UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 1, 2015

Mr. Paul Triska
Vice President, Technical Services
AREVA Inc.
7135 Minstrel Way, Ste. 300
Columbia, MD 21045

SUBJECT: RENEWAL AND AMENDMENT APPLICATION FOR MODEL NO. TN-RAM – REQUEST FOR SUPPLEMENTAL INFORMATION

Dear Mr. Triska:

By letter dated March 9, 2015, you submitted an application for renewal and amendment of Certificate of Compliance (CoC) No. 9233 for the Model No. TN-RAM package. Staff performed an acceptance review of your application to determine if the application contains sufficient technical information in scope and depth to allow the staff to complete the detailed technical review.

This letter is to advise you that based on our acceptance review, the application does not contain sufficient technical information. The information needed to continue our review is described in the enclosure to this letter. In order to schedule our technical review, this information should be provided by May 22, 2015. If the information described is not received by this date, the application may not be accepted for review.

If you have any questions regarding this matter, please contact me at (301) 415–5790.

Sincerely,

/RA/

John Vera, Project Manager
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9233
TAC Nos. L25001 and L25002

Enclosure: Request for Supplemental Information

Mr. Paul Triska
Vice President, Technical Services
AREVA Inc.
7135 Minstrel Way, Ste. 300
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NAME	JVera	MDeBose	CJohanson	AGray	VWilson	CAraguas
DATE	4/20/2015	4/22/2015	4/22/2015	4/23/2015	4/22/2015	4/24/2015
OFC	SFM	SFM				
NAME	MRahimi	MSampson				
DATE	4/24/2015	5/1/2015				

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DOCKET NO. 71-9233

REQUEST FOR SUPPLEMENTAL INFORMATION (RSI) FOR THE TN-RAM PACKAGE

THERMAL

RSI 3-1

Identify and provide cask component temperature limits.

The safety analysis report (SAR) Chapter 3, provides the thermal analysis results of the cask components but does not provide any specified thermal limits of these components to be compared to. These limits should be clearly identified so staff can perform a thermal evaluation.

This information is required to determine compliance with 10 CFR 71.33 and 71.43.

RSI 3-2

Clarify if the vent and drain port seals are captured in the term "lid seals" in the analysis and results.

a. SAR Table 3-1 provides a Summary of Results of cask components including "Lid Seals." It is not clear if this term includes vent and drain port seals in addition to the cask closure lid seals. The applicant should clarify if this term includes the vent and drain port seals so the staff can perform a thermal evaluation.
b. If the term "lid seals" does not include the vent and drain port seals, temperature limits and maximum temperatures under normal conditions of transport (NCT) and hypothetical accident conditions (HAC) should be provided for these seals so staff can perform a thermal evaluation.

This information is required to determine compliance with 10 CFR 71.33 and 71.43.

RSI 3-3

Explain how a maximum temperature of 115°F, for all package components, without insolation was determined in SAR Section 3.4.4.

SAR Section 3.4.4 states that "A review of the TN-RAM cask thermal evaluation without solar insolation shows that the maximum temperature among all the cask components is 115°F and is only 15°F higher than the ambient temperature of 100°F." SAR Table 3-4 shows the maximum temperature among all cask components under NCT is 148°F with insolation. The staff needs to understand how a maximum temperature of 115°F without insolation was determined so a review can be performed.

This information is required to determine compliance with 10 CFR 71.43.

RSI 3-4

Provide the temperature of the contents in the thermal analysis so that a review can be performed.

SAR page 3-11 states “Because the contents of the packaging are irradiated solid materials with a low decay heat load, the temperature of the contents is not a major concern and is not evaluated. Therefore, the cavity liner is not included in the model.” The decay heat load of the contents is 500 watts, which is relatively high and warrants a determination of content temperature.

This information is required to determine compliance with 10 CFR 71.43.

RSI 3-5

Clarify the term “cavity liner” and explain why it was not included in the model.

SAR page 3-11, states “Because the contents of the packaging are irradiated solid materials with a low decay heat load, the temperature of the contents is not a major concern and is not evaluated. Therefore, the cavity liner is not included in the model.”

a. Clarify the term “cavity liner.” The heat flux is applied to the cask body inner shell which is typically the most inner cask component. Explain what the “cavity liner” is.
b. If the “cavity liner” is another layer of material that fits inside the inner shell and is most adjacent to the contents, explain why it is not included in the model, recognizing that cask components that are closest to the contents will be the hottest and, generally, should be included in the model.

This information is required to determine compliance with 10 CFR 71.43.

SHIELDING

RSI 5-1

Demonstrate that the shielding analyses bound the contents that are to be shipped.

The analyzed contents in the shielding analysis (SAR Chapter 5) do not appear to bound the description of the proposed description of the contents in Section 5(b) within the draft certificate of compliance (CoC) in Enclosure 7 to the application’s transmittal letter. For example, there is no description of the size and geometry of the contents within the draft CoC, however, in all analyzed configurations for the shielding analyses, some volume of stainless steel is assumed and self-shielding is credited in some way. Based on the contents description in Section 1.2.3 of the SAR, the proposed contents do not appear to be concentrated point sources; however the description in the CoC would not prohibit a concentrated point source from being shipped in the TN-RAM. Either include specifications for the proposed contents that match the assumptions in the shielding analysis or revise the shielding analysis in Chapter 5 of the SAR to be more generalized (i.e., a point or line source that credits no geometry or self-shielding).

This information is needed to determine compliance with 10 CFR 71.33(b), 10 CFR 71.47(b) and 10 CFR 71.51(a)(2).

RSI 5-2

Discuss the use of the secondary container in the shielding analyses. Provide drawings of this component as necessary.

SAR Section 1.2.3 states: "The TN-RAM is designed to transport a payload of 9,500 lb of dry irradiated and contaminated, non-fuel-bearing solid materials (with only trace quantities of fissile materials present a contamination) in secondary containers. The safety analysis of the TN-RAM takes no credit for the containment provided by secondary containers." Section 5.1 states: "No credit is taken for the secondary container in the TN-RAM package to meet the shielding requirements." However Section 5.3.1 states that: "All source configurations are contained in a postulated 1 inch thick secondary container. The secondary container is modeled as air; however, the secondary container is part of the contents and the 9,500 lb (4309 kg) maximum payload… The secondary container was assumed to be 108 inches tall and sits on the bottom of the cask cavity. Some space is expected to remain at the top for the secondary container lid and handling equipment."

The staff finds the discussions about the secondary container to be contradictory. Although it appears as though the secondary container's shielding properties are not credited for radiation attenuation, it is still credited to contain the material under NCT and its geometry is also credited in shoring the material. This may be beneficial to safety as it appears that there could be radiation streaming over the lead shielding at the top of the cask side and if the material is assumed to stay within the secondary container, it is held below this streaming path.
In addition, if the secondary container fails, material could migrate around the cask during transport and find its way in a less conservative position than it is currently analyzed, perhaps near a streaming path or into the bottom cavity drain. If the secondary container is not credited for shoring material in this manner, the possibility of material migration in a less conservative position should be addressed and analyzed, and the shielding analyses should demonstrate that the failure of this component would not cause NCT dose rates to increase beyond regulatory limits. If the secondary container is necessary, a licensing drawing incorporating the container into the design needs to be provided, as well as a discussion addressing the structural effects of NCT on this component.

This information is needed to determine compliance with 10 CFR 71.33(a), 10 CFR 71.47(b) and 10 CFR 71.47(a)(2).

RSI 5-3

Provide additional information on establishing package activity limits for nuclides with gamma energies higher than that of Co-60.

SAR Section 1.2.3 states that radioactive contents are: "maximum of 30,000 Ci Cobalt-60 or equivalent. Equivalency to other radionuclides is determined by the total energy in its spectrum." Section 5.2.1 shows how this equivalency is determined. It appears that the goal of this conversion is to preserve the energy per second, however it does not provide any information about how the non-Co-60 material is attenuated by the package shielding. There is

a lower probability of lower energy gammas escaping the package than higher energy gammas. If the gamma energy is lower than that of the average Co-60 gammas, than the conversion to energy per second is conservative, however if it is higher it is non-conservative. Discuss additional measures needed to ensure non-Co-60 nuclides would meet package limits. Specifically address those nuclides with higher energy gammas.

This information is needed to determine compliance with 10 CFR 71.47(b) and 10 CFR 71.51(a)(2).