



March 24, 2014
E-37961

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Subject: Application for Revision 2 to Certificate of Compliance No. 9358 for the Model No. TN-LC Transportation Packaging, Docket No. 71-9358, Response to Request for Additional Information

References: Letter dated February 18, 2014, from John A. Vera (NRC) to Paul Triska (AREVA Inc.), Application for Revision 1 to Certificate of Compliance No. 9358 for the Model No. TN-LC Package - Request for Additional Information

Letter dated October 11, 2013, from Paul Triska (AREVA Inc.) to Document Control Desk (NRC), Application for Revision 1 to Certificate of Compliance No. 9358 for the Model No. TN-LC Transportation Packaging, Docket No. 71-9358 (E-36596)

This submittal provides responses to the request for additional information (RAI) as detailed in the letter from John A. Vera (NRC) to Paul Triska (AREVA Inc.) referenced above. Please note that the CoC revision number in the above subject line is 2. The CoC has been recently revised to Revision 1 resulting from an administrative change to the CoC holder's name.

This submittal contains the following enclosures:

- Enclosure 1 provides each RAI question, followed by a response.
- Enclosure 2 provides a list of additional changes that are not associated with the RAI.
- Enclosure 3 provides a list of the changed SAR pages for each of the RAIs and additional items.
- Enclosure 4 provides the replacement pages for the proprietary version of the SAR.
- Enclosure 5 provides the replacement pages for the non-proprietary version of the SAR.
- Enclosure 6 provides an affidavit, in accordance with 10 CFR 2.390, specifically requesting that you withhold proprietary information included in Enclosure 4 of this submittal from public disclosure. That information may not be used for any purpose other than to support the review of the RAI responses.

The changed areas are marked as follows:

- New or changed pages show "Revision 8, 03/14" in the header.
- Changed areas are indicated using revision bars in the right-hand margin. Newly inserted text is shown by italics.

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Should the NRC staff require additional information to support review of this application, please do not hesitate to contact Mr. Glenn Mathues at 410-910-6538 or me at 410-910-6820.

Sincerely,



Paul Triska
Vice President, Technical Services

cc: John A. Vera, U. S. Nuclear Regulatory Commission
• One electronic copy (DVD) of this letter and Enclosures 1, 2, 3, 4, and 6

Enclosures:

1. RAIs and Responses
2. List of Additional Changes, Not Associated with the RAI
3. List of RAIs and Additional Items, with Indication of the Associated Changed SAR Pages
4. Replacement Pages for the TN-LC SAR, Revision 8 (Proprietary Version)
5. Replacement Pages for the TN-LC SAR, Revision 8 (Non-Proprietary Version)
6. Affidavit Pursuant to 10 CFR 2.390

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REQUEST FOR ADDITIONAL INFORMATION**Chapter 2 – Structural Evaluation****RAI 2-1:**

Revise the descriptions on “Trunnions,” in Section 2.1.2.1, and “Lifting Devices,” in Section 2.5.1, of the application to recognize, as appropriate, that the stress analyses and acceptance criteria are per the ASME Code, Division 1, Subsection NF, for the shell- and plate-type component support structures.

The staff notes that the lifting trunnion as presented in Appendix 2.13.5 to the application is designed and fabricated per ANSI N14.6 to meet the 10 CFR 71.45 load factor and stress criterion against material yield strength. Since the structural analyses are performed by invoking the Subsection NF design-by-analysis methodology and stress acceptance criteria, they should properly be recognized in the main text of the application for clarity.

This information is needed for meeting the requirements of 10 CFR 71.45 for lifting device standards for all packages.

RESPONSE TO RAI 2-1

Clarification is added to Section 2.1.2.1 regarding the design criteria for the “Trunnions”. Furthermore, clarification is also added to Section 2.5.1.

The trunnions are designed and fabricated per ANSI N14.6 to meet the 10 CFR 71.45 load factor and stress criterion against material yield strength. Furthermore, weld stresses are increased by an appropriate load factor derived from ASME Subsection NF design-by-analysis methodology and stress criteria.

RAI 2-2:

Revise the tabulated “Summary of Lifting Stresses - Single Shoulder Trunnion” per Tables 2.13.5-6 and -7 of Appendix 2.13.5 to the application to recognize detailed stress evaluation for the base metals and the weld of the trunnion block-to-cask outer shell interface design.

The “weld bending stress” summary as tabulated in Page 2-16 of the application is subsumed and replaced with those of Tables 2.13.5-6 and -7. This should properly be recognized in the main text of the application for clarity.

This information is needed for meeting the requirements of 10 CFR 71.45 for lifting device standards for all packages.

RESPONSE TO RAI 2-2

Reference to Tables 2.13.5-6 and 2.13.5-7 has been added to the main text of the application for clarity, in addition to updating the table on Page 2-16 with the information from Tables 2.13.5-6 and -7.

RAI 2-3:

Revise Table 2.13.5-7 by providing necessary footnotes to recognize “identical” stress allowables are considered for evaluating both tensile and shear stresses.

“Different” tensile and shear stress allowables are commonly reported for the packaging components stress margin evaluation. Without appropriate footnoting for clarity, the stress summary as listed in the table is incomplete.

This information is needed for meeting the requirements of 10 CFR 71.45 for lifting device standards for all packages.

RESPONSE TO RAI 2-3

The following footnote is added to Table 2.13.5-7 to clarify the identical stress allowables for evaluating both tensile and shear stresses.

“Even though the allowable stress for tension and shear are the same, a load factor (6 g for tensile load and 9 g for shear load) derived from ASME Subsection NF was appropriately applied to the load for calculating the stresses. See Section 2.13.5.1.3 for details.”

List of Additional Changes, Not Associated with the RAI

	Additional Changes	Reason for the Change
1	<p>The following statement is removed from SAR Page 6.10.3-10: <i>Under NCT, the package internals are dry as the package is leak tight, while the HAC array analysis features an optimally moderated package in an infinite hexagonal lattice.</i></p>	<p>TN review of the SAR to follow up on a criticality modeling concern discussed in a conference call with NRC, discovered that these items were overlooked in the SAR revision. At a subsequent conference call with the NRC, TN informed the NRC regarding these items.</p>
2	<p>SAR Table 6.10.3-1 is updated to reflect the correct k_s values for both NCT and HAC conditions.</p>	<p>TN review of the SAR to follow up on a criticality modeling concern discussed in a conference call with NRC, discovered that these items were overlooked in the SAR revision. At a subsequent conference call with the NRC, TN informed the NRC regarding these items.</p>
3	<p>In the third sentence of the third paragraph of Section 2.13.11.2.1, the spelling of the word "though" is corrected to "through."</p>	<p>Corrects a typographical error.</p>
4	<p>Updates revision level and date on title page.</p>	<p>Updates the revision level and date.</p>
5	<p>Adds Revision 8 to the revision history.</p>	<p>Updates the revision history.</p>

**List of RAIs and Additional Items,
with Indication of the Associated Changed SAR Pages**

RAI or Additional Change Number	Changed SAR Page or Drawing
2-1	2-7 2-15
2-2	2-15 2-16
2-3	2.13.5-19
Additional Change 1 ⁽¹⁾	6.10.3-10
Additional Change 2 ⁽¹⁾	6.10.3-33
Additional Change 3 ⁽¹⁾	2.13.11-4
Additional Change 4 ⁽¹⁾	Title page
Additional Change 5 ⁽¹⁾	i

⁽¹⁾ See Enclosure 2 for description of additional changes.

Enclosure 5 to TN E-37961

Replacement Pages for the
TN-LC SAR, Revision 8
(Non-Proprietary Version)

NON-PROPRIETARY



**AREVA
Transnuclear, Inc.**

**TN-LC
TRANSPORTATION PACKAGE
SAFETY ANALYSIS REPORT**

**Revision 8
March 2014**

Proprietary Information Withheld Pursuant to 10 CFR 2.390.

Table 6.10.3-1
 Summary of TN-LC-TRIGA Criticality Evaluations

Normal Conditions of Transport (NCT)	
Case	k_s
Single Unit Maximum	0.8873
<i>Infinite</i> Array Maximum	0.9075
Hypothetical Accident Conditions (HAC)	
Case	k_s
Single Unit Maximum	0.8873
<i>Infinite</i> Array Maximum	0.9075
USL = 0.9301	

Table 6.10.3-2
 Characteristics of TRIGA Fuel Elements

Proprietary Information Withheld Pursuant to 10 CFR 2.390.

**AFFIDAVIT PURSUANT
TO 10 CFR 2.390**

AREVA Inc.)
State of Maryland) SS.
County of Howard)

I, Paul Triska, depose and say that I am a Vice President of AREVA Inc., duly authorized to execute this affidavit, and have reviewed or caused to have reviewed the information that is identified as proprietary and referenced in the following paragraph. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.390 of the Commission's regulations for withholding this information.

The information for which proprietary treatment is sought is contained in Enclosure 4:

- Portions of CoC 9358 Safety Analysis Report Appendices 2.13.11 and 6.10.3

These pages have been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by AREVA Inc. in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

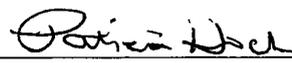
- 1) The information sought to be withheld from public disclosure involves portions of the Model TN-LC transportation packaging safety analysis report related to the design and analysis of the TN-LC transportation packaging, which are owned and have been held in confidence by AREVA Inc.
- 2) The information is of a type customarily held in confidence by AREVA Inc. and not customarily disclosed to the public. AREVA Inc. has a rational basis for determining the types of information customarily held in confidence by it.
- 3) Public disclosure of the information is likely to cause substantial harm to the competitive position of AREVA Inc. because the information is related to the design of transportation packaging, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with AREVA Inc., take marketing or other actions to improve their product's position or impair the position of AREVA Inc.'s product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

Further the deponent sayeth not.



Paul Triska
Vice President, AREVA Inc.

Subscribed and sworn to me before this 24th day of March, 2014.



Notary Public

My Commission Expires 11 / 17 / 2014