



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

August 20, 2015

Mr. T. J. Tate
Manager – Environmental, Health, Safety, & Licensing
AREVA Inc.
2101 Horn Rapids Rd.
Richland, WA 99354

**SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW OF THE MODEL
NO. 51032-2**

Dear Mr. Tate:

By letter dated June 30, 2015, AREVA Inc., submitted an application for a letter authorization to Certificate of Compliance (CoC) No. 9252 for the Model No. 51032-2 transportation package.

In connection with the staff's review, we need the information identified in the enclosure to this letter. We request you provide this information by September 18, 2015. Inform us at your earliest convenience, but no later than September 14, 2015, if a substantial date change is needed. To assist us in re-scheduling your review, you should include a new proposed submittal date.

If you have any questions regarding this matter, please contact me at 301-415-5253.

Sincerely,

A handwritten signature in black ink, appearing to read "Huda", followed by a long horizontal flourish.

Huda Akhavannik
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9252
TAC No. L25032

Enclosure: Request for Additional Information



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**Request for Additional Information
AREVA Inc.
Docket No. 71-9252
Model No. 51032-2 Package**

6.0 Criticality

- 6-1 Revise Section 8.2 of the application to provide an explicit validation of SCALE 6.0 and the ENDF/B-V cross section library for the Model No. 51032-2.

The letter authorization request includes new criticality calculations using SCALE 6.0. These calculations are not accompanied by an explicit code benchmarking analysis. Rather, these sections attempt to show applicability of the existing SCALE 4.4 validation to calculations using SCALE 6.0. ANS 8.24, *Validation of Neutron Transport Methods for Nuclear Criticality Safety Calculations*, states that: "The calculational methods and analysis techniques used to analyze the set of benchmarks shall be the same as those used to analyze the system or process to which the validation is applied." Code-to-code comparison is not considered an acceptable criticality safety method validation approach in industry standards, and is not considered acceptable by staff. Section 8.2 should be revised to include an explicit benchmarking analysis of SCALE 6.0 as used in the 51032-2 criticality analyses.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements of 10 CFR 71.55 and §71.59.

- 6-2 Revise the application to clarify the boundary conditions for the normal conditions of transport and hypothetical accident conditions array models.

Section 2.0 of the application states: "For cases with reflective boundary condition, the model is effectively infinitely long." This statement is listed as a conservatism in the analysis. However, all of the array models described in the application appear to be finite. The application should be revised to clarify that the array models are finite.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements for package arrays in 10 CFR 71.59.

- 6-3 Revise the application to clarify the modeling of the fuel assembly pellet diameter.

Section 5.1.1 of the application states that the "fuel pellet is modeled with an outer diameter equal to the nominal diameter plus tolerance," resulting in the maximum pellet diameter. Section 6.0 states that the fuel pellet is modeled with the minimum diameter,

and that "it has been established in Reference [1] that this is the most reactive condition." The application should be revised to clarify which condition of the pellet (i.e., maximum or minimum) has been modeled for this evaluation. Note that evaluations of the most reactive fuel assembly configuration typically find that maximum pellet diameter is more reactive.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements of 10 CFR 71.55 and §71.59.

- 6-4 Revise the application to clarify what criticality safety index (CSI) will be applied to packages shipped under this letter authorization.

The criticality analysis in the application evaluates package arrays under normal conditions of transport and hypothetical accident conditions, but does not determine an associated CSI. The CSI should be determined per the requirements for fissile material package arrays in 10 CFR 71.59. Note that the arrays currently considered in the criticality analysis are much larger than necessary to accomplish the shipping campaign described in the letter authorization request.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements for package arrays in 10 CFR 71.59.

- 6-5 Revise the application to consider high enrichment fuel assemblies closest to each other in adjacent packages in the array.

Although the criticality analysis of package arrays considers the location of the 4.95 weight percent enriched fuel assembly within a single package (i.e., left or right channel), it does not appear to consider situations where the 4.95 weight percent enriched fuel assemblies in adjacent packages are closest to each other (e.g., right channel in left package, and left channel in right package). Given the higher enrichment of these assemblies, closer placement within the array could increase neutron communication between the assemblies in the array if they are closer, particularly in the hypothetical accident conditions case where the strongbacks are shifted towards each other in adjacent packages.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements for package arrays in 10 CFR 71.59.

- 6-6 Revise the application to provide single package criticality evaluations per the requirements of 10 CFR 71.55(b), (d), and (e).

The current criticality evaluation for this letter authorization request considers arrays of packages under both normal conditions of transport and hypothetical accident conditions. However, it does not provide analyses for: (1) a single package with water

in-leakage per 10 CFR 71.55(b), (2) a single package under normal conditions of transport per §71.55(d), and a single package under hypothetical accident conditions per §71.55(e). The application should be revised to provide analyses demonstrating that a single package is subcritical under these conditions.

This information is needed to ensure that the Model No. 51032-2 package will continue to meet the criticality safety requirements of 10 CFR 71.55.

7.0 Operating Procedures

- 7-1 Revise the application to provide additional operating procedures needed for loading the fuel to be shipped under this letter authorization request.

Although the Crystal River fuel was never critical, it will be contaminated from having been in the core. The current operating procedures for the Model No. 51032-2 only consider loading of fresh, dry, uncontaminated fuel. Additional procedures should include steps for decontamination and drying of fuel assemblies. Note that, since this is a Type AF package, decontamination of this fuel should ensure that any remaining radioisotopes do not exceed an A_2 quantity.

This information is needed to ensure that the package complies with 10 CFR 71.43(f) and §71.87.

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Docket No. 71-9252
TAC No. L25032

Enclosure: Request for Additional Information

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ADAMS Accession No.:

OFC:						
NAME:	HAKhavannik	MDeBose	ABarto <i>AB</i>	MRahimi <i>MR</i>	MSampson <i>MS</i>	
DATE:	8/14/15	08/14/15	8/20/15	8/20/15	8/20/15	

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