increased containment pressure, alternate sealing mechanisms can be effective in preventing leakage. The staff finds the proposed changes acceptable.

TS Action 3.9.4.a includes a statement that the provisions of TS 3.0.3 are not applicable. Since this statement is redundant to TS Action 3.9.4.c, the licensee proposes that the statement be removed. The staff agrees that eliminating the redundant requirement has no adverse affect on safety.

TS Surveillance Requirement 4.9.4 requires each containment penetration to be in a closed or isolated condition. Since the wording of TS LCO 3.9.4 allows the use of "or equivalent," the licensee proposes to change the verification of containment isolation capability from "closed/isolated condition" to "required condition." The staff finds this change acceptable because of the limited definition of closed/isolated may not adequately describe the "required condition."

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

This 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 or changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational 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 (60 FR 39454). 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.

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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) 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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Date: November 17, 1995

Attachments: 1. Table 1, "Calculated Radiological Consequences"
2. Table 2, "Assumptions Used for Calculating Radiological Consequences"

TABLE 1

CALCULATED RADIOLOGICAL CONSEQUENCES
(rem)

Exclusion Area Boundary	Dose	SRP 15.7.4 Guidelines
Whole Body	0.21	6
Thyroid	50.2	75

Control Room Operator	Dose	GDC-19 Guidelines
Whole Body	0.02	5
Thyroid	0.93	Equivalent to 5 rem whole body*

* Guideline doses provided in Standard Review Plan Section 6.4 define the dose-equivalent as 30 rem to the thyroid.

ATTACHMENT 1

TABLE 2

ASSUMPTIONS USED FOR CALCULATING RADIOLOGICAL CONSEQUENCES

Parameters	Quantity
Power Level, Mwt	2,772
Number of Fuel Rods Damaged (1 assembly plus 32 rods)	208
Total Number of Rods	38,816
Shutdown time, hours	72
Power Peaking Factor*	1.65
Fission Product Release Duration*	2 hours
Release Fractions*	
Iodine	0.12
Noble Gases	0.30
Pool Decontamination Factors*	
Iodine	100
Noble Gases	1
Iodine Forms*	
Elemental	75%
Organic	25%
Core Fission Product Inventories per TID-14844	
Receptor Point Variables	
Exclusion Area Boundary**	
Atmospheric Relative Concentration, X/Q (sec/m^3)	
0-2 hours	2.2×10^{-4}
Low Population Zone**	
Atmospheric Relative Concentration, X/Q (sec/m^3)	
0-2 hours	9.6×10^{-6}
8-24 hours	6.6×10^{-6}
1-4 days	3.0×10^{-6}
4-30 days	9.5×10^{-7}
Control Room	
Atmospheric Relative Concentration, X/Q (sec/m^3)	5.85×10^{-4}
Control Room Volume, cubic feet	9.92×10^{4}
Maximum Infiltration Rate, ft^3/min	300
Geometry Factor	28.6
Iodine Protection Factor	143

Note: Dose conversion factors from ICRP-30 were utilized for all calculations

* Regulatory Guide 1.25
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ATTACHMENT 2