

February 3, 2006

Mr. Anthony L. Patko  
Director, Licensing Engineering  
NAC International  
3930 East Jones Bridge Road, Suite 200  
Norcross, GA 30092

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9235 FOR THE MODEL NO. NAC-STC  
PACKAGE - REQUEST FOR ADDITIONAL INFORMATION

Dear Mr. Patko:

This refers to your application dated August 4, 2005, as supplemented November 1, 2005, requesting amendment of Certificate of Compliance No. 9235 for the Model No. NAC-STC package.

In connection with our review, we need the information identified in the enclosure to this letter. Additional information requested by this letter should be submitted in the form of revised pages. To assist us in scheduling staff review of your response, we request that you provide this information by March 3, 2006. If you are unable to provide a response by that date, our review may be delayed.

If your response properly addresses the staff's questions, the staff estimates that the amended approval and its Safety Evaluation Report will be issued in April 2006.

If you have any questions regarding this matter, we would be pleased to discuss them via teleconference or meet with you and your staff. I may be contacted at (301) 415-8500.

Sincerely,

/RA/

José R. Cuadrado, Project Engineer  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 71-9235  
TAC No. L23885

Enclosure: Request for Additional Information

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## **Request for Additional Information**

**Docket No. 71-9235  
Model No. NAC-STC Package  
Certificate of Compliance No. 9235**

By application dated August 4, 2005, as supplemented November 1, 2005, NAC International (NAC) requested amendment of Certificate of Compliance No. 9235 for the Model No. NAC-STC package. This request identifies additional information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in connection with its review of the application. NUREG-1617, "Standard Review Plan for Transportation Packages for Spent Nuclear Fuel" was used by the staff in its review of the application. This request describes information needed by the staff for it to complete its review of the application and to determine whether the applicant has demonstrated compliance with regulatory requirements. The requested information is listed by chapter number and title in NUREG-1617.

### **Chapter 1 - General Information**

- 1-1 Verify the surface contamination requirements, as described in Item 8 of Section 1.2.3 of the Safety Analysis Report (SAR).

The requirement of surface contamination stated in Item 8 on page 1.2-22 relating to CFR is quoted as 10 CFR 71.87(l)(1). The staff reviewed 10 CFR Part 71 and found that there is no such provision in the regulations. This information should be corrected.

This information is needed to satisfy the requirements of 10 CFR 71.33.

### **Chapter 2 - Structural**

- 2-1 Clarify entries to Table 2.6.15.4-1 of the SAR to ensure that loading conditions are correctly identified and the stress summary tables are properly referenced.

The loading conditions, "Top End Drop, Pressure + Inertia," for stress intensities  $P_m$  and  $P_m + P_b$ , are inconsistent with those described in SAR Page 2.6.15.4-1, where the bounding conditions are stated to be the top end and bottom end drops without pressure. Also, the minimum margins of safety listed in Table 2.6.15.4-1 are not found in the specific table references listed for each end drop condition.

This information is needed to satisfy the requirements of 10 CFR 71.33.

### **Chapter 3 - Thermal**

- 3-1 Provide the projected maximum number of fuel assemblies, per cask loading, that could have stainless steel rods inserted into the RCCA guide tubes. If the majority of fuel assemblies in any given cask loading could have stainless steel rods inserted, describe, either quantitatively or qualitatively, how the current thermal analysis of the NAC-STC would be effected by the addition of the maximum possible number of stainless steel rods.

The proposed change to allow the insertion of solid stainless steel rods into Connecticut Yankee intact and damaged fuel assembly RCCA guide tubes that do not contain a RCCA could have an impact on the thermal performance of the cask system. The staff needs assurance that the thermal effects of this proposed amendment have been considered.

This information is needed to assure compliance with 10 CFR 71.7.

#### **Chapter 4 - Containment**

- 4-1 Revise the containment allowable leakage rate calculation in Section 4 of the SAR to list all relevant assumptions regarding the bounding fuel assembly, including the assumed assembly average power, burn time, and cool time for each cycle. Also, explain how each of the relevant fuel assembly assumptions are bounding with respect to containment of radioactive material.

Section 4.2 of the SAR gives basic bounding fuel assembly characteristics such as lattice type, average burnup, enrichment, and cool time, but does not give an assembly average power, burn time, and cool time for each cycle assumed for the source term determination. Also, Section 4.2 states that the source term of the reference fuel assembly bounds the licensed inventory as described in the shielding analysis of Section 5. However, it is not clear that the source term which is bounding for the shielding analysis is also bounding for the containment analysis.

This information is needed in order to determine that the Model No. NAC-STC meets the containment requirements of 10 CFR Part 71.51(a).

- 4-2 Revise the containment analysis to explain how the releasable crud activity per cask given in Table 4.2-2 was calculated.

Table 4.2-2 lists a releasable crud activity per cask of 3.71 TBq (100.2 Ci). Based on an assembly surface area of  $3.54 \times 10^5 \text{ cm}^2$ , a  $^{60}\text{Co}$  concentration of  $140 \mu\text{Ci}/\text{cm}^2$ , a crud spallation fraction of 0.15, and 26 assemblies per cask, the releasable crud activity should be 7.15 TBq (193.3 Ci).

This information is needed in order to determine that the Model No. NAC-STC meets the containment requirements of 10 CFR Part 71.51(a).

#### **Chapter 8 - Operating Procedures**

- 8-1 Revise Step 15 of Section 7.1.3.1 of the SAR to exclude the use of air as an acceptable gas for draining water from the cask cavity, or provide additional evidence that the use of air during cask draining will not result in damage to the fuel cladding as a result of oxidation of the fuel pellets.

As stated in proposed Interim Staff Guidance No. 22 (ISG-22), the exposure of spent nuclear fuel rods with cladding breaches to an oxidizing atmosphere can lead to oxidation of the fuel pellets, and cause further damage to the fuel cladding as a result of

fuel pellet swelling. The staff recommends that applications for spent nuclear fuel storage or transportation design approval demonstrate there will be reasonable assurance that the fuel cladding will be protected. For more information, please refer to Draft ISG-22, "Potential Rod Splitting Due to Exposure to an Oxidizing Atmosphere During Short-term Cask Loading Operations in LWR or Other Uranium Oxide Based Fuel."

This information is needed to satisfy the requirements of 10 CFR 71.33(b).