72-03

10 CFR 72.56

Progress Energy

Serial: RNP-RA/07-0071

SEP 26 2007

Director, Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON INDEPENDENT SPENT FUEL STORAGE INSTALLATION
DOCKET NO. 72-3/LICENSE NO. SNM-2502

REQUEST FOR ADMINISTRATIVE CHANGES TO THE
INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE

Ladies and Gentlemen:

In accordance with 10 CFR 72.56, Carolina Power and Light Company, also known as Progress Energy Carolinas, Inc. (PEC), requests changes to Appendix A, "Technical Specifications (TS)," and Appendix B, "Safeguards License Condition," of the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Independent Spent Fuel Storage Installation (ISFSI), Materials License No. SNM-2502. The proposed changes are administrative, as they delete or update out-dated information.

Attachment I provides an Affirmation as required by 10 CFR 72.16(b).

Attachment II provides a description of the current condition, a description of the proposed changes, a safety assessment that provides a basis for the conclusion that the proposed changes do not involve a genuine issue affecting public health and safety, and an environmental impact consideration which demonstrates that the proposed changes meet the eligibility criteria for categorical exclusion from the requirement to prepare an environmental assessment.

Attachment III provides a markup of the proposed changes. Attachment IV provides the retyped pages for the proposed changes. The changes proposed in Attachment III resulted in the need to repaginate Appendix A. Therefore, Attachment IV provides a retyped version of the entire Appendix A. Each page of Appendix A is expected to be issued with the next amendment number at the bottom, but only the revised text, as provided in Attachment III, will include change bars in the margin.

Progress Energy Carolinas, Inc.
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

NMSS01

NMSS

If you have any questions concerning this matter, please contact me at (843) 857-1253.

Sincerely,

C. T. Baucom
Manager - Support Services - Nuclear

RAC/rac

Attachments:

I. Affirmation
II. Request for Administrative Changes to the Independent Spent Fuel Storage Installation License
III. Markup of Current License Pages
IV. Retyped License Pages

c: Ms. S. E. Jenkins, Manager, Infectious and Radioactive Waste Management Section (SC)
Mr. A. Gantt, Chief, Bureau of Radiological Health (SC)
Dr. W. D. Travers, NRC, Region II
Mr. J. R. Hall, NRC, NMSS
NRC Resident Inspector, HBRSEP
Attorney General (SC)

AFFIRMATION

The information contained in letter RNP-RA/07-0071 is true and correct to the best of my information, knowledge, and belief; and the sources of my information are officers, employees, contractors, and agents of Progress Energy Carolinas, Inc. I declare under penalty of perjury that the foregoing is true and correct.

Executed On: 9/26/07

T. D. Walt
Vice President, HBRSEP, Unit No. 2

H. B. ROBINSON INDEPENDENT SPENT FUEL STORAGE INSTALLATION

REQUEST FOR ADMINISTRATIVE CHANGES TO THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE

Description of Current Condition, Proposed Changes, and Technical Justification

The H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Independent Spent Fuel Storage Installation (ISFSI) License No. SNM-2502 was renewed on March 30, 2005. Each page specifies the renewal date of March 30, 2005 in lieu of amendment numbers. This is the first requested amendment of the renewed license.

The following provides the current wording, proposed changes, and technical justification for the sections that are being revised:

1. Section 1.2 of Appendix A, "Technical Specifications," is titled "Preoperational License Conditions." This section specifies the conditions that had to be met prior to the initial loading of the ISFSI. This section is being deleted because it was only applicable prior to the initial loading. The initial and final loadings were completed in 1989, when the ISFSI was loaded to its full authorized capacity of eight modules (56 fuel assemblies). Current and future dry fuel loadings at HBRSEP, Unit No. 2, are being performed at a separate onsite ISFSI that is licensed under the General License provisions of 10 CFR 72.
2. Table 2-1 of Appendix A specifies a lifting height restriction as 8'. The single apostrophe symbol to designate feet is being replaced with the abbreviation "ft" for clarity.
3. Section 6.1 of Appendix A references four drawings by use of the original vendor drawing numbers. These are being replaced with the corresponding HBRSEP, Unit No. 2, drawing numbers. There have been no changes to the details provided in the current referenced vendor drawings. This is a change to the drawing number for improved document configuration control.
4. Section 1.0 of Appendix B, "Safeguards License Condition," specifies the names of the safeguards plans that must be maintained. This section is being revised to update the names of the plans. The section also provides information as to which plans contain safeguards information. The current wording is inaccurate as the Guard Training and Qualification Plan does include safeguards information. This information is being deleted on the basis that it is unnecessary detail in a license condition.

Safety Assessment and No Genuine Issue Determination

The proposed changes are administrative as they only delete obsolete or unnecessary information, clarify terminology, or revise document titles. There will be no physical changes to the ISFSI as a result of the proposed changes. There will be no revisions to the procedures that affect operation, maintenance, or performance of surveillances on the facility as a result of the proposed changes. The proposed changes have no impact on the safety of the ISFSI. Therefore, the proposed changes do not present a genuine issue as to whether public health and safety will be significantly affected.

Environmental Impact Consideration

Carolina Power and Light Company, also known as Progress Energy Carolinas, Inc., has reviewed the proposed amendment and has concluded that the request is eligible for a categorical exclusion from the requirement to prepare an environmental assessment or an environmental impact statement in accordance with 10 CFR 51.22(c)(10). The basis for this conclusion is that the request will involve issuance of an amendment to an ISFSI license pursuant to Part 72 that is administrative and does not involve a change in the design or operation of the facility.

United States Nuclear Regulatory Commission
Attachment III to Serial: RNP-RA/07-0071
8 pages including cover page

H. B. ROBINSON INDEPENDENT SPENT FUEL STORAGE INSTALLATION

REQUEST FOR ADMINISTRATIVE CHANGES TO THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE

MARKUP OF CURRENT LICENSE PAGES

e. Limiting Conditions: The minimum or maximum functional capabilities or performance levels of equipment required for safe operation of the facility.

f. Surveillance Requirements: Surveillance requirements include: (i) inspection, test, and calibration activities to ensure that the necessary integrity of required systems, components, and the spent fuel in storage is maintained; (ii) confirmation that operation of the installation is within the required functional and operating limits; and (iii) a confirmation that the limiting conditions required for safe storage are met.

g. Metric Tons of Uranium (MTU): Fuel quantity is expressed in terms of the uranium content of the fuel measured in metric tons.

h. Loading Operations: Loading Operations include all cask preparation steps prior to cask transport from the fuel building area.

1.2 PREOPERATIONAL LICENSE CONDITIONS

~~The license issued under Part 72 shall not allow the loading of spent nuclear fuel until such time as the following preoperational license conditions are satisfied:~~

~~1. A training exercise (dry run) of all dry shielded canisters (DSCs), modified IF-300 cask and horizontal storage module (HSM) loading and handling activities, shall be held which shall include but not be limited to those listed below. These tasks need not be performed in the order listed:~~

~~a. Loading DSC in cask.~~

~~b. DSC (length may be truncated) drying, welding, and cover gas backfilling operations.~~

Deleted

c. Moving cask to and aligning and docking with HSM on the storage pad.

d. Insertion of DSC in HSM.

e. Withdrawal of DSC from HSM.

f. Returning the cask to the decontamination pit.

g. Removing the cask lid and cutting open the DSC (length may be truncated) assuming fuel cladding failure.

h. Removing the DSC from the cask.

i. The cask interior shall be decontaminated prior to cask use to the levels specified in Section 2.4.1 of this appendix.

j. All cask handling shall be done using written procedures.

k. The activities listed above shall be performed or modified to show that each activity can be successfully executed prior to actual fuel loading.

2. The HBR Steam Electric Plant Unit 2 Emergency Plan shall be reviewed and modified as required to include the ISFSI. (Abnormal event notifications will have to be updated for ISFSI events.)

3. As required by Subpart H, a Physical Security Plan shall be established to implement a physical protection program for the ISFSI. Further, the HBR Steam Electric Plant Unit 2 Safeguards Contingency Plan and the Guard Training and Qualification Plan shall be modified as necessary to incorporate commitments to support the ISFSI.

~~4. A training module shall be developed for the HBR Steam Electric Plant Unit Training Program establishing an ISFSI Training and Certification Program which will include the following:~~

~~a. DSC and HSM Design (overview)~~

~~b. ISFSI Facility Design (overview)~~

~~c. ISFSI Safety Analysis (overview)~~

~~d. Fuel loading and DSC and cask handling procedures and abnormal procedures~~

~~e. ISFSI License (overview).~~

~~5. The HBR plant health physics procedures shall be reviewed and modified as required to include the ISFSI.~~

~~6. The HBR plant Administrative Procedures shall be reviewed and modified as required to include the ISFSI.~~

~~7. A procedure shall be developed for the documentation of the characterizations performed to select spent fuel to be stored in the canisters and modules.~~

~~8. Written operating and abnormal/emergency procedures shall be prepared.~~

1.3 GENERAL LICENSE CONDITIONS

1.3.1 Quality Assurance

The design, construction, and operation of the ISFSI shall be accomplished in accordance with the U.S. Nuclear Regulatory Commission (NRC) regulations specified in Title 10 of the U.S. Code of Federal Regulations. All commitments to the applicable NRC Regulatory Guides and to engineering and construction codes shall be carried out.

TABLE 2-1
OPERATING LIMITS

	Operating Limit
Max. Lifting Height with a Non-Redundant Lifting Device for IF-300 Cask	8~~'~~ ft
Dose Rate • Surface of HSM	≤ 200 mrem/hr
(These limits conform to transportation cask dose rate limits. Actual dose rates for most surface locations on the loaded HSM will be significantly less.)	
DSC Tightness	
(Standard He-Leak Rate) • Primary End Plug Closure Weld	$\leq 10^{-5}$ atm-cc/s
• Prefabricated Plug Weld	$\leq 10^{-5}$ atm-cc/s
• Secondary Closure Weld	Dye Penetrant Test (ASME B&PV Code Section III, Division 1, Subsection NB-5350 (1983) Liquid Penetrant Acceptance Standards)
Max. Specific Power of One Fuel Assembly*	1.0kW
Max. Cladding Temperature during storage*	380°C
Helium Pressure Limit (DSC Cavity)	0.0 psig ±0.5 psig (stable for 30 min after filling)
Pressure during Canister Drying (DSC Cavity)	≤ 3 torr (for not less than 10 min)

*These limits may be analytically determined.

6.0 MONITORING

Monitoring equipment may be installed in some or all DSCs & HSMs according to the manufacturer's and Carolina Power and Light Company's engineering department's recommendations. This equipment may include thermocouples. These devices do not perform a safety function and are not needed to ensure the proper operation of the ISFSI. However, they may be installed to provide an extra level of assurance in view of the limited experience available with this method of fuel storage at the time of this application.

This section provides proposed commitments to ensure that these instruments, although not important to safety, perform their intended functions.

6.1 THERMOCOUPLES

6.1.1 Specification

a. Thermocouples will be functionally checked before placement in storage per manufacturer's recommendations.

b. The DSC thermocouples will be connected to an external cable by means of a specially designed feed-through. This feed-through incorporates the redundant seal philosophy used in the DSC containment design. Details are shown in Drawings ~~RNT-162-M-2600~~HBR2-10671, Sheets 1 and 2, and ~~RNT-162-M-2609~~HBR2-10680. After the penetration plug assembly has been welded to the bottom of the DSC cover plate, a sleeve will be welded over the plug, forming a redundant seal. Thermocouple sheaths will likewise be brazed to the plug assembly at inner and outer surfaces of the penetrations. To preclude possible leakage through the aluminum oxide insulation, each end of the sheathed thermocouples will be sealed with an environmentally qualified resin. A leakage test will be performed (standard He leak rate $\leq 10^{-5}$ atm-cc/s) on the sealed DSC prior to loading operations.

c. HSM instrumentation will consist of thermocouples cast in place in the concrete and others attached to the surface and at various locations on the heat shield. Details of the HSM instrumentation are shown on drawings ~~RNT-162-C1113~~HBR2-10607 and ~~RNT-162-C-1114~~HBR2-10608.

6.1.2 Basis

Emplacement of monitoring equipment must not compromise the design integrity of the DSC or HSM.

1.0 SAFEGUARDS

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Physical Security Plan, ~~and~~ Safeguards Contingency Plan, and the Guard Training and Qualification Plan, including amendments made pursuant to the authority of 10 CFR 72.56 and
10 CFR 72.186, which are part of the license. ~~The Physical Security and Safeguards Contingency Plan contains safeguards information protected under 10 CFR 73.21. The Training and Qualification Plan is a declassified document that does not contain safeguards information.~~

United States Nuclear Regulatory Commission
Attachment IV to Serial: RNP-RA/07-0071
18 pages including cover page

H. B. ROBINSON INDEPENDENT SPENT FUEL STORAGE INSTALLATION

REQUEST FOR ADMINISTRATIVE CHANGES TO THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION LICENSE

RETYPED LICENSE PAGES

TABLE OF CONTENTS

1.0 INTRODUCTION

These Technical Specifications govern the safety of the receipt, possession, and storage of irradiated nuclear fuel at the H. B. Robinson (HBR) Independent Spent Fuel Storage Installation (ISFSI) and the transfer of such irradiated nuclear fuel to and from Unit 2 of the HBR Steam Electric Plant and the HBR Independent Spent Fuel Storage Installation.

1.1 DEFINITIONS

The following definitions apply for the purpose of these Technical Specifications.

a. Administrative Controls: Provisions relating to organization and management procedures, recordkeeping, review and audit, and reporting necessary to assure that the operations involved in the storage of spent fuel at the HBR ISFSI are performed in a safe manner.

b. Design Features: Features of the facility associated with the basic design such as materials of construction, geometric arrangements, dimensions, etc., which, if altered or modified, could have a significant effect on safety.

c. Functional and Operating Limits: Limits on fuel handling and storage conditions necessary to protect the integrity of the stored fuel, to protect employees against occupational exposures, and to guard against the uncontrolled release of radioactive materials.

d. Fuel Assembly: The unit of nuclear fuel in the form that is charged or discharged from the core of a light-water reactor (LWR). Normally will consist of a rectangular arrangement of fuel rods held together by end fittings, spacers, and tie rods.

e. Limiting Conditions: The minimum or maximum functional capabilities or performance levels of equipment required for safe operation of the facility.

f. Surveillance Requirements: Surveillance requirements include: (i) inspection, test, and calibration activities to ensure that the necessary integrity of required systems, components, and the spent fuel in storage is maintained; (ii) confirmation that operation of the installation is within the required functional and operating limits; and (iii) a confirmation that the limiting conditions required for safe storage are met.

g. Metric Tons of Uranium (MTU): Fuel quantity is expressed in terms of the uranium content of the fuel measured in metric tons.

h. Loading Operations: Loading Operations include all cask preparation steps prior to cask transport from the fuel building area.

1.2 PREOPERATIONAL LICENSE CONDITIONS

Deleted

1.3 GENERAL LICENSE CONDITIONS

1.3.1 Quality Assurance

The design, construction, and operation of the ISFSI shall be accomplished in accordance with the U.S. Nuclear Regulatory Commission (NRC) regulations specified in Title 10 of the U.S. Code of Federal Regulations. All commitments to the applicable NRC Regulatory Guides and to engineering and construction codes shall be carried out.

1.3.2 Fuel and Cask Handling Activities

Fuel and cask movement and handling activities which are to be performed in the HBR plant Fuel Handling Building will be governed by the requirements of the HBR Steam Electric Plant Unit 2 Facility Operating License (DPR-23) and associated Technical Specifications.

1.3.3 Administrative Controls

The HBR ISFSI is located on the HBR plant site and will be managed and operated by the HBR plant staff. The administrative controls shall be in accordance with the requirements of the HBR Steam Electric Plant Unit 2 Facility Operating License (DPR-23) and associated Technical Specifications.

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 FUEL TO BE STORED AT ISFSI

2.1.1 Specification

The spent nuclear fuel to be received and stored at the HBR ISFSI shall meet the following requirements:

(1) Only fuel irradiated at the HBR Unit No. 2 may be used.

(2) Maximum initial enrichment shall not exceed 3.5 weight percent U-235.

(3) Maximum assembly average burnup shall not exceed 35,000 megawatt-days per metric ton uranium.

(4) Maximum heat generation rate shall not exceed 1 kilowatt per fuel assembly.

(5) Fuel shall have cooled a minimum of 5 years after reactor discharge and prior to storage in the HBR ISFSI.

(6) Fuel shall be intact unconsolidated fuel.

(7) Maximum assembly mass shall not exceed 660 kilograms.

(8) Prior to insertion of a spent fuel assembly into a DSC, the identity of the assembly shall be independently verified.

2.1.2 Basis

The design criteria and subsequent safety analysis of the HBR ISFSI assumed certain characteristics and limitations for the fuels that are to be received and stored. Specification 2.1.1 assures that these bases remain valid by defining the source of the spent fuel, maximum initial enrichment, irradiation history, maximum thermal heat generation, and minimum post irradiation cooling time.

The radiological analyses are based on a radiation spectrum for 3.5 weight percent U-235 fuel at 35,000 MWD/MTU burnup. Compliance with the enrichment and burnup limits will ensure that the Dry Storage Casks design criteria are not exceeded.

2.2 DRY SHIELDED STORAGE CANISTER (DSC)

2.2.1 Specification

The DSCs used to store spent nuclear fuel in HSMs at the HBR ISFSI shall have the operating limits shown in Table 2-1.

2.2.2 Basis

The design criteria and subsequent safety analysis of the DSC assumed certain characteristics and operating limits for the use of the DSC. This specification assures that those design criteria are not exceeded.

2.3 DRY SHIELDED CANISTER INTERNAL COVER GAS

2.3.1 Specification

The DSC shall be backfilled with helium.

2.3.2 Basis

The thermal analysis performed for the DSC assumes the use of helium as a cover gas. In addition, the use of an inert gas (helium) is to ensure long-term maintenance of fuel clad integrity.

2.4 DRY SHIELDED CANISTER SURFACE CONTAMINATION

2.4.1 Specification

Removable contamination on the DSC shall be less than 220,000 dis/min/100 cm^2, from beta, gamma sources and 2,200 dis/min/100 cm^2 from alpha sources. Surveillance requirement 4.5.1 ensures that this requirement will be met.

2.4.2 Basis

Compliance with this limit ensures that the offsite dose limits in 10 CFR Part 20, 10 CFR Part 50 - Appendix I, 10 CFR Part 72, and 40 CFR Part 190 are met.

TABLE 2-1
OPERATING LIMITS

	Operating Limit
Max. Lifting Height with a Non-Redundant Lifting Device for IF-300 Cask	8 ft
Dose Rate • Surface of HSM	≤ 200 mrem/hr
(These limits conform to transportation cask dose rate limits. Actual dose rates for most surface locations on the loaded HSM will be significantly less.)	
DSC Tightness	
(Standard He-Leak Rate)	
• Primary End Plug Closure Weld	$\leq 10^{-5}$ atm-cc/s
• Prefabricated Plug Weld	$\leq 10^{-5}$ atm-cc/s
• Secondary Closure Weld	Dye Penetrant Test (ASME B&PV Code Section III, Division 1, Subsection NB-5350 (1983) Liquid Penetrant Acceptance Standards)
Max. Specific Power of One Fuel Assembly*	1.0kW
Max. Cladding Temperature during storage*	380°C
Helium Pressure Limit (DSC Cavity)	0.0 psig ±0.5 psig (stable for 30 min after filling)
Pressure during Canister Drying (DSC Cavity)	≤ 3 torr (for not less than 10 min)

*These limits may be analytically determined.

3.0 LIMITING CONDITIONS

3.1 LIMITING CONDITION - HANDLING HEIGHT

3.1.1 Specification

This specification applies to handling of a cask being used for spent fuel storage outside of the Fuel Handling Building and its cask decontamination area.

a. IF-300 cask with its attached HSM docking collar and lid and without an impact limiter shall not be handled at a height of greater than 8 feet.

b. In the event of a cask drop from a height greater than 15 in., fuel in a DSC in the cask shall be removed and inserted into a replacement DSC or returned to the spent fuel pool if damaged. The damaged DSC shall be decontaminated, removed from service, and disposed of, as may be appropriate.

3.1.2 Basis

The drop analyses performed for cask drop incidents for a DSC loaded in a modified IF-300 cask confirm that drops up to 8 feet can be sustained without unacceptable damage to the cask and DSC. This limiting condition ensures that the handling height limits will not be exceeded at the storage pad or in transit to and from the spent fuel pool. Design of the DSC is to ASME B & PV Code Section III, Division 1, Subsection NB for Class 1 components, Service Level D requirements.

4.0 SURVEILLANCE REQUIREMENTS

Requirements for surveillance of various radiation levels, cask internal pressure, contamination levels, DSC weld leak rates, and fuel related leak parameters are contained in this section. These requirements are summarized in Table 4-1 from details contained in Section 4.1 through 4.4.

TABLE 4-1

SURVEILLANCE REQUIREMENTS SUMMARY

Section	Quantity or Item	Period
4.1.1	Surveillance of the HSM Air Inlets and Outlets	D
4.2.1	Dose Rates (HSM surface)	M
4.3.1	Limits for Maximum Air Temperature Rise after Storage	I
4.4.1	Fuel Parameters	P
4.5.1	DSC and Cask Contamination	L
4.6.1	DSC Weld Testing	L
4.7.1	HSM Inspection	N/A
4.8.1	DSC Pressure	L

P - Prior to cask loading
L - During loading operations
D - Daily
M - During maintenance operations
I - At initial storage, 24 hours later, 7 days later
N/A - Not required

4.1 SURVEILLANCE OF THE HSM AIR INLETS AND OUTLETS

The HSM shall be inspected to verify that the air inlets and outlets are free from obstructions.

4.1.1 Specifications

Normal visual inspection frequency	Daily
Accident visual inspection frequency	Within 24 hours after an accident

4.1.2 Basis

To assure that no HSM air inlets or outlets are plugged for more than 48 hours and to assure that complete blockage of all inlets and exits due to an accident will be removed in less than 48 hours. Analysis in Chapter 8 of the HBR ISFSI SAR showed that no temperature limits are exceeded if a module is completely plugged for 48 hours. Therefore, for normal operations, an inspection of the inlets once per day will assure that any local obstructions can be removed. Likewise, after an accident, the HSMs should be examined within 24 hours to assure that air flow can be restored within 48 hours after the accident.

4.2 LIMITS FOR THE SURFACE DOSE RATE OF THE HSM DURING STORAGE

4.2.1 Specification

Surface dose rates at the following locations

(1)	Outside of HSM door on centerline of DSC	200 mrem/hr
(2)	Center of air inlets	200 mrem/hr
(3)	Center of air outlets	200 mrem/hr

Average Dose rates for the following surfaces

(1)	Roof	50 mrem/hr
(2)	Front/Back	50 mrem/hr
(3)	Side	50 mrem/hr

The HSM shall be monitored to verify that this specification has been met immediately after the DSC is placed in storage and the HSM front and rear accesses are closed.

4.2.2 Basis

The dose rates stated in this specification were selected to maintain as-low-as-is-reasonably-achievable exposures to personnel performing air duct clearing on the HSM. These dose rates are within industry accepted standards for contact handling, operation and maintenance of radioactive material. Personnel will be required to remove any potential air blockage. At 200 mrem/hr, the dose for a one hour job of unblocking the air inlets (or outlets) would be less than 200 mrem

(whole body) and, hence, would be only 4% of the total yearly burden. Furthermore, analysis provided in Chapter 7 of the HBR ISFSI SAR shows that the expected dose rates around the HSM surface will be well below the specifications listed above.

4.3 LIMITS FOR THE MAXIMUM AIR TEMPERATURE RISE

4.3.1 Specification

Maximum air temperature rise 100°F (55.6°C). The maximum air temperature rise from HSM inlet to outlet shall be checked at the time the DSC is stored in the HSM, again 24 hours later, and again after 7 days.

4.3.2 Basis

The 100°F (55.6°C) temperature rise was selected to limit the hottest rod in the DSC to below 716°F (380°C). If this temperature rise is maintained, then the hottest rod will be below the 716°F (380°C) limit even on the hottest day conditions of 125°F (51.7°C). The expected temperature rise is less than 100°F (i.e., 82°F (45.5°C); see Section 8.1.3 of HBR ISFSI SAR) and hence, the current design provides adequate margin for this specification. If the temperature rise is within the specifications, then the HSM and DSC are performing as designed and no further temperature measurements are required during normal surveillance.

4.4 FUEL PARAMETERS

4.4.1 Specifications

Type	15 x 15 PWR Fuel
Burnup	≤ 35,000 Mwd/MT
Initial (Beginning of Life) Enrichment	≤ 3.5% U-235
Heat generation	≤ 1.0 kW/fuel assembly
Fuel cooling period	≥ 5 years
Total fuel assembly mass	≤ 660 kg

This specification is applicable to all fuel to be stored in the ISFSI. This information shall be documented for each fuel assembly to be loaded in a DSC.

4.4.2 Basis

This specification was derived to insure that the peak fuel rod temperatures, surface doses, nuclear subcriticality and mass are below the design values.

4.5 DSC AND CASK CONTAMINATION

4.5.1 Specification

4.5.1.1

Prior to loading, the cask interior shall be smeared to ensure that removal contamination levels on the interior surfaces of the cask, excluding the drain and vent lines, are less than 22,000 dis/min/100cm^2, from beta, gamma sources, and 220 dis/min/100cm^2 from alpha sources.

4.5.1.2

After cask loading, but prior to moving the cask to the HSM, the top of the sealed DSC shall be smeared to ensure that removable contamination levels are less than 22,000 dis/min/100cm^2 from the beta, gamma sources, and 220 dis/min/100cm^2 from alpha sources. The cask exterior shall be smeared to ensure that removable contamination levels are less than 2,200 dis/min/100cm^2 from beta, gamma sources, and 220 dis/min/100cm^2 from alpha sources. This will ensure that the limits in 2.4.1 are met.

4.5.1.3

After cask unloading, the interior surfaces of the cask shall be smeared to ensure that removable contamination levels on the interior surfaces of the cask, excluding the drain and vent lines, are less than 220,000 dis/min/100cm^2 from beta, gamma sources and 2,200 dis/min/100cm^2 from alpha sources. This will ensure that the limits in 2.4.1 are met.

4.5.2 Basis

This surveillance requirement will ensure compliance with the DSC surface contamination limits of 2.4.1.

4.6 DSC WELD TESTING

4.6.1 Specification

During DSC loading operations, the primary plug closure and the prefabricated plug welds shall be tested using a helium leak detector to ensure that, for each leak, tightness is less than or equal to 10^{-5} atm-cc/s. The DSC secondary weld will be dye penetrant tested.

4.6.2 Basis

The safety analysis of leak tightness of the DSC as discussed is based on a weld being leak tight to 10^{-5} atm-cc/s. This check is done to ensure compliance with this design criteria.

4.7 HSM INSPECTION

4.7.1 Specification

No visual inspection of the interior concrete surfaces of the HSM is required.

4.7.2 Basis

Analysis of the HBR HSM shows the normal concrete temperature is below the point at which the potential for concrete deterioration or degradation would start, provided no subsequently loaded HSM stores spent fuel such that the total initial heat generation rate for the DSC stored exceeds that for the DSC in the first HSM loaded.

4.8 DSC PRESSURE

4.8.1 Specification

The helium backfill pressure in the DSC cavity shall be 0.0 psig ± 0.5 psig (stable for 30 minutes after filling).

4.8.2 Basis

The value of 0.0 psig was selected to assure that the pressure within the DSC is within pressure design limits of 25 psig during any expected normal operating condition.

5.0 DESIGN FEATURES

The HBR2 ISFSI design approval was based upon review of specific design drawings, some of which have been deemed appropriate for inclusion in the Technical Specifications. The drawings listed below have been reviewed and approved by the NRC either as part of the original license or in subsequent license amendments. This listing is provided for historical purposes; these drawings may be revised under the provisions of 10 CFR 72.48 as appropriate.

Drawings #	Rev. #	Title
RNT-162-C-1100	A	ISFSI (HSM) Horizontal Storage Module Site Plan
RNT-162-M-2701	A	ISFSI Cask Collar
RNT-162-M-2702	A	ISFSI Cask Collar Lid
RNT-162-M-2500	A	ISFSI DSC Assembly
RNT-162-M-2501	A	ISFSI DSC Basket Assembly
RNT-162-M-2402	P2	ISFSI NUHOMS Module Dimensions
RNT-162-C-1101	A	ISFSI Horizontal Storage Modules (HSM) General Layout and Details
RNT-162-C-1102	A	ISFSI HSM Foundation Plan, Sections and Details
RNT-162-M-2600	C	ISFSI Instrumented DSC Assembly
RNT-162-M-2609	E	ISFSI Instrumented DSC Penetration Plug Assembly
RNT-162-C-1113	A	ISFSI HSM Thermocouple Locations, Sections and Details
RNT-162-C-1114	A	ISFSI HSM Heat Shield Thermocouple Locations Plan, Sections and Details

5. 1 SITE

5.1.1 Specification

The HBR ISFSI is located on the HBR Steam Electric Plant Unit 2 site as shown in ISFSI SAR Figure 1.1-2, Plot Plan.

5.2 CASK DESIGN

5.2.1 Specification

The cask used in the HBR ISFSI to transfer the DSC to the HSM shall be an IF-300 cask modified with docking collar and lid as shown in Drawing Nos. HBR2-10704 and HBR2-10705, entitled ISFSI Cask Collar and ISFSI Cask Collar Lid, respectively.

5.3 DSC DESIGN

5.3.1 Specification

The DSC shall be as shown in Drawing Nos. HBR2-10656, ISFSI DSC Assembly, and HBR2-10657, ISFSI DSC Basket Assembly.

All components comprising the DSC pressure boundary shall be provided from ASME SA 240, Type 304 stainless steel or its equivalent.

The boron content of the DSC guide sleeves shall contain a minimum effective B-10 loading of 0.004 g/cm^2 over the length of the active fuel.

5.4 HSM DESIGN

5.4.1 Specification

The HSM shall be as shown in Drawing Nos. RNT-162-M-2402, ISFSI NUHOMS Module Dimensions, and RNT-162-C-1101, ISFSI Horizontal Storage Modules (HSM) General Layout and Details.

The HSM shall be constructed of concrete with a compressive strength greater than or equal to 4000 psi (cured for 28 days; 90 percent of all specimens tested) and a minimum unit weight of 145 pounds per cubic foot. The concrete shall be composed of Type II Portland cement meeting the requirements of ASTMC150. The aggregate shall meet the specifications of ASTMC33.

5.5 STORAGE PAD

5.5.1 Specification

As shown in Drawing Nos. RNT-162-C-1102, ISFSI HSM Foundation Plan, Sections and Details, and No. 87081-C-1202, Sheet 1 of 2, HSM Foundation Plan, Sections and Details, the ISFSI storage pads are reinforced concrete pads nominally 3-feet thick with a 2-foot thick unloading slab starting at 5 feet from the front end of the HSM for vehicle access. An 8-inch thick hydraulic ram mounting slab is situated at the rear of the modules. One storage pad supports three HSMs; the second storage pad supports five HSMs. Design criteria of the storage pads are contained in Section 8 of the HBR ISFSI SAR.

5.6 TOTAL STORAGE CAPACITY

5.6.1 Specification

The total storage capacity of the HBR ISFSI is 25.70 MTU.

6.0 MONITORING

Monitoring equipment may be installed in some or all DSCs & HSMs according to the manufacturer's and Carolina Power and Light Company's engineering department's recommendations. This equipment may include thermocouples. These devices do not perform a safety function and are not needed to ensure the proper operation of the ISFSI. However, they may be installed to provide an extra level of assurance in view of the limited experience available with this method of fuel storage at the time of this application.

This section provides proposed commitments to ensure that these instruments, although not important to safety, perform their intended functions.

6.1 THERMOCOUPLES

6.1.1 Specification

a. Thermocouples will be functionally checked before placement in storage per manufacturer's recommendations.

b. The DSC thermocouples will be connected to an external cable by means of a specially designed feed-through. This feed-through incorporates the redundant seal philosophy used in the DSC containment design. Details are shown in Drawings HBR2-10671, Sheets 1 and 2, and HBR2-10680. After the penetration plug assembly has been welded to the bottom of the DSC cover plate, a sleeve will be welded over the plug, forming a redundant seal. Thermocouple sheaths will likewise be brazed to the plug assembly at inner and outer surfaces of the penetrations. To preclude possible leakage through the aluminum oxide insulation, each end of the sheathed thermocouples will be sealed with an environmentally qualified resin. A leakage test will be performed (standard He leak rate $\leq 10^{-5}$ atm-cc/s) on the sealed DSC prior to loading operations.

c. HSM instrumentation will consist of thermocouples cast in place in the concrete and others attached to the surface and at various locations on the heat shield. Details of the HSM instrumentation are shown on drawings HBR2-10607 and HBR2-10608.

6.1.2 Basis

Emplacement of monitoring equipment must not compromise the design integrity of the DSC or HSM.

1.0 SAFEGUARDS

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved Physical Security Plan, Safeguards Contingency Plan, and the Guard Training and Qualification Plan, including amendments made pursuant to the authority of 10 CFR 72.56 and 10 CFR 72.186, which are part of the license.