



E-49950  
November 8, 2017

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

Subject: Application for Revision 8 to Certificate of Compliance No. 9319 for the Model Nos. MAP-12 and MAP-13, Docket No. 71-9319

Reference: Revision 7 to Certificate of Compliance No. 9319 for the Model Nos. MAP-12 and MAP-13, Docket No. 71-9319

In accordance with the requirements of 10 CFR 71.38, TN Americas LLC submits a request for renewal of the subject Certificate of Compliance (CoC) No. 9319, Revision 7. This CoC expires on January 31, 2018.

In support of the issuance of Revision 8 to Certificate of Compliance (CoC) No. 9319 for the Model Nos. MAP-12 and MAP-13, TN Americas LLC has revised and consolidated the supplements listed in CoC Revision 7, into the MAP PWR Fuel Shipping Package Safety Analysis Report (SAR), resulting in Revision 8.

In support of this application TN Americas LLC includes the following enclosures:

- Enclosure 1 is a description and justification of the changes from Revision 7 to Revision 8 of the MAP PWR Fuel Shipping SAR.
- Enclosure 2 is Revision 8 of the SAR. This enclosure is proprietary.
- Enclosure 3 is the public version of Revision 8 of the SAR. This enclosure is non-proprietary.
- Enclosure 4 is a markup of Revision 7 of CoC No. 9319 for the proposed changes discussed in Enclosure 1.

This revision incorporates the following supplements as listed in CoC Revision 7:

- Supplements dated October 24, December 6, and December 14, 2007, approved via CoC 9319, Revision 0 (SAR Revisions 0, 1, and 2).
- Supplements dated April 11, October 13, and October 31, 2008, approved via CoC 9319, Revision 1 (SAR Revision 3).
- Supplements dated June 8 and June 18, 2009, approved via CoC 9319, Revision 2 (SAR Revisions 4 and 5).
- Supplement dated July 22, 2010, approved via CoC 9319, Revision 3 (SAR Revision 6).
- Supplement dated January 14, 2011, approved via CoC 9319, Revision 4 (SAR Revision 7).

NMSSDI

**TN AMERICAS LLC**

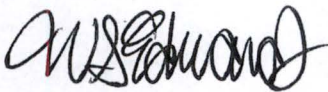
7135 Minstrel Way, Suite 300, Columbia, Maryland 21045  
Tel.: 410 910 6900 - Fax: 410 910 6902 - [www.us.aveva.com/AREVATN](http://www.us.aveva.com/AREVATN)

- Supplements dated December 5 and December 12, 2012, approved via CoC 9319, Revision 5 (letter request for CoC holder name change).
- Supplement dated January 27, 2014, approved via CoC 9319, Revision 6 (letter request for CoC holder name change).
- Supplement dated November 18, 2016, approved via CoC 9319, Revision 7 (letter request for CoC holder name change).

Each page of Revision 8 of the SAR reflects the revision number for which the most recent changes to the page were incorporated, with the revision number in the page header and the changed areas indicated using a revision bar in the right-hand margin and the new or changed text shown in italics.

Should you or your staff have any questions or require additional information to support review of this application, please contact Mr. Glenn Mathues by telephone at 410-910-6538.

Sincerely,



W. Scott Edwards  
Director of Transportation

cc: Bernard H. White, U.S. Nuclear Regulatory Commission

- One electronic copy (computer disk) of this letter and Enclosures 1, 2, and 4

Enclosures:

1. Description and Justification of SAR Changes
2. MAP PWR Fuel Shipping Package SAR Revision 8 (Proprietary)
3. MAP PWR Fuel Shipping Package SAR Revision 8 (Non-Proprietary)
4. Proposed Changes to CoC 9319 Revision 7

**Enclosure 1 to E-49950**

**Description and Justification of  
SAR Changes**



**Description, and Justification of Changes**  
(Safety Analysis Report, MAP PWR Fuel Shipping Package Revision 8)

Item	Chapter/Appendix/Section	Description and Justification
1	All	Changed name from AREVA NP to TN Americas LLC. CoC 9319 ownership was transferred from AREVA NP to TN Americas LLC in December 2012.
2	Proprietary Information Notice I	Added the Proprietary Information Notice page. A Proprietary Information Notice page was not previously included in the Safety Analysis Report (SAR).
3	Revision Log	Revised to reflect Revision 8 changes to the SAR.
4	Chapter 1, Section 1.3.1	Added a listing of MAP PWR Fuel Shipping Package drawings. The listing was not previously included.

**Enclosure 4 to E-49950**

**Proposed Changes to  
CoC 9319 Revision 7**



<b>NRC FORM 618</b> (8-2000) 10 CFR 71		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>			
<b>CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES</b>					
1. a. CERTIFICATE NUMBER  <div style="text-align: center; font-size: 1.2em;">9319</div>	b. REVISION NUMBER  <div style="text-align: center;"> <del>7</del> <span style="border: 1px solid black; padding: 2px 5px;">8</span> </div>	c. DOCKET NUMBER  <div style="text-align: center; font-size: 1.2em;">71-9319</div>	d. PACKAGE IDENTIFICATION NUMBER  <div style="text-align: center; font-size: 1.2em;">USA/9319/B(U)F-96</div>	PAGE  <div style="text-align: center; font-size: 1.2em;">1</div>	PAGES  <div style="text-align: center; font-size: 1.2em;">OF 6</div>

## 2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

## 3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

- |  |   |
|--|---|
| <p>a. ISSUED TO (Name and Address)</p> <p>TN Americas LLC<br/>         7135 Minstrel Way<br/>         Suite 300<br/>         Columbia, MD 21045</p> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-top: 10px;">TN Americas LLC</div> | <p>b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION</p> <p><del>AREVA NP, Inc., application dated March 13, 2007, as supplemented.</del></p> <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-top: 10px; float: right;">TBD</div> |
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## 4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

## 5.

### (a) Packaging

- (1) Model Nos.: MAP-12 and MAP-13
- (2) Description

The MAP package is designed to transport unirradiated uranium fuel assemblies with enrichment up to 5.0 weight percent. The package is designed to carry two fuel assemblies with core components. The package consists of two components: a base and lid. The containment system of the MAP package is the fuel rod cladding.

The base consists of a fixed stainless steel strong-back which supports the fuel assemblies. A series of inner stiffeners are secured to the underside of the strong-back to support the fuel assemblies. A neutron moderator and absorber are positioned directly beneath the strong-back between each inner stiffener. The base inner stiffeners are retained by a stainless steel cover. Exterior to the cover is a layer of rigid polyurethane foam and an outer shell of 11 gauge stainless steel. A 12-gauge stainless steel sheet is provided between the two middle stiffeners. Four stainless steel outer stiffeners support the package base. The payload rests on the "W" shaped strong-back (referred to as a W-plate) and is held in place with hinged and latched aluminum doors. The lid is very similar to that of the base – a "W" shaped stainless steel inner shell is fitted with a series of inner stiffeners, neutron moderator and absorbers, and a stainless steel cover is fitted over the stiffeners. The lid is fitted with trapezoidal impact limiters at each end. The impact limiters are constructed from rigid polyurethane foam encased by the package outer stainless shell skin. The base and lid include end plates with interlocking, interfacing angles.



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## 5.(a) (2) Description (continued)

There are two models of the MAP package, the MAP-12 and MAP-13. The weights and dimensions of the package are as follows:

MAP-12 (for 144-in Maximum Nominal Active Fuel Length):

Maximum Gross Weight	8,630 lbs
Maximum Payload Weight	3,400 lbs
Outer Dimensions	
Length	208 in
Width	45 in
Height	31 in

MAP-13 (for 150-in Maximum Nominal Active Fuel Length):

Maximum Gross Weight	8,630 lbs
Maximum Payload Weight	3,400 lbs
Outer Dimensions	
Length	221 in
Width	45 in
Height	31 in

## (3) Drawings

The MAP-12 and MAP-13 packages are fabricated and assembled in accordance with the following AREVA NP, Inc. Drawing Nos.:

9045393, Rev. 6;	9045402, Rev. 4;
9045397, Rev. 1;	9045403, Rev. 3;
9045399, Rev. 2;	9045404, Rev. 3;
9045401, Rev. 3;	9045405, Rev. 3.

## (b) Contents

## (1) Type and Form of Material

Enriched commercial grade uranium or enriched reprocessed uranium, as defined in ASTM C996-04, oxide fuel rods enriched to no more than 5.0 weight percent in the U-235 isotope, with limits specified in Table 1 below.

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5.(b) Contents (continued)

(2) Maximum Quantity of Material per Package

Table 1: Maximum Authorized Concentrations

Isotope	Maximum Content
U-232	$2.00 \times 10^{-9}$ g/g U
U-234	$2.00 \times 10^{-3}$ g/g U
U-235	$5.00 \times 10^{-2}$ g/g U
U-236	$2.50 \times 10^{-2}$ g/g U
U-238	Balance of Uranium
Np-237	$1.66 \times 10^{-6}$ g/g U
Pu-238	$6.20 \times 10^{-11}$ g/g U
Pu-239	$3.04 \times 10^{-9}$ g/g U
Pu-240	$3.04 \times 10^{-9}$ g/g U
Gamma Emitters	$5.18 \times 10^5$ MeV – Bq/kg U



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U.S. NUCLEAR REGULATORY COMMISSION

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5.(b) Contents (continued)

(3) Fuel Assembly

- (i) The parameters of the fuel assemblies that are permitted are specified in the table below.

Fuel Rod Array	14x14		15x15					16x16	17x17	
Assembly Type	1	2	1			2	3	1	1	2
No. of Fuel Rods	176	179	208			216	204	236	264	264
No. of Non-Fuel Cells	20	17	17			9	21	20	25	25
Nominal Fuel Rod Pitch (in)	0.580	0.556	0.568			0.550	0.563	0.506	0.502	0.496
Maximum Pellet Outer Diameter (in)	0.3812	0.3682	0.3622	0.3707	0.3742	0.3617	0.3682	0.3282	0.3252	0.3232
Minimum Fuel Rod Outer Diameter (in)	0.438	0.422	0.414	0.428	0.428	0.414	0.422	0.380	0.377	0.372
Minimum Clad Wall Thickness (in)	0.0245	0.0230	0.0220	0.0245	0.0230	0.0220	0.0230	0.0220	0.0220	0.0205
Minimum Guide Tube Wall Thickness (in)	N/A	N/A	0.0140	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Guide Tube Outer Diameter (in)	N/A	N/A	0.528	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Guide Tubes	N/A	N/A	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Instrument Tube Wall Thickness (in)	N/A	N/A	0.0240	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Minimum Instrument Tube Outer Diameter (in)	N/A	N/A	0.491	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Instrument Tubes	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Clad/Tube Material Type	Zr Alloy	Zr Alloy	Zr Alloy			Zr Alloy	Zr Alloy	Zr Alloy	Zr Alloy	Zr Alloy
Maximum Active Fuel Length (in)	160	160	160			160	160	160	160	160



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## 5.(b) Contents (continued)

## (3) Fuel Assembly (continued)

- (ii) Non-fissile base-plate mounted and spider body core components are permitted.
- (iii) Fuel rods assembled into the fuel assemblies are those loaded with sintered pellets of uranium oxides and/or with sintered pellets of uranium oxides mixed with various additives (e.g., Chromium, Boron, Gadolinium, and Europium).

(c) Criticality Safety Index: 2.8

## 6. In addition to the requirements of Subpart G of 10 CFR Part 71:

- (a) The package shall be prepared for shipment and operated in accordance with the Package Operations in Section 7 of the application, as supplemented.
- (b) Each package must meet the Acceptance Tests and Maintenance Program of Section 8 of the application, as supplemented.
- (c) Each fuel assembly must be unsheathed or must be enclosed in an unsealed, polyethylene or polypropylene sheath, which may not extend beyond the ends of the fuel assembly. The ends of the sheath may not be folded or taped in any manner that would prevent the flow of liquids into or out of the sheathed fuel assembly.
- (d) The fuel rods must be leak tested after fabrication to ensure that the leakage rate of the containment boundary is less than 1E-7 ref cc/sec.

7. Transport by air of fissile material is not authorized.

8. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

9. ~~Revision No. 6 of this certificate may be used until January 31, 2018.~~10. Expiration date: ~~January 31, 2018.~~


TBD



NRC FORM 618  
(8-2000)  
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

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TN Americas LLC

REFERENCES

AREVA NP, Inc., application dated March 13, 2007.

TBD

~~Supplements dated: October 24, December 6 and 14, 2007, April 11, October 13 and 31, 2008, June 8 and 18, 2009, July 22, 2010, January 14, 2011, December 5 and 12, 2012, January 27, 2014, and November 18, 2016.~~

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

*John McKirgan*

John McKirgan, Chief  
Spent Fuel Licensing Branch  
Division of Spent Fuel Management  
Office of Nuclear Material Safety  
and Safeguards

Date:

~~1/30/17~~

TBD