E-42575

Enclosure 9

CoC 1004 Amendment 8

Technical Specifications

Markup for Revision 1

ATTACHMENT A

TECHNICAL SPECIFICATIONS

TRANSNUCLEAR, INC.

STANDARDIZED NUHOMS® HORIZONTAL MODULAR STORAGE SYSTEM

CERTIFICATE OF COMPLIANCE NO. 1004

AMENDMENT NO. 8

DOCKET 72-1004

REVISION 1

3. The horizontal and vertical seismic acceleration levels of 0.25g and 0.17g, respectively.

4. The analyzed flood condition of 15 fps water velocity and a height of 50 feet of water (full submergence of the loaded HSM DSC).

5. The potential for fire and explosion should be addressed, based on site-specific considerations.

6. The HSM foundation design criteria are not included in the FSAR. Therefore, the nominal FSAR design or an alternative should be verified for individual sites in accordance with 10 CFR 72.212(b)(2)(ii). Also, in accordance with 10 CFR 72.212(b)(3), the foundation design should be evaluated against actual site parameters to determine whether its failure would cause the standardized NUHOMS® system to exceed the design basis accident conditions.

7. The potential for lightning damage to any electrical system associated with the standardized NUHOMS® system (e.g., thermal performance monitoring) should be addressed, based on site-specific considerations.

8. Any other site parameters or consideration that could decrease the effectiveness of cask systems important to safety.

In accordance with 10 CFR 72.212(b)(2), a record of the written evaluations must be retained by the licensee until spent fuel is no longer stored under the general license issued under 10 CFR 72.210.

1.1.2 Operating Procedures

Written operating procedures shall be prepared for cask handling, loading, movement, surveillance, and maintenance. The operating procedures suggested generically in the FSAR should provide the basis for the user's written operating procedure. The following additional procedure requested by NRC staff should be part of the user operating procedures:

> If fuel needs to be removed from the DSC, either at the end of service life or for inspection after an accident, precautions must be taken against the potential for the presence of damaged or oxidized fuel and to prevent radiological exposure to personnel during this operation. This can be achieved with this design by the use of the purge and fill valves which permit a determination of the atmosphere within the DSC before the removal of the inner top cover and shield plugs, prior to filling the DSC cavity with water (borated water for the 24P or 32PT or 24PHB or 24PTH). If the atmosphere within the DSC is helium, then operations should proceed normally with fuel removal either via the transfer cask or in the pool. However, if air is present within the DSC, then appropriate filters should be in place to preclude the uncontrolled release of any potential airborne radioactive particulate from the DSC via the purge-fill valves. This will protect both personnel and the operations area from potential contamination. For the accident case, personnel protection in the form of respirators or supplied air should be considered in accordance with the licensee's Radiation Protection Program.

, if available

1.2.8 HSM Maximum Air Exit Temperature with a Loaded 24P, 52B, 61BT, 32PT, 24PHB or 24PTH-S-LC Only

Limit/Specification:

Following initial DSC transfer to the HSM or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 100°F for ≥5 year cooled fuel, when fully loaded with 24 kW heat.

Applicability: This specification is applicable to all HSMs stored in the ISFSI. If a DSC is placed in the HSM with a heat load less than 24 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in the FSAR and SER.

Objective: The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM concrete do not exceed the temperatures calculated in Section 8 of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 100°F (with a thermal heat load of 24 kW), the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.

Action: If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the Specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.

The cask may be unloaded into the spent fuel pool, if one is available. If a spent fuel pool is not available, alternate means shall be employed to reduce cask temperatures.

Surveillance: The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 24 kW, then the HSM and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.

Basis: The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

1.2.8a HSM-H Maximum Air Exit Temperature with a Loaded 24PTH DSC

Limit/Specification:

Following initial DSC transfer to the HSM-H or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 100°F when fully loaded with 40.8 kW heat for 24PTH-S or 24PTH-L DSC (or 70ºF when fully loaded with 24PTH-S-LC DSC).

Applicability: This specification is applicable to all HSM-H modules stored in the ISFSI. If a DSC is placed in the HSM-H with a heat load less than 40.8 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in Appendix P of the FSAR.

Objective: The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM-H concrete do not exceed the temperatures calculated in Appendix P of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 100°F with a thermal heat load of 40.8 kW for 24PTH-S or 24PTH-L DSC (or 70ºF with a thermal heat load of 24.0 kW for 24PTH-S-LC), the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.

Action: If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM-H cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.

The cask may be unloaded into the spent fuel pool, if one is available. If a spent fuel pool is not available, alternate means shall be employed to reduce cask temperatures.

Surveillance: The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM-H or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 40.8 kW for 24PTH-S or 24PTH-L DSC (or 24.0 kW for 24PTH-S-LC DSC) then the HSM-H and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.

Basis: The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

, the DSC and TC

1.2.10 TC/DSC Handling Height Outside the Spent Fuel Pool Building

Limit/Specification:

1. When handling a loaded TC/DSC at a height greater than 80 inches outside the spent fuel pool building, a special lifting device that has at least twice the normal stress design factor for handling heavy loads, or a single failure proof handling system shall be used.

2. In the event of a drop of a loaded TC/DSC from a height greater than 15 inches: ~~(a) fuel in the DSC shall be returned to the reactor spent fuel pool; (b) the DSC shall be removed from service and evaluated for further use; and (c) the TC~~ shall be inspected for damage and evaluated for further use.

Applicability: The specification applies to handling the TC, loaded with the DSC, on route to, and at, the storage pad.

Objective:

1. To preclude a loaded TC/DSC drop from a height greater than 80 inches.

2. To maintain spent fuel integrity, according to the spent fuel specification for storage, continued confinement integrity, and DSC functional capability, after a tip-over or drop of a loaded DSC from a height greater than 15 inches.

Surveillance: In the event of a loaded TC/DSC drop accident, the system will be ~~returned to the reactor fuel handling building, where, after the fuel has been returned to the spent fuel pool, the DSC and TC will be~~ inspected and evaluated for future use.

Basis: The NRC evaluation of the TC/DSC drop analysis concurred that drops up to 80 inches, of the DSC inside the TC, can be sustained without breaching the confinement boundary, preventing removal of spent fuel assemblies, or causing a criticality accident. This specification ensures that handling height limits will not be exceeded in transit to, or at the storage pad. Acceptable damage may occur to the TC, DSC, and the fuel stored in the DSC, for drops of height greater than 15 inches. The specification requiring inspection of the DSC ~~and fuel~~ following a drop of 15 inches or greater ensures that the spent fuel will continue to meet the requirements for storage, the DSC will continue to provide confinement, and the TC will continue to provide its design functions of DSC transfer and shielding.

1.3.2 HSM or HSM-H Thermal Performance

Surveillance: Verify a temperature measurement of the thermal performance, for each HSM or HSM-H , on a daily basis. The temperature measurement could be any parameter such as (1) a direct measurement of the HSM or HSM-H temperatures, (2) a direct measurement of the DSC temperatures, (3) a comparison of the inlet and outlet temperature difference to predicted temperature differences for each individual HSM or HSM-H, or (4) other means that would identify and allow for the correction of off-normal thermal conditions that could lead to exceeding the concrete and fuel clad temperature criteria. If air temperatures are measured, they must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures. Also due to the proximity of adjacent HSM or HSM-H modules, care must be exercised to ensure that measured air temperatures reflect only the thermal performance of an individual module, and not the combined performance of adjacent modules.

Action: If the temperature measurement shows a significant unexplained difference, so as to indicate the approach of materials to the concrete or fuel clad temperature criteria, take appropriate action to determine the cause and return the canister to normal operation. If the measurement or other evidence suggests that the concrete accident temperature criteria (350°F) has been exceeded for more than 24 hours, the HSM or HSM-H must be removed from service unless the licensee can provide test results in accordance with ACI-349, appendix A.4.3, demonstrating that the structural strength of the HSM or HSM-H has an adequate margin of safety.

Basis: The temperature measurement should be of sufficient scope to provide the licensee with a positive means to identify conditions which threaten to approach temperature criteria for proper HSM or HSM-H operation and allow for the correction of off-normal thermal conditions that could lend to exceeding the concrete and fuel clad temperature criteria.

If the HSM is removed from service, one option is to unload the cask into the spent fuel pool, if one is available. If a spent fuel pool is not available, alternate means shall be employed to reduce cask temperatures.