March 15, 1995

Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: ISSUANCE OF TECHNICAL SPECIFICATION AMENDMENTS FOR THE BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3 (TAC NOS. M88083, M88084, AND M88085) (TS 320)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment Nos. 219, 235, and 193 to Facility Operating Licenses Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. These amendments are in response to your application dated October 12, 1993, regarding the revision of Tables to clarify isolation valve grouping for all three units. In addition, the amendment revises the Unit 3 Technical Specifications (TS) to reflect modifications that replace existing Reactor Water Cleanup (RWCU) Isolation System high compartment temperature detection switches with resistance temperature detectors (RTD) loops and add additional temperature detection instruments. The Unit 3 changes are similar to TS changes approved for Unit 2 in Amendments 189 and 213.

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

Sincerely,

ORIGINAL SIGNED BY:

Joseph F. Williams, Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260 and 50-296

Enclosures:
1. Amendment No. 219 to License No. DPR-33
2. Amendment No. 235 to License No. DPR-52
3. Amendment No. 193 to License No. DPR-68
4. Safety Evaluation

cc w/enclosures: See next page

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 219
License No. DPR-33

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

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 12, 1993, 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. DPR-33, is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 219, are hereby incorporated in the license. The licensee 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 within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Frederick J. Hebdon

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 219

FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE	INSERT
3.2/4.2-9	3.2/4.2-9
3.2/4.2-10	3.2/4.2-10
3.2/4.2-11	3.2/4.2-11
3.2/4.2-11a	3.2/4.2-11a*
3.2/4.2-18	3.2/4.2-18*
3.2/4.2-19	3.2/4.2-19
3.2/4.2-20	3.2/4.2-20
3.2/4.2-21	3.2/4.2-21*

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(15)	Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	≤ 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	≥2000 cfm and ≤ 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	≥2000 cfm and ≤ 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	≥2000 cfm and ≤ 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 ≤ t ≤ 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 ≤ t ≤ 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. Main Steamline High Radiation 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

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. Main Steamline High Radiation 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

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 3 (Actuation) Logic	N/A	C	
1	Group 6 Logic	N/A	F and G	1. Group 6: A Group 6 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure c. Reactor Building Ventilation High Radiation
1	Group 8 (Initiating) Logic	N/A	J	1. Group 8: A Group 8 isolation is automatically actuated by only the following conditions: a. High Drywell Pressure b. Reactor Vessel Low Water Level 2. Same as Group 2 initiating logic.
1	Reactor Building Isolation (refueling floor) Logic	N/A	H or F	
1	Reactor Building Isolation (reactor zone) Logic	N/A	H or G or A	
1(7) (8)	SGTS Train A Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train B Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train C Logic	N/A	L or (A and F)	

Refer to Table 3.2.B for RCIC and HPCI functions including Groups 4, 5, and 7 valves.

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TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	HPCI Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1	RCIC Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1(2)	Instrument Channel - Condensate Header Low Level (LS-73-56A & B)	$\geq$ Elev. 551'	A	1. Below trip setting will open HPCI suction valves to the suppression chamber.
1(2)	Instrument Channel - Suppression Chamber High Level	$\leq$ 7" above instrument zero	A	1. Above trip setting will open HPCI suction valves to the suppression chamber.
2(2)	Instrument Channel - Reactor High Water Level	$\leq$ 583" above vessel zero	A	1. Above trip setting trips RCIC turbine.
1	Instrument Channel - RCIC Turbine Steam Line High Flow	$\leq$ 450" H_2O (7)	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.
4(4)	Instrument Channel - RCIC Steam Line Space High Temperature	$\leq$200°F.	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Steam Supply Pressure - Low (PS 71-1A-D)	$\geq$50 psig	A	1. Below trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Turbine Exhaust Diaphragm Pressure - High (PS 71-11A-D)	$\leq$20 psig	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
2(2)	Instrument Channel - Reactor High Water Level	≤583" above vessel zero.	A	1. Above trip setting trips HPCI turbine.
1	Instrument Channel - HPCI Turbine Steam Line High Flow	≤90 psi (7)	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
4(4)	Instrument Channel - HPCI Steam Line Space High Temperature	≤200°F.	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Steam Supply Pressure - Low (PS 73-1A-D)	≥100 psig	A	1. Below trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Turbine Exhaust Diaphragm (PS 73-20A-D)	≤20 psig	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
1	Core Spray System Logic	N/A	B	1. Includes testing auto initiation inhibit to Core Spray Systems in other units.
1	RCIC System (Initiating) Logic	N/A	B	1. Includes Group 7 valves. 2. Group 7: A Group 7 isolation is automatically actuated by only the following condition: 1. The respective turbine steam supply valve not fully closed.
1	RCIC System (Isolation) Logic	N/A	B	1. Includes Group 5 valves. 2. Group 5: A Group 5 isolation is actuated by any of the following conditions: a. RCIC Steamline Space High Temperature b. RCIC Steamline High Flow c. RCIC Steamline Low Pressure d. RCIC Turbine Exhaust Diaphragm High Pressure
1 (16)	ADS Logic	N/A	A	

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	RHR (LPCI) System (Initiation)	N/A	B	
1	RHR (LPCI) System (Containment Cooling Spray) Logic	N/A	A	
1	HPCI System (Initiating) Logic	N/A	B	1. Includes Group 7 valves. 2. Group 7: A Group 7 isolation is automatically actuated by only the following condition: 1. The respective turbine steam supply valve not fully closed.
1	HPCI System (Isolation) Logic	N/A	B	1. Includes Group 4 valves. 2. Group 4: A Group 4 isolation is actuated by any of the following conditions: a. HPCI Steamline Space High Temperature b. HPCI Steamline High Flow c. HPCI Steamline Low Pressure d. HPCI Turbine Exhaust Diaphragm High Pressure
1	Core Spray System auto initiation inhibit (Core Spray auto initiation).	N/A	B	1. Inhibit due to the core spray system of another unit. 2. The inhibit is considered the contact in the auto initiating logic only; i.e., the permissive function of the inhibit.
1	LPCI System auto initiation inhibit (LPCI auto initiation)	N/A	B	1. Inhibit due to the LPCI System of another unit. 2. The inhibit is considered the contact in the auto initiating logic only, i.e., the permissive function of the inhibit.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1(3)	Core Spray Loop A Discharge Pressure (PI-75-20)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	Core Spray Loop B Discharge Pressure (PI-75-48)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop A Discharge Pressure (PI-74-51)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop B Discharge Pressure (PI-74-65)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(10)	Instrument Channel - RHR Start	N/A	A	1. Starts RHR area cooler fan when respective RHR motor starts.
1(10)	Instrument Channel - Thermostat (RHR Area Cooler Fan)	$\leq$100°F	A	1. Above trip setting starts RHR area cooler fans.
2(10)	Instrument Channel - Core Spray A or C Start	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts.
2(10)	Instrument Channel - Core Spray B or D	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts.

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 235
License No. DPR-52

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

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 12, 1993, 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. DPR-52, is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 235, are hereby incorporated in the license. The licensee 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 within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Frederick J. Hebdon

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 235

FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE	INSERT
3.2/4.2-9	3.2/4.2-9
3.2/4.2-10	3.2/4.2-10
3.2/4.2-11	3.2/4.2-11
3.2/4.2-11a	3.2/4.2-11a*
3.2/4.2-18	3.2/4.2-18*
3.2/4.2-19	3.2/4.2-19
3.2/4.2-20	3.2/4.2-20
3.2/4.2-21	3.2/4.2-21*

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	≤ 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	≥2000 cfm and ≤ 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	≥2000 cfm and ≤ 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	≥2000 cfm and ≤ 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 ≤ t ≤ 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 ≤ t ≤ 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. Main Steamline High Radiation 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

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. Main Steamline High Radiation 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

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 3 (Actuation) Logic	N/A	C	
1	Group 6 Logic	N/A	F and G	1. Group 6: A Group 6 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure c. Reactor Building Ventilation High Radiation
1	Group 8 (Initiating) Logic	N/A	J	1. Group 8: A Group 8 isolation is automatically actuated by only the following conditions: a. High Drywell Pressure b. Reactor Vessel Low Water Level 2. Same as Group 2 initiating logic.
1	Reactor Building Isolation (refueling floor) Logic	N/A	H or F	
1	Reactor Building Isolation (reactor zone) Logic	N/A	H or G or A	
1(7) (8)	SGTS Train A Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train B Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train C Logic	N/A	L or (A and F)	

Refer to Table 3.2.B for RCIC and HPCI functions including Groups 4, 5, and 7 valves.

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
2	Instrument Channel Reactor Water Cleanup System Main Steam Valve Vault (TIS-069-834A-D)	≤ 201.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Pipe Trench (TIS-069-835A-D)	≤ 135.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Pump Room 2A (TIS-069-836A-D)	≤ 152.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Pump Room 2B (TIS-069-837A-D)	≤ 152.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-838A-D)	≤ 143.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-839A-D)	≤ 170.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor

AMENDMENT NO. 213

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	HPCI Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1	RCIC Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1(2)	Instrument Channel - Condensate Header Low Level (LS-73-56A & B)	$\geq$ Elev. 551'	A	1. Below trip setting will open HPCI suction valves to the suppression chamber.
1(2)	Instrument Channel - Suppression Chamber High Level	$\leq$ 7" above instrument zero	A	1. Above trip setting will open HPCI suction valves to the suppression chamber.
2(2)	Instrument Channel - Reactor High Water Level (LIS-3-208A and LIS-3-208C)	$\leq$ 583" above vessel zero	A	1. Above trip setting trips RCIC turbine.
1	Instrument Channel - RCIC Turbine Steam Line High Flow (PDIS-71-1A and 1B)	$\leq$ 450" H_2O (7)	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Steam Supply Pressure - Low (PS 71-1A-D)	$\geq$50 psig	A	1. Below trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Turbine Exhaust Diaphragm Pressure - High (PS 71-11A-D)	$\leq$20 psig	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
2(2)	Instrument Channel - Reactor High Water Level (LIS-3-208B and LIS-3-208D)	≤583" above vessel zero.	A	1. Above trip setting trips HPCI turbine.
1	Instrument Channel - HPCI Turbine Steam Line High Flow (PDIS-73-1A and 1B)	≤90 psi (7)	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Steam Supply Pressure - Low (PS 73-1A-D)	≥100 psig	A	1. Below trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Turbine Exhaust Diaphragm (PS 73-20A-D)	≤20 psig	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
1	Core Spray System Logic	N/A	B	1. Includes testing auto initiation inhibit to Core Spray Systems in other units.
1	RCIC System (Initiating) Logic	N/A	B	
1	RCIC System (Isolation) Logic	N/A	B	1. Includes Group 5 valves. 2. Group 5: A Group 5 isolation is actuated by any of the following conditions: a. RCIC Steamline Space High Temperature b. RCIC Steamline High Flow c. RCIC Steamline Low Pressure d. RCIC Turbine Exhaust Diaphragm High Pressure
1 (16)	ADS Logic	N/A	A	
1	RHR (LPCI) System (Initiation)	N/A	B	

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	RHR (LPCI) System (Containment Cooling Spray) Logic	N/A	A	
1	HPCI System (Initiating) Logic	N/A	B	
1	HPCI System (Isolation) Logic	N/A	B	1. Includes Group 4 valves. 2. Group 4: A Group 4 isolation is actuated by any of the following conditions: a. HPCI Steamline Space High Temperature b. HPCI Steamline High Flow c. HPCI Steamline Low Pressure d. HPCI Turbine Exhaust Diaphragm High Pressure
1	Core Spray System auto initiation inhibit (Core Spray auto initiation).	N/A	B	1. Inhibit due to the core spray system of another unit. 2. The inhibit is considered the contact in the auto initiating logic only; i.e., the permissive function of the inhibit.
1	LPCI System auto initiation inhibit (LPCI auto initiation)	N/A	B	1. Inhibit due to the LPCI System of another unit. 2. The inhibit is considered the contact in the auto initiating logic only, i.e., the permissive function of the inhibit.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
50				
1(3)	Core Spray Loop A Discharge Pressure (PI-75-20)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	Core Spray Loop B Discharge Pressure (PI-75-48)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop A Discharge Pressure (PI-74-51)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop B Discharge Pressure (PI-74-65)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(10)	Instrument Channel - RHR Start	N/A	A	1. Starts RHR area cooler fan when respective RHR motor starts.
1(10)	Instrument Channel - Thermostat (RHR Area Cooler Fan)	$\leq$100°F	A	1. Above trip setting starts RHR area cooler fans.
2(10)	Instrument Channel - Core Spray A or C Start	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts
2(10)	Instrument Channel - Core Spray B or D	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 193
License No. DPR-68

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

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 12, 1993, 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. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 193, are hereby incorporated in the license. The licensee 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 within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Frederick J. Hebdon

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 193

FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf* pages are provided to maintain document completeness.

REMOVE	INSERT
3.2/4.2-7	3.2/4.2-7*
3.2/4.2-8	3.2/4.2-8
3.2/4.2-9	3.2/4.2-9
3.2/4.2-10	3.2/4.2-10
3.2/4.2-11	3.2/4.2-11
3.2/4.2-11a	3.2/4.2-11a
3.2/4.2-13a	3.2/4.2-13a
3.2/4.2-13b	3.2/4.2-13b*
3.2/4.2-18	3.2/4.2-18*
3.2/4.2-19	3.2/4.2-19
3.2/4.2-20	3.2/4.2-20
3.2/4.2-21	3.2/4.2-21*
3.2/4.2-41	3.2/4.2-41*
3.2/4.2-42	3.2/4.2-42
3.2/4.2-66	3.2/4.2-66
3.2/4.2-67	3.2/4.2-67*
3.7/4.7-34	3.7/4.7-34
3.7/4.7-35	3.7/4.7-35*

TABLE 3.2.A
PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Minimum No. Instrument Channels Operable Per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
2	Instrument Channel - Reactor Low Water Level(6)	≥ 538" above vessel zero	A or (B and E)	1. Below trip setting does the following: a. Initiates Reactor Building Isolation b. Initiates Primary Containment Isolation (Groups 2, 3, and 6) c. Initiates SGTS
1	Instrument Channel - Reactor High Pressure (PS-68-93 and 94)	100 ± 15 psig	D	1. Above trip setting isolates the shutdown cooling suction valves of the RHR system.
2	Instrument Channel - Reactor Low Water Level (LIS-3-56A-D, SW #1)	≥ 378" above vessel zero	A	1. Below trip setting initiates Main Steam Line Isolation
2	Instrument Channel - High Drywell Pressure (6) (PS-64-56A-D)	≤ 2.5 psig	A or (B and E)	1. Above trip setting does the following: a. Initiates Reactor Building Isolation b. Initiates Primary Containment Isolation c. Initiates SGTS

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
2	Instrument Channel - Low Pressure Main Steam Line	≥ 825 psig (4)	B	1. Below trip setting initiates Main Steam Line Isolation
2(3)	Instrument Channel - High Flow Main Steam Line	≤ 140% of rated steam flow	B	1. Above trip setting initiates Main Steam Line Isolation
2(12)	Instrument Channel - Main Steam Line Tunnel High Temperature	≤ 200°F	B	1. Above trip setting initiates Main Steam Line Isolation.
1(15)	Instrument Channel - Reactor Building Ventilation High Radiation - Reactor Zone	≤ 100 mr/hr or downscale	G	1. 1 upscale channel or 2 downscale channels will a. Initiate SGTS b. Isolate reactor zone and refueling floor. c. Close atmosphere control system.
2	Instrument Channel Reactor Water Cleanup System Main Steam Valve Vault (TIS-069-834A-D)	≤ 201.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Pipe Trench (TIS-069-835A-D)	≤ 135.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor

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
2	Instrument Channel Reactor Water Cleanup System Pump Room 3A (TIS-069-836A-D)	≤ 152.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Pump Room 3B (TIS-069-837A-D)	≤ 152.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-838A-D)	≤ 143.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
2	Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-839A-D)	≤ 170.0°F	C	Above Trip Setting initiates Isolation of Reactor Water Cleanup Lines to and from the Reactor
1(15)	Instrument Channel - Reactor Building Ventilation High Radiation - Refueling Zone	≤ 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	≥2000 cfm and ≤ 4000 cfm	H and (A or F)	Below 2000 cfm airflow R.H. heaters shall be shut off.

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
2(7) (8)	Instrument Channel SGTS Flow - Train B R. H. Heaters	≥2000 cfm and ≤ 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	≥2000 cfm and ≤ 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 ≤ t ≤ 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 ≤ t ≤ 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. Main steamline high radiation 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. Main Steamline High Radiation 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

Minimum No. Instrument Channels Operable per Trip Sys(1)(11)	Function	Trip Level Setting	Action (1)	Remarks
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 3A d. RWCU System High Temperature in the RWCU pump room 3B 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

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 3 (Actuation) Logic	N/A	C	
1	Group 6 Logic	N/A	F and G	1. Group 6: A Group 6 isolation is actuated by any of the following conditions: a. Reactor Vessel Low Water Level b. High Drywell Pressure c. Reactor Building Ventilation High Radiation
1	Group 8 (Initiating) Logic	N/A	J	1. Group 8: A Group 8 isolation is automatically actuated by only the following conditions: a. High Drywell Pressure b. Reactor Vessel Low Water Level 2. Same as Group 2 initiating logic.
1	Reactor Building Isolation (refueling floor) Logic	N/A	H or F	
1	Reactor Building Isolation (reactor zone) Logic	N/A	H or G or A	
1(7) (8)	SGTS Train A Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train B Logic	N/A	L or (A and F)	
1(7) (8)	SGTS Train C Logic	N/A	L or (A and F)	

Refer to Table 3.2.B for RCIC and HPCI functions including Groups 4, 5, and 7 valves.

NOTES FOR TABLE 3.2.A (Cont'd)

14. Deleted

15. There is a RBVRM trip function for the refueling zone and a RBVRM trip function for the reactor zone. Each trip function is composed of two divisional trip systems. Each trip system has one channel for each zone. Each channel contains two sensors, both of which must be OPERABLE for the channel to be OPERABLE. A channel downscale/inoperable trip occurs when either of the sensors are indicating less than the low radiation setpoint or are inoperable. A channel upscale trip occurs when both of the sensors are indicating higher than the high radiation setpoint. Only one channel upscale trip is required for trip function initiation. Two channel downscale trips in a zone are required for trip function initiation.

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TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	HPCI Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1	RCIC Trip System bus power monitor	N/A	C	1. Monitors availability of power to logic systems.
1(2)	Instrument Channel - Condensate Header Low Level (LS-73-56A & B)	$\geq$ Elev. 551'	A	1. Below trip setting will open HPCI suction valves to the suppression chamber.
2(2)	Instrument Channel - Suppression Chamber High Level	$\leq$ 7" above instrument zero	A	1. Above trip setting will open HPCI suction valves to the suppression chamber.
2(2)	Instrument Channel - Reactor High Water Level	$\leq$ 583" above vessel zero	A	1. Above trip setting trips RCIC turbine.
1	Instrument Channel - RCIC Turbine Steam Line High Flow	$\leq$ 450" H_2O (7)	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.
4(4)	Instrument Channel - RCIC Steam Line Space High Temperature	$\leq$200°F.	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Steam Supply Pressure - Low (PS 71-1A-D)	$\geq$50 psig	A	1. Below trip setting isolates RCIC system and trips RCIC turbine.
3(2)	Instrument Channel - RCIC Turbine Exhaust Diaphragm Pressure - High (PS 71-11A-D)	$\leq$ 20 psig	A	1. Above trip setting isolates RCIC system and trips RCIC turbine.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
2(2)	Instrument Channel - Reactor High Water Level	≤583" above vessel zero.	A	1. Above trip setting trips HPCI turbine.
1	Instrument Channel - HPCI Turbine Steam Line High Flow	≤90 psi (7)	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
4(4)	Instrument Channel - HPCI Steam Line Space High Temperature	≤200°F.	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Steam Supply Pressure - Low (PS 73-1A-D)	≥100 psig	A	1. Below trip setting isolates HPCI system and trips HPCI turbine.
3(2)	Instrument Channel - HPCI Turbine Exhaust Diaphragm (PS 73-20A-D)	≤20 psig	A	1. Above trip setting isolates HPCI system and trips HPCI turbine.
1	Core Spray System Logic	N/A	B	1. Includes testing auto initiation inhibit to Core Spray Systems in other units.
1	RCIC System (Initiating) Logic	N/A	B	1. Includes Group 7 valves. 2. Group 7: A Group 7 isolation is automatically actuated by only the following condition: 1. The respective turbine steam supply valve not fully closed.
1	RCIC System (Isolation) Logic	N/A	B	1. Includes Group 5 valves. 2. Group 5: A Group 5 isolation is actuated by any of the following conditions: a. RCIC Steamline Space High Temperature b. RCIC Steamline High Flow c. RCIC Steamline Low Pressure d. RCIC Turbine Exhaust Diaphragm High Pressure
1 (16)	ADS Logic	N/A	A	

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1	RHR (LPCI) System (Initiation)	N/A	B	
1	RHR (LPCI) System (Containment Cooling Spray) Logic	N/A	A	
1	HPCI System (Initiating) Logic	N/A	B	1. Includes Group 7 valves. 2. Group 7: A Group 7 isolation is automatically actuated by only the following condition: 1. The respective turbine steam supply valve not fully closed.
1	HPCI System (Isolation) Logic	N/A	B	1. Includes Group 4 valves. 2. Group 4: A Group 4 isolation is actuated by any of the following conditions: a. HPCI Steamline Space High Temperature b. HPCI Steamline High Flow c. HPCI Steamline Low Pressure d. HPCI Turbine Exhaust Diaphragm High Pressure
1(3)	Core Spray Loop A Discharge Pressure (PI-75-20)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	Core Spray Loop B Discharge Pressure (PI-75-48)	0 - 500 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop A Discharge Pressure (PI-74-51)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(3)	RHR Loop B Discharge Pressure (PI-74-65)	0 - 450 psig Indicator (9)	D	1. Part of filled discharge pipe requirements. Refer to Section 4.5.
1(10)	Instrument Channel - RHR Start	N/A	A	1. Starts RHR area cooler fan when respective RHR motor starts.

TABLE 3.2.B (Continued)

Minimum No. Operable Per Trip Sys(1)	Function	Trip Level Setting	Action	Remarks
1(10)	Instrument Channel - Thermostat (RHR Area Cooler Fan)	≤100°F	A	1. Above trip setting starts RHR area cooler fans.
2(10)	Instrument Channel - Core Spray A or C Start	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts.
2(10)	Instrument Channel - Core Spray B or D	N/A	A	1. Starts Core Spray area cooler fan when Core Spray motor starts.
1(10)	Instrument Channel - Thermostat (Core Spray Area Cooler Fan)	≤ 100°F	A	1. Above trip setting starts Core Spray area cooler fans.
1(10)	RHR Area Cooler Fan Logic	N/A	A	
1(10)	Core Spray Area Cooler Fan Logic	N/A	A	
1(11)	Instrument Channel - Core Spray Motors A or C Start	N/A	A	1. Starts RHRSW pumps A3, B1, C3, and D1
1(11)	Instrument Channel - Core Spray Motors B or D Start	N/A	A	1. Starts RHRSW pumps A3, B1, C3, and D1
1(12)	Instrument Channel - Core Spray Loop 1 Accident Signal (15)	N/A	A	1. Starts RHRSW pumps A3, B1, C3, and D1
1(12)	Instrument Channel - Core Spray Loop 2 Accident Signal (15)	N/A	A	1. Starts RHRSW pumps A3, B1, C3, and D1
1	RPT Logic	N/A	(17)	1. Trips recirculation pumps on turbine contrel valve fast closure or stop valve closure > 30% power.
1(13)	RHRSW Initiate Logic	N/A	(14)	

TABLE 4.2.A
SURVEILLANCE REQUIREMENTS FOR PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Function	Functional Test	Calibration Frequency	Instrument Check
Group 1 (Initiating) Logic	Checked during channel functional test. No further test required.(11)	N/A	N/A
Group 1 (Actuation) Logic	once/operating cycle (21)	N/A	N/A
Group 2 (Initiating) Logic	Checked during channel functional test. No further test required.	N/A	N/A
Group 2 (RHR Isolation-Actuation) Logic	once/operating cycle (21)	N/A	N/A
Group 8 (TIP-Actuation) Logic	once/operating cycle (21)	N/A	N/A
Group 2 (Drywell Sump Drains-Actuation) Logic	once/operating cycle (21)	N/A	N/A
Group 2 (Reactor Building and Refueling floor, and Drywell Vent and Purge-Actuation) Logic	once/operating cycle (21)	N/A	N/A
Group 3 (Initiating) Logic	Checked during channel functional test. No further test required.	N/A	N/A
Group 3 (Actuation) Logic	once/operating cycle (21)	N/A	N/A

TABLE 4.2.A (Cont'd)
SURVEILLANCE REQUIREMENTS FOR PRIMARY CONTAINMENT AND REACTOR BUILDING ISOLATION INSTRUMENTATION

Function	Functional Test	Calibration Frequency	Instrument Check
Group 6 Logic	once/operating cycle (18)	N/A	N/A
Group 8 (Initiating) Logic	Checked during channel functional test. No further test required.	N/A	N/A
Reactor Building Isolation (refueling floor) Logic	once/6 months (18)	(6)	N/A
Reactor Building Isolation (reactor zone) Logic	once/6 months (18)	(6)	N/A
SGTS Train A Logic	once/6 months (19)	N/A	N/A
SGTS Train B Logic	once/6 months (19)	N/A	N/A
SGTS Train C Logic	once/6 months (19)	N/A	N/A
Instrument Channel Reactor Water Cleanup System Main Steam Valve Vault (TIS-069-834A-D)	(1) (28)	4 months	N/A
Instrument Channel Reactor Water Cleanup System Pipe Trench (TIS-069-835A-D)	(1) (28)	4 months	N/A
Instrument Channel Reactor Water Cleanup System Pump Room 3A (TIS-069-836A-D)	(1) (28)	4 months	N/A
Instrument Channel Reactor Water Cleanup System Pump Room 3B (TIS-069-837A-D)	(1) (28)	4 months	N/A
Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-838A-D)	(1) (28)	4 months	N/A
Instrument Channel Reactor Water Cleanup System Heat Exchanger Room (TIS-069-839A-D)	(1) (28)	4 months	N/A

3.2 BASES (Cont'd)

The setting of 200°F for the main steam line tunnel detector is low enough to detect leaks of the order of 15 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation. In the event of a loss of the reactor building ventilation system, radiant heating in the vicinity of the main steam lines raises the ambient temperature above 200°F. The temperature increases can cause an unnecessary main steam line isolation and reactor scram. Permission is provided to bypass the temperature trip for four hours to avoid an unnecessary plant transient and allow performance of the secondary containment leak rate test or make repairs necessary to regain normal ventilation.

Pressure instrumentation is provided to close the main steam isolation valves in RUN Mode when the main steam line pressure drops below 825 psig.

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1-out-of-2 logic, and all sensors are required to be OPERABLE.

High temperature in the vicinity of the HPCI equipment is sensed by four sets of four bimetallic temperature switches. The 16 temperature switches are arranged in two trip systems with eight temperature switches in each trip system.

The HPCI trip settings of 90 psi for high flow and 200°F for high temperature are such that core uncovery is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation are arranged the same as that for the HPCI. The trip setting of 450" water for high flow and 200°F for temperature are based on the same criteria as the HPCI.

High temperature at the Reactor Water Cleanup (RWCU) System in the main steam valve vault, RWCU pump room 3A, RWCU pump room 3B, RWCU heat exchanger room or in the space near the pipe trench containing RWCU piping could indicate a break in the cleanup system. When high temperature occurs, the cleanup system is isolated.

The instrumentation which initiates CSCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion, the specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed. An exception to this is when logic functional testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal so that MCPR does not decrease to 1.07. The trip logic for this function is 1-out-of-n: e.g., any trip on one of six APRMs, eight IRMs, or four SRMs will result in a rod block.

The minimum instrument channel requirements assure sufficient instrumentation to assure the single failure criteria is met. The minimum instrument channel requirements for the RBM may be reduced by one for maintenance, testing, or calibration. This does not significantly increase the risk of an inadvertent control rod withdrawal, as the other channel is available, and the RBM is a backup system to the written sequence for withdrawal of control rods.

The APRM rod block function is flow biased and prevents a significant reduction in MCPR, especially during operation at reduced flow. The APRM provides gross core protection; i.e., limits the gross core power increase from withdrawal of control rods in the normal withdrawal sequence. The trips are set so that MCPR is maintained greater than 1.07.

The RBM rod block function provides local protection of the core; i.e., the prevention of critical power in a local region of the core, for a single rod withdrawal error from a limiting control rod pattern.

If the IRM channels are in the worst condition of allowed bypass, the sealing arrangement is such that for unbypassed IRM channels, a rod block signal is generated before the detected neutrons flux has increased by more than a factor of 10.

A downscale indication is an indication the instrument has failed or the instrument is not sensitive enough. In either case the instrument will not respond to changes in control rod motion and thus, control rod motion is prevented.

The refueling interlocks also operate one logic channel, and are required for safety only when the mode switch is in the refueling position.

For effective emergency core cooling for small pipe breaks, the HPCI system must function since reactor pressure does not decrease rapid enough to allow either core spray or LPCI to operate in time. The automatic pressure relief function is provided as a backup to the HPCI in the event the HPCI does not operate. The arrangement of the tripping contacts is such as to provide this function when necessary and minimize spurious operation. The trip settings given in the specification are adequate to assure the above criteria are met. The specification preserves the effectiveness of the system during periods of maintenance, testing, or calibration, and also minimizes the risk of inadvertent operation; i.e., only one instrument channel out of service.

Two radiation monitors are provided for each unit which initiate Primary Containment Isolation (Group 6 isolation valves) Reactor Building Isolation and operation of the Standby Gas Treatment System. These instrument channels monitor the radiation in the reactor zone ventilation exhaust ducts and in the refueling zone.

in the system, isolation is provided by high temperature in the cleanup system area. Also, since the vessel could potentially be drained through the cleanup system, a low-level isolation is provided.

Groups 4 and 5 - Process lines are designed to remain OPERABLE and mitigate the consequences of an accident which results in the isolation of other process lines. The signals which initiate isolation of Groups 4 and 5 process lines are therefore indicative of a condition which would render them inoperable.

Group 6 - Lines are connected to the primary containment but not directly to the reactor vessel. These valves are isolated on reactor low water level (538"), high drywell pressure, or reactor building ventilation high radiation which would indicate a possible accident and necessitate primary containment isolation.

Group 7 - Process lines are closed only on the respective turbine steam supply valve not fully closed. This assures that the valves are not open when HPCI or RCIC action is required.

Group 8 - Line (traveling in-core probe) is isolated on high drywell pressure or reactor low water level (538"). This is to assure that this line does not provide a leakage path when containment pressure or reactor water level indicates a possible accident condition.

The maximum closure time for the automatic isolation valves of the primary containment and reactor vessel isolation control system have been selected in consideration of the design intent to prevent core uncovering following pipe breaks outside the primary containment and the need to contain released fission products following pipe breaks inside the primary containment.

In satisfying this design intent, an additional margin has been included in specifying maximum closure times. This margin permits identification of degraded valve performance prior to exceeding the design closure times.

In order to assure that the doses that may result from a steam line break do not exceed the 10 CFR 100 guidelines, it is necessary that no fuel rod perforation resulting from the accident occur prior to closure of the main steam line isolation valves. Analyses indicate that fuel rod cladding perforations would be avoided for main steam valve closure times, including instrument delay, as long as 10.5 seconds.

These valves are highly reliable, have low service requirements and most are normally closed. The initiating sensors and associated trip logic are also checked to demonstrate the capability for automatic isolation. The test interval of once per operating cycle for automatic initiation results in a failure probability of 1.1×10^{-7} that a line will not isolate. More frequent testing for valve OPERABILITY in accordance with Specification 1.0.MM results in a greater assurance that the valve will be OPERABLE when needed.

The main steamline isolation valves are functionally tested per Specification 1.0.MM to establish a high degree of reliability.

The primary containment is penetrated by several small diameter instrument lines connected to the reactor coolant system. Each instrument line contains a 0.25-inch restricting orifice inside the primary containment and an excess flow check valve outside the primary containment.

3.7.E/4.7.E Control Room Emergency Ventilation

The control room emergency ventilation system is designed to filter the control room atmosphere for intake air and/or for recirculation during control room isolation conditions. The control room emergency ventilation system is designed to automatically start upon control room isolation and to assist other sources of pressurization in maintaining the control room at a positive pressure.

High efficiency particulate absolute (HEPA) filters are installed prior to the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine to the control room. The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the allowable levels stated in Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50. Operation of the fans significantly different from the design flow will change the removal efficiency of the HEPA filters and charcoal adsorbers.

If the system is found to be inoperable, there is no immediate threat to the control room and reactor operation or refueling operation may continue for a

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 219 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 235 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 193 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

DOCKET NOS. 50-259, 50-260, AND 50-296

1.0 INTRODUCTION

By letter dated October 12, 1993, the Tennesse Valley Authority (the licensee) requested changes to the Technical Specifications (TS) for the Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3. The proposed changes would revise Tables to clarify isolation valve grouping for all three units, change the BFN Unit 3 TS to reflect modifications that replace existing Reactor Water Cleanup (RWCU) Isolation System high compartment temperature detection switches with resistance temperature detector (RTD) loops, and add additional temperature detection instruments. The proposed BFN Unit 3 changes are similar to TS changes approved for BFN Unit 2 on February 6, 1991 and May 5, 1993.

2.0 DISCUSSION AND EVALUATION - BFN UNIT 3 CHANGES

Reactor Water Cleanup System

The RWCU system provides continuous purification of the reactor coolant system (RCS). The system consists of pumps (two pumps 180 gpm each, one running - one standby), heat exchangers, filter-demineralizers, strainers and associated piping located in various compartments within the reactor building. The system is designed to automatically isolate under conditions which could cause any of the following:

a. Excessive loss of coolant from the reactor vessel leading to core uncovery;

b. Unacceptable radiological consequences of a small reactor coolant line break outside containment;

c. Damage to safety-related structures and equipment.

RWCU systems also have non-safety-grade isolation functions for RWCU equipment protection.

ENCLOSURE 4

RWCU Isolation System

A Group 3 isolation causes closure of RWCU suction containment isolation valves FCV-69-1 and FCV-69-2, and return line isolation valve FCV-69-12. The initiation signals for Group 3 isolation are:

1. Reactor Vessel Low Water (same level as scram setpoint)
2. RWCU System High Water Temperature Downstream of Nonregenerative Heat Exchanger
3. RWCU Pipe Break Detection ("J" signal)
4. Standby Liquid Control System Actuation

The temperature detectors for RWCU break detection are located in the RWCU Pump Rooms, RWCU Heat Exchanger Rooms, RWCU Pipe Trench Area and Main Steam Valve Vault. The temperature setpoints are selected so as to be high enough to avoid spurious actuations due to events such as loss of ventilation, and low enough to ensure sufficiently rapid break detection to meet the criteria (a), (b) and (c) above.

RWCU System Design Changes

Due to RWCU pump vibration and seal leakage problems associated with the high temperature of the coolant to be purified, the licensee has modified the BFN Unit 3 RWCU system flow path such that the RCS fluid is cooled in the RWCU nonregenerative heat exchanger before entering the RWCU pump suction. As discussed below, a high-energy line break (HELB) analysis of the new configuration indicated a need for additional temperature detection switches for RWCU isolation in the event of an RWCU line break and associated reactor coolant leakage in certain associated reactor building compartments. Certain floor drain high temperature detection switches which were part of the RWCU isolation instrumentation system were determined to be unnecessary and were deleted. Remaining high temperature detection switch circuits are being replaced by resistance temperature detectors (RTDs) installed in analog instrument loops.

HELB Analysis

HELB analyses are performed to determine the environmental conditions that would result from postulated high energy line breaks outside containment. The licensee's HELB analyses use a RELAP5/MOD2 computer model to calculate the associated mass and energy release profile for a postulated line break. The mass and energy data were used as a boundary condition for a MONSTER model of the reactor building. RELAP5 and MONSTER are digital computer codes for performing thermal hydraulic analyses. The results provide a time-temperature profile of compartment response to the line break. This time-temperature profile is used to determine the minimum analytical setpoint for the RTDs in that compartment. In a safety evaluation dated May 5, 1993, the staff provided its basis for acceptance of the licensee's methodology. Acceptance was based on a confirmatory staff analysis which verified that the licensee's

RELAP/MONSTER methodology provides a conservative analysis of compartment response to an HELB. The staff has reviewed its May 5, 1993 evaluation for BFN Unit 2, and has determined the methodology is also applicable to BFN Unit 3. Therefore, the BFN Unit 3 analysis is acceptable on the basis of the staff's BFN Unit 2 findings.

Dose Analyses

New dose calculations are not required. The affected piping and compartments are located within a secondary containment fission product boundary. The secondary containment vent effluent paths are provided with automatic isolation by an independent secondary containment isolation system whose setpoints are unaffected by this amendment.

Proposed TS Changes

The staff reviewed the proposed TS changes to determine if they provide appropriate Limiting Conditions for Operation (LCOs) and Surveillance Requirements (SRs) as required by 10 CFR 50.36. LCOs and SRs for former instruments including two channels (in each of two trip systems) of Floor Drain High Temperature detectors and two channels (in each of two trip systems) of RWCU Space High Temperature detectors would be deleted. These instruments are no longer necessary due to the modification revising the flow path. New operability and surveillance requirements would be added for new high temperature detection instruments for the following spaces: main steam valve vault, RWCU Pipe Trench, RWCU Pump Room 3A, RWCU Pump Room 3B, RWCU Heat Exchanger Room. The changes to the LCOs and SRs are reflected in revisions to Tables 3.2.A and 4.2.A and in the BASES of the TS. The Action Statements for the new instruments are the same as for the former instruments. The calibration intervals for the former switches was once per cycle, but for the new RTDs will be every four months.

The staff has reviewed its evaluations of February 6, 1991 and May 5, 1993 for similar changes for BFN Unit 2, and has confirmed these evaluations are applicable to BFN Unit 3. The staff finds that the new instrumentation satisfy appropriate design requirements, including environmental qualification and IEEE standards. The staff also finds that the temperature setpoint and system logic provide reasonable assurance that the RWCU will not be vulnerable to spurious isolation, and will be properly isolated in the event of an RWCU pipe break. Therefore, the proposed changes to the BFN Unit 3 TS as described above are acceptable.

3.0 OTHER CHANGES - BFN UNITS 1, 2, AND 3

Also included in the proposed amendments are some editorial and grammatical changes to Tables 3.2.A and 3.2.B, for all three Browns Ferry units. These changes do not affect the actual operability and surveillance requirements, and are acceptable.

4.0 EVALUATION SUMMARY

The plant modifications and associated TS changes for BFN Unit 3 are similar to previous BFN Unit 2 changes described in previous amendments and are acceptable on a similar basis, as discussed above. The proposed changes will not adversely affect the RWCU isolation system's capability to isolate an RWCU HELB to prevent: (a) excessive loss of coolant from the reactor vessel leading to core uncovery, (b) unacceptable radiological consequences of a small reactor coolant line break outside containment, and (c) damage to safety-related structures and equipment. The editorial and grammatical changes for BFN Units 1, 2 and 3 are acceptable on the basis that they do not result in any actual changes to the facilities' operability and surveillance requirements.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 630). Accordingly, the amendments meet 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 amendments.

7.0 CONCLUSION

The Commission has concluded, based upon 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, and (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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