Nancy Osgood - Air Transport of the TN-BGC1 Package - Request for AdditionalInformation

From: "FALGOUX Jean-Louis" <jeanlouis.falgoux@areva.com>
To: "Nancy Osgood" <NLO@nrc.gov>, <michael.conroy@dot.gov>
Date: 12/21/2007 6:41 AM
Subject: Air Transport of the TN-BGC1 Package - Request for AdditionalInformation
CC: <rick.boyle@dot.gov>, "Jack Edlow" <jedlow@edlow.com>, <mconde@edlow.com>, "Zhian Li" <ZXL1@nrc.gov>, "HALLE Laurent (CERCA)" <laurent.halle@areva.com>

Dear All,

Following your last requests, please find here joined our explanation:

(a) Provide the details of the fuel region that is assumed, both for Type 119 and Type 424 fuel. This should include: Maximum mass of U-235 per package, maximum mass of U-235 per fuel element, and maximum and minimum uranium concentration considered in the analysis.

CERCA's answers:
(a) The given maximum mass is a mass of total Uranium by package, so as to be penalizing, it was calculated by taking into account dimensions of the actual fissile material, while the calculations were made with penalizing dimensions :

For the type 119, with:
* **Fissile diameter of the element: 3.63 cm**
* **fissile Height of the element: 38.1 cm**
* **Density of UZrH2: 7.24**
* **Mass of UZrH2 for 6 elements = 17.13 kg**
* **Uranium content in UZrH2 for the type 119 : 31 %**
* **The maximum of Uranium per package = 5.3 kg**

The calculations were made with:
* **Fissile diameter of the element: 3.73 cm**
* **Fissile Height of the element: 39 cm**
* **Density of UZrH2: 7.24**
* **Mass of UZrH2 for 6 elements = 18.51 kg**
* **Uranium content in UZrH2 for the type 119 : 31 %**
* **The maximum of Uranium per package = 5.7 kg**

For the type 424, with:
* **Fissile diameter of the element: 1.29 cm**
* **Fissile Height of the element: 55.8 cm**

* **Density of UZrH2: 8.40**
* **Mass of UZrH2 for 23 elements = 14.09 kg**
* **Uranium content in UZrH2 for the type 424: 47 %**
* **The maximum of Uranium per package = 6.6 kg**

The calculations were made with:
* **Fissile diameter of the element: 1.4 cm**
* **Fissile Height of the element: 56 cm**
* **Density of UZrH2: 8.40**
* **Mass of UZrH2 for 23 elements = 16.61 kg**
* **Uranium content in UZrH2 for the type 424: 47 %**
* **The maximum of Uranium per package = 7.8 kg**

(b) Provide the details of the resin region, including the thickness of the resin region. Is this the entire resin region or just the burned or unburned region? What is the assumed density and composition of the resin regions (burned and unburned).

CERCA's answer:
(b) The thickness of the resin corresponds to the total volume of resin in the container (burned and unburned), the composition and the used density (unburned) are given chapter 4.2. As demonstrated in the chapter 6.5.2, the resin being placed behind the steel, it has no impact on the reactivity of the package for air transport.

© Confirm the quantity of water moderation from the packaging used in the analysis (not including the hydrogen present in the fuel matrix), i.e., is the total water quantity 2000 grams or 2900 grams per package, and what packaging components contribute to this water quantity?

CERCA's answer:
(c) The 2900 g of water correspond to cardboards surrounding elements and the 10 % of humidity in the wood. So as to be penalizing, the total weight of cardboards was modelized by water :

* **Weight of a cardboard : 200 g,**
* **6 cardboards is equivalent in 1200 g of water,**
* **10 % of humidity in the wood corresponds in 1700 g of water**
* **<u>Quantity of total water: 2900 g of water</u>**

The calculations with 2000 g of water only demonstrate that the fissile material is not over moderated with the totality of the hydrogenated products in the package.

I hope that these explanations are clear enough & that we can get your approval very very soon.

Best regards,...and for those taking Christmas holiday's, JOYOUS NOEL and Merry

Christmas !!!

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Files	Size	Date & Time
MESSAGE	3863	12/21/2007 6:40:51 AM
TEXT.htm	9643	
Mime.822	16524	

Options
Expiration Date: None
Priority: High
ReplyRequested: No
Return Notification: None

Concealed Subject: No

Security: Standard

Junk Mail Handling Evaluation Results
Message is eligible for Junk Mail handling
This message was not classified as Junk Mail

Junk Mail settings when this message was delivered
Junk Mail handling disabled by User
Junk Mail handling disabled by Administrator
Junk List is not enabled
Junk Mail using personal address books is not enabled
Block List is not enabled