

REGULATORY DOCKET FILE COPY

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

MARCH 17 1980

Mr. Hugh G. Parris
 Manager of Power
 Tennessee Valley Authority
 500A Chestnut Street Tower II
 Chattanooga, Tennessee 37401

Dear Mr. Parris:

The Commission has issued the enclosed Amendment Nos. 60, 55 and 3a to Facility Licenses Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3. These amendments are in response to your letter of January 21, 1980, as supplemented by your letters of February 25, 1980 and March 13, 1980.

The amendments add a condition to the license for each facility authorizing you to temporarily store low-level radioactive waste in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the exclusion area. The total amount of low-level waste to be stored shall not exceed 1320 curies of total activity. This authorization expires two years from the effective date of these amendments and is subject to all the conditions and restrictions proposed in your application of January 21, 1980. As per the commitment in your application, prior to the end of the two years, all containers of waste which will be stored in the pavilion shall be removed and the building decontaminated as necessary for other unrestricted uses. In your application, you also committed to implement a concerted effort to reduce the volume of low-level waste which is generated at the Browns Ferry facility.

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

Sincerely,
 Original Signed by
 T. A. Ippolito

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

Enclosures and ccs:
 See next page

*SEE PREVIOUS YELLOW FOR CONCURRENCES

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DATE	3/14/80	3/14/80	3/14/80	3/14/80	3/ /80	3/ /80

Mr. Hugh G. Parris

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March 17, 1980

Enclosures:

1. Amendment No. 60 to DPR-33
2. Amendment No. 55 to DPR-52
3. Amendment No. 32 to DPR-68
4. Safety Evaluation
5. Notice

cc w/enclosures:

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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. 60
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 January 21, 1980, as supplemented by letters dated February 25, 1980 and March 13, 1980, 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 applications, 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, paragraph 2.D. of Facility License No. DPR-33 is hereby amended by adding subparagraph (3) as follows:
 - (3) The licensee is authorized to temporarily store low-level radioactive waste in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the site exclusion area. The total amount of low-level waste to be stored shall not exceed 1320 curies of total activity. This authorization expires two years from the effective date of this amendment and is subject to all the conditions and restrictions in TVA's application dated January 21, 1980.

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

Date of Issuance: March 17, 1980



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. 55
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 January 21, 1980, as supplemented by letters dated February 25, 1980 and March 13, 1980, 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 applications, 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, paragraph 2.D. of Facility License No. DPR-52 is hereby amended by adding subparagraph (3) as follows:
 - (3) The licensee is authorized to temporarily store low-level radioactive waste in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the site exclusion area. The total amount of low-level waste to be stored shall not exceed 1320 curies of total activity. This authorization expires two years from the effective date of this amendment and is subject to all the conditions and restrictions in TVA's application dated January 21, 1980.

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

Date of Issuance: March 17, 1980



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. 32
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 January 21, 1980, as supplemented by letters dated February 25, 1980 and March 13, 1980, 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, paragraph 2.D. of Facility License No. DPR-68 is hereby amended by adding subparagraph (3) as follows:
 - (3) The licensee is authorized to temporarily store low-level radioactive waste in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the site exclusion area. The total amount of low-level waste to be stored shall not exceed 1320 curies of total activity. This authorization expires two years from the effective date of this amendment and is subject to all the conditions and restrictions in TVA's application dated January 21, 1980.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Date of Issuance: March 17, 1980



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 60 TO FACILITY OPERATING LICENSE NO. DPR 33

AMENDMENT NO. 55 TO FACILITY OPERATING LICENSE NO. DPR-52

AMENDMENT NO. 32 TO FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

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

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

1.0 Introduction

By letter dated January 21, 1980, and supplemented by letters dated February 25, 1980 and March 13, 1980, the Tennessee Valley Authority (the licensee or TVA) requested amendments to Facility Operating License Nos. DPR-33, DPR-52 and DPR-68 for the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3. The proposed amendments would authorize TVA to temporarily store low-level radioactive waste onsite in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the site exclusion area. The total amount of low-level waste which TVA proposes to store in the building would contain less than 1320 curies of total activity. The authorization was requested for a period of time not to exceed two years. In their application, TVA proposed modifications to the building and to the fencing surrounding the building to make it a restricted area; TVA also proposed various conditions and restrictions they would implement with respect to storage of low-level waste in the building.

2.0 Discussion

Prior to submission of the subject application for amendments, a meeting was held with TVA on January 16, 1980 to discuss the licensee's intentions and considerations for onsite storage. After gleaning the initial information, the staff requested that TVA provide, with the proposed license amendment, supporting information and limiting conditions on duration of storage, maximum curie quantities, container dose rate criteria, access control, fire and weather protection, occupational exposure control considerations, monitoring and inventory controls, and contingencies for volume minimization, decontamination, and decommissioning. Information was also requested as to TVA's proposed long-range plans and the integration needed prior to the proposed termination date of the temporary storage authorization.

3.0 Evaluation

The licensee's radiological assessment addressed both the liquid and airborne release pathways for normal and potential accident conditions. The licensee's conclusion was that normal release would be within 10 CFR Part 50, Appendix I, guidelines and that all potential accident release consequences offsite would be below 10 CFR Part 20 dose limits.

The staff conducted an independent review and analysis of the potential radiological hazards and concluded that waste storage facility releases would be nonexistent during normal operations and minimal under accident conditions. A comparison of the staff's and licensee's assumptions, radiological dose consequences, and dose rate projections is listed in Tables 1, 2, and 3. The following is a detailed review of the staff's findings.

3.1 Radioactive Release Considerations

The staff does not expect airborne or liquid releases under normal operations because of the following analyses: A hypothetical mechanism for potential releases during normal operations from the proposed waste storage structure would be due to external water (i.e., rain) entering the storage area and transporting radioactivity to the environment. The proposed storage facility will be protected from the weather by a roof and sheet plastic over the waste containers. Additionally, the containers (i.e., 55-gallon drums and metal boxes) will be sealed and painted to reduce external corrosion, and only dry waste will be considered for storage. Consequently, the staff would expect the container integrity to be maintained under normal conditions for the intended two year storage period. If water should enter the storage area, it will be collected and retained within the 8-inch curbs and sump with the provision for sampling and processing (if contaminated) through the existing plant radwaste system. Since surface contaminants on storage containers will meet existing DOT shipping requirements (i.e., 49 CFR Part 173.397), normal airborne radioactive release is not considered to be significant. Based on the above, it is concluded that normal release from the proposed storage facility would not be expected and, therefore, would have no significant impact on the expected effluent releases from the facility.

3.2 Accidental Release Considerations

The staff determined that accidents involving releases are unlikely and the risks minimal because of the type of metal containers, material being stored, the storage time considered, the anticipated weather and potential flooding conditions, and the protection and controls being provided. The following considerations were analyzed in developing the staff's position.

Flooding and other accident mechanisms for transporting the total Curie content via liquid pathways were determined to be highly improbable, since the proposed storage facility is at an elevation of 590 feet compared to the 100-year design basis flood plain of 574 feet. In addition, it was determined that should an unspecified event occur causing complete degradation of container and sump integrity, with 100% of the total radioactivity being released via a liquid pathway from the storage area, the dose consequence at the site boundary would be insignificant and the maximum radionuclide concentration at the nearest public water supply would be <1.0% of the MPC 10 CFR Part 20, Appendix B, limits.

The airborne releases created by an accidental fire were determined to be the worst possible dose consequence scenario. The licensee, in its assessment, assumed all stored waste was consumed in the fire and approximately 1% of the total radioactivity stored (~ 13 Curies) was released to the environment. The licensee's approach appears to be conservative in assuming that all the trash burns and marginal with regard to the fraction of radioactivity released. When considering the proposed fire protection (i.e., external fire retardant materials, fire watch and fire hydrants) in conjunction with sealed steel drums and boxes, it would be difficult to speculate that more than a few of the waste drums could be completely consumed in any hypothetical fire. The staff's analysis assumed conservatively that only 10% of the drums and their content would be consumed. However, when considering the potential for radioactive release, it was assumed that 100% of the radioiodine and 10% of the remaining radionuclides were released to the environment. The composition of the stored waste was also considered to have undergone radioactive decay for a period of greater than one third the intended storage period (i.e., ~9 months). The expected doses from a hypothetical fire scenario are shown in Table 2. When considering the low probability that the fire would occur with the maximum activity (1320 Curies) being stored in conjunction with the low probability of a fire occurrence, the risk associated with this low dose consequence event is considered minimal and acceptable.

3.3 Dose Control Onsite/Offsite

A comparison was made of the projected security fence and site boundary dose rates (shown in Table 3). The proposed limits of 1320 Curies in the storage structure with 0.5 Curies per drum and <700 mr/hr on the surface of the container will assure that, under the proposed design configuration with shielding walls and fence locations, the limits of 10 CFR Part 50 and 40 CFR Part 190 will not be exceeded. Access to the waste storage structure will be restricted by means of a fence and a locked gate or guarded when access is needed by plant personnel. Since all entries in the waste storage structure will be supervised by Health Physics personnel, there is reasonable assurance that occupational doses will be controlled in a safe and well administered manner.

Licensee ALARA dose control considerations applicable to the handling of the drums in preparation for transport and placement in the temporary storage facility are being incorporated in the plant waste storage procedures. Additional ALARA methodology is being proposed in the construction of shield walls around three sides of the storage structure. The licensee is also proposing steps in decontamination of the waste storage drums prior to storage. Based on the above proposed conditions, it is concluded that dose rates at the site boundary, security fence, and within the warehouse areas, due to the proposed waste storage, would have no significant effect on the health and safety of the public or operating personnel.

4.0 Environmental Considerations

We have determined that these amendments do not authorize a change in effluent types or an increase in power level and will not significantly increase the total amounts of effluents or the potential for accidental releases of radioactivity to the environment. We have, therefore, determined that these amendments 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, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

5.0 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.

Dated: March 17, 1980

TABLE 1

MAJOR ASSUMPTIONS FOR RADIOLOGICAL ASSESSMENT

<u>General</u>	<u>TVA</u>	<u>NRC</u>
Type of Waste	Dry Trash	Misc. Dry Trash
Max Activity		
TOTAL	1320 Ci	1320 Ci
Per Container	0.5 Ci	0.5 Ci
Isotopic Breakdown*		
	77% Zn-65	20% Zn-65
	6% I-131	3% I-131
	4% Co-60	16% Co-60
	4% Cr-51	43% Cr-51
	3% Cs-137	6% Cs-137
	3% Cs-134	6% Cs-134
Dose Rate on Each Drum	700 mR/hr-contact	Same
<u>Accidental Release To River</u>		
Leach Fraction	100%	100%
Distance to River	400m	400m
Leach Rate Volume, cc	1.4×10^8	1.4×10^8
Dilution Factor	1.8×10^{-5}	1×10^{-5}
<u>Accidental Fire</u>		
Fraction Release	0.01	0.01 for I^{131} ; 0.01 other
Met \bar{X}/Q	$3.4 \times 10^{-3} \text{ c/m}^3$	1×10^{-3}
Distance to Site Boundary	600M	600M

*The staff's isotopic distribution is based on historic data from the licensee's solid waste shipment reports.

TABLE 2

RADIOLOGICAL ASSESSMENT/DOSE CONSEQUENCES FOR ACCIDENTAL RELEASES

	<u>Licensee</u>	<u>Commission</u>
<u>Accidental Release to River</u> (via groundwater)	< 1% MPC	< 1% MPC
<u>Accidental Fire</u>	7 mrem (whole body)	18.0 mrem (whole body)
Site	100 mrem (WB)	90 mrem (WB)
Boundary	100 mrem (bone)	70 mrem (bone)
Air Subm. Dose	1420 mrem (lung)	1600 mrem (lung)
Inhalation Dose	1000 mrem (thyroid)	900 mrem (thyroid)

TABLE 3

COMPARISON DOSE RATE PROJECTIONS FOR ONSITE STORAGE

<u>Dose Rate Projection</u>	<u>Licensee</u>	<u>Commission</u>
At Security Fence		
500 ft north	0.6 mR/hr	0.02 mrem/hr
260 ft east	0.6 mR/hr	<0.01 mrem/hr
260 ft west	0.6 mR/hr	0.2 mrem/hr
At Site Boundary		
Direct Exposure	3.1 mR/yr	2.2 mrem/yr
Plant Effluents	-	<u>~5.0 mrem/yr</u>
Total		~7.0 mrem/yr

40 CFR 190 limit - 25 mrem/yr from all fuel cycle sources.

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-259, 50-260 AND 50-296TENNESSEE VALLEY AUTHORITYNOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY
OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 60 to Facility Operating License No. DPR-33, Amendment No. 55 to Facility Operating License No. DPR-52 and Amendment No. 32 to Facility Operating License No. DPR-68 issued to Tennessee Valley Authority (the licensee), which revised the licenses for operation of the Browns Ferry Nuclear Plant, Units Nos. 1, 2 and 3, located in Limestone County, Alabama. The amendments are effective as of the date of issuance.

These amendments authorize the licensee to temporarily store low-level radioactive waste in an existing covered pavilion that is situated outside the security fence, as presently located, but inside the site exclusion area. The total amount of low-level waste authorized to be stored is not to exceed 1320 curies of total activity. This authorization expires two years from the effective date of these amendments and is subject to conditions and restrictions specified in the licensee's application.

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.


- 2 -

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 this action, see (1) the application for amendments dated January 21, 1980, as supplemented by letters dated February 25, 1980 and March 13, 1980, (2) Amendment No. 60 to License No. DPR-33, Amendment No. 55 to License No. DPR-52, and Amendment No. 32 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 17th day of March 1980.

FOR THE NUCLEAR REGULATORY COMMISSION


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