50-346

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

September 29, 1994

Mr. John P. Stetz
Vice President - Nuclear, Davis-Besse
Centerior Service Company
c/o Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, Ohio 43449

SUBJECT: AMENDMENT NO. 191 TO FACILITY OPERATING LICENSE NO. NPF-3 - DAVIS-BESSE UNIT NO. 1 NUCLEAR POWER STATION, (TAC NO. M89365)

Dear Mr. Stetz:

The Commission has issued Amendment No. 191 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1. The amendment revises the Technical Specifications (TS) in response to your application dated March 30, 1994.

This amendment revises the TS as follows:

(1) TS 3/4.1.1.1 and 3/4.10.4 -Increases the required boration rate from 18 gpm to 25 gpm, in the event the shutdown requirement is not met.

(2) TS 3/4.1.2.8 - Increase the minimum required volume of liquid in the Boric Acid Addition System (BAAS) from 600 gallons to 700 gallons.

(3) TS 3/4.1.2.8, 3/4.1.2.9 and 3/4.5.4 - Increase the minimum required boron concentration in the Borated Water Storage Tank (BWST) from 1800 ppm to 2100 ppm.

(4) TS 3.1.2.9, Figure 3.1-1 - Increase the minimum borated water volume corresponding to different boron concentrations in the BAAS.

(5) TS 3/4.5.1 - Increase the minimum boron concentration in the Core Flooding Tanks (CFT) to the same concentration as in the BWST (2100 ppm).

(6) TS 3/4.1.2.9 and 3/4.5.4 - Increase the allowable outage time for restoring boron concentration and temperature in the BWST from one hour to 8 hours.

(7) TS 3/4.5.1 - Increase the allowable outage time for restoring boron concentration in the CFT from 1 hour to 72 hours and modify the requirement for an inoperable CFT due to other causes than boron concentration by requiring restoration of the CFT to operable status

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within one hour or be in hot standby within the next 6 hours and with reduced reactor coolant pressure to less than 800 psig within the following 12 hours.

(8) TS 3/4.5.1 - Eliminate the surveillance requirement to sample for boron concentration in the CFT within 6 hours of each solution volume increase of more than 80 gallons if the solution volume increase was the result of addition from the BWST.

(9) TS 3/4.5.2 - Increase the minimum value of pH in the sump from 6 to 7 and simplify its verification by reducing sample size.

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:

Linda L. Gundrum, Acting Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Enclosures 1. Amendment No. 191 to License No. NPF-3
2. Safety Evaluation

cc w/encl: See Attached List

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within one hour or be in hot standby within the next 6 hours and with reduced reactor coolant pressure to less than 800 psig within the following 12 hours.

(8) TS 3/4.5.1 - Eliminate the surveillance requirement to sample for boron concentration in the CFT within 6 hours of each solution volume increase of more than 80 gallons if the solution volume increase was the result of addition from the BWST.

(9) TS 3/4.5.2 - Increase the minimum value of pH in the sump from 6 to 7 and simplify its verification by reducing sample size.

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,

Linda L. Gundrum

Linda L. Gundrum, Acting Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Enclosures: 1. Amendment No. 191 to License No. NPF-3
2. Safety Evaluation

cc w/encl: See Attached List

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

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. 191
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 March 30, 1994, 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:

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(a) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 191, 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

Cynthia A Carpenter for
John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of issuance: September 29, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 191

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.

Remove	Insert
3/4 1-1	3/4 1-1
3/4 1-14	3/4 1-14
3/4 1-16	3/4 1-16
3/4 1-17	3/4 1-17
3/4 1-18	3/4 1-18
B 3/4 1-2	B 3/4 1-2
B 3/4 1-3	B 3/4 1-3
3/4 5-1	3/4 5-1
3/4 5-2	3/4 5-2
3/4 5-5	3/4 5-5
3/4 5-7	3/4 5-7
B 3/4 5-1	B 3/4 5-1
B 3/4 5-2	B 3/4 5-2
--------	B 3/4 5-2a
3/4 10-4	3/4 10-4

3/4.1 REACTIVITY CONTROL SYSTEMS

3/4.1.1 BORATION CONTROL

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.1.1.1 The SHUTDOWN MARGIN shall be $\geq$ 1% $\Delta k/k$.

APPLICABILITY: MODES 1, 2*, 3, 4 and 5.

ACTION:

With the SHUTDOWN MARGIN < 1% $\Delta k/k$, immediately initiate and continue boration at $\geq$ 25 gpm of 7875 ppm boron or its equivalent, until the required SHUTDOWN MARGIN is restored.

SURVEILLANCE REQUIREMENTS

4.1.1.1.1 The SHUTDOWN MARGIN shall be determined to be $\geq$ 1% $\Delta k/k$:

a. Within one hour after detection of an inoperable control rod(s) and at least once per 12 hours thereafter while the rod(s) is inoperable. If the inoperable control rod is immovable or untrippable, the above required SHUTDOWN MARGIN shall be increased by an amount at least equal to the withdrawn worth of the immovable or untrippable control rod(s).

b. When in MODES 1 or 2#, at least once per 12 hours, by verifying that regulating rod groups withdrawal is within the limits of Specification 3.1.3.6.

c. When in MODE 2## within 4 hours prior to achieving reactor criticality by verifying that the predicted critical control rod position is within the limits of Specification 3.1.3.6.

d. Prior to initial operation above 5% RATED THERMAL POWER after each fuel loading by consideration of the factors of e. below, with the regulating rod groups at the maximum insertion limit of Specification 3.1.3.6.

#With $K_{eff} \geq 1.0$.
##With $K_{eff} < 1.0$.
*See Special Test Exception 3.10.4.

REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.8 As a minimum, one of the following borated water sources shall be OPERABLE:

a. A boric acid addition system with:

1. A minimum available borated water volume of 700 gallons,

2. Between 7875 and 13,125 ppm of boron, and

3. A minimum solution temperature of 105°F.

b. The borated water storage tank (BWST) with:

1. A minimum available borated water volume of 3,000 gallons,

2. A minimum boron concentration of 2100 ppm, and

3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 5 and 6

ACTION:

With no borated water sources OPERABLE, suspend all operations involving CORE ALTERATION or positive reactivity changes until at least one borated water source is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

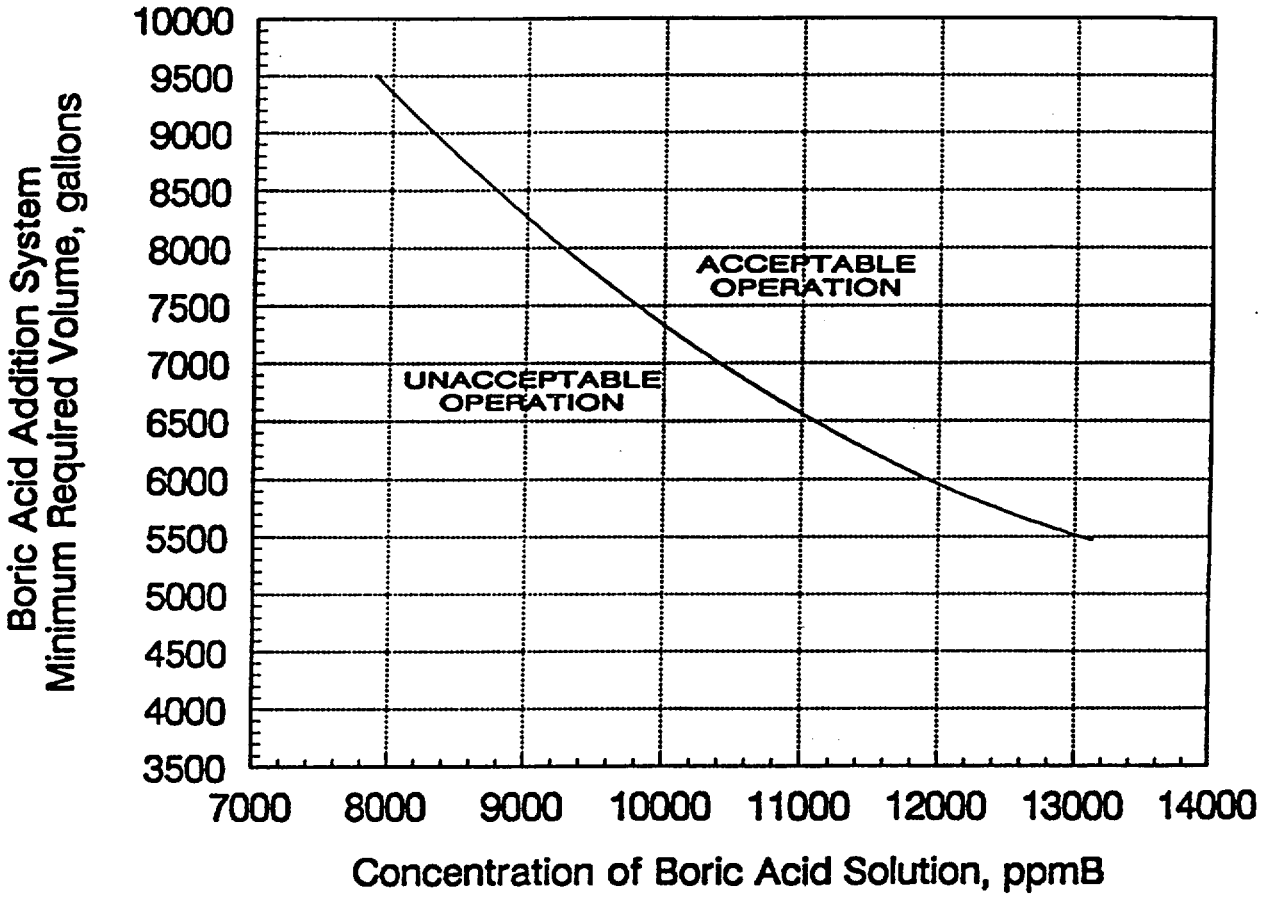
4.1.2.8 The above required borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the available borated water volume of the source,

2. Verifying the boron concentration of the water, and

Figure 3.1-1 Boric Acid Addition System Minimum Required Volume as a Function of Boric Acid Concentration Required in Modes 1-4



REACTIVITY CONTROL SYSTEMS

BORATED WATER SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.9 Each of the following borated water sources shall be OPERABLE:

a. The boric acid addition system (BAAS) with:

1. A minimum available borated water volume in accordance with Figure 3.1-1,

2. Between 7875 and 13,125 ppm of boron, and

3. A minimum solution temperature of 105°F.

b. The borated water storage tank (BWST) with:

1. An available borated water volume of between 482,778 and 550,000 gallons,

2. Between 2100 and 2200 ppm of boron, and

3. A minimum solution temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With the boric acid addition system (BAAS) inoperable, restore the BAAS to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 6 hours; restore the BAAS to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

b. With the BWST inoperable because of boron concentration or temperature not within limits, restore the BWST to OPERABLE status within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With the BWST inoperable for reasons other than boron concentration or temperature not within limits, restore the BWST to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.9 Each borated water source shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the available borated water volume of each water source,

2. Verifying the boron concentration in each water source, and

3. Verifying the BAAS solution temperature.

b. At least once per 24 hours by verifying the BWST temperature when the outside air temperature is < 35°F.

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. With either the borated water storage tank (BWST) boron concentration or BWST borated water temperature not within limits, the condition must be corrected in eight hours. The eight hour limit to restore the temperature or boron concentration to within limits was developed considering the time required to change boron concentration or temperature and assuming that the contents of the BWST are still available for injection.

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 9071 gallons of 7875 ppm borated water from the boric acid addition system (BAAS) or 75,300 gallons of 2100 ppm borated water from the BWST.

The requirement for a minimum available volume of 482,778 gallons of borated water in the BWST 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 stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity changes in the event the single injection system becomes inoperable.

3/4.1.2 BORATION SYSTEMS (Continued)

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 70°F. This condition requires either 700 gallons of 7875 ppm borated water from the BAAS or 3,000 gallons of 2100 ppm borated water from the BWST.

The bottom 4 inches of the BWST are not available, and the instrumentation is calibrated to reflect the available volume. All of the boric acid addition tank volume is available. The limits on water volume, and boron concentration ensure a pH value of between 7.0 and 11.0 of the solution recirculated within containment after a design basis accident. The pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion cracking on mechanical systems and components.

The OPERABILITY of one boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section (1) ensure that acceptable power distribution limits are maintained, (2) ensure that the minimum SHUTDOWN MARGIN is maintained, and (3) limit the potential effects of a rod ejection accident. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original criteria are met. For example, misalignment of a safety or regulating rod requires a restriction in THERMAL POWER. The reactivity worth of a misaligned rod is limited for the remainder of the fuel cycle to prevent exceeding the assumptions used in the safety analysis.

The position of a rod declared inoperable due to misalignment should not be included in computing the average group position for determining the OPERABILITY of rods with lesser misalignments.

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

CORE FLOODING TANKS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system core flooding tank (CFT) shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume between 7555 and 8004 gallons of borated water,

c. Between 2100 and 3500 ppm of boron, and

d. A nitrogen cover-pressure of between 575 and 625 psig.

APPLICABILITY: MODES 1, 2 and 3*.

ACTION:

a. With one CFT inoperable because of boron concentration not within limits, restore the inoperable CFT to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and reduce the RCS pressure to less than 800 psig within the following 12 hours.

b. With any CFT inoperable for reasons other than boron concentration not within limits, restore the CFT to OPERABLE status within one hour or be in HOT STANDBY within the next 6 hours and reduce the RCS pressure to less than 800 psig within the following 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each core flooding tank shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks, and

2. Verifying that each tank isolation valve is open.

*With Reactor Coolant pressure > 800 psig.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days, and within 6 hours of each solution volume increase of $\geq$ 80 gallons that is not the result of addition from the borated water storage tank (BWST), by verifying the boron concentration of the CFT solution.

c. At least once per 31 days by verifying that power to the isolation valve operator is disconnected by locking the breakers in the open position.

d. At least once per 18 months by verifying that each core flooding tank isolation valve opens automatically and is interlocked against closing whenever the Reactor Coolant System pressure exceeds 800 psig.

4. Verifying that a minimum of 72 cubic feet of trisodium phosphate dodecahydrate (TSP) is contained within the TSP storage baskets.

5. Verify that a representative sample of TSP from a TSP storage basket has a density of $\geq$ 53 lbs/cu ft.

6. Verifying that when a representative sample of TSP from a TSP storage basket is submerged, without agitation, in at least one liter of 180 $\pm$ 10°F borated water from the BWST, such that the resulting concentration of TSP is less than 0.84 grams per liter, the pH of the mixed solution is raised to $\geq$7 (measured at 77°F) within 4 hours.

e. At least once per 18 months, during shutdown, by

1. Verifying that each automatic valve in the flow path actuates to its correct position on a safety injection test signal.

2. Verifying that each HPI and LPI pump starts automatically upon receipt of a SFAS test signal.

f. By performing a vacuum leakage rate test of the watertight enclosure for valves DH-11 and DH-12 that assures the motor operators on valves DH-11 and DH-12 will not be flooded for at least 7 days following a LOCA:

1. At least once per 18 months.

2. After each opening of the watertight enclosure.

3. After any maintenance on or modification to the watertight enclosure which could affect its integrity.

g. By verifying the correct position of each mechanical position stop for valves DH-14A and DH-14B.

1. Within 4 hours following completion of the opening of the valves to their mechanical position stop or following completion of maintenance on the valve when the LPI system is required to be OPERABLE.

2. At least once per 18 months.

EMERGENCY CORE COOLING SYSTEMS

BORATED WATER STORAGE TANK

LIMITING CONDITION FOR OPERATION

3.5.4 The borated water storage tank (BWST) shall be OPERABLE with:

a. An available borated water volume of between 482,778 and 550,000 gallons,

b. Between 2100 and 2200 ppm of boron, and

c. A minimum water temperature of 35°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With the BWST inoperable because of boron concentration or temperature not within limits, restore the BWST to OPERABLE status within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With the BWST inoperable for reasons other than boron concentration or temperature not within limits, restore the BWST to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.5.4 The BWST shall be demonstrated OPERABLE:

a. At least once per 7 days by:

1. Verifying the available borated water volume in the tank,

2. Verifying the boron concentration of the water.

b. At least once per 24 hours by verifying the water temperature when outside air temperature <35°F.

3/4.5.1 CORE FLOODING TANKS

The OPERABILITY of each core flooding tank ensures that a sufficient volume of borated water will be immediately forced into the reactor vessel in the event the RCS pressure falls below the pressure of the tanks. This initial surge of water into the vessel provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on volume, boron concentration and pressure ensure that the assumptions used for core flooding tank injection in the safety analysis are met.

The tank power operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In addition, as these tank isolation valves fail to meet single failure criteria, removal of power to the valves is required.

The one hour limit for operation with a core flooding tank (CFT) inoperable for reasons other than boron concentration not within limits minimizes the time the plant is exposed to a possible LOCA event occurring with failure of a CFT, which may result in unacceptable peak cladding temperatures.

With boron concentration for one CFT not within limits, the condition must be corrected within 72 hours. The 72 hour limit was developed considering that the effects of reduced boron concentration on core subcriticality during reflood are minor. Boiling of the ECCS water in the core during reflood concentrates the boron in the saturated liquid that remains in the core. In addition, the volume of the CFTs is still available for injection. Since the boron requirements are based on the average boron concentration of the total volume of both CFTs, the consequences are less severe than they would be if the contents of a CFT were not available for injection.

The completion times to bring the plant to a MODE in which the Limiting Condition for Operation (LCO) does not apply are reasonable based on operating experience. The completion times allow plant conditions to be changed in an orderly manner and without challenging plant systems.

CFT boron concentration sampling within 6 hours after an 80 gallon volume increase will identify whether inleakage from the RCS has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water inventory is from the borated water storage tank (BWST), because the water contained in the BWST is within CFT boron concentration requirements.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The operability of two independent ECCS subsystems with RCS average temperature $\geq$ 280°F ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the core flooding tanks is capable of supplying sufficient core cooling to maintain the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long term core cooling capability in the recirculation mode during the accident recovery period.

With the RCS temperature below 280°F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that, at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. The decay heat removal system leak rate surveillance requirements assure that the leakage rates assumed for the system during the recirculation phase of the low pressure injection will not be exceeded.

The function of the trisodium phosphate dodecahydrate (TSP) contained in baskets in the containment normal sump is to neutralize the acidity of the post-LOCA borated water mixture prior to establishing containment emergency sump recirculation. The borated water storage tank (BWST) borated water has a nominal pH value of approximately 5. Raising the borated water mixture to a pH value of 7 will ensure that chloride stress corrosion does not occur in austenitic stainless steels in the event that chloride levels increase as a result of contamination on the surfaces of the reactor containment building. Also, a pH of 7 is assumed for the containment emergency sump for iodine retention and removal post-LOCA by the containment spray system.

The Surveillance Requirements (SR) associated with TSP ensure that the minimum amount and density of TSP is stored in the baskets, and that the TSP in the baskets is sufficient to provide adequate, post-LOCA, long-term pH adjustment.

Surveillance requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

Containment Emergency Sump Recirculation Valves DH-9A and DH-9B are de-energized during MODES 1, 2, 3 and 4 to preclude postulated inadvertent opening of the valves in the event of a Control Room fire, which could result in draining the Borated Water Storage Tank to the Containment Emergency Sump and the loss of this water source for normal plant shutdown. Re-energization of DH-9A and DH-9B is permitted on an intermittent basis during MODES 1, 2, 3 and 4 under administrative controls. Station procedures identify the precautions which must be taken when re-energizing these valves under such controls.

Borated Water Storage Tank (BWST) outlet isolation valves DH-7A and DH-7B are de-energized during MODES 1, 2, 3, and 4 to preclude postulated

inadvertent closure of the valves in the event of a fire, which could result in a loss of the availability of the BWST. Re-energization of valves DH-7A and DH-7B is permitted on an intermittent basis during MODES 1, 2, 3, and 4 under administrative controls. Station procedures identify the precautions which must be taken when re-energizing these valves under such controls.

3/4.5.4 BORATED WATER STORAGE TANK

The OPERABILITY of the borated water storage tank (BWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on the BWST minimum volume and boron concentration ensure that:

1) sufficient water is available within containment to permit recirculation cooling flow to the core following manual switchover to the recirculation mode, and

2) The reactor will remain at least 1% $\Delta k/k$ subcritical in the cold condition at 70°F, xenon free, while only crediting 50% of the control rods' worth following mixing of the BWST and the RCS water volumes.

These assumptions ensure that the reactor remains subcritical in the cold condition following mixing of the BWST and the RCS water volumes.

With either the BWST boron concentration or BWST borated water temperature not within limits, the condition must be corrected in eight hours. The eight hour limit to restore the temperature or boron concentration to within limits was developed considering the time required to change boron concentration or temperature and assuming that the contents of the BWST are still available for injection.

The bottom 4 inches of the BWST are not available, and the instrumentation is calibrated to reflect the available volume. The limits on water volume, and boron concentration ensure a pH value of between 7.0 and 11.0 of the solution sprayed within the containment after a design basis accident. The pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion cracking on mechanical systems and components.

SPECIAL TEST EXCEPTIONS

SHUTDOWN MARGIN

LIMITING CONDITION FOR OPERATION

3.10.4 The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 may be suspended for measurement of control rod worth and shutdown margin provided:

a. Reactivity equivalent to at least the highest estimated control rod worth is available for trip insertion from OPERABLE control rod(s), and

b. All axial power shaping rods are withdrawn to at least 35% (indicated position) and OPERABLE.

APPLICABILITY: MODE 2

ACTION:

a. With any safety or regulating control rod not fully inserted and with less than the above reactivity equivalent available for trip insertion or the axial power shaping rods not within their withdrawal limits, immediately initiate and continue boration at $\geq$ 25 gpm of 7875 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

b. With all safety or regulating control rods fully inserted and the reactor subcritical by less than the above reactivity equivalent, immediately initiate and continue boration at $\geq$ 25 gpm of 7875 ppm boric acid solution or its equivalent until the SHUTDOWN MARGIN required by Specification 3.1.1.1 is restored.

SURVEILLANCE REQUIREMENTS

4.10.4.1 The position of each safety, regulating, and axial power shaping rod either partially or fully withdrawn shall be determined at least once per 2 hours.

4.10.4.2 Each safety or regulating control rod not fully inserted shall be demonstrated capable of full insertion when tripped from at least the 50% withdrawn position within 24 hours prior to reducing the SHUTDOWN MARGIN to less than the limits of Specification 3.1.1.1.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 191 TO FACILITY OPERATING LICENSE NO. NPF-3

TOLEDO EDISON COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated March 30, 1994, Centerior Energy requested an amendment to Operating License NPF-3, which would revise the Davis-Besse Nuclear Power Station Unit 1 Technical Specifications (TS). Specifically, the proposed changes would increase the required boration flowrate from 18 gpm to 25 gpm in the event the required shutdown margin is not met, and increase the minimum boron concentration for the borated water storage tank (BWST) and the core flooding tanks (CFT) from 1800 ppm to 2100 ppm, and increase the minimum boric acid addition system (BAAS) volume from 600 gallons to 700 gallons. The proposed changes would also revise the Action statements for an inoperable BWST or CFT, and the Surveillance Requirements relating to boron concentration sampling of the CFT and the chemistry testing of the trisodium phosphate (TSP) contained in baskets in the containment normal sump.

2.0 EVALUATION

A proposed change to TS 3/4.1.1.1 would revise the Action statement to increase the required boration flowrate from 18 gpm to 25 gpm in the event the shutdown margin requirement is not met; boration must be initiated immediately and continued until the shutdown margin is within its limit. Since it is imperative to raise the boron concentration of the reactor coolant system as quickly as possible, an increase in required boration flowrate is in the conservative direction and is, therefore, acceptable. The same change to the Action statements of TS 3/4.10.4 makes this special test exception consistent with TS 3/4.1.1.1.

Proposed changes to TS 3/4.1.2.8 would increase the minimum required BAAS volume from 600 gallons to 700 gallons and increase the minimum required BWST boron concentration from 1800 ppm to 2100 ppm during shutdown Modes 5 and 6 (below 200 °F). The boron capability required below 200 °F must be sufficient to provide a shutdown margin of 1% after xenon decay and cooldown from 200 °F to 70 °F. This requirement is met with either 700 gallons of 7875 ppm borated

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water from the BAAS or 3000 gallons of 2100 ppm borated water from the BWST. The proposed changes are, therefore, acceptable.

Proposed changes to TS 3/4.1.2.9 and TS 3/4.5.4, applicable during Modes 1, 2, 3, and 4, would revise TS Figure 3.1-1 and increase the minimum required BWST boron concentration from 1800 ppm to 2100 ppm. The boration capability of the BWST and the BAAS must be sufficient to provide a shutdown margin from all operating conditions of 1% 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 9071 gallons of 7875 ppm borated water from the BAAS or 75,300 gallons of 2100 ppm borated water from the BWST. This requirement is met by the proposed changes and bounded by the proposed new Figure 3.1-1. The proposed changes are, therefore, acceptable.

Proposed changes to the Action statements of TS 3/4.1.2.9 and TS 3/4.5.4 would increase the allowable outage time for restoring the BWST to operable status from 1 hour to 8 hours in the event it is inoperable because of boron concentration or temperature not within limits. The 1 hour requirement will remain if the BWST is inoperable for any other reason. This 8 hour limit was developed by considering the time required to change boron concentration or temperature and is consistent with NUREG-1430, "Revised Standard Technical Specifications for Babcock & Wilcox Pressurized Water Reactors." In addition, since the contents of the BWST would remain available for injection during the 8-hour time period, if necessary, there would be no adverse effect on plant safety. The proposed changes to the Action statements are, therefore, acceptable.

A proposed change to TS 3/4.5.1 would increase the minimum required CFT boron concentration from 1800 ppm to 2100 ppm. This would ensure that the minimum boron concentration of the CFTs is the same as the proposed minimum boron concentration for the BWST, as assumed in the reload analysis for the post-LOCA borated water mixture concentration. As for the similar change approved previously for the BWST, the boron concentration increase is in the conservative direction and would have no adverse effect on plant safety. The proposed change is, therefore, acceptable.

A proposed change to the Action statement of TS 3/4.5.1 would increase the allowable outage time for restoring a CFT to operable status, in the event, it is inoperable due to the boron concentration not being within limits, from 1 hour to 72 hours. If it is inoperable for any other reason, the 1-hour allowable outage time would remain in effect. With a reduced boron concentration, the ability to maintain subcriticality may be reduced, but the effects of reduced boron concentration on core subcriticality during post-LOCA reflood would be minor, because the initial voiding maintains the reactor subcritical. In addition, the volume of the CFT would still be available for injection. Therefore, this change, which is consistent with NUREG-1430, is acceptable.

Another proposed change to the Action statements of TS 3/4.5.1 would change the actions that need to be taken in the event CFT operability cannot be restored. The Action statement would change from requiring the plant to go to hot shutdown (Mode 4) to hot standby (Mode 3) with RCS pressure less than 800 psig. TS 3/4.5.1 is applicable in Modes 1 and 2, and in Mode 3 with the RCS pressure greater than 800 psig. In Mode 3 with RCS pressure below 800 psig, the CFT motor-operated isolation valves are closed to isolate the CFTs from the RCS. Therefore, the proposed change would be consistent with the applicability Modes of the TS and is acceptable.

A proposed change to TS 3/4.5.1 would replace the current Action statement 3.5.1.b for a CFT inoperable due to the isolation valve being closed with a new Action statement which would allow one hour to restore the CFT to operable status for any reason other than the boron concentration not being within limits. The current TS Action requires either immediate opening of the isolation valve or proceeding with a controlled plant shutdown within 1 hour. Due to the severity of the consequences should a LOCA occur in this condition, the 1 hour completion time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action is taken and minimizes the time the plant is potentially exposed to a LOCA in this degraded condition. If the CFT cannot be returned to operable status within 1 hour, the plant must be placed in a Mode in which the LCO does not apply. As mentioned previously, this may be done by placing the plant in Mode 3 with RCS pressure less than 800 psig. The proposed change is acceptable and consistent with NUREG-1430.

A final proposed change to TS 3/4.5.1 would eliminate the Surveillance Requirement 4.5.1.b to sample the CFT boron concentration within 6 hours of a solution volume increase of greater than 80 gallons, if the solution volume increase was the result of addition from the BWST. This proposed change is acceptable because the water contained in the BWST is within CFT boron concentration requirements and, therefore, the addition of BWST water would not result in the CFT boron concentration going out of limits.

The proposed changes to the TS Bases associated with the above proposed TS changes are consistent with the proposed changes and are acceptable.

Recently, both Three Mile Island, Unit 1 and Oconee have discovered control rods which dropped slower than TS requirements. A possible reason for the slower drop-times has been attributed to crud deposits in the control rod drive mechanisms. The crud is believed to originate throughout the RCS and is due, in part, to operation with relatively low pH levels, caused by longer fuel cycles using increased RCS boron concentrations without compensating increases in lithium concentrations. In response to our request, the licensee stated that this problem does not exist at Davis-Besse since they do not have the older type of control rod mechanisms in use at Three Mile Island, Unit 1 and Oconee. Since the problem has not been seen in the newer type of mechanism used at Davis-Besse, the staff agrees with the licensee's assessment.

The staff has reviewed the proposed changes to the Davis-Besse TS described and evaluated above and finds them acceptable for the reasons stated in the above evaluation.

3.0 STATE CONSULATION

In accordance with the Commission's regulation, 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 and 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 (59 FR 27067). 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) 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: September 29, 1994