

SEPTEMBER 12 1978

Docket No. 50-259

Tennessee Valley Authority  
ATTN: Mr. H. B. Hughes  
Manager of Power  
830 Power Building  
Chattanooga, Tennessee 37401

Gentlemen:

The Commission has issued the enclosed Amendment No. 15 to Facility License No. DPR-68 for the Browns Ferry Nuclear Plant, Unit No. 3. This amendment consists of changes to the Technical Specifications in response to your request of September 8, 1978.

This amendment changes the Technical Specifications to clarify that the reactor protection system instrument channels must be operable only when there is fuel in the reactor. In addition, the change removes the requirement for a minimum count rate on the Source Range Monitors when all the fuel is being removed from the reactor provided that all control rods are fully inserted and rendered electrically inoperable. The change authorized by this amendment is identical to the changes authorized by Amendment No. 33 to DPR-33 and Amendment No. 30 to DPR-52 for Browns Ferry Units Nos. 1 and 2, respectively, issued with our letter of September 13, 1977.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

Original signed by

Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Enclosures:

1. Amendment No. 15 to DPR-68
2. Safety Evaluation
3. Notice

cc w/enclosures: \*SEE PREVIOUS YELLOW FOR CONCURRENCES

see next page

OFFICE	ORB#3	ORB#3	OELD	ORB#3		
SURNAME	*SSheppard	*RClark:acr	*MCutchin	Tippolito		
DATE	9/12/78	9/11/78	9/11/78	9/12/78		

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Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
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cc: H. S. Sanger, Jr., Esquire  
General Counsel  
Tennessee Valley Authority  
400 Commerce Avenue  
E 11B 33 C  
Knoxville, Tennessee 37902

Mr. D. McCloud  
Tennessee Valley Authority  
303 Power Building  
Chattanooga, Tennessee 37401

Mr. William E. Garner  
Route 4, Box 354  
Scottsboro, Alabama 35768

Mr. Charles R. Christopher  
Chairman, Limestone County Commission  
Post Office Box 188  
Athens, Alabama 35611

Ira L. Myers, M.D.  
State Health Officer  
State Department of Public Health  
State Office Building  
Montgomery, Alabama 36104

Mr. C. S. Walker  
Tennessee Valley Authority  
400 Commerce Avenue  
W 9D199 C  
Knoxville, Tennessee 37902

Athens Public Library  
South and Forrest  
Athens, Alabama 35611

Director, Office of Urban & Federal  
Affairs  
108 Parkway Towers  
404 James Robertson Way  
Nashville, Tennessee 37219

Chief, Energy Systems  
Analyses Branch (AW-459)  
Office of Radiation Programs  
U.S. Environmental Protection Agency  
Room 645, East Tower  
401 M Street, SW  
Washington, D.C. 20460

U. S. Environmental Protection  
Agency  
Region IV Office  
ATTN: EIS Coordinator  
345 Courtland Street  
Atlanta, Georgia 30308



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 15  
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 September 8, 1978, 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 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. 15, 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 the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: September 12, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 15

FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

Revise Appendix A as follows:

Remove the following pages and replace with identically numbered pages:

31  
336  
342  
343

Marginal lines indicate revised area.

**3.1 REACTOR PROTECTION SYSTEM****Applicability**

Applies to the instrumentation and associated devices which initiate a reactor scram.

**Objective**

To assure the operability of the reactor protection system.

**Specification**

When there is fuel in the vessel, the setpoints, minimum number of trip systems, and minimum number of instrument channels that must be operable for each position of the reactor mode switch shall be as given in Table 3.1.A.

**4.1 REACTOR PROTECTION SYSTEM****Applicability**

Applies to the surveillance of the instrumentation and associated devices which initiate reactor scram.

**Objective**

To specify the type and frequency of surveillance to be applied to the protection instrumentation.

**Specification**

- A. Instrumentation systems shall be functionally tested and calibrated as indicated in Tables 4.1.A and 4.1.B respectively.
- B. Daily during reactor power operation at greater than or equal to 25% thermal power, the ratio of Fraction of Rated Power (FRP) to Core Maximum Fraction of Limiting Power Density (CMFLPD) shall be checked and the scram and APRM Rod Block settings given by equations in specifications 2.1.A.1 and 2.1.B shall be calculated.
- C. When it is determined that a channel is failed in the unsafe condition, the other RPS channels that monitor the same variable shall be functionally tested immediately before the trip system containing the failure is tripped. The trip system containing the unsafe failure may be untripped for short periods of time to allow functional testing of the other trip system. The trip system may be in the untripped position for no more than eight hours per functional test period for this testing.

**3.10 CORE ALTERATIONS****B. Core-Monitoring**

1. During core alterations, except as in 3.10.B.2, two SRM's shall be operable, in or adjacent to any quadrant where fuel or control rods are being moved. For an SRM to be considered operable, the following shall be satisfied:
  - a. The SRM shall be inserted to the normal operating level. (Use of special moveable, dunking type detectors during initial fuel loading and major core alterations in place of normal detectors is permissible as long as the detector is connected to the normal SRM circuit.)
  - b. The SRM shall have a minimum of 3 cps with all rods fully inserted in the core, if one or more fuel assemblies are in the core.
2. During a complete core removal, the SRM's shall have an initial minimum count rate of 3 cps prior to fuel removal, with all rods fully inserted and rendered electrically inoperable. The count rate will diminish during fuel removal. Individual control rods outside the periphery of the then existing fuel matrix may be electrically armed and moved for maintenance after all fuel in the cell containing (controlled by) that control rod have been removed from the reactor core.

**4.10 CORE ALTERATIONS****B. Core Monitoring**

Prior to making any alterations to the core the SRM's shall be functionally tested and checked for neutron response. Thereafter, while required to be operable, the SRM's will be checked daily for response.



provides primary reactivity control for the fuel assemblies in the cell associated with that control rod.

Thus, removal of an entire cell (fuel assemblies plus control rod) results in a lower reactivity potential of the core. The requirements for SRM operability during these core alterations assure sufficient core monitoring.

#### REFERENCES

1. Refueling interlocks (BFNP FSAR Subsection 7.6)

#### B. Core Monitoring

The SRM's are provided to monitor the core during periods of station shutdown and to guide the operator during refueling operations and station startup. Requiring two operable SRM's in or adjacent to any core quadrant where fuel or control rods are being moved assures adequate monitoring of that quadrant during such alterations. The requirement of 3 counts per second provides assurance that neutron flux is being monitored and insures that startup is conducted only if the source range flux level is above the minimum assumed in the control rod drop accident.

Under the special condition of removing the full core with all control rods inserted and electrically disarmed, it is permissible to allow SRM count rate to decrease below 3 cps. All fuel moves during core unloading will reduce reactivity. It is expected that the SRM's will drop below 3 cps before all of the fuel is unloaded. Since there will be no reactivity additions during this period, the low number of counts will not present a hazard. When all of the fuel has been removed to the spent fuel storage pool, SRM's will no longer be required. Requiring the SRM's to be functionally tested prior to fuel removal assures that the SRM's will be operable at the start of fuel removal. The daily response check of the SRM's ensures their continued operability until the count rate diminishes due to fuel removal. Control rods in cells from which all fuel has been removed and which are outside the periphery of the then existing fuel matrix may be armed electrically and moved for maintenance purposes during full core removal, provided all rods that control fuel are fully inserted and electrically disarmed.

#### REFERENCES

1. Neutron Monitoring System (BFNP FSAR Subsection 7.5)
2. Morgan, W. R., "In-Core Neutron Monitoring System for General Electric Boiling Water Reactors," General Electric Company, Atomic Power Equipment Department, November 1968, revised April 1969 (APED-5706)

### C. Spent Fuel Pool Water

The design of the spent fuel storage pool provides a storage location for approximately 140 percent of the full core load of fuel assemblies in the reactor building which ensures adequate shielding, cooling, and reactivity control of irradiated fuel. An analysis has been performed which shows that a water level at or in excess of eight and one-half feet over the top of the stored assemblies will provide shielding such that the maximum calculated radiological doses do not exceed the limits of 10 CFR 20. The normal water level provides 14-1/2 feet of additional water shielding. The capacity of the skimmer surge tanks is available to maintain the water level at its normal height for three days in the absence of additional water input from the condensate storage tanks. All penetrations of the fuel pool have been installed at such a height that their presence does not provide a possible drainage route that could lower the normal water level more than one-half foot.

The fuel pool cooling system is designed to maintain the pool water temperature less than 125°F during normal heat loads. If the reactor core is completely unloaded when the pool contains two previous discharge batches, the temperatures may increase to greater than 125°F. The RHR system supplemental fuel pool cooling mode will be used under these conditions to maintain the pool temperature to less than 125°F.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 15 TO FACILITY OPERATING LICENSE NO. DPR-68  
TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT, UNIT NO. 3  
DOCKET NO. 50-296

Introduction

By letter dated September 8, 1978, the Tennessee Valley Authority (the licensee or TVA) requested changes to the Technical Specifications (Appendix A) appended to Facility Operating License No. DPR-68 for the Browns Ferry Nuclear Plant, Unit No. 3. The proposed amendment and revised Technical Specifications clarify that the reactor protection system instrument channels must be operable only when there is fuel in the reactor. In addition the proposed changes remove the requirement for a minimum count rate on the Source Range Monitors (SRM) when all the fuel is being removed from the reactor provided that all control rods in the then existing fuel matrix are fully inserted and rendered electrically inoperable.

Background

TVA is shutting down Browns Ferry Unit No. 3 on September 8, 1978 for the first refueling of the facility. During the refueling outage, TVA plans to modify the control rod drive return line. To accomplish this, all of the fuel will be removed from the reactor and stored in the spent fuel pool. When all of the fuel is removed from the reactor, TVA plans to perform maintenance on the neutron monitoring system detectors which will require taking them out of service. Therefore, TVA has requested the change in the Technical Specification to clarify that the reactor protection system instrument channels must be operable only when there is fuel in the reactor.

The second change, removal of the requirement for a minimum SRM count rate during removal of all the fuel from the reactor, is proposed by TVA to alleviate the need for using special, moveable, dunking type detectors during the fuel unloading.

### Evaluation

The reactor protection system consists of that instrumentation and associated devices that initiate a reactor scram to provide protection against violating safety limits established in the Technical Specifications. When there is no fuel in the reactor, the scram serves no function. Therefore, the reactor protection system is not required to be operable under that condition and we find the proposed change acceptable.

Requiring a minimum count rate on the SRM channels, along with other considerations, provides assurance that the SRM channels are operable. For the shutdown condition the SRM channels monitor core reactivity to provide assurance that the shutdown margin is being maintained. With the proposed change, the required shutdown margin will be assured by the fact that, as fuel is being removed, the core reactivity will be reduced thereby increasing the shutdown margin, and by the fact that the control rods within the fuel matrix will be disabled in the fully inserted position thereby precluding the introduction of an increase in reactivity by rod movement. The SRM channels will provide core reactivity monitoring above 3 cps indication prior to fuel removal and during a large portion of the fuel removal process. In fact, the SRM's will remain in place and would readily detect any significant increase in reactivity in the late stages of fuel removal when they are indicating less than 3 counts per second. Based on the above considerations, we conclude that sufficient compensatory conditions are included in the proposed specification and that this change is acceptable.

### Environmental Consideration

We have determined that this amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that this amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR Section 51.5(d)(4) that an environmental impact statement, negative declaration, or environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: September 12, 1978

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-296

TENNESSEE VALLEY AUTHORITY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 15 to Facility Operating License No. DPR-68 issued to Tennessee Valley Authority (the licensee), which revised Technical Specifications for operation of the Browns Ferry Nuclear Plant, Unit No. 3, located in Limestone County, Alabama. The amendment is effective as of the date of issuance.

This amendment changes the Technical Specifications to clarify that the reactor protection system instrument channels must be operable only when there is fuel in the reactor. In addition, the change removes the requirement for a minimum count rate on the Source Range Monitors when all the fuel is being removed from the reactor provided that all control rods are fully inserted and rendered electrically inoperable. The change authorized by this amendment is identical to the changes authorized by Amendment No. 33 to DPR-33 and Amendment No. 30 to DPR-52 for Browns Ferry Units Nos. 1 and 2, respectively, issued with the Commission's letter of September 13, 1977.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made


appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4) an environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated September 8, 1978, (2) Amendment No. 15 to License No. DPR-68, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Athens Public Library, South and Forrest, Athens, Alabama 35611. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 12 day of September 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Thomas A. Ippolito, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors