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Docket Files 30-19102
50-259/260/296

PDR	LCRouse	
LPDR	PLoysen	LA File
DCS	FSturz	
NMSS R/F	JLaverty	
FCAF R/f	TIppolito	

Docket No. 30-19102

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

Gentlemen:

We are reviewing your application dated July 31, 1980 as amended November 17, 1980, for amendment of your facility operating licenses for Browns Ferry Nuclear Plant Units 1, 2, and 3 under the provisions of 10 CFR Part 30. We may issue a separate Part 30 license if the required favorable findings are made.

Based on our review of your submittal, a site visit and meetings with TVA representatives, several matters were found that require clarification, expansion and resolution so that our safety and environmental reviews may continue. As a result, we have prepared a list of questions and request for additional information that is enclosed.

We would appreciate an item by item response. In addition, you should revise or amend the application as appropriate to reflect your response. Please let me know within two weeks the date by which you anticipate submitting your response and application changes. If you have any questions or wish to meet to discuss the list of questions and request for additional information, please contact Peter Loysen (FTS-427-4205).

Sincerely,

Original signed by
Leland C. Rouse

Leland C. Rouse, Chief
Advanced Fuel and Spent Fuel
Licensing Branch
Division of Fuel Cycle and
Material Safety

Enclosure:
List of Questions and Request
for Additional Information

cc: Service List

OFFICE	FCAF	FCAF	FCAF				
SURNAME	FSturz:flb	PLoysen	LCRouse				
DATE	74205 7/31/81	7/31/81	8/10/81				

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LIST OF QUESTIONS AND REQUEST FOR ADDITIONAL INFORMATION

1. Resin Characteristics and Container Integrity

Historically, there have been several accidents involving resins stored in a radiation field that have caused considerable damage. More recently, safe storage of TMI-EPICOR loaded resin liners for long periods of time has been questioned; with estimates of liner perforation occurring in 15 to 19 months. Although these situations may not be directly applicable to your proposed action, we have similar concerns regarding the ability of the storage containers to maintain their integrity for the duration of storage. Based upon the information in the application and discussions with the TVA staff (March 18 and 19, 1981), there is insufficient information to support any conclusion regarding container integrity and potential problems with five-year or life-of-plant storage of wastes, in particular spent ion exchange resin liners. We therefore request you to provide us with an evaluation of potential problems and the ability of waste storage containers to maintain their integrity during the five-year license term and life-of-plant storage.

The evaluation and its bases should consider, but not be limited to, such things as follows:

(1) physical, chemical and radiological characteristics of the wastes;

(2) changes in the physical and chemical characteristics of wastes which may be expected to occur (i.e., decomposition, gas generation, etc.);

(3) physical and chemical characteristics of the container materials;

(4) compatibility of the container materials to the waste forms and environmental conditions external to the containers;

(5) ranges of waste compositions that could be stored in the containers;

(6) provisions to minimize potential problems (i.e., containers equipped with special vent designs to allow depressurization).

2. Integrity Monitoring

Periodic inspections (at least quarterly) of container integrity (swelling, corrosion products, breach) should be performed. Use of high integrity containers (300 year lifetime design) would permit an inspection program of reduced scope. Please provide a description of your proposed container monitoring program. Features to be considered might include, but not be limited to the following:

(1) type inspection to be performed;

a. visual,

b. tv monitors,

c. inspecting and sampling designated waste containers. (Designated waste containers should comprise a representative sample of types of waste containers stored, length of time stored and number of modules in use.)

(2) the characteristics to be monitored;

(3) other monitoring to detect potential problems;

a. fire detection,

b. air sampling (airborne radioactivity, explosive gases),

c. liquids sampling.

(4) evaluation of occupational and population doses, if any, resulting from the monitoring program.

3. Operation of Modules

In your application you provided estimates of doses from normal operations based on the assumption that the stored waste would be volume reduced by incineration. However, since TVA has not made an application to reduce LLW by incineration, the NRC staff requires additional information. Based on the same time and motion analyses, operating conditions and site data, and assuming the waste stored is not volume reduced by incineration, please provide an assessment of the occupational and environmental doses for the five-year license term and life-of-plant storage.

Please provide the three additional information requirements in this area. They are:

(1) A copy of page VI.B-2 (RMSM, dated 12/15/80, Revision 8) the time and motions estimates. It is not in the information provided during the site visit.

(2) Confirmation that Table 3.3-1 of Design Criteria #BFN-50-D745 is currently the design basis for non-volume reduced waste. Furthermore, license limits for the total curie content of both the resin and miscellaneous wastes should be specified. These limits should be large enough that they would not be exceeded, during anticipated normal operations, for the five-year duration of the license.

(3) A discussion of the schedule for placement of trash and resin liner containers into the storage modules. In particular, if batching is anticipated, please provide estimated number of containers per batch for each type of waste.

4. Control of crane lift height

In the application, four accidents involving the dropping of a module cap are discussed. Three of these accidents involve dropping a module cap onto another cap, and dropping the cap into or onto the module itself. In each accident the consequence is mitigated by controlling the height that a cap can be lifted (five feet above an open module). The type of control is administrative.

From the control cab of the crane it would appear difficult to estimate the height of the lift by direct observation. Please describe how an operator can comply with the administrative controls, and describe any instrumentation that an operator would use to control the lift height.

5. Design basis for radiation protection

In discussions with TVA on March 18 and 19, 1981 the design considerations for analysis of modules were discussed. Your "Design Criteria for the Long-Term Onsite Storage Facility for Low-Level Radioactive Waste" indicates that the modules are designed for conformance with 10 CFR 20. To complete a review of this design a description of the basic assumptions and methods of calculations used is necessary. This discussion should describe the assumed source term(s), shielding characteristics of the concrete, and the methods of calculation.

6. Volume Reduction

In calculating occupational and population doses, you have assumed that all waste will be volume-reduced by incineration, trash by a factor of 36 and resins by a factor of 10. However, you have not included doses from the incineration operations nor described the operations for our review. Is volume reduction by incineration intended to be part of the storage program? If so, we require additional information about its impacts. If not, why are the doses calculated using the assumption of incinerated wastes?

7. Need for the Proposed Action

Your application discusses the need for the proposed action in Section 1.3. It states the proposed action is needed because:

-- Chem-Nuclear Systems, Inc. has reduced TVA's monthly allotment of burial volume, and

-- TVA is now generating waste at other nuclear plants besides the Browns Ferry Plant and where as TVA has additional wastes to dispose of within the alloted volume.

These arguments are convincing to an informed reader. However for readers not familiar with the schedule for future TVA nuclear plants, the volume of low-level waste generated from different reactor types, and TVA's historical allotment and actual volume used, these reasons may not be so convincing. Therefore, please provide specific information concerning:

(1) historical data on the allotments at various disposal sites;

(2) historical data on actual volume shipped to various disposal sites; and

(3) continued anticipated future utilization of disposal sites for disposition of Browns Ferry low level waste;

(4) projection of the volume to be disposed of over the next 5 years from both the Browns Ferry Plant and other TVA plants.

This kind of specific information will put the need for the proposed action into perspective and clearly show the real requirements for managing Browns Ferry Waste.

8. Retrieval

Impacts from retrieval of waste from the storage modules at the conclusion of storage were not included in the application. Within the context of your response to questions 6 and 7, please provide estimates of how long it would take to remove the wastes at the end of the 5-year license term as well as at the end of life-of-plant storage, and an evaluation of the occupational and population doses from retrieval. In these estimates and evaluation, you should also consider the availability of the following items:

(1) container handling equipment
(2) shipping casks and vehicles
(3) clement weather
(4) anticipated disposal capacity

9. Organizational

Please identify those organizations within TVA and BFNP having responsibility for radiological safety and discuss how these organizations meet the requirements of 10 CFR 33.13(c). This may be described by reference to the appropriate portions of the reactor operating license if applicable.

10. Fire Detection and Suppression

Please explain the basis for your decision not to incorporate automatic fire detection and fire suppression systems into the design of the storage modules.

11. Miscellaneous

The following is a list of information pertinent to the analysis in support of the TVA low-level waste storage request provided verbally during the site visit of March 18 and 19, 1981. Please confirm or clarify the following:

(1) The water table under the waste storage site is between elevation 530 and 550 feet (i.e., 30 to 50 feet below the grade of the storage area).

(2) The metal gratings are to be used on the floor of each module as well as between layers of containers.

(3) The fire hydrant water can be taken from two independent sources.

(4) All applicable features, practices, and procedures described in your facility operating licenses, including FSAR's and EIS's will apply to construction and operation of the low-level waste storage modules (i.e., health physics practices, monitoring, etc.).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
TENNESSEE VALLEY AUTHORITY	)	Docket No. 030-19102
	)	
(Brown Ferry Nuclear Plant)	)	
	)	

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