From: Michael.Conroy@dot.gov
Sent: Thursday, September 24, 2009 3:17 PM
To: Staab, Christopher
Subject: RE: Three additional queries concerning NCS-45 (below)
Attachments: Page 8 from '3-Beschreibung_der_Verpackung_rev3_E'.pdf

Chris-

NCS has responded to your 3 questions of today as follows:

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1. "For the NCS 45 in total 4 limits are set by the safety analysis and licensed in the certificate of package approval:
    1. The Gamma and Neutron source terms defined by the formulas on page 2 of the certificate of package approval (which are an simplified version of Formula 1 and Formula 2 defined in chapter 7 "Dose Rate calculation")
    2. The thermal power defined in Table 1 and Table 5 of the certificate of package approval (which complies with Table 5.2 in chapter 5 "Thermal Analysis")
    3. The fissile mass and/or fissile mass distribution specified in Tables 1.1 to 1.5 of the certificate and taken into account throughout chapter 8 "Criticality Safety Analysis"
    4. The heavy metal mass specified in Tables 1.1a/(b) to 1.5a/(b) taken into account throughout in chapter 6 "Activity Release Analysis"

These 4 limits have all to be fulfilled at the same time.

Because the thermal power is related to the heavy metal mass – beside irradiation history, cooling time – the actual to be expected thermal power of the various contents was checked in chapter 6, where the heavy metal mass is defined. The tables in section 6.7.2 indicate that 3000 W might only be exceeded for content 1.4 for burn-up not much less than 33 GWd/MgU and cooling time not much more than 120 days and not using interior components. The heavy metal mass in this case is 167 kg, which is already a very theoretical value, as it requires more than 80 fuel rods to be loaded into the NCS 45 cavity of 220 mm diameter. Furthermore, the limits for the source terms (see 1. above) would restrict the heavy metal mass to about 100 kg (please see for that the "admissible" heavy metal mass derived from "typical" source terms in Table 7-43) which would lead to a thermal power below the limit of 3000 W.

As summary: the payload for 120 GWd/MgU and a cooling time is for all contents not more than 12 kg heavy metal (Table 1.1a, 1.2a, 1.3a, 1.5a of the certificate), the thermal power will be typically 1600 W (see Table 6-88)."

2. "Question 2 will be answered shortly, for this we will translate the material data and material test sheets and submit them to you."

3. "Enclosed please find page 3-8 with the corrected reference."

I will forward the Question 2 material to you after I receive it from NCS.

From: Staab, Christopher [mailto:Christopher.Staab@nrc.gov]
Sent: Thursday, September 24, 2009 7:46 AM

To: Conroy, Michael (PHMSA)
Subject: Three additional queries concerning NCS-45 (below)

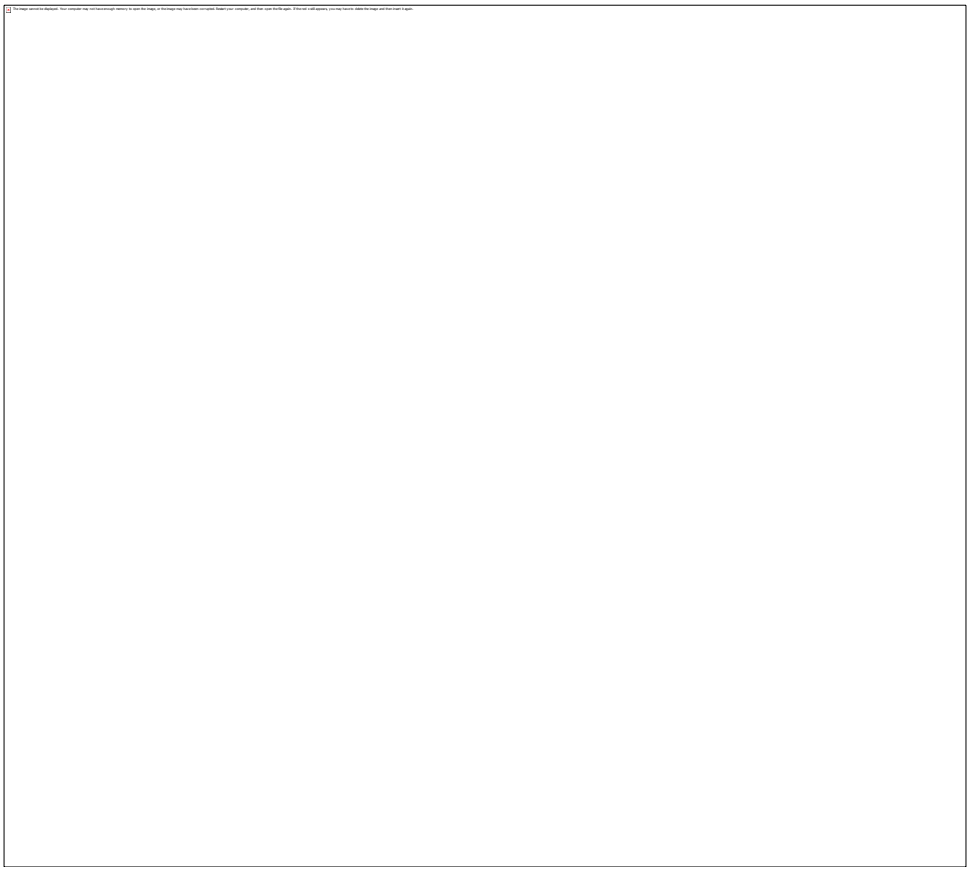
1) Provide justifications for the accuracy of or review and correct (if necessary) the decay heat provided in Table 5-2 of the Safety Analysis Report and update the thermal analysis (if necessary) based on updated decay heat.

The applicant provides, in Tables 5-2 of the Safety Analysis Report (SAR), the maximum allowed decay heat. The shielding analysis, Chapter 7, of the SAR indicates that the maximum payload is 100 Kg of PWR or BWR spent fuel with 120 GWd/MTU burnup and 120 days of cooling time. The staff's confirmatory analysis on the decay heat for the same amount of spent fuel materials shows that the maximum decay heat is equivalent to 100 Kg fuel with 60 GWd/MTU burnup and 120 day cooling time. The applicant is requested to provide justification on why the maximum of 3000 Watts decay heat provides the upper bound for the payload decay heat.

This information is needed for the staff to determine if the shielding design of the NCS 45 meets the requirements of para. 652 and para. 653 of the IAEA's Regulations for the Safe Transport of Radioactive Material TS-R-1.

2) The applicant refers to EPDM gaskets beign qualified to -40°C, and the state (see Chapter 6). There is nothing in Chapter 6 about gaskets.

3) Editorial: On page 3-8 on NCS 0017 Rev. 3, there appears to be a link or reference missing.
That page is below.



E-mail Properties

Mail Envelope Properties (562790706699C84791677A45DCF6F4F8063911)

Subject: RE: Three additional queries concerning NCS-45 (below)
Sent Date: 9/24/2009 3:17:05 PM
Received Date: 9/24/2009 3:17:05 PM
From: Michael.Conroy@dot.gov

Created By: Michael.Conroy@dot.gov

Recipients:
Christopher.Staab@nrc.gov (Staab, Christopher)
Tracking Status: None

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Files	Size	Date & Time
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image001.gif	16277	
Page 8 from '3-Beschreibung_der_Verpackung_rev3_E'.pdf	49887	

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