

February 14, 1995

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

SUBJECT: ISSUANCE OF TECHNICAL SPECIFICATION AMENDMENT FOR THE BROWNS FERRY  
NUCLEAR PLANT UNIT 3 (TAC NO. M89245) (TS 340)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment No. 189 to Facility Operating License No. DPR-68 for the Browns Ferry Nuclear Plant (BFN) Unit 3. This amendment is in response to your application dated March 29, 1994 regarding load shed logic being added to BFN Unit 3 480 volt emergency power systems.

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

Sincerely,

ORIGINAL SIGNED BY:

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

Docket No. 50-296

Enclosures: 1. Amendment No. 189 to License No. DPR-68  
2. Safety Evaluation

cc w/enclosures: See next page

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 189  
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 March 29, 1994, 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.

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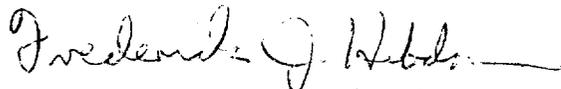
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-68 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 189, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment: Changes to the Technical  
Specifications

Date of Issuance: February 14, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 189

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

3.9/4.9-5  
3.9/4.9-6  
3.9/4.9-7  
3.9/4.9-8

INSERT

3.9/4.9-5  
3.9/4.9-6\*  
3.9/4.9-7  
3.9/4.9-8\*

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3. Buses and Boards Available

- a. The respective start bus is energized for each common station-service transformer designated as an offsite power source.
  
- b. The 4-kV bus tie board is energized if a cooling tower transformer is designated as an offsite power source.
  
- c. The 4-kV shutdown boards (3EA, 3EB, 3EC, 3ED) are energized.
  
- d. The 480-V shutdown boards 3A and 3B are energized.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

3. Logic Systems

- a. Both divisions of the accident signal logic system shall be tested every 18 months to demonstrate that it will function on actuation of the core spray system of the reactor to provide an automatic start signal to all 4 diesel generators.
  
- b. Once every 18 months, the condition under which the 480-volt load shedding logic system is required shall be simulated to demonstrate that the load shedding logic system would initiate load shedding signals on the diesel auxiliary boards, RMOV boards, and the 480-volt shutdown boards.

6.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

3.9.A.3. (Cont'd)

- e. Loss of voltage and degraded voltage relays OPERABLE on 4-kV shutdown boards 3EA, 3EB, 3EC, and 3ED.
  - f. The 480-V diesel auxiliary boards 3EA and 3EB are energized.
  - g. The 480-V reactor motor-operated valve (RMOV) boards 3D & 3E are energized with motor-generator (mg) sets 3DN, 3DA, 3EN, and 3EA in service.
4. The 250-V shutdown board 3EB battery, all three unit batteries, a battery charger for each battery, and associated battery boards are OPERABLE.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4. Undervoltage Relays

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

3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

LIMITING CONDITIONS FOR OPERATION

3.9.A. Auxiliary Electrical Equipment

5. Logic Systems

- a. Accident signal logic system is OPERABLE.
- b. 480-volt load shedding logic system is OPERABLE.

6. There shall be a minimum of 35,280 gallons of diesel fuel in each of the 7-day diesel-generator fuel tank assemblies.

SURVEILLANCE REQUIREMENTS

4.9.A. Auxiliary Electrical System

4.9.A.4. (Cont'd)

c. The loss of voltage and degraded voltage relays which start the diesel generators from the 4-kV shutdown boards shall be calibrated annually for trip and reset and the measurements logged. These relays shall be calibrated as specified in Table 4.9.A.4.c.

d. 4-kV shutdown board voltages shall be recorded once every 12 hours.

5. 480-V RMOV Boards 3D and 3E

a. Once per operating cycle, the automatic transfer feature for 480-V RMOV boards 3D and 3E shall be functionally tested to verify auto-transfer capability.

### 3.9/4.9 AUXILIARY ELECTRICAL SYSTEM

#### LIMITING CONDITIONS FOR OPERATION

##### 3.9.B. Operation with Inoperable Equipment

Whenever the reactor is in STARTUP mode or RUN mode and not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A except as specified herein.

1. From and after the date that only one offsite power source is available, reactor operation is permissible under this condition for seven days.
2. When one unit 3 diesel generator (3A, 3B, 3C, or 3D) is inoperable, continued reactor operation is permissible during the succeeding 7 days, provided that two offsite power sources are available as specified in 3.9.A.1.c. and all of the CS, RHR (LPCI and containment cooling) systems, and the remaining three unit 3 diesel generators are OPERABLE. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be shut down and in the Cold Condition within 24 hours.

#### SURVEILLANCE REQUIREMENTS

##### 4.9.B. Operation with Inoperable Equipment

1. When only one offsite power source is OPERABLE, all unit 3 diesel generators must be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.
2. When one unit 3 diesel generator is found to be inoperable, all of the remaining unit 3 diesel generators shall be demonstrated to be OPERABLE within 24 hours, and power availability for the associated boards shall be verified within 1 hour and at least once per 8 hours thereafter.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 189 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-296

1.0 INTRODUCTION

On March 29, 1994, the Tennessee Valley Authority (the licensee) requested revision of the Technical Specifications (TS) for the Browns Ferry Nuclear Plant (BFN) Unit 3. The proposed changes reflect a design change adding a load shedding logic system to the BFN Unit 3 480-volt emergency power supplies. The proposed TS changes include the addition of a Limiting Condition for Operation (LCO) 3.9.A.5.b and a Surveillance Requirement (SR) 4.9.A.3.b for the 480-volt load shedding logic system. The addition of the load shedding logic system is to ensure that the maximum capacity of the emergency diesel generators (EDGs) at BFN Unit 3 would not be exceeded during a postulated loss of offsite power (LOOP) concurrent with a loss-of-coolant accident (LOCA).

2.0 EVALUATION

As part of the design baseline verification program to support restart of BFN Unit 3, the licensee performed an EDG capacity analysis. This analysis showed that the maximum capacity of Unit 3 EDGs 3A and 3C could be exceeded and overloaded during multiunit operation if a LOOP occurred concurrently with a LOCA. Therefore, before BFN Unit 3 is restarted, the licensee will implement a design change to automatically shed 480-volt loads not required for short-term post-accident mitigation from the auxiliary power system.

The NRC staff has reviewed the proposed changes in TS Section 3.9/4.9, "Auxiliary Electrical System" associated with the addition of LCO 3.9.A.5.b and SR 4.9.A.3.b. The staff's evaluation of each proposed TS amendment for BFN Unit 3 is as follows:

**Logic Systems Limiting Condition for Operation**

The licensee proposes that current LCO 3.9.A.5 be renamed "Logic Systems," and that its current content be redesignated as LCO 3.9.A.5.a. In addition, the licensee proposes to add LCO 3.9.A.5.b, which states that the 480-volt load shedding logic system is operable.

ENCLOSURE 2

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BFN Unit 3 has four EDGs that supply standby power to the Unit 3 auxiliary power system, which consists of: four 4-kV shutdown boards, two 480-volt shutdown boards, five reactor motor operated valve (RMOV) boards, four motor generator sets, two diesel auxiliary boards, and a standby gas treatment system board. Currently, the 480-volt auxiliary power system at BFN Unit 3 has provision for undervoltage load shedding only. With the EDG capacity analysis showing that the maximum capacity of the Unit 3 EDGs 3A and 3C could be exceeded and overload these EDGs during multiunit operation if a LOOP occurs concurrently with a LOCA, the licensee plans to install a 480-volt load shedding logic system. With a LOOP concurrent with a LOCA signal, the system will trip 480-volt loads that are not required for short-term post-accident mitigation from 480-volt shutdown boards, diesel auxiliary boards, and RMOV boards. This will ensure that the loads on the EDG are within the rated capacity. To provide appropriate controls on the load shed system availability, the licensee has proposed to revise TS LCO 3.9.A.5.b.

Since the purpose of the auxiliary power system is to ensure an adequate supply of electrical power for operation of those systems required for safe shutdown of BFN Unit 3, the staff finds that implementation of a design change whereby nonessential loads are shed from the Unit 3 auxiliary power system ensures that the EDGs can supply adequate power under postulated design basis accident (i.e., LOOP and LOCA) conditions. The licensee also states that BFN Units 1 and 2 share four EDGs, and that there has always been a 480-volt load shedding logic feature for these units from the time the units were licensed. The staff has reviewed the current TS for BFN Units 1 and 2, and has confirmed that a load shedding provision similar to that proposed for BFN Unit 3 exists. The staff finds that proposed LCO change for BFN Unit 3 makes its TS consistent with those of Units 1 and 2 in this regard.

In addition, the staff has audited the licensee's design change documentation prepared in accordance with 10 CFR 50.59, and finds that it provides adequate basis for implementing the load shedding logic system and assurance that this objective is met. The staff concurs with the licensee that addition of this system is necessary and should be addressed in the TS. On this basis, the staff concludes that proposed LCO 3.9.A.5.b is acceptable.

#### **Load Shed Surveillance Requirements**

To ensure that the 480-volt load shedding logic system is tested regularly, the licensee proposes to add TS SR 4.9.A.3.b, which states:

Once every 18 months, the condition under which the 480-volt load shedding logic system is required shall be simulated to demonstrate that the load shedding logic system would initiate load shedding signals on the diesel auxiliary boards, RMOV boards, and the 480-volt shutdown boards.

The licensee explains that on the basis of its review of NUREG-1433, "Standard Technical Specification (STS), General Electric Plants, BWR/4," and Paragraph 2.a of Regulatory Guide (RG) 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electrical Power Systems at Nuclear Power Plants," the 480-volt load shedding logic system should be tested every

18 months. By testing the system every 18 months, the licensee contends that the capability of the EDGs to supply power during a design basis accident is ensured, thus ensuring minimum performance standards are preserved. The staff has reviewed SR 3.8.1.19 of NUREG-1433 and Paragraph 2.a of RG 1.108 and finds that the proposed interval is consistent with existing regulatory guidance. Therefore, the addition of SR 4.9.A.3.b is acceptable.

### 3.0 STATE CONSULTATION

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

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 39597). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### 5.0 CONCLUSION

The Commission has concluded, based upon the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and (3) issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Peter Kang

Dated: February 14, 1995

Mr. Oliver D. Kingsley, Jr.  
Tennessee Valley Authority

**BROWNS FERRY NUCLEAR PLANT**

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