Docket No. 50-346

December 8, 1992

Mr. Donald C. Shelton
Vice President, Nuclear - Davis-Besse
Centerior Service Company
c/o Toledo Edison Company
300 Madison Avenue
Toledo, Ohio 43652

Docket File NRC & LPDRS
PD33 RDG FILE PD33 GRAY FILE

JRoe	TKing	OPA
JHannon	JHopkins	OC/LFMB
PKreutzer	OGC	BClayton R3
GHill (4)	DHagen	
RJones	Wanda Jones	
CGrimes	ACRS (10)	

Dear Mr. Shelton:

SUBJECT: AMENDMENT NO. 176 TO FACILITY OPERATING LICENSE NO. NPF-3
(TAC NO. M83391)

The Commission has issued Amendment No. 176 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The amendment revises the Technical Specifications in response to your application dated May 1, 1992.

This amendment revises Technical Specification (TS) 3/4.1.1.2, "Reactivity Control Systems-Boron Dilution," and its Bases. The revision allows the addition of water of lower boron concentration than the reactor coolant system (RCS) during refueling with the RCS flow rate less than 2800 gpm, provided that the boron concentration of the water to be added is greater than the boron concentration corresponding to the more restrictive reactivity condition specified in TS 3.9.1, "Refueling Operations - Boron Concentration."

A copy of the Safety Evaluation is also enclosed. Notice of issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY:

Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 176 to License No. NPF-3
2. Safety Evaluation

cc w/enclsures:
See next page

OFFICE	LA:PD33	PM:PD33 JBH	BC:RSB	OGC	D:PD33
NAME	PKueuzer	JHopkins:jd	RJones	CPW	JHannon
DATE	11/25/92	11/25/92	11/30/92	12/1/92	11/25/92

JBH 12/8/92

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cc:

Mary E. O'Reilly
Centerior Energy Corporation
300 Madison Avenue
Toledo, Ohio 43652

Mr. Robert W. Schrauder
Manager, Nuclear Licensing
Toledo Edison Company
300 Madison Avenue
Toledo, Ohio 43652

Gerald Charnoff, Esq.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, N.W.
Washington, D.C. 20037

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, MD 20852

Resident Inspector
U. S. Nuclear Regulatory Commission
5503 N. State Route 2
Oak Harbor, Ohio 43449

Mr. Murray R. Edelman
Executive Vice President -
Power Generation
Centerior Service Company
6200 Oak Tree Boulevard
Independence, Ohio 44101

Radiological Health Program
Ohio Department of Health
Post Office Box 118
Columbus, Ohio 43266-0149

Attorney General
Department of Attorney
General
30 East Broad Street
Columbus, Ohio 43215

Mr. James W. Harris, Director
Division of Power Generation
Ohio Department of Industrial Regulations
P. O. Box 825
Columbus, Ohio 43216

Ohio Environmental Protection Agency
DERR--Compliance Unit
ATTN: Zack A. Clayton
P. O. Box 1049
Columbus, Ohio 43266-0149

President, Board of Ottawa
County Commissioners
Port Clinton, Ohio 43452

State of Ohio
Public Utilities Commission
180 East Broad Street
Columbus, Ohio 43266-0573

Mr. James R. Williams
State Liaison to the NRC
Adjutant General's Department
Office of Emergency Management Agency
2825 West Granville Road
Columbus, Ohio 43235-2712

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

TOLEDO EDISON COMPANY

CENTERIOR SERVICE COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DOCKET NO. 50-346

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 176
License No. NPF-3

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Toledo Edison Company, Centerior Service Company, and the Cleveland Electric Illuminating Company (the licensees) dated May 1, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-3 is hereby amended to read as follows:

(a) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.176 , are hereby incorporated in the license. The Toledo Edison Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented not later than 90 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of issuance: December 8, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 176

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Remove	Insert
3/4 1-3	3/4 1-3
B 3/4 1-1	B 3/4 1-1

BORON DILUTION

LIMITING CONDITION FOR OPERATION

3.1.1.2 The flow rate of reactor coolant through the Reactor Coolant System shall be $\geq$ 2800 gpm whenever a reduction in Reactor Coolant System boron concentration is being made.*

APPLICABILITY: All MODES.

ACTION:

With the flow rate of reactor coolant through the Reactor Coolant System < 2800 gpm, immediately suspend all operations involving a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.1.1.2 The flow rate of reactor coolant through the Reactor Coolant System shall be determined to be $\geq$ 2800 gpm within one hour prior to the start of and at least once per hour during a reduction in the Reactor Coolant System boron concentration by either:

a. Verifying at least one reactor coolant pump is in operation, or

b. Verifying that at least one DHR pump is in operation and supplying $\geq$ 2800 gpm to the Reactor Coolant System.

*In MODE 6 the Reactor Coolant System (RCS) boron concentration may be greater than the boron concentration of water available for addition. If the flowrate of reactor coolant through the RCS is less than 2800 gpm, water of lower boron concentration than the existing RCS concentration may be added to the RCS provided that the boron concentration of the water to be added is equal to or greater than the boron concentration corresponding to the more restrictive reactivity condition specified in Specification 3.9.1.

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.3 The moderator temperature coefficient (MTC) shall be:

a. Less positive than 0.9×10^{-4} $\Delta k/k/°F$ whenever THERMAL POWER is < 95% of RATED THERMAL POWER,

b. Less positive than 0.0×10^{-4} $\Delta k/k/°F$ whenever THERMAL POWER is $\geq$ 95% of RATED THERMAL POWER, and

c. Equal to or less negative than the limit provided in the CORE OPERATING LIMITS REPORT at RATED THERMAL POWER.

APPLICABILITY: MODES 1 and 2*#.

ACTION:

With the moderator temperature coefficient outside any of the above limits, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.1.3.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.3.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.

b. At any THERMAL POWER, within 7 days after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

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*With $k_{eff} \geq 1.0$.

#See Special Test Exception 3.10.2.

3/4.1.1 BORATION CONTROL

3/4.1.1.1 SHUTDOWN MARGIN

A sufficient SHUTDOWN MARGIN ensures that 1) the reactor can be made subcritical from all operating conditions, 2) the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and 3) the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition. During Modes 1 and 2 the SHUTDOWN MARGIN is known to be within limits if all control rods are OPERABLE and withdrawn to or beyond the insertion limit.

SHUTDOWN MARGIN requirements vary throughout core life as a function of fuel depletion, RCS boron concentration and RCS T_{avg}. The most restrictive condition occurs at EOL, with T_{avg} at no load operating temperature. The SHUTDOWN MARGIN required is consistent with FSAR safety analysis assumptions.

3/4.1.1.2 BORON DILUTION

A minimum flow rate of at least 2800 gpm provides adequate mixing, prevents stratification and ensures that reactivity changes will be gradual through the Reactor Coolant System in the core during boron concentration reductions in the Reactor Coolant System. A flow rate of at least 2800 gpm will circulate an equivalent Reactor Coolant System volume of 12,110 cubic feet in approximately 30 minutes. The reactivity change rate associated with boron concentration reduction will be within the capability for operator recognition and control.

In MODE 6, the RCS boron concentration is typically somewhat higher than the minimum boron concentration required by Specification 3.9.1, and could be higher than the boron concentration of normal sources of water addition. At reduced inventory conditions in the RCS, in order to reduce the possibility of vortexing, the flowrate through the decay heat system may be procedurally restricted to somewhat less than 2800 gpm. In this situation, if water with a boron concentration equal to or greater than the boron concentration required by Specification 3.9.1 is added to the RCS, the RCS is assured to remain above the Specification 3.9.1 requirement, and a flowrate of less than 2800 gpm is not of concern.

3/4.1.1.3 MODERATOR TEMPERATURE COEFFICIENT

The limitations on moderator temperature coefficient (MTC) are provided to ensure that the assumptions used in the accident and transient analyses remain valid through each fuel cycle. The surveillance requirement for measurement of the MTC each fuel cycle are adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup. The confirmation that the measured MTC value is within its limit provides assurance that the coefficient will be maintained within acceptable values throughout each fuel cycle.

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the reactor coolant system average temperature less than 525°F. This limitation is required to ensure (1) the moderator temperature coefficient is within its analyzed temperature range, (2) the protective instrumentation is within its normal operating range, (3) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and (4) the reactor pressure vessel is above its minimum RT_{NDT} temperature.

3/4.1.2. BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include (1) borated water sources, (2) makeup or DHR pumps, (3) separate flow paths, (4) boric acid pumps, (5) associated heat tracing systems, and (6) an emergency power supply from operable emergency busses.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

The boration capability of either system is sufficient to provide a SHUTDOWN MARGIN from all operating conditions of 1.0% $\Delta k/k$ after xenon decay and cooldown to 200°F. The maximum boration capability requirement occurs from full power equilibrium xenon conditions and requires the equivalent of either 7373 gallons of 8742 ppm borated water from the boric acid storage tanks or 52,726 gallons of 1800 ppm borated water from the borated water storage tank.

The requirement for a minimum available volume of 482,778 gallons of borated water in the borated water storage tank ensures the capability for borating the RCS to the desired level. The specified quantity of borated water is consistent with the ECCS requirements of Specification 3.5.4; therefore, the larger volume of borated water is specified.

With the RCS temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 176 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 May 1, 1992, Toledo Edison Company (the licensee) proposed an amendment to the Technical Specifications for the Davis-Besse Nuclear Power Station, Unit 1 (DBNPS). The proposed change involves Technical Specification (TS) 3/4.1.1.2, "Reactivity Control Systems-Boron Dilution," and its Bases. The change would allow the addition of water of lower boron concentration than the reactor coolant system (RCS) in Mode 6 (refueling) with the RCS flow rate less than 2800 gpm, provided that the boron concentration of the water to be added is greater than the boron concentration corresponding to the more restrictive reactivity condition specified in TS 3.9.1, "Refueling Operations - Boron Concentration."

2.0 EVALUATION

Technical Specification 3.1.1.2 requires that the flow rate of reactor coolant through the RCS be greater than or equal to 2800 gpm whenever a reduction in RCS boron concentration is being made. This minimum flow rate provides adequate mixing, prevents stratification, and ensures that reactivity changes will be gradual in the RCS.

Maintenance activities during refueling may require that the RCS level be reduced. When this occurs, procedural limits are placed on the maximum decay heat removal (DHR) flow rate to prevent vortexing and pump cavitation. The proposed change to TS 3.1.1.2 would result in less burden to the operators and greater flexibility in the choice of water addition sources with the DHR flow rate procedurally restricted to less than 2800 gpm. Without the proposed change, the boric acid addition tank is used to raise RCS level until it is high enough such that the DHR flow rate can be increased above 2800 gpm and then the desired water sources (e.g., borated water storage tank or a clean

waste receiver tank) can be used for any necessary water addition. The proposed change eliminates the step of having to increase the RCS level using the boric acid addition tank.

Technical Specification 3.9.1 requires a boron concentration such that the more restrictive of the following reactivity conditions is met:

1. Either a K-effective of 0.95 or less, which includes a 1% delta K/K conservative allowance for uncertainties, or

2. A boron concentration of greater than or equal to 1800 ppm, which includes a 50 ppm conservative allowance for uncertainties.

If the RCS meets these reactivity condition requirements, and water is added to the RCS that also meets these reactivity condition requirements, then the RCS is assured to remain in compliance with the reactivity condition requirements. The possibility that the added water may be of lower boron concentration than the RCS is, therefore, of no adverse consequence to safety.

The NRC staff has reviewed the licensee's application and based on the above finds that the proposed change to the water addition boron concentration requirements is acceptable. Therefore, the amendment is approved.

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 effluents 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 (57 FR 40222). 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.

Principal Contributor: J. Hopkins

Date: December 8, 1992