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- GG. Site Boundary - Shall be that line beyond which the land is not owned, leased, or otherwise controlled by TVA.
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- II. Dose Equivalent I-131 - The DOSE EQUIVALENT I-131 shall be the concentration of I-131 (in  $\mu\text{Ci/gm}$ ) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factor used for this calculation shall be those listed in Table III of TID-14844 "Calculation of Distance Factors for Power and Test Reactor Sites".
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- LL. Surveillance - Surveillance Requirements shall be met during the OPERATIONAL CONDITIONS or other conditions specified for individual limiting conditions for operation unless otherwise stated in an individual Surveillance Requirements. Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval. It is not intended that this (extension) provision be used repeatedly as a convenience to extend surveillance intervals beyond that specified for surveillances that are not performed during refueling outages.

Performance of a Surveillance Requirement within the specified time interval shall constitute compliance and OPERABILITY requirements for a limiting condition for operation and associated action statements unless otherwise required by these specifications. Surveillance Requirements do not have to be performed on inoperable equipment.

TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Unit	Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
BFN Unit 1	1(15)	Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	$\leq 100$ mr/hr or downscale	F	1. 1 upscale channel or 2 downscale channels will a. Initiate SGTS b. Isolate refueling floor c. Close atmosphere control system.
	2(7) (8)	Instrument Channel SGTS Flow - Train A R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
	2(7) (8)	Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
	2(7) (8)	Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
	1	Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
	1	Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
	2(10)	Group 1 (Initiating) Logic	N/A	A	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main Steamline High Radiation</del> c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

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TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Minimum No.  
Instrument  
Channels Operable  
per Trip Sys(1)(1)

	Function	Trip Level Setting	Action (1)	Remarks
1	Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main Steamline High Radiation</del> c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure
			(Deleted)	
2	Group 2 (Initiating) Logic	N/A	A or (B and E)	1. Group 2: A Group 2 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure
1	Group 2 (RHR Isolation-Actuation) Logic	N/A	D	
1	Group 8 (TIP-Actuation) Logic	N/A	J	
1	Group 2 (Drywell Sump Drains-Actuation) Logic	N/A	K	
1	Group 2 (Reactor Building & Refueling Floor, and Drywell Vent and Purge-Actuation) Logic	N/A	F and G	1. Part of Group 6 Logic
2	Group 3 (Initiating) Logic	N/A	C	1. Group 3: A Group 3 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. Reactor Water Cleanup System High Temperature c. Reactor Water Cleanup System High Drain Temperature

BFN  
Unit 1

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# UNIT 2

**MARKED UP PAGES**

Section

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	H.	Snubbers . . . . .	3.6/4.6-15
3.7/4.7		Containment Systems . . . . .	3.7/4.7-1
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	B.	Standby Gas Treatment System . . . . .	3.7/4.7-13
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	G.	Containment Atmosphere Dilution System (CAD) . . . . .	3.7/4.7-22
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3.8/4.8		Radioactive Materials . . . . .	3.8/4.8-1
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	B.	Airborne Effluents . . . . .	3.8/4.8-3
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9. Simulated Automatic Actuation - Simulated automatic actuation means applying a simulated signal to the sensor to actuate the circuit in question.
10. Logic - A logic is an arrangement of relays, contacts, and other components that produces a decision output.
- (a) Initiating - A logic that receives signals from channels and produces decision outputs to the actuation logic.
- (b) Actuation - A logic that receives signals (either from initiation logic or channels) and produces decision outputs to accomplish a protective action.
11. Channel Calibration - Shall be the adjustment, as necessary, of the channel output such that it responds with necessary range and accuracy to known values of the parameters which the channel monitors. The channel calibration shall encompass the entire channel including alarm and/or trip functions and shall include the channel functional test. The channel calibration may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated. Non-calibratable components shall be excluded from this requirement, but will be included in channel functional test and source check.
12. Channel Functional Test - Shall be:
- a. Analog/Digital Channels - the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions.
- b. Bistable Channels - the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.
- (Deleted)
13. Source Check - Shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source or multiple of sources.



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- II. Dose Equivalent I-131 - The DOSE EQUIVALENT I-131 shall be the concentration of I-131 (in  $\mu\text{Ci/gm}$ ) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factor used for this calculation shall be those listed in Table III of TID-14844 "Calculation of Distance Factors for Power and Test Reactor Sites".
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- LL. Surveillance - Surveillance Requirements shall be met during the OPERATIONAL CONDITIONS or other conditions specified for individual limiting conditions for operation unless otherwise stated in an individual Surveillance Requirements. Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval. It is not intended that this (extension) provision be used repeatedly as a convenience to extend surveillance intervals beyond that specified for surveillances that are not performed during refueling outages.

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TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
1(14)	Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	$\leq 100$ mr/hr or downscale	F	1. 1 upscale channel or 2 downscale channels will a. Initiate SGTS b. Isolate refueling floor c. Close atmosphere control system.
2(7) (8)	Instrument Channel SGTS Flow - Train A R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
2(7) (8)	Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
2(7) (8)	Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
1	Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
1	Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
2(10)	Group 1 (Initiating) Logic	N/A	A	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main Steamline High Radiation</del> c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

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BFN  
Unit 2

3.2/4.2-9

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TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

BFN  
Unit 2

Minimum No.  
Instrument  
Channels Operable  
per Trip Sys(1)(1)

	Function	Trip Level Setting	Action (1)	Remarks
1	Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main Steamline High Radiation</del> c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure
2	Group 2 (Initiating) Logic	N/A	A or (B and E)	1. Group 2: A Group 2 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure
1	Group 2 (RHR Isolation-Actuation) Logic	N/A	D	
1	Group 8 (TIP-Actuation) Logic	N/A	J	
1	Group 2 (Drywell Sump Drains-Actuation) Logic	N/A	K	
1	Group 2 (Reactor Building & Refueling Floor, and Drywell Vent and Purge-Actuation) Logic	N/A	F and G	1. Part of Group 6 Logic
2	Group 3 (Initiating) Logic	N/A	C	1. Group 3: A Group 3 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. Reactor Water Cleanup (RWCU) System High Temperature in the main steam valve vault c. RWCU System High Temperature in the RWCU pump room 2A d. RWCU System High Temperature in the RWCU pump room 2B e. RWCU System High Temperature in the RWCU heat exchanger room f. RWCU System High Temperature in the space near the pipe trench containing RWCU piping

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3.2/4.2-10

AMENDMENT NO. 235

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TABLE 3.2.B  
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Unit	BFN	Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
2		2	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	≥ 470" above vessel zero.	A	1. Below trip setting initiates HPCI.
		2	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	≥ 470" above vessel zero.	A	1. Multiplier relays initiate RCIC.
		<del>2</del>	<del>Instrument Channel - Reactor Low Water Level (LS-3-58A-D)</del>	<del>≥ 398" above vessel zero.</del>	<del>A</del>	<del>1. Below trip setting initiates CSS. Multiplier relays initiate LPCI. 2. Multiplier relay from CSS initiates accident signal (15).</del>
		2(16)	Instrument Channel - Reactor Low Water Level (LS-3-58A-D)	≥ 398" above vessel zero.	A	1. Below trip settings, in conjunction with drywell high pressure, low water level permissive, ADS timer timed out and CSS or RHR pump running, initiates ADS. 2. Below trip settings, in conjunction with low reactor water level permissive, ADS timer timed out, ADS high drywell pressure bypass timer timed out, CSS or RHR pump running, initiates ADS.
		1(16)	Instrument Channel - Reactor Low Water Level Permissive (LIS-3-184, 185)	≥ 544" above vessel zero.	A	1. Below trip setting permissive for initiating signals on ADS.
		1	Instrument Channel - Reactor Low Water Level (LIS-3-52 and LIS-3-62A)	≥ 312 5/16" above vessel zero. (2/3 core height)	A	1. Below trip setting prevents inadvertent operation of containment spray during accident condition.

**DELETE**

\*Only one trip system will be required to be OPERABLE during the period that the Reactor Vessel water level instrumentation modification requested by NRC Bulletin 93-03 is being performed, provided that the reactor is in the COLD SHUTDOWN CONDITION. Manual and automatic initiating capability of CSS and LPCI will be available, but with a reduced number of instrument channels.

Unit

3.2/4.2-14

AMENDMENT NO. 279

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LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.9.A. Auxiliary Electrical Equipment4.9.A. Auxiliary Electrical S

## 3.9.A.3. (Cont'd)

- d. The 480-V shutdown boards 2A and 2B are energized.
  - e. The units 1 and 2 diesel auxiliary boards are energized.
  - f. Loss of voltage and degraded voltage relays OPERABLE on 4-kV shutdown boards A, B, C, and D.
  - g. Shutdown buses 1 and 2 energized.
  - h. The 480-V reactor motor-operated valve (RMOV) boards 2D & 2E are energized with motor-generator (mg) sets 2DN, 2DA, 2EN, and 2EA in service.
4. The three 250-V unit batteries, the four shutdown board batteries, a battery charger for each battery, and associated battery boards are OPERABLE \* *DELETE*

## 4. Undervoltage Relays

- a. (Deleted)
- b. Once every 18 mont the conditions und which the loss of and degraded volta relays are require be simulated with undervoltage on ea shutdown board to demonstrate that t associated diesel generator will sta

*DELETE*

\*Except as specified in 3.9.B.8.c on page 3.9/4.9-10a from January 1, 1995, to December 31, 1995.

## LIMITING CONDITIONS FOR OPERATION

## SURVEILLANCE REQUIREMENTS

3.9.B Operation With Inoperable Equipment

\*g. From and after the date that one of the 250-V shutdown board batteries and/or its associated battery board is found to be inoperable for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding five days in accordance with 3.9.B.7 except as noted in 3.9.B.8.a, b, and c below:

- a. For the purpose of shutdown board battery and component replacement only, REACTOR POWER OPERATION is permissible for the succeeding forty-five (45) days providing:
1. Only one of the shutdown board batteries and associated components is being replaced at a time.
  2. All components normally supplied from the shutdown board battery which is being replaced are fed from its alternate source.
  3. Units 1 and 3 are defueled.
- b. NRC notification for 3.9.B.7 is not required for shutdown board battery and component replacement.
- c. Resumption of REACTOR POWER OPERATION is permissible following a shutdown while shutdown board battery and component replacements are in progress.

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\* From January 1, 1995, to December 31, 1995, the provisions of Specification 3.9.B.8 on this page will apply while modifications are being performed on the shutdown board batteries and/or their associated battery boards.

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BFW  
Unit 2

3.9/4.9-10b

AMENDMENT NO. 228



## LIMITING CONDITIONS FOR OPERATION

## SURVEILLANCE REQUIREMENTS

3.9.B Operation With Inoperable Equipment

~~8.~~  
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\*

From and after the date that one of the 250-V shutdown board batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding five days in accordance with 3.9.B.7.

9. When one division of the logic system is INOPERABLE, continued REACTOR POWER OPERATION is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.3 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.
10. (deleted)
11. The following limiting conditions for operation exist for the undervoltage relays which start the diesel generators on the 4-kV shutdown boards.

~~DELETE~~

\* From January 1, 1995, to December 31, 1995, the provisions of Specification 3.9.B.8 on page 3.9/4.9-10a will apply while modifications are being performed on the shutdown board batteries and/or their associated battery boards.

# UNIT 3

MARKED UP PAGES

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D. Relief Valves . . . . .		3.6/4.6-10
E. Jet Pumps . . . . .		3.6/4.6-11
F. Recirculation Pump Operation . . . . .		3.6/4.6-12
G. Structural Integrity . . . . .		3.6/4.6-13
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D. Primary Containment Isolation Valves . . . . .		3.7/4.7-17
E. Control Room Emergency Ventilation . . . . .		3.7/4.7-19
F. Primary Containment Purge System . . . . .		3.7/4.7-21
G. Containment Atmosphere Dilution System (CAD) . . . . .		3.7/4.7-22
H. Containment Atmosphere Monitoring (CAM) System H <sub>2</sub> Analyzer . . . . .		3.7/4.7-23a
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A. Liquid Effluents . . . . .		3.8/4.8-1
B. Airborne Effluents . . . . .		3.8/4.8-3
C. (Deleted) . . . . .		3.8/4.8-4
D. <del>(Deleted)</del> <del>Mechanical Vacuum Pump</del> . . . . .		3.8/4.8-4
E. Miscellaneous Radioactive Materials Sources . . . . .		3.8/4.8-5
F. (Deleted) . . . . .		3.8/4.8-6
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A. Auxiliary Electrical Equipment . . . . .		3.9/4.9-1

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- HH. Unrestricted Area - Any area at or beyond the SITE BOUNDARY to which access is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials or any area within the SITE BOUNDARY used for industrial, commercial, institutional, or recreational purposes.
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TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Minimum No.  
Instrument  
Channels Operable  
per Trip Sys(1)(1)

	Function	Trip Level Setting	Action (1)	Remarks
2(7) (8)	Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
2(7) (8)	Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
1	Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
1	Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
2(10)	Group 1 (Initiating) Logic	N/A	A	1. A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main steamline high radiation</del> c. Main steamline high flow d. Main steamline space high temperature e. Main steamline low pressure
1	Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. <del>Main Steamline High Radiation</del> c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

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Unit 3

3.2/4.2-10

AMENDMENT NO. 193

MAR 15 1995

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT (BFN)  
UNITS 1, 2, and 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-352  
REVISED PAGES

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# UNIT 1

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1.0 DEFINITIONS (Cont'd)

- GG. Site Boundary - Shall be that line beyond which the land is not owned, leased, or otherwise controlled by TVA.
- HH. Unrestricted Area - Any area at or beyond the SITE BOUNDARY to which access is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials or any area within the SITE BOUNDARY used for industrial, commercial, institutional, or recreational purposes.
- II. Dose Equivalent I-131 - The DOSE EQUIVALENT I-131 shall be the concentration of I-131 (in  $\mu\text{Ci/gm}$ ) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factor used for this calculation shall be those listed in Table III of TID-14844 "Calculation of Distance Factors for Power and Test Reactor Sites".
- JJ. Gaseous Waste Treatment System - The charcoal adsorber vessels installed on the discharge of the steam jet air ejector to provide delay to a unit's offgas activity prior to release.
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- LL. Surveillance - Surveillance Requirements shall be met during the OPERATIONAL CONDITIONS or other conditions specified for individual limiting conditions for operation unless otherwise stated in an individual Surveillance Requirements. Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval. It is not intended that this (extension) provision be used repeatedly as a convenience to extend surveillance intervals beyond that specified for surveillances that are not performed during refueling outages.

Performance of a Surveillance Requirement within the specified time interval shall constitute compliance and OPERABILITY requirements for a limiting condition for operation and associated action statements unless otherwise required by these specifications. Surveillance Requirements do not have to be performed on inoperable equipment.

TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Unit	Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
BFN Unit 1	1(15)	Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	$\leq 150$ mR/hr or downscale	F	1. 1 upscale channel or 2 downscale channels will a. Initiate SGTS b. Isolate refueling floor c. Close atmosphere control system.
	2(7) (8)	Instrument Channel SGTS Flow - Train A R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
	2(7) (8)	Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
3.2/4.2-9	2(7) (8)	Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
	1	Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
	1	Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
	2(10)	Group 1 (Initiating) Logic	N/A	A	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

BFN Unit 1	Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
	1	Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure
	2	Group 2 (Initiating) Logic	N/A	A or (B and E)	1. Group 2: A Group 2 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure
	1	Group 2 (RHR Isolation-Actuation) Logic	N/A	D	
	1	Group 8 (TIP-Actuation) Logic	N/A	J	
	1	Group 2 (Drywell Sump Drains-Actuation) Logic	N/A	K	
	1	Group 2 (Reactor Building & Refueling Floor, and Drywell Vent and Purge-Actuation) Logic	N/A	F and G	1. Part of Group 6 Logic
	2	Group 3 (Initiating) Logic	N/A	C	1. Group 3: A Group 3 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. Reactor Water Cleanup System High Temperature c. Reactor Water Cleanup System High Drain Temperature

3.2/4.2-10

# UNIT 2

REVISED PAGES



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1.0 DEFINITIONS (Cont'd)

9. Simulated Automatic Actuation - Simulated automatic actuation means applying a simulated signal to the sensor to actuate the circuit in question.
10. Logic - A logic is an arrangement of relays, contacts, and other components that produces a decision output.
  - (a) Initiating - A logic that receives signals from channels and produces decision outputs to the actuation logic.
  - (b) Actuation - A logic that receives signals (either from initiation logic or channels) and produces decision outputs to accomplish a protective action.
11. Channel Calibration - Shall be the adjustment, as necessary, of the channel output such that it responds with necessary range and accuracy to known values of the parameters which the channel monitors. The channel calibration shall encompass the entire channel including alarm and/or trip functions and shall include the channel functional test. The channel calibration may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated. Non-calibratable components shall be excluded from this requirement, but will be included in channel functional test and source check.
12. Channel Functional Test - Shall be:
  - a. Analog/Digital Channels - the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions.
  - b. Bistable Channels - the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions.
13. (Deleted)

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- II. Dose Equivalent I-131 - The DOSE EQUIVALENT I-131 shall be the concentration of I-131 (in  $\mu\text{Ci/gm}$ ) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factor used for this calculation shall be those listed in Table III of TID-14844 "Calculation of Distance Factors for Power and Test Reactor Sites".
- JJ. Gaseous Waste Treatment System - The charcoal adsorber vessels installed on the discharge of the steam jet air ejector to provide delay to a unit's offgas activity prior to release.
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TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

BFN  
Unit 2

Minimum No.  
Instrument  
Channels Operable  
per Trip Sys(1)(1)

Function	Trip Level Setting	Action (1)	Remarks
Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	$\leq 100$ mr/hr or downscale	F	1. 1 upscale channel or 2 downscale channels will a. Initiate SGTS b. Isolate refueling floor c. Close atmosphere control system.
Instrument Channel SGTS Flow - Train A R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
Group 1 (Initiating) Logic	N/A	A	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

3.2/4.2-9

TABLE 3.2.A (Continued)  
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
1	Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure
2	Group 2 (Initiating) Logic	N/A	A or (B and E)	1. Group 2: A Group 2 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure
1	Group 2 (RHR Isolation-Actuation) Logic	N/A	D	
1	Group 8 (TIP-Actuation) Logic	N/A	J	
1	Group 2 (Drywell Sump Drains-Actuation) Logic	N/A	K	
1	Group 2 (Reactor Building & Refueling Floor, and Drywell Vent and Purge-Actuation) Logic	N/A	F and G	1. Part of Group 6 Logic
2	Group 3 (Initiating) Logic	N/A	C	1. Group 3: A Group 3 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. Reactor Water Cleanup (RWCU) System High Temperature in the main steam valve vault c. RWCU System High Temperature in the RWCU pump room 2A d. RWCU System High Temperature in the RWCU pump room 2B e. RWCU System High Temperature in the RWCU heat exchanger room f. RWCU System High Temperature in the space near the pipe trench containing RWCU piping

BFN  
Unit 2

3.2/4.2-10

TABLE 3.2.B  
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

BFN  
Unit 2

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
2	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	$\geq 470$ " above vessel zero.	A	1. Below trip setting initiates HPCI.
2	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	$\geq 470$ " above vessel zero.	A	1. Multiplier relays initiate RCIC.
2	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	$\geq 398$ " above vessel zero.	A	1. Below trip setting initiates CSS. Multiplier relays initiate LPCI. 2. Multiplier relay from CSS initiates accident signal (15).
2(16)	Instrument Channel - Reactor Low Water Level (LIS-3-58A-D)	$\geq 398$ " above vessel zero.	A	1. Below trip settings, in conjunction with drywell high pressure, low water level permissive, ADS timer timed out and CSS or RHR pump running, initiates ADS. 2. Below trip settings, in conjunction with low reactor water level permissive, ADS timer timed out, ADS high drywell pressure bypass timer timed out, CSS or RHR pump running, initiates ADS.
1(16)	Instrument Channel - Reactor Low Water Level Permissive (LIS-3-184, 185)	$\geq 544$ " above vessel zero.	A	1. Below trip setting permissive for initiating signals on ADS.
1	Instrument Channel - Reactor Low Water Level (LIS-3-52 and LIS-3-62A)	$\geq 312 \frac{5}{16}$ " above vessel zero. (2/3 core height)	A	1. Below trip setting prevents inadvertent operation of containment spray during accident condition.

3.2/4.2-14

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3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.3. (Cont'd)

- d. The 480-V shutdown boards 2A and 2B are energized.
- e. The units 1 and 2 diesel auxiliary boards are energized.
- f. Loss of voltage and degraded voltage relays OPERABLE on 4-kV shutdown boards A, B, C, and D.
- g. Shutdown buses 1 and 2 energized.
- h. The 480-V reactor motor-operated valve (RMOV) boards 2D & 2E are energized with motor-generator (mg) sets 2DN, 2DA, 2EN, and 2EA in service.

- 4. The three 250-V unit batteries, the four shutdown board batteries, a battery charger for each battery, and associated battery boards are OPERABLE.

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SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4. Undervoltage Relays

- a. (Deleted)
- b. Once every 18 months, the conditions under which the loss of voltage and degraded voltage relays are required shall be simulated with an undervoltage on each shutdown board to demonstrate that the associated diesel generator will start.

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation With Inoperable Equipment

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8. From and after the date that one of the 250-V shutdown board batteries and/or its associated battery board is found to be INOPERABLE for any reason, continued REACTOR POWER OPERATION is permissible during the succeeding five days in accordance with 3.9.B.7.
  9. When one division of the logic system is INOPERABLE, continued REACTOR POWER OPERATION is permissible under this condition for seven days, provided the CSCS requirements listed in Specification 3.9.B.3 are satisfied. The NRC shall be notified within 24 hours of the situation, the precautions to be taken during this period, and the plans to return the failed component to an OPERABLE state.
  10. (deleted)
  11. The following limiting conditions for operation exist for the undervoltage relays which start the diesel generators on the 4-kV shutdown boards.
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PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

BFN  
Unit 3

Minimum No.  
Instrument  
Channels Operable  
per Trip Sys(1)(11)

Function	Trip Level Setting	Action (1)	Remarks
Instrument Channel SGTS Flow - Train B R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	Hi and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
Instrument Channel SGTS Flow - Train C R. H. Heaters	$\geq 2000$ cfm and $\leq 4000$ cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.
Reactor Building Isolation Timer (refueling floor)	$0 \leq t \leq 2$ secs.	H or F	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
Reactor Building Isolation Timer (reactor zone)	$0 \leq t \leq 2$ secs.	G or A or H	1. Below trip setting prevents spurious trips and system perturbations from initiating isolation.
Group 1 (Initiating) Logic	N/A	A	1. A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main steamline high flow d. Main steamline space high temperature e. Main steamline low pressure
Group 1 (Actuation) Logic	N/A	B	1. Group 1: A Group 1 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Low Water Level b. Deleted c. Main Steamline High Flow d. Main Steamline Space High Temperature e. Main Steamline Low Pressure

3.2/4.2-10