December 27, 1988

Docket Nos. 50-259/260/296

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: BROWNS FERRY NUCLEAR PLANT (BFN) UPGRADE TO FIRE PROTECTION TECHNICAL SPECIFICATION SECTION 3.11 and 4.11 (TACS 00440, 00441, 00442) (TS 247)

The Commission has issued the enclosed Amendments Nos. 162, 159, and 133to Facility Operating Licenses Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units 1, 2 and 3, respectively. These amendments are in response to your application dated August 3, 1988. The amendments clarify the Limiting Conditions for Operation and Surveillance Requirements for the fire protection systems.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

Original signed by

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Enclosures:
1. Amendment No. 162 to License No. DPR-33
2. Amendment No. 159to License No. DPR-52
3. Amendment No. 133to License No. DPR-68
4. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION:

Docket File	BDLiaw	JRutberg
NRC PDR	Wanda Jones	FMcCoy
Local PDR	OGC	DHagan
JPartlow	ACRS (10)	BLittle
OSP Rdg.	EJordan	Projects Rdg
SRichardson	TBarnhart (12)	BFN File
SBlack	GPA/PA	
GGears	LFMB	
DMoran	EButcher	
MSimms	DCrutchfield	

8901030252 881227
PDR ADOCK 05000259
P PDC

*SEE PREVIOUS CONCURRENCE

OFC	:OSP:TVA/LA*	:OSP:TVA/PM*	:OGC*	:TVA:AD/P	:	:	:
NAME	:MSimms	:DMoran	:	:SBlack	:	:	:
DATE	:11/09/88	12/08/88	: 11/30 /88	:12/27/88	:	:	:

OFFICIAL RECORD COPY

cc:
General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
E11 B33
Knoxville, Tennessee 37902

Mr. R. L. Gridley
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. C. Mason
Tennessee Valley Authority
Browns Ferry Nuclear Plant
P.O. Box 2000
Decatur, Alabama 35602

Mr. P. Carier
Tennessee Valley Authority
Browns Ferry Nuclear Plant
P.O. Box 2000
Decatur, Alabama 35602

Mr. D. L. Williams
Tennessee Valley Authority
400 West Summit Hill Drive
W10 B85
Knoxville, Tennessee 37902

Chairman, Limestone County Commission
P.O. Box 188
Athens, Alabama 35611

Claude Earl Fox, M.D.
State Health Officer
State Department of Public Health
State Office Building
Montgomery, Alabama 36130

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Resident Inspector/Browns Ferry NP
U.S. Nuclear Regulatory Commission
Route 12, Box 637
Athens, Alabama 35611

Dr. Henry Myers, Science Advisor
Committee on Interior
and Insular Affairs
U. S. House of Representatives
Washington, D.C. 20515

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 162
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 August 3, 1988, 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. 162, 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 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 27, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 162

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
iii	iii*
iv	iv
vii	vii
viii	viii*
3.11/4.11-1	3.11/4.11-1
3.11/4.11-2	3.11/4.11-2
3.11/4.11-3	3.11/4.11-3
3.11/4/11-4	3.11/4.11-4
3.11/4.11-5	3.11/4.11-5
3.11/4.11-6	3.11/4.11-6
3.11/4.11-7	3.11/4.11-7
3.11/4.11-8	3.11/4.11-8
3.11/4.11-9	3.11/4.11-9
3.11/4.11-10	3.11/4.11-10
3.11/4.11-11	3.11/4.11-11
3.11/4.11-12	3.11/4.11-12
3.11/4.11-13	3.11/4.11-13
3.11/4.11-14	3.11/4.11-14
3.11/4.11-15	3.11/4.11-15
	3.11/4.11-16
	3.11/4.11-17
	3.11/4.11-18
	3.11/4.11-19
	3.11/4.11-20
	3.11/4.11-21
	3.11/4.11-22
	3.11/4.11-23
	3.11/4.11-24

LIST OF ILLUSTRATIONS

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11. FIRE PROTECTION SYSTEMS	4.11 FIRE PROTECTION SYSTEMS
Applicability	Applicability
Applies to the operating status of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building elevation 586.	Applies to the surveillance requirements of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building, elevation 586 when the corresponding limiting conditions for operation are in effect.
Objective	Objective
To ensure availability of the Fire Protection Systems.	To verify the OPERABILITY of the Fire Protection System.
3.11.A FIRE DETECTION INSTRUMENTATION	4.11.A FIRE DETECTION INSTRUMENTATION
1. As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.11.A shall be OPERABLE whenever equipment protected by the fire detection instrument is required to be OPERABLE.	1. Each of the required fire detection instruments shall be demonstrated OPERABLE at least semiannually by performance of a CHANNEL FUNCTIONAL TEST.
a. The fire detection system's heat and smoke detectors for all protected zones shall be OPERABLE.	2. The supervised circuits associated with alarms of each of the above required fire detection instruments shall be demonstrated OPERABLE at least semiannually.
	3. The nonsupervised circuits associated with alarms of each of the above required instruments shall be demonstrated OPERABLE at least monthly.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.A FIRE DETECTION INSTRUMENTATION (Cont'd) b. If Specification 3.11.A.1.a cannot be met, a patrolling fire watch will be established to ensure that each protected zone or area with inoperable detectors is checked at intervals no greater than once each hour.	4.11.A FIRE DETECTION INSTRUMENTATION (Cont'd)
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be OPERABLE at all times with: a. Two high-pressure fire pumps, one electric and one diesel, each with a capacity of 2500 gpm, with their discharge aligned to the fire suppression header. b. An OPERABLE flow path capable of taking suction from Wheeler Reservoir and transferring the water through distribution piping with OPERABLE sectionalizing control or isolation valves to the yard hydrant curb valves, the last valve ahead of the water flow alarm device on each sprinkler or hose standpipe and the last valve ahead of the system valve on each spray system required to be OPERABLE per Specification 3.11.C, 3.11.E, and 3.11.F.	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be demonstrated OPERABLE: a. At least monthly by starting each electric-motor-driven high-pressure fire pump and operating it for at least 15 minutes on recirculation flow. b. At least monthly by verifying that each manual, power operated or automatic valve in the flow path which is not electrically supervised is in its correct position. c. At least semiannually by performance of a system flush. d. Biocide will be added upon completion of Surveillance 4.11.B.1.c.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.	e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following hours.	f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and: (1) Verifying that each automatic valve in the flow path actuates to its correct position, (2) Verifying that each electric high-pressure fire pump develops at least 2500 gpm at a system head of 300 feet. (3) Verifying the diesel-driven high-pressure fire pump develops at least 2500 gpm at a system head of 340 feet.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd) (4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig. g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association. 2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE: a. At least monthly by: (1) Verifying the fuel tank contains at least 150 gallons of fuel. (2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	b. At least quarterly by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-75, is within the acceptable limits specified in table 1 of ASTM-D975-77 when checked for viscosity, water, and sediment.
	c. At least once per 18 months, by subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service.
	3. The diesel-driven high-pressure fire pump starting 24-volt battery bank and charger shall be demonstrated OPERABLE:
	a. At least weekly by verifying that:
	(1) The electrolyte level of each pilot cell is above the plates,
	(2) The pilot cell specific gravity, corrected to 77° F and full electrolyte level, is greater than or equal to 1.200,

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	(3) The pilot cell voltage is greater than or equal to 24 volts, and (4) The overall battery voltage is greater than or equal to 24 volts. b. At least quarterly by verifying that the specific gravity is appropriate for continued service of the battery. c. At least once per 18 months by verifying that: (1) The batteries, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration, and (2) Battery terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.
4. The raw service water storage tank level shall be maintained above level 723'7" by the raw service water pumps.	4. Simulated automatic and manual actuation of raw service water pumps and operation of tank level switches will be conducted annually.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd) 5. If Specification 3.11.B.4 cannot be met, a fire pump shall be started and run continuously until the raw service water pumps can maintain a raw service water storage tank level above 723'7".	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd) 5. The High-Pressure Fire Protection System pressure shall be logged daily.
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS 1. The spray and sprinkler systems in Table 3.11.B shall be OPERABLE whenever equipment protected by the spray and/or sprinkler systems is required to be OPERABLE. 2. With one or more of the above required spray and/or sprinkler systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas specifically identified in Table 3.11.B; for other areas listed in Table 3.11.B, establish an hourly fire watch patrol.	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS 1. Each of the required spray and sprinkler systems in Table 3.11.B shall be demonstrated OPERABLE: a. At least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position. b. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel. c. At least once per 18 months: (1) By performing a system functional test which includes simulated automatic actuation of the system, verifying that the automatic valves in the flow path actuate to their correct positions on a fire alarm test signal.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd)	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd) (2) By a visual inspection of the dry pipe spray and sprinkler headers to verify their integrity. (3) By a visual inspection of each sprinkler or water spray nozzle's spray area to verify that the spray pattern is not obstructed. d. At least once per 3 years, by performing an air flow test through each open head spray header and verifying that each open head spray and sprinkler nozzle is unobstructed.
3.11.D CO_2 SYSTEMS 1. The low pressure CO_2 systems protecting the following areas shall be OPERABLE whenever equipment protected by the CO_2 systems is required to be OPERABLE.	4.11.D CO_2 SYSTEMS 1. Each of the required CO_2 systems shall be demonstrated OPERABLE at least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.D CO_2 SYSTEMS (Cont'd)	4.11.D CO_2 SYSTEMS (Cont'd)
a. Unit 1 and 2 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms b. Unit 3 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms c. Computer Rooms 1, 2, and 3 Elevation 593, Control Building d. Auxiliary Instrument Rooms 1, 2, and 3 e. Spreading Room A, Elevation 606, Control Building f. Spreading Room B, Elevation 606, Control Building	a. At least weekly by verifying the CO_2 storage tank level to be greater than 8.5 tons for unit 1 and 2 and 3 tons for unit 3 and pressure to be greater than 275 psig, and b. At least once per 18 months by verifying: (1) The system, including associated ventilation system fire dampers and fire door release mechanisms, actuates manually and automatically upon receipt of a simulated actuation signal, and (2) Flow from each nozzle during a "Puff Test."
2. With one or more of the the above CO_2 systems inoperable, within 1 hour establish an hourly fire watch patrol.	
3.11.E FIRE HOSE STATIONS	4.11.E FIRE HOSE STATIONS
1. The fire hose stations shown in Table 3.11.C shall be OPERABLE whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE.	1. Each of the fire hose stations shown in Table 3.11.C shall be demonstrated OPERABLE: a. At least monthly by a visual inspection to assure all required equipment is at the station.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.E FIRE HOSE STATIONS (Cont'd)	4.11.E FIRE HOSE STATIONS (Cont'd)
a. With one or more of the fire hose stations shown in Table 3.11.C inoperable, provide gated wye(s) on the nearest OPERABLE hose station(s). One outlet of the wye shall be connected to the standard length of hose provided for the hose station. The second outlet of the wye shall be connected to a length of hose sufficient to provide coverage for the area left unprotected by the inoperable hose station. Where it can be demonstrated that the physical routing of the fire hose would result in a recognizable hazard to operating technicians, plant equipment, or the hose itself, the fire hose shall be stored in a roll at the outlet of the OPERABLE hose station. Signs shall be mounted above the gated wye(s) to identify the proper hose to use. The above action shall be accomplished within 1 hour if the inoperable fire hose is the primary means of fire suppression; otherwise, route the additional hose within 24 hours.	b. At least once per 18 months by: (1) Removing the hose for inspection and re-racking, and (2) Inspection of all gaskets and replacing any degraded gaskets in the couplings. c. At least once per 3 years by: (1) Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage. (2) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.F YARD FIRE HYDRANTS AND HOSE HOUSES	4.11.F YARD FIRE HYDRANTS AND HOSE HOUSES
1. The yard fire hydrants and associated hose houses shown in Table 3.11.D shall be OPERABLE whenever equipment in the areas protected by the yard fire hydrants is required to be OPERABLE.	1. Each of the yard fire hydrants and hose houses shown in Table 3.11.D shall be demonstrated OPERABLE:
a. With one or more of the yard fire hydrants or associated hose houses shown in Table 3.11.D inoperable, within 1 hour have sufficient additional lengths of 2 1/2 inch diameter hose located in an adjacent OPERABLE hose house to provide service to the unprotected area(s) if the inoperable fire hydrant or associated hose house is the primary means of fire suppression; otherwise, provide the additional hose within 24 hours.	a. At least monthly by visual inspection of the hose house to assure all required equipment is at the hose house. b. At least semiannually, during March, April, or May and during September, October, or November, by visually inspecting each yard fire hydrant and verifying that the hydrant barrel is dry and that the hydrant is not damaged. c. At least yearly by: (1) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater. (2) Replacement of all degraded gaskets in couplings. (3) Performing a flow check of each hydrant.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.G FIRE-RATED ASSEMBLIES	4.11.G FIRE-RATED ASSEMBLIES
1. All fire barrier assemblies, including walls, floor/ceilings, conduit wraps, and other fire barriers; separating fire areas or separating systems important to safe shutdown within a fire area; and all sealing devices in fire rated assembly penetrations, including fire doors, fire dampers, and fire-rated cable and piping penetration seals, shall be OPERABLE at all times.	1. Each of the required fire-rated assemblies and penetration sealing devices shall be verified OPERABLE at least once per 18 months by performing a visual inspection of:
a. With one or more of the required fire-rated assemblies and/or sealing devices inoperable, within one hour establish a continuous fire watch on at least one side of the affected assembly(s) and/or sealing device(s) or verify the OPERABILITY of fire detectors on at least one side of the inoperable assembly(s) or sealing device(s) and establish an hourly fire watch patrol.	a. The exposed surfaces of each fire-rated assembly, b. Each fire damper and associated hardware, and c. At least 10 percent of each type of sealed penetration. If changes in appearance or abnormal degradations are found, a visual inspection of an additional 10 percent of each type of sealed penetration shall be made. This inspection process shall be continued until a 10 percent sample with no apparent changes in appearance or abnormal degradation is found. Samples shall be selected, such that each penetration seal will be inspected at least once per 15 years.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.G FIRE-RATED ASSEMBLIES (Cont'd)	4.11.G FIRE-RATED ASSEMBLIES (Cont'd)
	2. Each of the required fire doors shall be verified OPERABLE by inspecting the automatic hold-open, release, and closing mechanisms and latches at least semiannually and by verifying:
	a. The OPERABILITY of the fire door supervision system for each electrically supervised fire door by performing a CHANNEL FUNCTIONAL TEST at least monthly.
	b. That each locked-closed fire door is verified closed at least weekly.
	c. That doors with automatic hold-open and release mechanisms are free of obstructions at least daily and perform a FUNCTIONAL TEST of these mechanisms at least once per 18 months.
	d. That each unlocked normally closed fire door without electrical supervision is verified closed at least daily.
3.11.H Open Flames, Welding, and Burning in the Cable Spreading Room	
There shall be no use of open flame, welding, or burning in the cable spreading room unless the reactor is in the COLD SHUTDOWN CONDITION.	

TABLE 3.11.A

FIRE DETECTION INSTRUMENTATION

Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
1. Reactor - 519	None	HPCI	Heat	Actuate Fixed Spray
2. Reactor - 519	None	RCIC	Heat	Annunciation
3. Reactor - 565	1-25-286	General Area	Smoke	Actuate Preaction System
4. Reactor - 565	1-25-313	Cable Tray Zones G, H, K, L	Heat and Smoke	Actuate Fixed Spray
5. Reactor - 565	1-25-282	Cable Tray Zone G	Heat	Actuate Fixed Spray
6. Reactor - 565	1-25-291	Cable Tray Zone H	Heat	Actuate Fixed Spray
7. Reactor - 565	1-25-319	Cable Tray Zone K	Heat	Actuate Fixed Spray
8. Reactor - 565	1-25-288	Cable Tray Zone L	Heat	Actuate Fixed Spray
9. Reactor - 593	1-25-287	General Area	Smoke	Actuate Preaction System
10. Reactor - 593	1-25-311	Cable Tray Zones A, B, C, D, E, F, N, P, Q	Heat and Smoke	Actuate Fixed Spray
11. Reactor - 593	1-25-281A	Cable Tray Zones A, B, C, D	Heat	Actuate Fixed Spray
12. Reactor - 593	1-25-281B	Cable Tray Zones E, F	Heat	Actuate Fixed Spray
13. Reactor - 593	1-25-315	Cable Tray Zones N, P	Heat	Actuate Fixed Spray
14. Reactor - 593	1-25-290	Cable Tray Zone Q	Heat	Actuate Fixed Spray
15. Reactor - 621	1-25-303	General Area	Smoke	Actuate Preaction System
16. Reactor - 639	1-25-333	Recirculation MG Sets	Heat	Actuate AFFF System
17. Diesel Generator Units 1 and 2 - 565	None	Diesel Generator Rooms and Fuel Oil Transfer Room	Heat	Actuate CO_2 System
18. Diesel Generator Units 1 and 2 - 565	1-25-331	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
19.	Diesel Generator Units 1 and 2 - 583	1-25-331	Diesel Auxiliary Board Rooms A & B	Smoke	Door Release
20.	Diesel Generator Units 1 and 2 - 583	None	Aux BD A Compt 7 Aux BD B Compt 10	Smoke	Annunciation
21.	Diesel Generator Units 1 and 2 - 583	None	Diesel Auxiliary Board Rooms A & B	Heat	Actuate CO_2 System
22.	Diesel Generator Unit 3 - 565	None	Diesel Generator Rooms and Fuel Oil Pump Room	Heat	Actuate CO_2 System
23.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System
24.	Diesel Generator Building Unit 3 - 565	3-25-295	Shutdown Board Rooms 3EB & 3ED and Bus Tie Room	Smoke	Annunciation
25.	Diesel Generator Building Unit 3 - 565	3-25-289	Pipe and Electrical Tunnel	Heat	Actuate Fixed Spray
26.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Heat and Smoke	Actuate Fixed Spray
27.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Heat	Actuate CO_2 System
28.	Diesel Generator Building Unit 3 - 583	3-25-305	Shutdown Board Rooms 3EA, 3EB, 3EC, & 3ED; Bus Tie Room; and Diesel Auxiliary Board Rooms	Smoke	Door Release
29.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Smoke	Annunciation
30.	Diesel Generator Building Unit 3 - 583	None	Mechanical Equipment Rooms	Duct	Actuate Damper
31.	Control Bay - 593	1-25-325	Instrument Shop, MG Set Rooms, Battery Room 1, and Battery Board Room 1	Smoke	Annunciation

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
32.	Control Bay - 593	None	Auxiliary Instrument Room 1	Smoke	Annunciation
33.	Control Bay - 593	None	Unit 1 and 2 Computer Room	Smoke	Annunciation
34.	Control Bay - 593	None	Communications Battery/Board Room, Communications Room, MG Sets, Battery Board Room 2, and Battery Room 2	Smoke	Annunciation
35.	Control Bay - 593	None	Auxiliary Instrument Room 2	Smoke	Annunciation
36.	Control Bay - 593	None	Shutdown Board Room B	Duct	Actuate Damper
37.	Control Bay - 593	None	Shutdown Board Room D	Duct	Annunciation
38.	Control Bay - 593	None	Auxiliary Instrument Room 3	Smoke	Annunciation
39.	Control Bay - 593	None	Unit 3 Computer Room	Smoke	Annunciation
40.	Control Bay - 593	3-25-327	MG Set Rooms, Battery Room 3, and Battery Board Room 3	Smoke	Annunciation
41.	Control Bay - 606	1-25-323	Spreading Room A	Heat and Smoke	Actuate Preaction System
42.	Control Bay - 606	3-25-324	Spreading Room B	Heat and Smoke	Actuate Preaction System
43.	Control Bay - 606, 617	1-25-328	Mechanical Equipment Room, Locker Room, Toilet, Instrument Calibration Room, Shift Engineer Office, and Kitchen,	Heat and Smoke	Actuate Preaction System
44.	Control Bay - 617	None	Unit 1 Control Room	Smoke	Annunciation
45.	Control Bay - 617	None	Shutdown Board Room A	Duct	Actuate Damper

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
46.	Control Bay - 617	None	Shutdown Board Room C	Duct	Annunciation
47.	Control Bay - 617	None	Unit 2 Control Room	Smoke	Annunciation
48.	Control Bay - 617	None	Relay Room	Smoke	Annunciation
49.	Control Bay - 617	None	Unit 3 Control Room	Smoke	Annunciation
50.	Control Bay - 617	3-25-329	NRC Room, TSO Operating Room, Locker Room, Toilet and Mechanical Room	Heat or Smoke	Actuate Preaction System
51.	Control Bay - 621	None	Shutdown Board Room E	Duct	Actuate Damper
52.	Control Bay - 621	None	Shutdown Board Room F	Duct	Actuate Damper
53.	Turbine - 565	0-25-297	Cable Tunnel to Intake Pumping Station	Smoke	Annunciation
54.	Turbine - 586	1-25-283	Cable Tray Zones A, B, & C	Heat	Actuate Fixed Spray
55.	Turbine - 586	1-25-334	Cable Tray Zones A, B, & C	Heat and Smoke	Actuate Fixed Spray
56.	Turbine - 586	3-25-293	South Wall	Smoke	Annunciation
57.	Intake Pumping Station	0-25-296	Intake Pumping Station	Smoke	Actuate Preaction System

TABLE 3.11.B

SPRAY/SPRINKLER SYSTEMS

Building Elevation	System Control Valve	Area Protected	System
1. Reactor - 519	1-26-37	HPCI	Water Spray
2. Reactor - 565	1-26-78K	Cable Tray Zone K	Water Spray
3. Reactor - 565	1-26-78L	Cable Tray Zone L	Water Spray
4. Reactor - 565	1-26-76G	Cable Tray Zone G	Water Spray
5. Reactor - 565	1-26-76H	Cable Tray Zone H	Water Spray
6. Reactor - 593	1-26-74A	Cable Tray Zone A	Water Spray
7. Reactor - 593	1-26-74B	Cable Tray Zone B	Water Spray
8. Reactor - 593	1-26-74C	Cable Tray Zone C	Water Spray
9. Reactor - 593	1-26-74D	Cable Tray Zone D	Water Spray
10. Reactor - 593	1-26-75E	Cable Tray Zone E	Water Spray
11. Reactor - 593	1-26-75F	Cable Tray Zone F	Water Spray
12. Reactor - 593	1-26-79N	Cable Tray Zone N	Water Spray
13. Reactor - 593	1-26-79P	Cable Tray Zone P	Water Spray
14. Reactor - 593	1-26-79Q	Cable Tray Zone Q	Water Spray
*15. Reactor - 639	1-26-88	Recirculation MG Sets	Aqueous Film Forming Foam
*16. Reactor - 565, 593, & 621	1-26-77	General	Preaction
17. Diesel Generator Building - Units 1 & 2 - 565	1-26-80	Pipe and Electrical Tunnel	Preaction
18. Diesel Generator Building - Unit 3 - 565	3-26-81	Pipe and Electrical Tunnel	Preaction
19. Diesel Generator Building - Unit 3 - 565	3-26-82	Pipe and Electrical Tunnel	Water Spray
20. Turbine - 586	1-26-73A	Cable Tray Zone A	Water Spray
21. Turbine - 586	1-26-73B	Cable Tray Zone B	Water Spray

TABLE 3.11.B (Cont'd)

SPRAY/SPRINKLER SYSTEMS

Building Elevation	System Control Valve	Area Protected	System
22. Turbine - 586	1-26-73C	Cable Tray Zone C	Water Spray
23. Control Bay - 593	1-26-104	Battery Room 1, Battery Board Room 1	Manual Sprinkler
24. Control Bay - 593	2-26-104	Battery Room 2, Battery Board Room 2	Manual Sprinkler
25. Control Bay - 593	3-26-104	Battery Room 3, Battery Board Room 3	Manual Sprinkler
26. Control Bay - 606	1-26-98	Spreading Room A	Preaction
27. Control Bay - 606	3-26-99	Spreading Room B	Preaction
28. Control Bay - 617	1-26-87	Mechanical Equipment Room, Toilet, Locker Room, Instrument Calibration Room, Shift Engineer's Office and Kitchen.	Preaction
29. Control Bay - 617	3-26-87	NRC Room, TSO Operations Room, Locker Room, Toilet, and Mechanical Room	Preaction
*30. Intake Pumping Station - 550	0-26-72E	North Bay Wall	Preaction

* When one or more of the required sprinkler systems are inoperable, within one hour establish a continuous fire watch for the following preaction systems protecting areas containing redundant safe shutdown equipment: 1-26-77, 1-26-88 and 0-26-72E. The continuous fire watch will not be stationed in one location but will move thoughout the area normally protected by the suppression system once each hour. The continuous fire watch shall not leave the area without a proper relief. Only one fire watch is required for each sprinkler system in the reactor building and only one fire watch is required for the intake pumping station.

TABLE 3.11.C

HOSE STATIONS

	Building - Elevation	Location
1.	Reactor - 639 (Foam)	Stairwell at R7, t-line
2.	Reactor - 664	R3, u-line
3.	Reactor - 664	R4, p-line
4.	Reactor - 639	R2, u-line
5.	Reactor - 639	R4, p-line
6.	Reactor - 635	R4, p-line
7.	Reactor - 621	R3, u-line
8.	Reactor - 621	R4, p-line
9.	Reactor - 593	R4, p-line
10.	Reactor - 593	R3, u-line
11.	Reactor - 565	R3, u-line
12.	Reactor - 565	R7, p-line
13.	Reactor - 565	R1, p-line
14.	Reactor - 541	R7, p-line
15.	Reactor - 541	R2, u-line
16.	Reactor - 541	R1, p-line
17.	Reactor - 519	R7, u-line
18.	Reactor - 717	R7, p-line
19.	Diesel Generator Units 1 & 2 - 583	Diesel Auxiliary Board Room A
20.	Diesel Generator Units 1 & 2 - 583	Misc. Equipment Room
21.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
22.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D
23.	Diesel Generator Unit 3 - 583	Diesel Auxiliary Board Room 3EA
24.	Diesel Generator Unit 3 - 583	Misc. Equipment Room
25.	Diesel Generator Unit 3 - 583	Stairwell Outside Shutdown Board Room 3EC

TABLE 3.11.C (Cont'd)

HOSE STATIONS

	Building - Elevation	Location
26.	Diesel Generator Unit 3 - 565	Stairwell Outside Shutdown Board Room 3ED
27.	Diesel Generator Unit 3 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D
28.	Diesel Generator Unit 3- 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
29.	Turbine - 586	T2, m-line
30.	Turbine - 586	T11, m-line
31.	Turbine - 586	T16, m-line
32.	Control Bay - 617	R1, n-line
33.	Control Bay - 617	R4, n-line
34.	Control Bay - 606	R3, p-line
35.	Control Bay - 593	R4, n-line
36.	Control Bay - 593	R11, n-line
37.	Control Bay - 617	R10, n-line
38.	Control Bay - 617	R13, n-line
39.	Control Bay - 617	R18, n-line
40.	Control Bay - 593	R18, n-line
41.	Intake Pumping Station - 550	Center of IPS Building
42.	Intake Pumping Station - 550	East End of IPS Building
43.	Intake Pumping Station - 550	West End of IPS Building

TABLE 3.11.D

YARD FIRE HYDRANTS AND FIRE HOSE HOUSES

	Fire Hydrant Valve Number	Location	Fire Hose House Number
1.	0-26-531	East of Condensate Storage Tank No. 3	3
2.	0-26-530	East of Diesel Generator Building Unit 3	3
3.	0-26-526	South of Reactor Building Unit 3	2 or 3
4.	0-26-525	South of Reactor Building Unit 2	2
5.	0-26-524	South of Reactor Building Unit 1	2
6.	0-26-523	Southwest of Diesel Generator Building Units 1 and 2	1

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO_2 systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2500 gpm water supply capacity.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific operability verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 159
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 August 3, 1988, 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.159 , 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 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 27, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 159

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
iii	iii*
iv	iv
vii	vii
viii	viii*
3.11/4.11-1	3.11/4.11-1
3.11/4.11-2	3.11/4.11-2
3.11/4.11-3	3.11/4.11-3
3.11/4/11-4	3.11/4.11-4
3.11/4.11-5	3.11/4.11-5
3.11/4.11-6	3.11/4.11-6
3.11/4.11-7	3.11/4.11-7
3.11/4.11-8	3.11/4.11-8
3.11/4.11-9	3.11/4.11-9
3.11/4.11-10	3.11/4.11-10
3.11/4.11-11	3.11/4.11-11
3.11/4.11-12	3.11/4.11-12
3.11/4.11-13	3.11/4.11-13
3.11/4.11-14	3.11/4.11-14
3.11/4.11-15	3.11/4.11-15
	3.11/4.11-16
	3.11/4.11-17
	3.11/4.11-18
	3.11/4.11-19
	3.11/4.11-20
	3.11/4.11-21
	3.11/4.11-22

LIST OF TABLES (Cont'd)

LIST OF ILLUSTRATIONS

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11. FIRE PROTECTION SYSTEMS	4.11 FIRE PROTECTION SYSTEMS
Applicability	Applicability
Applies to the operating status of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building elevation 586.	Applies to the surveillance requirements of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building, elevation 586 when the corresponding limiting conditions for operation are in effect.
Objective	Objective
To ensure availability of the Fire Protection Systems.	To verify the OPERABILITY of the Fire Protection System.
3.11.A FIRE DETECTION INSTRUMENTATION	4.11.A FIRE DETECTION INSTRUMENTATION
1. As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.11.A shall be OPERABLE whenever equipment protected by the fire detection instrument is required to be OPERABLE.	1. Each of the required fire detection instruments shall be demonstrated OPERABLE at least semiannually by performance of a CHANNEL FUNCTIONAL TEST.
a. The fire detection system's heat and smoke detectors for all protected zones shall be OPERABLE.	2. The supervised circuits associated with alarms of each of the above required fire detection instruments shall be demonstrated OPERABLE at least semiannually.
	3. The nonsupervised circuits associated with alarms of each of the above required instruments shall be demonstrated OPERABLE at least monthly.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.A FIRE DETECTION INSTRUMENTATION (Cont'd) b. If Specification 3.11.A.1.a cannot be met, a patrolling fire watch will be established to ensure that each protected zone or area with inoperable detectors is checked at intervals no greater than once each hour.	4.11.A FIRE DETECTION INSTRUMENTATION (Cont'd)
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be OPERABLE at all times with: a. Two high-pressure fire pumps, one electric and one diesel, each with a capacity of 2500 gpm, with their discharge aligned to the fire suppression header. b. An OPERABLE flow path capable of taking suction from Wheeler Reservoir and transferring the water through distribution piping with OPERABLE sectionalizing control or isolation valves to the yard hydrant curb valves, the last valve ahead of the water flow alarm device on each sprinkler or hose standpipe and the last valve ahead of the system valve on each spray system required to be OPERABLE per Specification 3.11.C, 3.11.E, and 3.11.F.	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be demonstrated OPERABLE: a. At least monthly by starting each electric-motor-driven high-pressure fire pump and operating it for at least 15 minutes on recirculation flow. b. At least monthly by verifying that each manual, power operated or automatic valve in the flow path which is not electrically supervised is in its correct position. c. At least semiannually by performance of a system flush. d. Biocide will be added upon completion of Surveillance 4.11.B.1.c.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.	e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following 24 hours.	f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and: (1) Verifying that each automatic valve in the flow path actuates to its correct position, (2) Verifying that each electric high-pressure fire pump develops at least 2500 gpm at a system head of 300 feet. (3) Verifying the diesel-driven high-pressure fire pump develops at least 2500 gpm at a system head of 340 feet.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	(4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig.
	g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association.
	2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE:
	a. At least monthly by:
	(1) Verifying the fuel tank contains at least 150 gallons of fuel.
	(2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

b. At least quarterly by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-75, is within the acceptable limits specified in table 1 of ASTM-D975-77 when checked for viscosity, water, and sediment.

c. At least once per 18 months, by subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service.

3. The diesel-driven high-pressure fire pump starting 24-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least weekly by verifying that:

(1) The electrolyte level of each pilot cell is above the plates,

(2) The pilot cell specific gravity, corrected to 77° F and full electrolyte level, is greater than or equal to 1.200,

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	(3) The pilot cell voltage is greater than or equal to 24 volts, and (4) The overall battery voltage is greater than or equal to 24 volts. b. At least quarterly by verifying that the specific gravity is appropriate for continued service of the battery. c. At least once per 18 months by verifying that: (1) The batteries, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration, and (2) Battery terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.
4. The raw service water storage tank level shall be maintained above level 723'7" by the raw service water pumps.	4. Simulated automatic and manual actuation of raw service water pumps and operation of tank level switches will be conducted annually.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
5. If Specification 3.11.B.4 cannot be met, a fire pump shall be started and run continuously until the raw service water pumps can maintain a raw service water storage tank level above 723'7".	5. The High-Pressure Fire Protection System pressure shall be logged daily.
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS
1. The spray and sprinkler systems in Table 3.11.B shall be OPERABLE whenever equipment protected by the spray and/or sprinkler systems is required to be OPERABLE.	1. Each of the required spray and sprinkler systems in Table 3.11.B shall be demonstrated OPERABLE:
2. With one or more of the above required spray and/or sprinkler systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas specifically identified in Table 3.11.B; for other areas listed in Table 3.11.B, establish an hourly fire watch patrol.	a. At least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position. b. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel. c. At least once per 18 months: (1) By performing a system functional test which includes simulated automatic actuation of the system, verifying that the automatic valves in the flow path actuate to their correct positions on a fire alarm test signal.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd)	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd)
	(2) By a visual inspection of the dry pipe spray and sprinkler headers to verify their integrity.
	(3) By a visual inspection of each sprinkler or water spray nozzle's spray area to verify that the spray pattern is not obstructed.
	d. At least once per 3 years, by performing an air flow test through each open head spray header and verifying that each open head spray and sprinkler nozzle is unobstructed.
3.11.D CO_2 SYSTEMS	4.11.D CO_2 SYSTEMS
1. The low pressure CO_2 systems protecting the following areas shall be OPERABLE whenever equipment protected by the CO_2 systems is required to be OPERABLE.	1. Each of the required CO_2 systems shall be demonstrated OPERABLE at least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.D CO_2 SYSTEMS (Cont'd)	4.11.D CO_2 SYSTEMS (Cont'd)
a. Unit 1 and 2 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms b. Unit 3 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms c. Computer Rooms 1, 2, and 3 Elevation 593, Control Building d. Auxiliary Instrument Rooms 1, 2, and 3 e. Spreading Room A, Elevation 606, Control Building f. Spreading Room B, Elevation 606, Control Building	a. At least weekly by verifying the CO_2 storage tank level to be greater than 8.5 tons for unit 1 and 2 and 3 tons for unit 3 and pressure to be greater than 275 psig, and b. At least once per 18 months by verifying: (1) The system, including associated ventilation system fire dampers and fire door release mechanisms, actuates manually and automatically upon receipt of a simulated actuation signal, and (2) Flow from each nozzle during a "Puff Test."
2. With one or more of the the above CO_2 systems inoperable, within 1 hour establish an hourly fire watch patrol.	
3.11.E FIRE HOSE STATIONS	4.11.E FIRE HOSE STATIONS
1. The fire hose stations shown in Table 3.11.C shall be OPERABLE whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE.	1. Each of the fire hose stations shown in Table 3.11.C shall be demonstrated OPERABLE: a. At least monthly by a visual inspection to assure all required equipment is at the station.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.E FIRE HOSE STATIONS (Cont'd)	4.11.E FIRE HOSE STATIONS (Cont'd)
a. With one or more of the fire hose stations shown in Table 3.11.C inoperable, provide gated wye(s) on the nearest OPERABLE hose station(s). One outlet of the wye shall be connected to the standard length of hose provided for the hose station. The second outlet of the wye shall be connected to a length of hose sufficient to provide coverage for the area left unprotected by the inoperable hose station. Where it can be demonstrated that the physical routing of the fire hose would result in a recognizable hazard to operating technicians, plant equipment, or the hose itself, the fire hose shall be stored in a roll at the outlet of the OPERABLE hose station. Signs shall be mounted above the gated wye(s) to identify the proper hose to use. The above action shall be accomplished within 1 hour if the inoperable fire hose is the primary means of fire suppression; otherwise, route the additional hose within 24 hours.	b. At least once per 18 months by: (1) Removing the hose for inspection and re-racking, and (2) Inspection of all gaskets and replacing any degraded gaskets in the couplings. c. At least once per 3 years by: (1) Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage. (2) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.F YARD FIRE HYDRANTS AND HOSE HOUSES	4.11.F YARD FIRE HYDRANTS AND HOSE HOUSES
1. The yard fire hydrants and associated hose houses shown in Table 3.11.D shall be OPERABLE whenever equipment in the areas protected by the yard fire hydrants is required to be OPERABLE.	1. Each of the yard fire hydrants and hose houses shown in Table 3.11.D shall be demonstrated OPERABLE:
a. With one or more of the yard fire hydrants or associated hose houses shown in Table 3.11.D inoperable, within 1 hour have sufficient additional lengths of 2 1/2 inch diameter hose located in an adjacent OPERABLE hose house to provide service to the unprotected area(s) if the inoperable fire hydrant or associated hose house is the primary means of fire suppression; otherwise, provide the additional hose within 24 hours.	a. At least monthly by visual inspection of the hose house to assure all required equipment is at the hose house. b. At least semiannually, during March, April, or May and during September, October, or November, by visually inspecting each yard fire hydrant and verifying that the hydrant barrel is dry and that the hydrant is not damaged. c. At least yearly by: (1) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater. (2) Replacement of all degraded gaskets in couplings. (3) Performing a flow check of each hydrant.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.G FIRE-RATED ASSEMBLIES	4.11.G FIRE-RATED ASSEMBLIES
1. All fire barrier assemblies, including walls, floor/ ceilings, conduit wraps, and other fire barriers; separating fire areas or separating systems important to safe shutdown within a fire area; and all sealing devices in fire rated assembly penetrations, including fire doors, fire dampers, and fire-rated cable and piping penetration seals, shall be OPERABLE at all times.	1. Each of the required fire-rated assemblies and penetration sealing devices shall be verified OPERABLE at least once per 18 months by performing a visual inspection of:
a. With one or more of the required fire-rated assemblies and/or sealing devices inoperable, within one hour establish a continuous fire watch on at least one side of the affected assembly(s) and/or sealing device(s) or verify the OPERABILITY of fire detectors on at least one side of the inoperable assembly(s) or sealing device(s) and establish an hourly fire watch patrol.	a. The exposed surfaces of each fire-rated assembly, b. Each fire damper and associated hardware, and c. At least 10 percent of each type of sealed penetration. If changes in appearance or abnormal degradations are found, a visual inspection of an additional 10 percent of each type of sealed penetration shall be made. This inspection process shall be continued until a 10 percent sample with no apparent changes in appearance or abnormal degradation is found. Samples shall be selected, such that each penetration seal will be inspected at least once per 15 years.

LIMITING CONDITIONS FOR OPERATION

3.11.G FIRE-RATED ASSEMBLIES (Cont'd)

SURVEILLANCE REQUIREMENTS

4.11.G FIRE-RATED ASSEMBLIES (Cont'd)

2. Each of the required fire doors shall be verified OPERABLE by inspecting the automatic hold-open, release, and closing mechanisms and latches at least semiannually and by verifying:

   a. The OPERABILITY of the fire door supervision system for each electrically supervised fire door by performing a CHANNEL FUNCTIONAL TEST at least monthly.

   b. That each locked-closed fire door is verified closed at least weekly.

   c. That doors with automatic hold-open and release mechanisms are free of obstructions at least daily and perform a FUNCTIONAL TEST of these mechanisms at least once per 18 months.

   d. That each unlocked normally closed fire door without electrical supervision is verified closed at least daily.

3.11.H Open Flames, Welding, and Burning in the Cable Spreading Room

There shall be no use of open flame, welding, or burning in the cable spreading room unless the reactor is in the COLD SHUTDOWN CONDITION.

TABLE 3.11.A

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
1.	Reactor - 519	None	HPCI	Heat	Actuate Fixed Spray
2.	Reactor - 519	None	RCIC	Heat	Annunciation
3.	Reactor - 519/541	2-25-313	RHR	Smoke	Actuate Preaction System
4.	Reactor - 565	2-25-291	General Area	Smoke	Actuate Preaction System
5.	Reactor - 593	2-25-287	General Area	Smoke	Actuate Preaction System
6.	Reactor - 621	2-25-303	General Area	Smoke	Actuate Preaction System
7.	Reactor - 639	2-25-333	Recirculation MG Sets	Heat	Actuate AFFF System
8.	Diesel Generator Units 1 and 2 - 565	None	Diesel Generator Rooms and Fuel Oil Transfer Room	Heat	Actuate CO_2 System
9.	Diesel Generator Units 1 and 2 - 565	1-25-331	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System
10.	Diesel Generator Units 1 and 2 - 583	1-25-331	Diesel Auxiliary Board Rooms A & B	Smoke	Door Release
11.	Diesel Generator Units 1 and 2 - 583	None	Aux BD A Compt 7 Aux BD B Compt 10	Smoke	Annunciation
12.	Diesel Generator Units 1 and 2 - 583	None	Diesel Auxiliary Board Rooms A & B	Heat	Actuate CO_2 System
13.	Diesel Generator Unit 3 - 565	None	Diesel Generator Rooms and Fuel Oil Pump Room	Heat	Actuate CO_2 System
14.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System
15.	Diesel Generator Building Unit 3 - 565	3-25-295	Shutdown Board Rooms 3EB & 3ED and Bus Tie Room	Smoke	Annunciation
16.	Diesel Generator Building Unit 3 - 565	3-25-289	Pipe and Electrical Tunnel	Heat	Actuate Fixed Spray

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
17.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Heat and Smoke	Actuate Fixed Spray
18.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Heat	Actuate CO_2 System
19.	Diesel Generator Building Unit 3 - 583	3-25-305	Shutdown Board Rooms 3EA, 3EB, 3EC, & 3ED; Bus Tie Room; and Diesel Auxiliary Board Rooms	Smoke	Door Release
20.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Smoke	Annunciation
21.	Diesel Generator Building Unit 3 - 583	None	Mechanical Equipment Rooms	Duct	Actuate Damper
22.	Control Bay - 593	1-25-325	Instrument Shop, MG Set Rooms, Battery Room 1, and Battery Board Room 1	Smoke	Annunciation
23.	Control Bay - 593	None	Auxiliary Instrument Room 1	Smoke	Annunciation
24.	Control Bay - 593	None	Unit 1 and 2 Computer Room	Smoke	Annunciation
25.	Control Bay - 593	None	Communications Battery/Board Room, Communications Room, MG Sets, Battery Board Room 2, and Battery Room 2	Smoke	Annunciation
26.	Control Bay - 593	None	Auxiliary Instrument Room 2	Smoke	Annunciation
27.	Control Bay - 593	None	Shutdown Board Room B	Duct	Actuate Damper
28.	Control Bay - 593	None	Shutdown Board Room D	Duct	Annunciation
29.	Control Bay - 593	None	Auxiliary Instrument Room 3	Smoke	Annunciation
30.	Control Bay - 593	None	Unit 3 Computer Room	Smoke	Annunciation
31.	Control Bay - 593	3-25-327	MG Set Rooms, Battery Room 3, and Battery Board Room 3	Smoke	Annunciation

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
32.	Control Bay - 606	1-25-323	Spreading Room A	Heat and Smoke	Actuate Preaction System
33.	Control Bay - 606	3-25-324	Spreading Room B	Heat and Smoke	Actuate Preaction System
34.	Control Bay - 606, 617	1-25-328	Mechanical Equipment Room, Locker Room, Toilet, Instrument Calibration Room, Shift Engineer Office, and Kitchen,	Heat and Smoke	Actuate Preaction System
35.	Control Bay - 617	None	Unit 1 Control Room	Smoke	Annunciation
36.	Control Bay - 617	None	Shutdown Board Room A	Duct	Actuate Damper
37.	Control Bay - 617	None	Shutdown Board Room C	Duct	Annunciation
38.	Control Bay - 617	None	Unit 2 Control Room	Smoke	Annunciation
39.	Control Bay - 617	None	Relay Room	Smoke	Annunciation
40.	Control Bay - 617	None	Unit 3 Control Room	Smoke	Annunciation
41.	Control Bay - 617	3-25-329	NRC Room, TSO Operating Room, Locker Room, Toilet and Mechanical Room	Heat or Smoke	Actuate Preaction System
42.	Control Bay - 621	None	Shutdown Board Room E	Duct	Actuate Damper
43.	Control Bay - 621	None	Shutdown Board Room F	Duct	Actuate Damper
44.	Turbine - 565	0-25-297	Cable Tunnel to Intake Pumping Station	Smoke	Annunciation
45.	Turbine - 586	1-25-283	Cable Tray Zones A, B, & C	Heat	Actuate Fixed Spray
46.	Turbine - 586	1-25-334	Cable Tray Zones A, B, & C	Heat and Smoke	Actuate Fixed Spray
47.	Turbine - 586	3-25-293	South Wall	Smoke	Annunciation
48.	Intake Pumping Station	0-25-296	Intake Pumping Station	Smoke	Actuate Preaction System

TABLE 3.11.B

SPRAY/SPRINKLER SYSTEMS

Building Elevation	System Control Valve	Area Protected	System
1. Reactor - 519	2-26-37	HPCI	Water Spray
* 2. Reactor - 565, 593, & 621	2-26-77	General	Preaction
* 3. Reactor - 639	2-26-88	Recirculation MG Sets	Aqueous Film Forming Foam
4. Diesel Generator Building - Units 1 & 2 - 565	1-26-80	Pipe and Electrical Tunnel	Preaction
5. Diesel Generator Building - Unit 3 - 565	3-26-81	Pipe and Electrical Tunnel	Preaction
6. Diesel Generator Building - Unit 3 - 565	3-26-82	Pipe and Electrical Tunnel	Water Spray
7. Turbine - 586	1-26-73A	Cable Tray Zone A	Water Spray
8. Turbine - 586	1-26-73B	Cable Tray Zone B	Water Spray
9. Turbine - 586	1-26-73C	Cable Tray Zone C	Water Spray
10. Control Bay - 593	1-26-104	Battery Room 1, Battery Board Room 1	Manual Sprinkler
11. Control Bay - 593	2-26-104	Battery Room 2, Battery Board Room 2	Manual Sprinkler
12. Control Bay - 593	3-26-104	Battery Room 3, Battery Board Room 3	Manual Sprinkler
13. Control Bay - 606	1-26-98	Spreading Room A	Preaction
14. Control Bay - 606	3-26-99	Spreading Room B	Preaction
15. Control Bay - 617	1-26-87	Mechanical Equipment Room, Locker Room, Toilet, Instrument Calibration Room, Shift Engineers' Office, and Kitchen	Preaction
16. Control Bay - 617	3-26-87	NRC Room, TSO Operations Room, Locker Room, Toilet, and Mechanical Room.	Preaction
*17. Intake Pumping Station - 550	0-26-72E	North Bay Wall	Preaction

* When one or more of the required sprinkler systems are inoperable, within one hour establish a continuous fire watch for the following preaction systems protecting areas containing redundant safe shutdown equipment: 2-26-77, 2-26-88 and 0-26-72E. The continuous fire watch will not be stationed in one location but will move thoughout the area normally protected by the suppression system once each hour. The continous fire watch shall not leave the area without a proper relief. Only one fire watch is required for each sprinkler system in the reactor building and only one fire watch is required for the intake pumping station.

TABLE 3.11.C

HOSE STATIONS

	Building - Elevation	Location
1.	Reactor - 664	R11, p-line
2.	Reactor - 664	R12, u-line
3.	Reactor - 639	R12, u-line
4.	Reactor - 639	R9, u-line
5.	Reactor - 639	R10, p-line
6.	Reactor - 635	R12, p-line
7.	Reactor - 621	R12, t-line
8.	Reactor - 621	R10, p-line
9.	Reactor - 621	R9, u-line
10.	Reactor - 593	R12, t-line
11.	Reactor - 593	R10, p-line
12.	Reactor - 593	R9, u-line
13.	Reactor - 565	R14, p-line
14.	Reactor - 565	R13, u-line
15.	Reactor - 565	R8, p-line
16.	Reactor - 565	R9, u-line
17.	Reactor - 541	R13, u-line
18.	Reactor - 541	R14, p-line
19.	Reactor - 541	R9, u-line
20.	Reactor - 541	R8, p-line
21.	Reactor - 717	R15, p-line
22.	Diesel Generator Units 1 & 2 - 583	Diesel Auxiliary Board Room A
23.	Diesel Generator Units 1 & 2 - 583	Misc. Equipment Room
24.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
25.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D

TABLE 3.11.C

HOSE STATIONS (Cont'd)

	Building - Elevation	Location
26.	Diesel Generator Unit 3 - 583	Diesel Auxiliary Board Room 3EA
27.	Diesel Generator Unit 3 - 583	Misc. Equipment Room
28.	Diesel Generator Unit 3 - 583	Stairwell Outside Shutdown Board Room 3EC
29.	Diesel Generator Unit 3 - 565	Stairwell Outside Shutdown Board Room 3ED
30.	Diesel Generator Unit 3 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D
31.	Diesel Generator Unit 3- 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
32.	Turbine - 586	T2, m-line
33.	Turbine - 586	T11, m-line
34.	Turbine - 586	T16, m-line
35.	Control Bay - 617	R1, n-line
36.	Control Bay - 617	R4, n-line
37.	Control Bay - 606	R3, p-line
38.	Control Bay - 593	R4, n-line
39.	Control Bay - 593	R11, n-line
40.	Control Bay - 617	R10, n-line
41.	Control Bay - 617	R13, n-line
42.	Control Bay - 617	R18, n-line
43.	Control Bay - 593	R18, n-line
44.	Intake Pumping Station - 550	Center of IPS Building
45.	Intake Pumping Station - 550	East End of IPS Building
46.	Intake Pumping Station - 550	West End of IPS Building

TABLE 3.11.D

YARD FIRE HYDRANTS AND FIRE HOSE HOUSES

	Fire Hydrant Valve Number	Location	Fire Hose House Number
1.	0-26-531	East of Condensate Storage Tank No. 3	3
2.	0-26-530	East of Diesel Generator Building Unit 3	3
3.	0-26-526	South of Reactor Building Unit 3	2 or 3
4.	0-26-525	South of Reactor Building Unit 2	2
5.	0-26-524	South of Reactor Building Unit 1	2
6.	0-26-523	Southwest of Diesel Generator Building Units 1 and 2	1

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO_2 systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2500 gpm water supply capacity.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific operability verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 133
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 August 3, 1988, 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. 133, 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 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 27, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 133

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
iii	iii*
iv	iv
vii	vii
viii	viii*
3.11/4.11-1	3.11/4.11-1
3.11/4.11-2	3.11/4.11-2
3.11/4.11-3	3.11/4.11-3
3.11/4/11-4	3.11/4.11-4
3.11/4.11-5	3.11/4.11-5
3.11/4.11-6	3.11/4.11-6
3.11/4.11-7	3.11/4.11-7
3.11/4.11-8	3.11/4.11-8
3.11/4.11-9	3.11/4.11-9
3.11/4.11-10	3.11/4.11-10
3.11/4.11-11	3.11/4.11-11
3.11/4.11-12	3.11/4.11-12
3.11/4.11-13	3.11/4.11-13
3.11/4.11-14	3.11/4.11-14
3.11/4.11-15	3.11/4.11-15
	3.11/4.11-16
	3.11/4.11-17
	3.11/4.11-18
	3.11/4.11-19
	3.11/4.11-20
	3.11/4.11-21
	3.11/4.11-22
	3.11/4.11-23
	3.11/4.11-24

LIST OF ILLUSTRATIONS

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11. FIRE PROTECTION SYSTEMS	4.11 FIRE PROTECTION SYSTEMS
Applicability Applies to the operating status of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building elevation 586.	Applicability Applies to the surveillance requirements of the applicable fire suppression and/or detection systems and fire barriers for the reactor building, diesel generator buildings, control bay, intake pumping station, cable tunnel to the intake pumping station, and cable trays along the south wall of the turbine building, elevation 586 when the corresponding limiting conditions for operation are in effect.
Objective To ensure availability of the Fire Protection Systems.	Objective To verify the OPERABILITY of the Fire Protection System.
3.11.A FIRE DETECTION INSTRUMENTATION	4.11.A FIRE DETECTION INSTRUMENTATION
1. As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.11.A shall be OPERABLE whenever equipment protected by the fire detection instrument is required to be OPERABLE. a. The fire detection system's heat and smoke detectors for all protected zones shall be OPERABLE.	1. Each of the required fire detection instruments shall be demonstrated OPERABLE at least semiannually by performance of a CHANNEL FUNCTIONAL TEST. 2. The supervised circuits associated with alarms of each of the above required fire detection instruments shall be demonstrated OPERABLE at least semiannually. 3. The nonsupervised circuits associated with alarms of each of the above required instruments shall be demonstrated OPERABLE at least monthly.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.A FIRE DETECTION INSTRUMENTATION (Cont'd) b. If Specification 3.11.A.1.a cannot be met, a patrolling fire watch will be established to ensure that each protected zone or area with inoperable detectors is checked at intervals no greater than once each hour.	4.11.A FIRE DETECTION INSTRUMENTATION (Cont'd)
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be OPERABLE at all times with: a. Two high-pressure fire pumps, one electric and one diesel, each with a capacity of 2500 gpm, with their discharge aligned to the fire suppression header. b. An OPERABLE flow path capable of taking suction from Wheeler Reservoir and transferring the water through distribution piping with OPERABLE sectionalizing control or isolation valves to the yard hydrant curb valves, the last valve ahead of the water flow alarm device on each sprinkler or hose standpipe and the last valve ahead of the system valve on each spray system required to be OPERABLE per Specification 3.11.C, 3.11.E, and 3.11.F.	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS 1. The High-Pressure Fire Protection System shall be demonstrated OPERABLE: a. At least monthly by starting each electric-motor-driven high-pressure fire pump and operating it for at least 15 minutes on recirculation flow. b. At least monthly by verifying that each manual, power operated or automatic valve in the flow path which is not electrically supervised is in its correct position. c. At least semiannually by performance of a system flush. d. Biocide will be added upon completion of Surveillance 4.11.B.1.c.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
2. With only the diesel or one or more of the three electric pumps OPERABLE, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply.	e. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel.
3. With no high-pressure fire pumps OPERABLE, establish a backup fire water system within 24 hours or be in COLD SHUTDOWN CONDITION within the following 24 hours.	f. At least once per 18 months, by performing a system functional test which includes simulated actuation of the system throughout its operating sequence, and: (1) Verifying that each automatic valve in the flow path actuates to its correct position, (2) Verifying that each electric high-pressure fire pump develops at least 2500 gpm at a system head of 300 feet. (3) Verifying the diesel-driven high-pressure fire pump develops at least 2500 gpm at a system head of 340 feet.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	(4) Verifying that after initial high-pressure fire pump actuation each subsequent high-pressure fire pump starts sequentially to maintain the High-Pressure Fire Protection System pressure greater than or equal to 120 psig.
	g. At least once per 3 years by performing a flow test of the system in accordance with the Fire Protection Handbook published by the National Fire Protection Association.
	2. The diesel-driven high-pressure fire pump shall be demonstrated OPERABLE:
	a. At least monthly by:
	(1) Verifying the fuel tank contains at least 150 gallons of fuel.
	(2) Starting the pump from ambient conditions and operating for greater than or equal to 30 minutes on recirculation flow.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)

b. At least quarterly by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-75, is within the acceptable limits specified in table 1 of ASTM-D975-77 when checked for viscosity, water, and sediment.

c. At least once per 18 months, by subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service.

3. The diesel-driven high-pressure fire pump starting 24-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least weekly by verifying that:

(1) The electrolyte level of each pilot cell is above the plates,

(2) The pilot cell specific gravity, corrected to 77° F and full electrolyte level, is greater than or equal to 1.200,

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
	(3) The pilot cell voltage is greater than or equal to 24 volts, and (4) The overall battery voltage is greater than or equal to 24 volts. b. At least quarterly by verifying that the specific gravity is appropriate for continued service of the battery. c. At least once per 18 months by verifying that: (1) The batteries, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration, and (2) Battery terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.
4. The raw service water storage tank level shall be maintained above level 723'7" by the raw service water pumps.	4. Simulated automatic and manual actuation of raw service water pumps and operation of tank level switches will be conducted annually.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)	4.11.B FIRE PUMPS AND WATER DISTRIBUTION MAINS (Cont'd)
5. If Specification 3.11.B.4 cannot be met, a fire pump shall be started and run continuously until the raw service water pumps can maintain a raw service water storage tank level above 723'7".	5. The High-Pressure Fire Protection System pressure shall be logged daily.
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS
1. The spray and sprinkler systems in Table 3.11.B shall be OPERABLE whenever equipment protected by the spray and/or sprinkler systems is required to be OPERABLE.	1. Each of the required spray and sprinkler systems in Table 3.11.B shall be demonstrated OPERABLE:
2. With one or more of the above required spray and/or sprinkler systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas specifically identified in Table 3.11.B; for other areas listed in Table 3.11.B, establish an hourly fire watch patrol.	a. At least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position. b. At least yearly by cycling each testable valve in the flow path through at least one complete cycle of full travel. c. At least once per 18 months: (1) By performing a system functional test which includes simulated automatic actuation of the system, verifying that the automatic valves in the flow path actuate to their correct positions on a fire alarm test signal.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd)	4.11.C SPRAY AND/OR SPRINKLER SYSTEMS (Cont'd)
	(2) By a visual inspection of the dry pipe spray and sprinkler headers to verify their integrity.
	(3) By a visual inspection of each sprinkler or water spray nozzle's spray area to verify that the spray pattern is not obstructed.
	d. At least once per 3 years, by performing an air flow test through each open head spray header and verifying that each open head spray and sprinkler nozzle is unobstructed.
3.11.D CO_2 SYSTEMS	4.11.D CO_2 SYSTEMS
1. The low pressure CO_2 systems protecting the following areas shall be OPERABLE whenever equipment protected by the CO_2 systems is required to be OPERABLE.	1. Each of the required CO_2 systems shall be demonstrated OPERABLE at least monthly by verifying that each manual, power operated or automatic valve in the flow path is in its correct position.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.D CO_2 SYSTEMS (Cont'd)	4.11.D CO_2 SYSTEMS (Cont'd)
a. Unit 1 and 2 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms b. Unit 3 Diesel Generator Rooms, Auxiliary Board Rooms, and Fuel Transfer Pump Rooms c. Computer Rooms 1, 2, and 3 Elevation 593, Control Building d. Auxiliary Instrument Rooms 1, 2, and 3 e. Spreading Room A, Elevation 606, Control Building f. Spreading Room B, Elevation 606, Control Building	a. At least weekly by verifying the CO_2 storage tank level to be greater than 8.5 tons for unit 1 and 2 and 3 tons for unit 3 and pressure to be greater than 275 psig, and b. At least once per 18 months by verifying: (1) The system, including associated ventilation system fire dampers and fire door release mechanisms, actuates manually and automatically upon receipt of a simulated actuation signal, and (2) Flow from each nozzle during a "Puff Test."
2. With one or more of the the above CO_2 systems inoperable, within 1 hour establish an hourly fire watch patrol.	
3.11.E FIRE HOSE STATIONS	4.11.E FIRE HOSE STATIONS
1. The fire hose stations shown in Table 3.11.C shall be OPERABLE whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE.	1. Each of the fire hose stations shown in Table 3.11.C shall be demonstrated OPERABLE: a. At least monthly by a visual inspection to assure all required equipment is at the station.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.E FIRE HOSE STATIONS (Cont'd)	4.11.E FIRE HOSE STATIONS (Cont'd)
a. With one or more of the fire hose stations shown in Table 3.11.C inoperable, provide gated wye(s) on the nearest OPERABLE hose station(s). One outlet of the wye shall be connected to the standard length of hose provided for the hose station. The second outlet of the wye shall be connected to a length of hose sufficient to provide coverage for the area left unprotected by the inoperable hose station. Where it can be demonstrated that the physical routing of the fire hose would result in a recognizable hazard to operating technicians, plant equipment, or the hose itself, the fire hose shall be stored in a roll at the outlet of the OPERABLE hose station. Signs shall be mounted above the gated wye(s) to identify the proper hose to use. The above action shall be accomplished within 1 hour if the inoperable fire hose is the primary means of fire suppression; otherwise, route the additional hose within 24 hours.	b. At least once per 18 months by: (1) Removing the hose for inspection and re-racking, and (2) Inspection of all gaskets and replacing any degraded gaskets in the couplings. c. At least once per 3 years by: (1) Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage. (2) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.F YARD FIRE HYDRANTS AND HOSE HOUSES	4.11.F YARD FIRE HYDRANTS AND HOSE HOUSES
1. The yard fire hydrants and associated hose houses shown in Table 3.11.D shall be OPERABLE whenever equipment in the areas protected by the yard fire hydrants is required to be OPERABLE.	1. Each of the yard fire hydrants and hose houses shown in Table 3.11.D shall be demonstrated OPERABLE:
a. With one or more of the yard fire hydrants or associated hose houses shown in Table 3.11.D inoperable, within 1 hour have sufficient additional lengths of 2 1/2 inch diameter hose located in an adjacent OPERABLE hose house to provide service to the unprotected area(s) if the inoperable fire hydrant or associated hose house is the primary means of fire suppression; otherwise, provide the additional hose within 24 hours.	a. At least monthly by visual inspection of the hose house to assure all required equipment is at the hose house. b. At least semiannually, during March, April, or May and during September, October, or November, by visually inspecting each yard fire hydrant and verifying that the hydrant barrel is dry and that the hydrant is not damaged. c. At least yearly by: (1) Conducting a hose hydrostatic test at a pressure of 150 psig or at least 50 psig above the maximum fire main operating pressure, whichever is greater. (2) Replacement of all degraded gaskets in couplings. (3) Performing a flow check of each hydrant.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.11.G FIRE-RATED ASSEMBLIES	4.11.G FIRE-RATED ASSEMBLIES
1. All fire barrier assemblies, including walls, floor/ ceilings, conduit wraps, and other fire barriers; separating fire areas or separating systems important to safe shutdown within a fire area; and all sealing devices in fire rated assembly penetrations, including fire doors, fire dampers, and fire-rated cable and piping penetration seals, shall be OPERABLE at all times.	1. Each of the required fire-rated assemblies and penetration sealing devices shall be verified OPERABLE at least once per 18 months by performing a visual inspection of:
a. With one or more of the required fire-rated assemblies and/or sealing devices inoperable, within one hour establish a continuous fire watch on at least one side of the affected assembly(s) and/or sealing device(s) or verify the OPERABILITY of fire detectors on at least one side of the inoperable assembly(s) or sealing device(s) and establish an hourly fire watch patrol.	a. The exposed surfaces of each fire-rated assembly, b. Each fire damper and associated hardware, and c. At least 10 percent of each type of sealed penetration. If changes in appearance or abnormal degradations are found, a visual inspection of an additional 10 percent of each type of sealed penetration shall be made. This inspection process shall be continued until a 10 percent sample with no apparent changes in appearance or abnormal degradation is found. Samples shall be selected, such that each penetration seal will be inspected at least once per 15 years.

LIMITING CONDITIONS FOR OPERATION

3.11.G FIRE-RATED ASSEMBLIES (Cont'd)

SURVEILLANCE REQUIREMENTS

4.11.G FIRE-RATED ASSEMBLIES (Cont'd)

2. Each of the required fire doors shall be verified OPERABLE by inspecting the automatic hold-open, release, and closing mechanisms and latches at least semiannually and by verifying:

   a. The OPERABILITY of the fire door supervision system for each electrically supervised fire door by performing a CHANNEL FUNCTIONAL TEST at least monthly.

   b. That each locked-closed fire door is verified closed at least weekly.

   c. That doors with automatic hold-open and release mechanisms are free of obstructions at least daily and perform a FUNCTIONAL TEST of these mechanisms at least once per 18 months.

   d. That each unlocked normally closed fire door without electrical supervision is verified closed at least daily.

3.11.H Open Flames, Welding, and Burning in the Cable Spreading Room

There shall be no use of open flame, welding, or burning in the cable spreading room unless the reactor is in the COLD SHUTDOWN CONDITION.

TABLE 3.11.A

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
1.	Reactor - 519	None	HPCI	Heat	Actuate Fixed Spray
2.	Reactor - 519	None	RCIC	Heat	Annunciation
3.	Reactor - 565	3-25-286	General Area	Smoke	Actuate Preaction System
4.	Reactor - 565	3-25-313	Cable Tray Zones J, K, L, M	Heat and Smoke	Actuate Fixed Spray
5.	Reactor - 565	3-25-291	Cable Tray Zone J	Heat	Actuate Fixed Spray
6.	Reactor - 565	3-25-322	Cable Tray Zone K	Heat	Actuate Fixed Spray
7.	Reactor - 565	3-25-288	Cable Tray Zone L	Heat	Actuate Fixed Spray
8.	Reactor - 565	3-25-321	Cable Tray Zone M	Heat	Actuate Fixed Spray
9.	Reactor - 593	3-25-287	General Area	Smoke	Actuate Preaction System
10.	Reactor - 593	3-25-311	Cable Tray Zones A, B, C, D, E, F, N, P, Q	Heat and Smoke	Actuate Fixed Spray
11.	Reactor - 593	3-25-281A	Cable Tray Zones C, D, E, F	Heat	Actuate Fixed Spray
12.	Reactor - 593	3-25-281B	Cable Tray Zones A, B	Heat	Actuate Fixed Spray
13.	Reactor - 593	3-25-290	Cable Tray Zone Q	Heat	Actuate Fixed Spray
14.	Reactor - 593	3-25-292	Cable Tray Zone P	Heat	Actuate Fixed Spray
15.	Reactor - 593	3-25-318	Cable Tray Zone N	Heat	Actuate Fixed Spray
16.	Reactor - 621	3-25-303	General Area	Smoke	Actuate Preaction System
17.	Reactor - 639	3-25-333	Recirculation MG Sets	Heat	Actuate AFFF System
18.	Diesel Generator Units 1 and 2 - 565	None	Diesel Generator Rooms and Fuel Oil Transfer Room	Heat	Actuate CO_2 System
19.	Diesel Generator Units 1 and 2 - 565	1-25-331	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
20.	Diesel Generator Units 1 and 2 - 583	1-25-331	Diesel Auxiliary Board Rooms A & B	Smoke	Door Release
21.	Diesel Generator Units 1 and 2 - 583	None	Aux BD A Compt 7 Aux BD B Compt 10	Smoke	Annunciation
22.	Diesel Generator Units 1 and 2 - 583	None	Diesel Auxiliary Board Rooms A & B	Heat	Actuate CO_2 System
23.	Diesel Generator Unit 3 - 565	None	Diesel Generator Rooms and Fuel Oil Pump Room	Heat	Actuate CO_2 System
24.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Smoke	Actuate Preaction System
25.	Diesel Generator Building Unit 3 - 565	3-25-295	Shutdown Board Rooms 3EB & 3ED and Bus Tie Room	Smoke	Annunciation
26.	Diesel Generator Building Unit 3 - 565	3-25-289	Pipe and Electrical Tunnel	Heat	Actuate Fixed Spray
27.	Diesel Generator Building Unit 3 - 565	3-25-332	Pipe and Electrical Tunnel	Heat and Smoke	Actuate Fixed Spray
28.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Heat	Actuate CO_2 System
29.	Diesel Generator Building Unit 3 - 583	3-25-305	Shutdown Board Rooms 3EA, 3EB, 3EC, & 3ED; Bus Tie Room; and Diesel Auxiliary Board Rooms	Smoke	Door Release
30.	Diesel Generator Building Unit 3 - 583	None	Diesel Auxiliary Board Rooms 3EA & 3EB	Smoke	Annunciation
31.	Diesel Generator Building Unit 3 - 583	None	Mechanical Equipment Rooms	Duct	Actuate Damper
32.	Control Bay - 593	1-25-325	Instrument Shop, MG Set Rooms, Battery Room 1, and Battery Board Room 1	Smoke	Annunciation

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
33.	Control Bay - 593	None	Auxiliary Instrument Room 1	Smoke	Annunciation
34.	Control Bay - 593	None	Unit 1 and 2 Computer Room	Smoke	Annunciation
35.	Control Bay - 593	None	Communications Battery/Board Room, Communications Room, MG Sets, Battery Board Room 2, and Battery Room 2	Smoke	Annunciation
36.	Control Bay - 593	None	Auxiliary Instrument Room 2	Smoke	Annunciation
37.	Control Bay - 593	None	Shutdown Board Room B	Duct	Actuate Damper
38.	Control Bay - 593	None	Shutdown Board Room D	Duct	Annunciation
39.	Control Bay - 593	None	Auxiliary Instrument Room 3	Smoke	Annunciation
40.	Control Bay - 593	None	Unit 3 Computer Room	Smoke	Annunciation
41.	Control Bay - 593	3-25-327	MG Set Rooms, Battery Room 3, and Battery Board Room 3	Smoke	Annunciation
42.	Control Bay - 606	1-25-323	Spreading Room A	Heat and Smoke	Actuate Preaction System
43.	Control Bay - 606	3-25-324	Spreading Room B	Heat and Smoke	Actuate Preaction System
44.	Control Bay - 606, 617	1-25-328	Mechanical Equipment Room, Locker Room, Toilet, Instrument Calibration Room, Shift Engineer Office, and Kitchen,	Heat and Smoke	Actuate Preaction System
45.	Control Bay - 617	None	Unit 1 Control Room	Smoke	Annunciation
46.	Control Bay - 617	None	Shutdown Board Room A	Duct	Actuate Damper

TABLE 3.11.A (Cont'd)

FIRE DETECTION INSTRUMENTATION

	Instrument Location Building-Elevation	LOCAL PANEL	Area Protected/ Equipment	Detector Type	Function
47.	Control Bay - 617	None	Shutdown Board Room C	Duct	Annunciation
48.	Control Bay - 617	None	Unit 2 Control Room	Smoke	Annunciation
49.	Control Bay - 617	None	Relay Room	Smoke	Annunciation
50.	Control Bay - 617	None	Unit 3 Control Room	Smoke	Annunciation
51.	Control Bay - 617	3-25-329	NRC Room, TSO Operating Room, Locker Room, Toilet and Mechanical Room	Heat or Smoke	Actuate Preaction System
52.	Control Bay - 621	None	Shutdown Board Room E	Duct	Actuate Damper
53.	Control Bay - 621	None	Shutdown Board Room F	Duct	Actuate Damper
54.	Turbine - 565	0-25-297	Cable Tunnel to Intake Pumping Station	Smoke	Annunciation
55.	Turbine - 586	1-25-283	Cable Tray Zones A, B, & C	Heat	Actuate Fixed Spray
56.	Turbine - 586	1-25-334	Cable Tray Zones A, B, & C	Heat and Smoke	Actuate Fixed Spray
57.	Turbine - 586	3-25-293	South Wall	Smoke	Annunciation
58.	Intake Pumping Station	0-25-296	Intake Pumping Station	Smoke	Actuate Preaction System

TABLE 3.11.B

SPRAY/SPRINKLER SYSTEMS

Building-Elevation	System Control Valve	Area Protected	System
1. Reactor - 519	3-26-37	HPCI	Water Spray
2. Reactor - 565	3-26-78J	Cable Tray Zone J	Water Spray
3. Reactor - 565	3-26-78K	Cable Tray Zone K	Water Spray
4. Reactor - 565	3-26-78L	Cable Tray Zone L	Water Spray
5. Reactor - 565	3-26-78M	Cable Tray Zone M	Water Spray
6. Reactor - 593	3-26-75A	Cable Tray Zone A	Water Spray
7. Reactor - 593	3-26-75B	Cable Tray Zone B	Water Spray
8. Reactor - 593	3-26-74C	Cable Tray Zone C	Water Spray
9. Reactor - 593	3-26-74D	Cable Tray Zone D	Water Spray
10. Reactor - 593	3-26-74E	Cable Tray Zone E	Water Spray
11. Reactor - 593	3-26-74F	Cable Tray Zone F	Water Spray
12. Reactor - 595	3-26-79N	Cable Tray Zone N	Water Spray
13. Reactor - 593	3-26-79P	Cable Tray Zone P	Water Spray
14. Reactor - 593	3-26-79Q	Cable Tray Zone Q	Water Spray
*15. Reactor - 639	3-26-88	Recirculation MG Sets	Aqueous Film Forming Foam
*16. Reactor - 565, 593, & 621	3-26-77	General	Preaction
17. Diesel Generator Building - Units 1 & 2 - 565	1-26-80	Pipe and Electrical Tunnel	Preaction
18. Diesel Generator Building - Unit 3 - 565	3-26-81	Pipe and Electrical Tunnel	Preaction
19. Diesel Generator Building - Unit 3 - 565	3-26-82	Pipe and Electrical Tunnel	Water Spray
20 Turbine - 586	1-26-73A	Cable Tray Zone A	Water Spray
21. Turbine - 586	1-26-73B	Cable Tray Zone B	Water Spray
22. Turbine - 586	1-26-73C	Cable Tray Zone C	Water Spray
23. Control Bay - 593	1-26-104	Battery Room 1, Battery Board Room 1	Manual Sprinkler

TABLE 3.11.B (Cont'd)

SPRAY/SPRINKLER SYSTEMS

Building-Elevation	System Control Valve	Area Protected	System
24. Control Bay - 593	2-26-104	Battery Room 2, Battery Board Room 2	Manual Sprinkler
25. Control Bay - 593	3-26-104	Battery Room 3, Battery Board Room 3	Manual Sprinkler
26. Control Bay - 606	1-26-98	Spreading Room A	Preaction
27. Control Bay - 606	3-26-99	Spreading Room B	Preaction
28. Control Bay - 617	1-26-87	Mechanical Equipment Room, Toilet, Locker room, Instrument Calibration Room, Shift Engineers' Office, and Kitchen	Preaction
29. Control Bay - 617	3-26-87	NRC Room, TSO Operations Room, Locker Room, Toilet, and Mechanical Room	Preaction
*30. Intake Pumping Station - 550	0-26-72E	North Bay Wall	Preaction

* When one or more of the required sprinkler systems are inoperable, within one hour establish a continuous fire watch for the following preaction systems protecting areas containing redundant safe shutdown equipment: 3-26-77, 3-26-88 and 0-26-72E. The continuous fire watch will not be stationed in one location but will move thoughout the area normally protected by the suppression system once each hour. The continous fire watch shall not leave the area without a proper relief. Only one fire watch is required for each sprinkler system in the reactor building and only one fire watch is required for the intake pumping station.

TABLE 3.11.C

HOSE STATIONS

	Building - Elevation	Location
1.	Reactor - 664	R19, u-line
2.	Reactor - 664	R18, p-line
3.	Reactor - 639	R19, u-line
4.	Reactor - 639	R17, p-line
5.	Reactor - 639 (Foam)	Stairwell at R15, t-line
6.	Reactor - 621	R19, p-line
7.	Reactor - 621	R19, u-line
8.	Reactor - 621	R17, p-line
9.	Reactor - 593	R19, u-line
10.	Reactor - 593	R17, p-line
11.	Reactor - 565	R21, p-line
12.	Reactor - 565	R20, u-line
13.	Reactor - 565	R16, u-line
14.	Reactor - 565	R15, p-line
15.	Reactor - 541	R21, n-line
16.	Reactor - 541	R21, u-line
17.	Reactor - 541	R15, u-line
18.	Reactor - 541	R15, p-line
19.	Reactor - 519	R15, u-line
20.	Diesel Generator Units 1 & 2 - 583	Diesel Auxiliary Board Room A
21.	Diesel Generator Units 1 & 2 - 583	Misc. Equipment Room
22.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
23.	Diesel Generator Units 1 & 2 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D
24.	Diesel Generator Unit 3 - 583	Diesel Auxiliary Board Room 3EA
25.	Diesel Generator Unit 3 - 583	Misc. Equipment Room

TABLE 3.11.C (Cont'd)

HOSE STATIONS

	Building - Elevation	Location
26.	Diesel Generator Unit 3 - 583	Stairwell Outside Shutdown Board Room 3EC
27.	Diesel Generator Unit 3 - 565	Stairwell Outside Shutdown Board Room 3ED
28.	Diesel Generator Unit 3 - 565	Pipe and Electrical Tunnel Outside Diesel Generator Room D
29.	Diesel Generator Unit 3- 565	Pipe and Electrical Tunnel Outside Diesel Generator Room A
30.	Turbine - 586	T2, m-line
31.	Turbine - 586	T11, m-line
32.	Turbine - 586	T16, m-line
33.	Control Bay - 617	R1, n-line
34.	Control Bay - 617	R4, n-line
35.	Control Bay - 606	R3, p-line
36.	Control Bay - 593	R4, n-line
37.	Control Bay - 593	R11, n-line
38.	Control Bay - 617	R10, n-line
39.	Control Bay - 617	R13, n-line
40.	Control Bay - 617	R18, n-line
41.	Control Bay - 593	R18, n-line
42.	Intake Pumping Station - 550	Center of IPS Building
43.	Intake Pumping Station - 550	East End of IPS Building
44.	Intake Pumping Station - 550	West End of IPS Building

TABLE 3.11.D

YARD FIRE HYDRANTS AND FIRE HOSE HOUSES

	Fire Hydrant Valve Number	Location	Fire Hose House Number
1.	0-26-531	East of Condensate Storage Tank No. 3	3
2.	0-26-530	East of Diesel Generator Building Unit 3	3
3.	0-26-526	South of Reactor Building Unit 3	2 or 3
4.	0-26-525	South of Reactor Building Unit 2	2
5.	0-26-524	South of Reactor Building Unit 1	2
6.	0-26-523	Southwest of Diesel Generator Building Units 1 and 2	1

FIRE PROTECTION SYSTEMS

The OPERABILITY of the fire protection systems ensures that adequate fire protection features are available to detect, confine, and extinguish fires occurring in any portion of the facility where safety-related equipment is located. The fire protection system consists of fire detection instrumentation, fire pumps, and water distribution mains, spray and/or sprinkler systems, CO_2 systems, fire hose stations, yard fire hydrants and hose house stations and fire barriers. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety-related equipment and is a major element in the facility fire protection program. OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems that are actuated by fire detectors will discharge extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program.

In the event that portions of the fire protection systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. When the inoperable fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the inoperable equipment is the primary means of fire suppression.

If in the event that all the high-pressure fire pumps become inoperable, an alternate backup pump or supply is available, such as using the additional fire pump which normally protects outlying areas and mobile fire apparatus to maintain the 2500 gpm water supply capacity.

Fire protection water systems protecting areas containing redundant safe shutdown systems, as defined in BFN's Fire Hazard Analysis, warrant more stringent compensatory measures (i.e., continuous fire watches) than areas containing only one division of safe shutdown systems or safety-related equipment not required for safe shutdown under fire conditions.

The surveillance requirements provide assurances that the minimum OPERABILITY requirements of the fire protection systems are met. All fire protection equipment surveillances required by this technical specification can be performed when the unit is in any operating mode.

FIRE PROTECTION SYSTEMS (Cont'd)

Flushing of the high-pressure fire protection system mains and building headers assures that sediment and marine growth is removed from the system to prevent obstruction. Subsequent biocide addition reduces further marine organism growth. Individual hose stations and fire hydrants are not included in the overall flush requirements, but are flushed periodically during specific operability verifications. Hydraulic performance of the water fire suppression system is tested in accordance with the 16th Edition of the Fire Protection Handbook, published by the National Fire Protection Association.

The functional integrity of the fire barrier assemblies and penetration sealing devices ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire from involving several areas of the facility prior to detection and extinguishment. The fire barrier penetrations are a passive element in the facility fire protection program and are subject to periodic inspections.

The barrier penetrations, including fire doors, fire dampers, and cable and pipe penetration seals, are considered functional when the visually observed condition indicates no significant degradation.

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

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS

SUPPORTING AMENDMENT NO. 162 TO FACILITY OPERATING LICENSE NO. DPR-33

AMENDMENT NO. 159 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 133 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3

DOCKET NOS. 50-529 50-260 AND 50-296

1.0 INTRODUCTION

The licensee proposes to change the Technical Specifications (TS) of the Browns Ferry Nuclear Plants (BFN), Units 1, 2, and 3 by revising the limiting conditions for operation and the surveillance requirements for fire protection systems. These changes are proposed in order to eliminate ambiguity and to bring the BFN Technical Specifications into conformance with the guidelines of the Boiling Water Reactor Standard Technical Specifications (BWR STS) and other acceptable industry practices.

2.0 EVALUATION

Technical Specifications are being revised to delete ambiguities and to clarify fire protection system Limiting Conditions for Operation (LCO) and Surveillance Requirements (SR). The BWR STS, Regulations, and the National Fire Protection Association (NFPA) codes were used to provide guidance for these changes.

2.1 LIMITING CONDITIONS FOR OPERATION WHICH HAVE BEEN CHANGED

Many of the LCO changes do not alter the intent of the current TS; however, the wording has been changed to be more consistent with current industry practices and standards. Those LCOs that require a change in current BFN practices are discussed below.

a. The requirements for establishing a firewatch and shutting down the reactor in the event of loss of operability of at least two high pressure fire pumps or the loss of the automatic start logic have been modified (original LCO 3.11.A.1 and 3.11.A.2). The new LCOs (3.11.B.1, 3.11.B.2 and 3.11.B.3) require that wich only the diesel or one of the electric pumps operable, an alternate backup pump or supply must be provided within 7 days. With no high pressure pumps operable, the licensee must establish an alternate supply within 24 hours. The LCOs do not require reactor shutdown if an alternate supply is provided. It is the staff's interpretation that the alternate supply must be equivalent to the existing supply. In areas where the differences between the supplies are significant in terms of fire protection requirements, further compensatory measures must be provided.

b. Components of the high pressure fire system may now be removed for testing, emergency operations, maintenance, and modification without the plant manager's approval. (LCO 3.11.A.5 deleted). Proper compensatory measures are now assured by administrative controls.

c. The licensee is no longer required to go to cold shutdown if a CO_2 system is inoperable for more than 7 days. (LCO 3.11.B.3 deleted). The licensee states that this deletion is justified because all CO_2 systems are backed up by manual fire fighting hose stations or by fixed water suppression system. The requirement for an hourly firewatch has been added (New LCO 3.11.D.2).

d. The requirement for a continuous fire watch in the case of loss of CO_2 protection to the cable spreading room or to a diesel generator building has been deleted (LCO 3.11.B.4). An hourly fire watch is required in the new LCO 3.11.D.2. As with c. above, further compensatory measures may be required.

e. Components of the CO_2 fire protection system may now be removed for maintenance and modification without the plant manager's approval. (LCO 3.11.B.5 deleted; same justification as b above)

f. Technical specifications on air masks and cylinders were removed (LCO 3.11.G deleted). Air masks and cylinders are controlled by administrative procedures which are covered by the BFN Fire Protection Program.

g. The requirement for a continuous fire watch in the immediate vicinity where work involving open flame welding or burning is in progress has been removed (LCO 3.11.H deleted). Administrative Controls have been developed in regard to welding and cutting using NFPA standards.

h. The requirement that there be no open flame welding and burning in the cable spreading room unless the reactor is in cold shutdown condition has been removed. The removal of the requirement was justified by the licensee on the basis of the automatic preaction sprinkler system in the cable spreading room. At the present time there are a number of deviations from NFPA codes in the automatic preaction sprinkler systems and its effectiveness has not been verified by the staff.

It is the staff's conclusion that this change should be rejected until the cable spreading room can be inspected by the staff. This will be done during the Appendix R inspection audit in 1989. Depending on the condition of the preaction system, the staff may either refuse to grant the T.S. deletion or support the deletion with requirements that additional administrative controls be in effect whenever welding or burning takes place in the Cable Spreading Room when the reactor is not in a cold shutdown condition.

2.2 LIMITING CONDITIONS FOR OPERATION WHICH HAVE BEEN ADDED

The following LCOs have been added to improve and clarify system operability requirements. These changes will enhance the current technical specifications by providing more meaningful LCOs and clearer guidance for BFN personnel.

a. LCO 3.11.C, "The Fire Protection Spray and/or Sprinkler System," is being added to identify which spray/sprinkler systems are required to be operable, its location, and what actions are needed to be taken if one of the subject systems becomes inoperable.

b. LCO 3.11.F, "The Fire Protection Yard Hydrants and Hose House," is being added to identify which hydrants and hose houses are required to be operable, their specific locations, and what actions are to be taken if one or more of the hydrants and houses become inoperable.

c. LCO, 3.11.E, "Fire Protection Fire Hose Stations," is being added to identify which hose stations are required to be operable, their location, when they are required to be operable, and what actions to take in the event one or more hose stations become inoperable.

2.3 SURVEILLANCE REQUIREMENTS WHICH HAVE BEEN CHANGED

Many of the SR changes consist of making the SR periodicity and surveillance wording consistent with the current industry standards and practices. These changes will allow some relaxation in the frequency of testing the fire protection equipment while still verifying system operability. SR changes belonging to such category are discussed below.

a. System functional tests on the fire pumps are required to be performed at 18 month intervals rather than at yearly intervals as is now required. This is in accordance with the BWR STS.

b. Spray headers and nozzles will be inspected for blockage once every 3 years instead of once a year (New SR 4.11.C.1.d). This is in accordance with the BWR STS.

c. Yard loop and cooling tower loop hydraulic performance verification is being changed from once a year to once every three years (New SR 4.11.B.1.g). This is in accordance with NFPA codes.

d. Simulated automatic actuation of ventilation system fire dampers and fire door release mechanisms has been changed from once a year to once per 18 months (New SR 4.11.D.1.b). This is in accordance with the BWR STS.

e. CO_2 storage tank pressure and level checking has been changed from daily to weekly (New SR 4.11.D.1.a). This is in accordance with BWR STS.

f. The testing of supervised circuits of the fire detection system has been changed from once every two months to semi-annually (New SR 4.11.A.2). This is in accordance with the BWR STS.

g. The checking of every sealed fire penetration has been changed from once per 18 months to a checking of 10% of the seals every 18 months (Existing SR 4.11.G). This is in accordance with the BWR STS.

2.4 SURVEILLANCE REQUIREMENTS WHICH HAVE BEEN ADDED

The following SRs are being added to provide clearer and better defined SRs to verify system operability:

a. SR 4.11.B, "The Fire Pumps and Water Distribution Mains," for the diesel fire pump is being added to ensure that the diesel fuel tank is maintained at a specific level and the fuel oil is tested in accordance with industry accepted standards. In addition, the added SR ensures that an inspection of the pump is performed as recommended by the manufacturer. SRs demonstrating diesel battery operability are also being added which will further ensure that the diesel fire pump will perform its intended function when called upon.

b. SR 4.11.C The SR being added for the "Spray and Sprinkler System," is to demonstrate that the valves in the flow path are operable and ensure system integrity is maintained. This SR also verifies that the open nozzles in this system are verified to be free of any blockage.

c. SR 4.11.E.1, "The Fire Hose Station," is being added to ensure that the required equipment to maintain the system is operable and the hoses are maintained in an operable condition by performing any needed maintenance such as replacing any degraded gaskets and performing hydrostatic tests.

d. SR 4.11.F, "The Yard Fire Hydrants and Hose House," is being added to verify that the required equipment is in the hose house, to ensure that the hydrants are not damaged, and that a hydrant flow test is performed. This SR also ensures that a hydrostatic test is performed on the fire hoses to ensure their integrity.

e. SR 4.11.G.2, "The Fire-Rated Assemblies," is being added to verify the operability of the fire doors and their release mechanisms and to ensure that the doors are in their correct position in order to perform their intended function.

2.5 CONCLUSION

As a result of this proposed TS change, the Bases section has also been enhanced to provide additional information to better explain the BFN fire protection system. We have concluded that the proposed TS changes are acceptable. The removal of some TS requirements will add importance to the adequacy and acceptability of existing BFN fire protection systems. It is

expected, however, that any additional compensatory measures required for compliance with Appendix R will be accomplished with appropriate administrative controls.

3.0 ENVIRONMENTAL CONSIDERTION

The amendments involve a change to a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding. 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 nor environmental assessment need to be prepared in connection with the issuance of these amendments.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (53 FR 36674) on September 21, 1988 and consulted with the State of Alabama. No public comments were received and the State of Alabama did not have any comments.

The staff has concluded, based on the consideration discussed above, that: (1) there is reasonable assurance that the health and safety of the public will nt be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributors: S. B. Kim and R. Wescott

Dated: December 27, 1988