



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

## SAFETY EVALUATION REPORT

Docket No. 72-1026  
FuelSolutions™ Spent Fuel Management System  
Certificate of Compliance No. 1026  
Amendment No. 2

### SUMMARY

This Safety Evaluation Report (SER) documents the review and evaluation of an amendment application for the FuelSolutions™ Spent Fuel Management System, W74 canister. By application dated March 30, 2001, as supplemented July 16, August 9, and September 19, 2001, BNFL Fuel Solutions (BFS) requested an amendment to the Certificate of Compliance No. 1026 for the W74 canister only. BFS requested that the Technical Specification (TS) and basis be revised to provide an alternative to returning the W74 canister to the spent fuel building, to clarify the terminology for fuel to be stored in the W74 canister, and to revise the thermocouples called out for consistency with the Safety Analysis Report (SAR).

The application, as supplemented, included the necessary engineering analyses and proposed Safety Analysis Report (SAR) page changes. The proposed SAR revisions will be incorporated into the Final Safety Analysis Report (FSAR).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application, as supplemented, including the engineering analyses, proposed SAR revisions, and other supporting documents submitted with the application. Based on the statements and representations in the application, as supplemented, the staff concludes that the FuelSolutions™ Spent Fuel Management System, W74 canister, as amended, meets the requirements of 10 CFR Part 72.

### 1.0 GENERAL INFORMATION

The applicant requested that an alternative be approved to returning the W74 canister to the fuel building in TS 3.3.2 and 3.3.3. It was proposed to return the canister to the transfer cask for a maximum of 270 days while restoring normal storage conditions. The applicant also requested that thermocouple call out and associated temperatures be revised to be consistent with those presented in the SAR. The applicant provided clarification on the terminology used for fuel to be stored in the W74 canister. Due to the limited scope of the amendment request, only those sections affected are addressed in this SER.

### 2.0 STRUCTURAL

The NRC staff reviewed the proposed changes in the W74 canister TS, Limiting Condition for Operation (LCO) 3.3.2 and LCO 3.3.3. Specifically, BFS requested to change the required action from "Return CANISTER to the Fuel Building and remove all fuel assemblies" to "Return CANISTER to TRANSFER CASK."

The application stated that: "the (transfer) cask will be secured in the horizontal position in an appropriate location by the licensee, with a cask centerline height not exceeding 108 inches and a support base at least 131 inches wide; this is consistent with the licensing basis in FSAR Chapter 3, such as provided by the skid/trailer system."

The canister and transfer cask have been evaluated for the normal, off-normal, accident and (extreme) natural phenomena loading conditions. Thus, it can be concluded that there is no event which would lead to structural integrity problems during temporary storage (maximum of 270 days) of a loaded canister in the transfer cask.

Based on the above, the staff concludes that returning the W74 canister to the transfer cask while restoring normal storage conditions is acceptable.

### **3.0 THERMAL**

Current TS LCO 3.3.2 references the liner thermocouple, but the listed temperature limits correspond to the mid-wall thermocouple temperatures. The applicant proposed to correct these temperature limits to reflect the liner thermocouple temperatures. These corrections are consistent with the current SAR analyses and are therefore acceptable.

The applicant proposed to modify TS 3.3.2, "Storage Cask Temperatures During Storage," to eliminate Action B.2, which references the fuel building and removal of all fuel assemblies from the cask system. As an alternative, the applicant proposed three new actions and associated completion times, as follows:

*A.6 Verify storage cask temperature returns to within the limit. 48 hours*

*B.2 Return canister to transfer cask. 30 days*

*and*

*B.3 Return canister to repaired or replacement storage cask. 270 days*

This cask system is being used at the Big Rock Point (BRP) Plant, which is being decommissioned. As part of this process, the spent fuel pool will be taken out of service. As an alternative to moving the fuel to the spent fuel pool if there is a problem with a storage cask, the applicant has proposed to move the fuel canister to the transfer cask (within 30 days) and to return the canister to a repaired or replacement storage cask (within 270 days). To justify this approach, the applicant stated that the current and revised thermal and structural evaluations demonstrate that the transfer cask would provide acceptable storage of the canister for the proposed extended time.

The A.6 completion time of 48 hours is consistent with the current TS and provides adequate time for the cask performance to be evaluated without compromising the system. Therefore, this new action is acceptable.

The B.2 completion time of 30 days is consistent with the current Action B.2 and ensures that the action will be taken before the cask system is compromised. Therefore, the specified action and completion time are acceptable.

To evaluate the proposed B.3 completion time of 270 days, the staff reviewed the current and revised thermal and structural evaluations to determine if the transfer cask would provide acceptable storage for 270 days. Based on this review, the staff determined that all system components would remain within acceptable temperature limits. Therefore, the staff concluded that keeping the canister in the transfer cask for 270 days is acceptable.

The applicant proposed to modify TS 3.3.3, "Storage Cask Temperatures During Horizontal Transfer," to eliminate Action C.1, which references the fuel building and removal of all fuel assemblies from the cask system. As an alternative, the applicant proposed two new actions and associated completion times, as follows:

*C.1 Return canister to transfer cask. 30 days*

*and*

*C.2 Return canister to repaired or replacement storage cask. 270 days*

These changes are similar to the changes analyzed in TS 3.3.2, and are supported by the same thermal and structural evaluations. All of the evaluations discussed in that review apply to this change request also. Therefore, these changes are acceptable.

In addition, clarifications and editorial changes to the existing text were proposed. The staff agrees that these changes are editorial in nature and provide clarification. Therefore, they are acceptable.

#### **4.0 SHIELDING**

The changes requested in this amendment, with the exception of the revision to TS 3.3, Storage Cask Integrity, will not affect the shielding evaluation.

The changes to TS 3.3 consider an off-normal situation where the W74 canister could be placed within the Transfer Cask for up to 270 days while the Storage Cask is either being repaired or replaced. As described in Sections 2 and 3 of this SER, the staff has reviewed the structural and thermal evaluations and agrees that the transfer cask will provide adequate protection against normal, off-normal and accident conditions during this temporary period. The SAR does not include a shielding evaluation for this off-normal condition. However, the applicant has included in the TS 3.3 Bases a commitment at the time of the off-normal occurrence to demonstrate compliance with the regulations of 10 CFR 72.104 and to evaluate the need for supplemental shielding under the authority of 10 CFR 72.48. The staff agrees that evaluating the off-site doses at the time of this off-normal occurrence is acceptable because such an evaluation would consider cask- and site-specific parameters as well as the time expected for recovery.

The staff concludes that should the W74 canister be temporarily placed in the transfer cask, evaluating compliance with 10 CFR 72.104 at the time of such an off-normal event is in compliance with the requirements of 10 CFR Part 72.

## **5.0 CRITICALITY**

The applicant proposed revisions to TS Tables 2.1-3 and 2.1-4 to clarify that the contents of the W74 canister are limited to spent fuel and other radioactive materials associated with spent fuel storage. These additions ensure that the contents will be consistent with 10 CFR 72.2 and are therefore acceptable.

## **6.0 ACCIDENT ANALYSIS**

The changes requested in this amendment, with the exception of the revision to TS 3.3, Storage Cask Integrity, will not affect the accident analyses.

The changes to TS 3.3 consider an off-normal situation where the W74 canister could be placed within the Transfer Cask for up to 270 days while the Storage Cask is either being repaired or replaced. To prevent freezing of the neutron shield, TS 3.4, Transfer Integrity, requires temperature monitoring of the neutron shield and ensures that the neutron shield temperature does not fall below 40°F when the ambient air temperature is 32°F. Since temporarily placing the W74 canister within the transfer cask could span 270 days, it is possible that this off-normal situation could exist during severely cold weather. The applicant has included in the TS 3.3 Bases a commitment at the time of the off-normal occurrence to evaluate the possibility of freezing of the neutron shield and to impose any preventive measures as necessary. The staff agrees that performing the evaluation at the time of this off-normal occurrence is acceptable because such an evaluation would consider cask- and site-specific parameters as well as the time for recovery.

The staff concludes that should an off-normal event result in the implementation of TS 3.4, temporarily placing the W74 canister in the transfer cask is in compliance with the requirements of 10 CFR Part 72.

## **7.0 CONDITIONS FOR CASK USE - OPERATING CONTROLS AND LIMITS OR TECHNICAL SPECIFICATIONS**

The proposed certificate changes for this amendment to the W74 canister are as follows:

1. TS 2.1, "Fuel to be stored in the FuelSolutions™ W74 canister" was revised to clarify the description of the other non-fissile material permitted to be in the fuel assembly.
2. TS 3.3.2, changed the temperatures to correspond to the liner thermocouple.
3. TS 3.3.2 and TS 3.3.3, changed required action "return canister to the fuel building and remove all assemblies" to "return canister to transfer cask", and added "return canister to repaired or replaced storage cask" within 270 days.

The staff has reviewed these changes, as discussed in this SER, and have found them to be acceptable.

#### **CONCLUSION - EVALUATION FINDINGS**

The staff has reviewed the FuelSolutions™ W74 canister amendment application, as supplemented, including the engineering analyses, proposed SAR revisions, and other supporting documents submitted with the application. Based on the information provided in the application, as supplemented, the staff concludes that the FuelSolutions™ W74 canister, as amended, meets the requirements of 10 CFR Part 72.

Issued with Certificate of Compliance No. 1026, Amendment No. 2,  
on January 25, 2002.