

March 16, 2001

RS-01-035

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Supplement to Request for Technical Specification Change, "Boron Dilution Protection System"

- References: (1) Letter from R. M. Krich (Exelon Generation Company, LLC) to U. S. NRC, "Request for Technical Specification Change - Revise the Applicability of Technical Specification 3.3.9, 'Boron Dilution Protection System (BDPS),' dated June 19, 2000
- (2) Letter from M. Chawla (U. S. NRC) to O. D. Kingsley (Exelon Generation Company, LLC), "Request for Technical Specifications Change to Revise the Applicability of Technical Specification 3.3.9, Boron Dilution Protection System (BDPS) for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2," dated February 21, 2001

In the Reference 1 letter, in accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," we requested a change to the Technical Specifications (TS) of Facility Operating License Nos. NPF-72, NPF-77, NPF-37 and NPF-66, for the Braidwood Station, Units 1 and 2, and the Byron Station, Units 1 and 2, respectively. The proposed change revised the Applicability of TS 3.3.9, "Boron Dilution Protection System (BDPS)." As stated in the Reference 1 letter, during the upcoming Braidwood Station and Byron Station refueling outages, required modifications supporting the proposed TS change will be installed and the existing automatic valve actuation features of the BDPS will be removed.

The revised Applicability of TS 3.3.9 would have made the TS applicable to the unit only until the automatic valve actuation feature of the BDPS is eliminated during that respective unit's refueling outage. Upon startup of the unit following its refueling outage in which the automatic

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valve actuation feature of the BDPS is eliminated, TS 3.3.9 would no longer have been applicable.

As a result of discussions with the NRC on January 24, 2001, and on March 1, 2001, and in response to the Reference 2 letter, we are providing a supplement to the proposed TS change in the Reference 1 letter. In general, the proposed changes to TS 3.3.9 delete references to automatic valve actuation and related actions as well as reliance on source range detectors for detection of a boron dilution event, including the appropriate re-numbering of action conditions and surveillance requirements (SR).

Supplemental changes being proposed to TS Limiting Condition for Operation (LCO) 3.3.9 include requirements to have one or more reactor coolant pump(s) in operation; each Reactor Coolant System (RCS) loop isolation valve open; and the BDPS instrumentation in TS Table 3.3.9-1 operable. These additional requirements support assumptions in the boron dilution reanalysis regarding RCS volume and uniform boron concentration.

All existing TS Condition Statements, requirements and NOTES related to the source range neutron flux channels, BDPS trains and automatic switch over functions will be deleted as a result of those supplemental changes. These include TS SR 3.3.9.1, SR 3.3.9.7, SR 3.3.9.9, and ACTION CONDITION E.

Additional controls were added or clarified based on the proposed BDPS modifications. These include revision to the LCO NOTE, allowing the new Boron Dilution Alert Alarm to be bypassed during startup, addition of a new SR 3.3.9.4 to verify the new Alert Channel Selector switch is in the correct position every 12 hours and the addition of Table 3.3.9-1, "Boron Dilution Protection System Instrumentation."

ACTION CONDITION C, "Two trains inoperable due to the Refueling Water Storage Tank (RWST) boron concentration not within limits," and SR 3.3.9.5, "Verify RWST boron concentration is greater than the equivalent (Shutdown Margin) SDM limits specified in the (Core Operating Limits Report) COLR," were deleted since requirements currently exist to verify RWST level and concentration every seven days in TS SR 3.5.4.4 (i.e., in Modes 3, "Hot Standby," and 4, "Hot Shutdown") and in the licensee controlled Technical Requirements Manual.

Attachment C to the Reference 1 letter contained our evaluation performed using the criteria in 10 CFR 50.91(a)(1), "Notice for public comment," which provided information supporting a finding of no significant hazards consideration using the standards in 10 CFR 50.92(c), "Issuance of amendment." Since the proposed additional changes provided in this supplement are more restrictive than the originally proposed changes, the previous determination of no significant hazards consideration has not been impacted.

Attachment D to the Reference 1 letter contained our evaluation of the proposed changes against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21, "Criteria for and identification of licensing and regulatory actions requiring environmental assessments." In consideration of the additional changes, we have determined that the proposed TS change continues to meet the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9), "Criteria for categorical exclusion;

identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," and that no irreversible consequences exist in accordance with 10 CFR 50.92(b).

Attachments A-1 and A-2 include the marked-up TS page for the proposed additional changes for Braidwood Station and Byron Station, respectively. Attachments B-1 and B-2 include the associated TS page with the proposed additional changes incorporated for Braidwood Station and Byron Station, respectively. Attachment C includes additional information requested by the NRC on March 1, 2001.

The associated TS Bases change will be made in accordance with the provisions of 10 CFR 50.59, "Changes, tests, and experiments," and TS 5.5.14, "Technical Specifications (TS) Bases Control Program." Therefore, the TS Bases are not included in this supplement.

The proposed additional changes have been reviewed by the Braidwood Station and Byron Station Plant Operations Review Committees and approved by the Nuclear Safety Review Boards in accordance with the Quality Assurance Program.

Exelon Generation Company, LLC is notifying the State of Illinois of this supplement to the application for change to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

Should you have any questions concerning this letter, please contact Ms. Kelly M. Root at (630) 663-7292.

Respectfully,



R. M. Krich
Director - Licensing
Mid-West Regional Operating Group

Attachments:

Affidavit

- Attachment A-1: Marked-Up Page for Proposed Change for Braidwood Station
- Attachment A-2: Marked-Up Page for Proposed Change for Byron Station
- Attachment B-1: Incorporated Proposed Change for Braidwood Station
- Attachment B-2: Incorporated Proposed Change for Byron Station
- Attachment C: Supplemental Information Related to Request for Technical Specification (TS) Change for TS 3.3.9, "Boron Dilution Protection System (BDPS)"

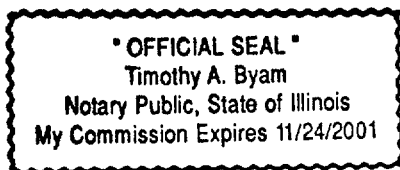
cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - Braidwood Station
NRC Senior Resident Inspector - Byron Station
Office of Nuclear Facility Safety - Illinois Department of Nuclear Safety

STATE OF ILLINOIS)
COUNTY OF DUPAGE)
IN THE MATTER OF)
EXELON GENERATION COMPANY, LLC) Docket Nos.
BRAIDWOOD STATION - UNITS 1 and 2) STN 50-456 and STN 50-457
BYRON STATION - UNITS 1 and 2) STN 50-454 and STN 50-455

SUBJECT: Supplement to Request for Technical Specification (TS) Change for TS 3.3.9, "Boron Dilution Protection System (BDPS)"

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.





R. M. Krich
Director - Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and

for the State above named, this 16th day of

March, 2001.



Notary Public

(OFFICIAL SEAL)

ATTACHMENT A-1

THE PROPOSED CHANGE FOR BRAIDWOOD STATION

MARKED-UP TS PAGES

3.3.9-1

3.3.9-2

3.3.9-3

3.3.9-4

Insert

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Protection System (BDPS)

with:

- One or more reactor coolant pump(s) in operation;
- Each Reactor Coolant System (RCS) loop isolation valve open; and
- The BDPS instrumentation in Table 3.3.9-1 OPERABLE.

LCO 3.3.9 ~~Two trains of the~~ BDPS shall be OPERABLE.

~~NOTE~~
The ~~boron dilution flux doubling signal~~ may be ~~blocked~~ in MODE 3 during reactor startup. *bypassed*

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

~~NOTE~~
Unborated water source isolation valves may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable. Boron Dilution Alert channel	A.1 Restore train <i>channel</i> to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u> B.2 Verify unborated water source isolation valves closed.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two trains inoperable due to the Refueling Water Storage Tank (RWST) boron concentration not within limits.	C.1 Close and deactivate isolation valves from the RWST.	8 hours
C D. Two trains inoperable for reasons other than Condition C. Two Boron Dilution Alert channels inoperable. <u>OR</u> No reactor coolant pump in operation. <u>OR</u> One or more RCS loop isolation valve(s) not open.	C D.1 Close unborated water source isolation valves. <u>AND</u> C D.2 Perform SR 3.1.1.1. <u>AND</u> C D.3 Verify unborated water source isolation valves closed.	1 hour 1 hour <u>AND</u> Once per 12 hours thereafter Once per 12 hours
E. Two trains inoperable due to required source range neutron flux monitor inoperable for control room monitoring of core status.	E.1 Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	<p>-----NOTE----- Not required to be performed prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -----</p> <p>Verify required source range monitor signal to BDPS is indicating a count rate ≥ 10 cps.</p>	12 hours
SR 3.3.9.2	<p>¹ Verify required ^{one or more} reactor coolant pump^(s) in operation.</p>	12 hours
SR 3.3.9.3	<p>² Verify each Reactor Coolant System ^{RCS} loop isolation valve is open.</p>	12 hours
SR 3.3.9.4	<p>³ Perform CHANNEL CHECK.</p>	12 hours
SR 3.3.9.5	<p>Verify RWST boron concentration is greater than the equivalent SDM limits specified in the COLR.</p>	7 days
SR 3.3.9.6	<p>⁵ Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	31 days
SR 3.3.9.7	<p>Verify the BDPS alarm setpoint is less than or equal to an increase of twice the count rate within a 10 minute period.</p>	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.9.8⁶</p> <p>NOTE Not required to be performed prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3.</p> <p>Perform COT.</p>	<p>92 days</p>
<p>SR 3.3.9.9</p> <p>Verify each BDPS valve actuates to its correct position on an actual or simulated signal.</p>	<p>18 months</p>
<p>SR 3.3.9.10⁷</p> <p>NOTE Neutron detectors are excluded from CHANNEL CALIBRATION.</p> <p>Perform CHANNEL CALIBRATION.</p>	<p>NOTE The CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function.</p> <p>18 months</p>

SR 3.3.9.4 Verify each Boron Dilution Alert channel selector switch is in the Normal position. 12 hours

INSERT

BDPS
3.3.9

Table 3.3.9-1 (page 1 of 1)
Boron Dilution Protection System Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
Boron Dilution Alert Channels			
Volume Control Tank Level High	2	SR 3.3.9.3 SR 3.3.9.6 SR 3.3.9.7	≤ 71.15%

ATTACHMENT A-2

THE PROPOSED CHANGE FOR BYRON STATION

MARKED-UP TS PAGES

3.3.9-1

3.3.9-2

3.3.9-3

3.3.9-4

Insert

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Protection System (BDPS)

with:
a. One or more reactor coolant pump(s) in operation;
b. Each Reactor Coolant System (RCS) loop isolation valve open; and
c. The BDPS instrumentation in Table 3.3.9-1 OPERABLE.

LC0 3.3.9 ~~Two trains of the~~ BDPS shall be OPERABLE.

NOTE
The boron dilution ~~flux doubling signal~~ ^{Alert alarm} may be blocked in MODE 3 during reactor startup. *bypassed*

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

NOTE
Unborated water source isolation valves may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One train inoperable. <i>Boron Dilution Alert channel</i>	A.1 <i>channel</i> Restore train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u> B.2 Verify unborated water source isolation valves closed.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two trains inoperable due to the Refueling Water Storage Tank (RWST) boron concentration not within limits.	C.1 Close and deactivate isolation valves from the RWST.	8 hours
C D. Two trains inoperable for reasons other than Condition C. Two Boron Dilution Alert channels inoperable, <u>OR</u> No reactor coolant pump in operation, <u>OR</u> One or more RCS loop isolation valve(s) not open.	C D.1 Close unborated water source isolation valves. <u>AND</u> C D.2 Perform SR 3.1.1.1. <u>AND</u> C D.3 Verify unborated water source isolation valves closed.	1 hour 1 hour <u>AND</u> Once per 12 hours thereafter Once per 12 hours
E. Two trains inoperable due to required source range neutron flux monitor inoperable for control room monitoring of core status.	E.1 Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	<p>-----NOTE----- Not required to be performed prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3.</p> <p>Verify required source range monitor signal to BDPS is indicating a count rate ≥ 10 cps.</p>	12 hours
SR 3.3.9.2	<p>one or more Verify required reactor coolant pump(s) in operation.</p>	12 hours
SR 3.3.9.3	<p>2 RCS Verify each Reactor Coolant System loop isolation valve is open.</p>	12 hours
SR 3.3.9.4	<p>3 Perform CHANNEL CHECK.</p>	12 hours
SR 3.3.9.5	<p>Verify RWST boron concentration is greater than the equivalent SDM limits specified in the COLR.</p>	7 days
SR 3.3.9.6	<p>5 Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p>	31 days
SR 3.3.9.7	<p>Verify the BDPS alarm setpoint is less than or equal to an increase of twice the count rate within a 10 minute period.</p>	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
6 SR 3.3.9.8	<p>NOTE</p> <p>Not required to be performed prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3.</p>	92 days
	Perform COT.	
SR 3.3.9.9	Verify each BDPS valve actuates to its correct position on an actual or simulated signal.	18 months
7 SR 3.3.9.10	<p>NOTE</p> <p>Neutron detectors are excluded from CHANNEL CALIBRATION.</p>	<p>NOTE</p> <p>The CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function.</p> <p>18 months</p>
	Perform CHANNEL CALIBRATION.	

SR 3.3.9.4 Verify each Boron Dilution Alert channel selector switch is in the Normal position. 12 hours

INSERT

BDPS
3.3.9

Table 3.3.9-1 (page 1 of 1)
Boron Dilution Protection System Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
Boron Dilution Alert Channels			
Volume Control Tank Level High	2	SR 3.3.9.3 SR 3.3.9.6 SR 3.3.9.7	≤ 71.15%

ATTACHMENT B-1

PROPOSED CHANGE INCORPORATED FOR BRAIDWOOD STATION

TS PAGES

3.3.9-1

3.3.9-2

3.3.9-3

3.3.9-4

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Protection System (BDPS)

LCO 3.3.9 BDPS shall be OPERABLE with:

- a. One or more reactor coolant pump(s) in operation;
- b. Each Reactor Coolant System (RCS) loop isolation valve open; and
- c. The BDPS instrumentation in Table 3.3.9-1 OPERABLE.

-----NOTE-----

The Boron Dilution Alert Alarm may be bypassed in MODE 3 during reactor startup.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

-----NOTE-----

Unborated water source isolation valves may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Boron Dilution Alert channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u> B.2 Verify unborated water source isolation valves closed.	Once per 31 days
C. Two Boron Dilution Alert channels inoperable. <u>OR</u> No reactor coolant pump in operation. <u>OR</u> One or more RCS loop isolation valve(s) not open.	C.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u>	
	C.2 Perform SR 3.1.1.1.	1 hour
	<u>AND</u>	
	C.3 Verify unborated water source isolation valves closed.	Once per 12 hours thereafter
	<u>AND</u>	
	C.3 Verify unborated water source isolation valves closed.	Once per 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Verify one or more reactor coolant pump(s) in operation.	12 hours
SR 3.3.9.2	Verify each RCS loop isolation valve is open.	12 hours
SR 3.3.9.3	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.4	Verify each Boron Dilution Alert channel selector switch is in the Normal position.	12 hours
SR 3.3.9.5	Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.3.9.6	Perform COT.	92 days
SR 3.3.9.7	<p>-----NOTE----- The CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function. -----</p> <p>Perform CHANNEL CALIBRATION.</p>	18 months

Table 3.3.9-1 (page 1 of 1)
Boron Dilution Protection System Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
Boron Dilution Alert Channels			
Volume Control Tank Level High	2	SR 3.3.9.3 SR 3.3.9.6 SR 3.3.9.7	≤ 71.15%

ATTACHMENT B-2

PROPOSED CHANGE INCORPORATED FOR BYRON STATION

TS PAGES

3.3.9-1

3.3.9-2

3.3.9-3

3.3.9-4

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Protection System (BDPS)

LCO 3.3.9 BDPS shall be OPERABLE with:

- a. One or more reactor coolant pump(s) in operation;
- b. Each Reactor Coolant System (RCS) loop isolation valve open; and
- c. The BDPS instrumentation in Table 3.3.9-1 OPERABLE.

-----NOTE-----

The Boron Dilution Alert Alarm may be bypassed in MODE 3 during reactor startup.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

-----NOTE-----

Unborated water source isolation valves may be unisolated intermittently under administrative controls.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Boron Dilution Alert channel inoperable.	A.1 Restore channel to OPERABLE status.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u> B.2 Verify unborated water source isolation valves closed.	Once per 31 days
C. Two Boron Dilution Alert channels inoperable. <u>OR</u> No reactor coolant pump in operation. <u>OR</u> One or more RCS loop isolation valve(s) not open.	C.1 Close unborated water source isolation valves.	1 hour
	<u>AND</u>	
	C.2 Perform SR 3.1.1.1.	1 hour
	<u>AND</u>	Once per 12 hours thereafter
	<u>AND</u> C.3 Verify unborated water source isolation valves closed.	Once per 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Verify one or more reactor coolant pump(s) in operation.	12 hours
SR 3.3.9.2	Verify each RCS loop isolation valve is open.	12 hours
SR 3.3.9.3	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.4	Verify each Boron Dilution Alert channel selector switch is in the Normal position.	12 hours
SR 3.3.9.5	Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.3.9.6	Perform COT.	92 days
SR 3.3.9.7	<p>-----NOTE----- The CHANNEL CALIBRATION is only required to include that portion of the channel associated with the Boron Dilution Alert function. -----</p> <p>Perform CHANNEL CALIBRATION.</p>	18 months

Table 3.3.9-1 (page 1 of 1)
Boron Dilution Protection System Instrumentation

FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
Boron Dilution Alert Channels			
Volume Control Tank Level High	2	SR 3.3.9.3 SR 3.3.9.6 SR 3.3.9.7	≤ 71.15%

ATTACHMENT C

Additional Information Related to Request for Technical Specification (TS) Change for TS 3.3.9, "Boron Dilution Protection System (BDPS)"

The following additional information was discussed during a telephone conference call with representatives of the NRC and Exelon Generation Company, LLC, on March 1, 2001.

NRC Question

"How has the licensee determined that plant operators can reliably perform the required actions in the time allowed to successfully mitigate the event (i.e., there is assurance that all operators can successfully perform the required actions)?"

"How has the licensee considered NRC Information Notice 97-78 ("Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times")?"

Response

All licensed operators at Braidwood and Byron Stations, as part of their initial license training program, as well as their continuing requalification training program, are trained to recognize and mitigate a boron dilution event. Training in the classroom and simulator covers the symptoms of an inadvertent boron dilution and the use of procedures to diagnose and respond to boron dilution events. Abnormal operating procedures 1(2)BwOA PRI-12, "Uncontrolled Dilution Unit 1(2)," and 1(2)BOA PRI-12, "Uncontrolled Dilution Unit 1(2)," are in place at Braidwood Station and Byron Station, respectively, to guide the licensed operators in their response to an inadvertent boron dilution event.

Specific simulator scenarios involving inadvertent boron dilution events are included in the initial license and requalification training programs. Certified simulator instructors and Operations Department management personnel observe and evaluate the performance of individual licensed operators and overall operations crew performance in response to various scenarios, including boron dilution events, on our plant-referenced simulators. Based on these observations and evaluations of individuals and crew performance in response to boron dilution scenarios, we have determined that plant operators can reliably perform the required actions in the time allowed to successfully mitigate boron dilution events.

NRC Information Notice 97-78 contains guidance for determining the appropriateness of crediting operator actions in place of automatic actions. In the event of an inadvertent boron dilution, the specific actions being credited involve opening two refueling water storage tank (RWST) isolation valves and closing two volume control tank (VCT) isolation valves. These actions would be taken by control room licensed operators in accordance with procedural guidance. We have reviewed the Information Notice and concluded that crediting these specific operator actions is consistent with the guidelines discussed in the Information Notice.

NRC Question

"Page 3/27 (attachment E, June 19, 2000 submittal): What is the licensee's basis for assuming that there is reasonable assurance that plant operators will be able to diagnose and mitigate a boron dilution event, in 30 minutes, under conditions where the high VCT alarm fails to annunciate? Also, under these conditions, how does the licensee know that the system will allow the operator to respond in 30 minutes before the inadvertent criticality occurs?"

Response

Under conditions where the high VCT alarm fails to annunciate, the licensed operator will be alerted to a boron dilution event through various other instruments, indications, and alarms. These include the following:

- current neutron flux doubling alarm associated with the current BDPS;
- source range detectors hi flux at shutdown alarm;
- indicated and audible source range detector counts;
- boric acid and primary water flow deviation alarms and totalizers;
- valve position indications;
- control board recorders; and
- charging flow annunciators.

In addition, as noted in the response to the previous question, abnormal operating procedures are in place to guide the licensed operators' actions for responding to an inadvertent boron dilution event. The licensed operators are trained to respond to this event. The training simulator scenarios include slow dilution events which are typically more difficult to diagnose than large/fast boron dilution events. Based on operating crew performance on the simulator and operating experience, it is reasonable to assume that operators can terminate this event in 30 minutes or less.