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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 At least one of the following boron injection flow paths shall be OPERABLE.

a. A flow path from the concentrated boric acid storage system via a boric acid pump and a makeup or decay heat removal (DHR) pump to the Reactor Coolant System, if only the boric acid storage system ~~in Specification 3.1.2.8a~~ is OPERABLE, or

b. A flow path from the borated water storage tank via a makeup or DHR pump to the Reactor Coolant System if only the borated water storage tank ~~in Specification 3.1.2.8b~~ is OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one injection path is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

a. At least once per 7 days(1) by verifying that the pipe temperature of the heat traced portion of the flow path is $\geq$ 105°F when a flow path from the concentrated boric acid storage system is used, and

b. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position is in its correct position.

(1)If the 7 day verification falls during transfers of makeup water or dilute boron solutions (fluid source concentration of less than 5000 ppmB), the verification period may be extended up to 8 hours after the addition of dilute boron solution has been stopped for a period of at least 8 hours.

~~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 900 gallons,~~

~~2. ≥ 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 2600 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~~

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~~REACTIVITY CONTROL SYSTEMS~~

~~SURVEILLANCE REQUIREMENTS (Continued)~~

~~3. Verifying the boric acid addition system solution temperature when it is the source of borated water.~~

~~b. At least once per 24 hours by verifying the BWST temperature when it is the source of borated water and the outside air temperature is < 35°F.~~

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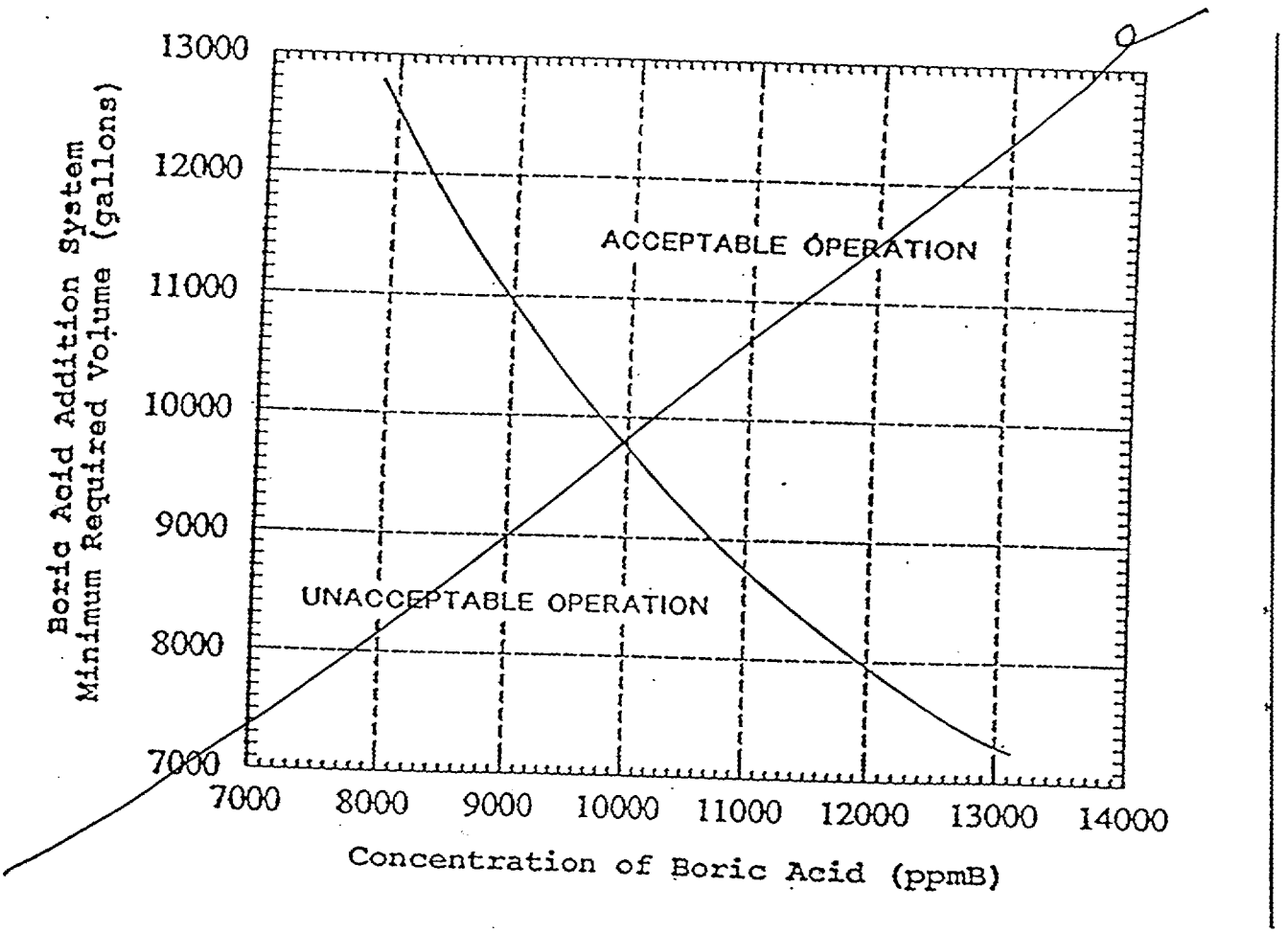
~~Figure 3.1-1 Boric Acid Addition System Minimum Required Volume as a Function of Boric Acid Concentration Required in Modes 1-4~~



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~~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. ≥ 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. ≥ 2600 and ≤ 2800 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% Δk/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.~~

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~~REACTIVITY CONTROL SYSTEMS~~

~~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.~~

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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. ≥ 2600 and ≤ 2800 ppm of boron, and

c. A minimum water temperature of 35°F.

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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.

REACTIVITY CONTROL SYSTEMS

BASES

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, depending on operating conditions, 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% Δk/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 12,200 gallons of 7875 ppm borated water from the boric acid addition system (BAAS) or 86,700 gallons of 2600 ppm borated water from the BWST. The minimum value for the BAAS of 12,200 gallons at a concentration of 7875 ppm boron is a lower value than that shown in TS Figure 3.1-1 because the Bases value is the minimum required actual value, whereas TS Figure 3.1-1 shows the minimum indicated value, which was conservatively increased to account for instrument and chemical analysis tolerances.~~ The available borated water volume range and boron concentration range for the Boric Acid Addition System (BAAS), required to support this boration capability, are provided in the Updated Safety Analysis Report. The requirements relative to the Borated Water Storage Tank (BWST) are provided in Limiting Condition for Operation (LCO) 3.5.4.

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REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.2 BORATION SYSTEMS (Continued)

~~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.

The boration ~~boron~~ capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% Δk/k after xenon decay and cooldown from 200°F to 70°F. ~~This condition requires either 900 gallons of 7875 ppm borated water from the BAAS or 3,000 gallons of 2600 ppm borated water from the BWST.~~ The available borated water volume range and boron concentration range for the BAAS and the BWST, required to support this boration capability, are provided in the Updated Safety Analysis Report.

~~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.

BASES (Continued)

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.

The Decay Heat Isolation Valve and Pressurizer Heater Interlock setpoint is based on preventing over-pressurization of the Decay Heat Removal System normal suction line piping. The value stated is the RCS pressure at the sensing instrument's tap. It has been adjusted to reflect the elevation difference between the sensor's location and the pipe of concern.

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

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2) The reactor will remain at least 1% Δk/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.

Docket Number 50-346
License Number NPF-3
Serial Number 2470
Enclosure 2

COMMITMENT LIST

THE FOLLOWING LIST IDENTIFIES THOSE ACTIONS COMMITTED TO BY DAVIS-BESSE NUCLEAR POWER STATION IN THIS DOCUMENT. ANY OTHER ACTIONS DISCUSSED IN THE SUBMITTAL REPRESENT INTENDED OR PLANNED ACTIONS BY DAVIS-BESSE. THEY ARE DESCRIBED ONLY AS INFORMATION AND ARE NOT REGULATORY COMMITMENTS. PLEASE NOTIFY THE MANAGER – REGULATORY AFFAIRS (419-321-8466) AT DAVIS-BESSE OF ANY QUESTIONS REGARDING THIS DOCUMENT OR ANY ASSOCIATED REGULATORY COMMITMENTS.

COMMITMENTS	DUE DATE
Relocate the requirements of TS 3/4.1.2.8 and 3/4.1.2.9 to the TRM.	No later than the implementation of the NRC-approved License Amendment that allows for their removal from the TS.