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

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September 13, 1977

Posted

Docket Nos. 50-259
and 50-260

Am-30 to
DPR-52

Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
Manager of Power
818 Power Building
Chattanooga, Tennessee 37201

Gentlemen:

The Commission has issued the enclosed Amendment Nos. 33 and 30 to Facility License Nos. DPR-33 and DPR-52 for the Browns Ferry Nuclear Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications in response to your request of August 10, 1977.

The amendments change 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 changes remove the requirement for a minimum countrate 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.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "A. Schwencer".

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures and cc:
See next page

September 13, 1977

Enclosures:

1. Amendment No. 33 to DPR-33
2. Amendment No. 30 to DPR-52
3. Safety Evaluation
4. Notice

cc w/encl:

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

Athens Public Library
South and Forrest
Athens, Alabama 35611

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

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. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 33
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 10, 1977, 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-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. 33, 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 issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 13, 1977



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 30
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 10, 1977, 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-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. 30, 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 issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 13, 1977

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 33 TO FACILITY LICENSE NO. DPR-33

AMENDMENT NO. 30 TO FACILITY LICENSE NO. DPR-52

DOCKET NOS. 50-259 AND 50-260

Revise Appendix A as follows:

Remove the following pages and replace with identically numbered pages.

31
305
306
311
312

3.1 REACTOR PROTECTION SYSTEMApplicability

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 SYSTEMApplicability

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 maximum total peaking factor 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.A Refueling Interlocks

being withdrawn may be bypassed on a withdrawn control rod after the fuel assemblies in the cell containing (controlled by) that control rod have been removed from the reactor core. All other refueling interlocks shall be operable.

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.A Refueling InterlocksB. 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.

3.10.C Spent Fuel Pool Water

1. Whenever irradiated fuel is stored in the spent fuel pool, the pool water level shall be maintained at a depth of 8 1/2 feet or greater above the top of the spent fuel. A minimum of 6-1/2 feet of water shall be maintained over single irradiated fuel assemblies during transfer and handling operations.
2. Whenever irradiated fuel is in the fuel pool, the pool water temperature shall be $\leq 150^{\circ}\text{F}$.
3. Fuel pool water shall be maintained within the following limits:

 conductivity ≤ 10 umhos/cm
 @ 25°C

 chlorides ≤ 0.5 ppm

4.10.C Spent Fuel Pool Water

1. Whenever irradiated fuel is stored in the spent fuel pool, the water level and temperature shall be recorded daily.
2. A sample of fuel pool water shall be analyzed in accordance with the following specifications:
 - a. At least daily for conductivity and chloride ion content.
 - b. At least once per 8 hours for conductivity and chloride content when the fuel pool cleanup system is inoperable.

1.10 BASES

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.

3.10.C BASES

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 temperature 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.

3.10.D/4.10.D BASES

Reactor Building Crane

The reactor building crane and 125-ton hoist are required to be operable for handling of the spent fuel in the reactor building. The controls for the 125-ton hoist are located in the crane cab. The 5-ton has both cab and pendant controls.

A visual inspection of the load-bearing hoist wire rope assures detection of signs of distress or wear so that corrections can be promptly made if needed.

The testing of the various limits and interlocks assures their proper operation when the crane is used.

3.10.E/4.10.E

Spent Fuel Cask

The spent fuel cask design incorporates removable lifting trunnions. The visual inspection of the trunnions and fasteners prior to attachment to the cask assures that no visual damage has occurred during prior handling. The trunnions must be properly attached to the cask for lifting of the cask and the visual inspection assures correct installation.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 33 AND 30

FACILITY LICENSE NOS. DPR-33 AND DPR-52

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-259 AND 50-260

Introduction

Tennessee Valley Authority (TVA) submitted an application for amendments to Operating License Nos. DPP-33 and DPR-52 on August 10, 1977, which proposed changes to the Browns Ferry Nuclear Plant, Unit Nos. 1 and 2 Technical Specifications. The proposed changes 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 countrate 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

During the first refueling outage of Unit 1, scheduled to commence on September 13, 1977, TVA plans to remove all the fuel from the Unit 1 reactor so that they can drill the fuel assembly lower tie plates of those fuel assemblies that are to remain in the core for cycle 2. The drilling of these fuel assemblies to provide bypass flow was approved by Amendment Nos. 20 and 17 to the operating licenses, issued March 3, 1976. 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 countrate 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 countrate 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 these amendments do 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 these amendments involve an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §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 these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: September 13, 1977

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-259 AND 50-260

TENNESSEE VALLEY AUTHORITY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY
OPERATING LICENSES

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment Nos. 33 and 30 to Facility Operating License Nos. DPR-33 and DPR-52 issued to Tennessee Valley Authority (the licensee), which revised Technical Specifications for operation of the Browns Ferry Nuclear Plant, Unit Nos. 1 and 2 (the facility), located in Limestone County, Alabama. The amendments are effective as of the date of issuance.

The amendments change 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 changes remove the requirement for a minimum countrate 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 application for the amendments 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 amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to the this action, see (1) the application for amendments dated August 10, 1977, (2) Amendment Nos. 33 and 30 to License Nos. DPR-33 and DPR-52, and (3) the Commission's Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., 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 13th day of September 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors