



August 1, 2013  
NRC:13:063

U.S. Nuclear Regulatory Commission  
Document Control Desk  
11555 Rockville Pike  
Rockville, MD 20852

**Request for Review and Approval of ANP-10323P, "Fuel Rod Thermal Mechanical Methodology for Boiling Water Reactors and Pressurized Water Reactors"**

AREVA NP Inc. (AREVA NP) requests the NRC's review and approval of the topical report ANP-10323P, "Fuel Rod Thermal Mechanical Methodology for Boiling Water Reactors and Pressurized Water Reactors."

This report presents a methodology for the realistic evaluation of the thermal-mechanical performance of UO<sub>2</sub> and Mixed Oxide (MOX) fuel rods for Boiling Water Reactors (BWRs) and Pressurized Water Reactors (PWRs) which complies with the requirements of Section 4.2 of NUREG-0800. The methodology consists of the best-estimate fuel performance code GALILEO that models the thermal-mechanical behavior of the fuel rods, and application methodology for determining the behavior of rods in a BWR and a PWR core during normal operation and anticipated operational occurrences. The objective of the methodology is to quantify the fuel design margins to the generic design criteria.

This topical report supports the U.S. Department of Energy plutonium disposition program which is intended to dispose of weapons grade plutonium by converting it into MOX fuel for use in a nuclear reactor. NRC approval of this topical report is being requested to support use of UO<sub>2</sub> and MOX fuel in BWRs and PWRs.

The topical report ANP-10323P is part of AREVA NP's response to NRC Information Notice 2009-23: Nuclear Fuel Thermal Conductivity Degradation. This information notice states that previous fuel performance codes did not model the impact of irradiation on fuel thermal conductivity adequately. The GALILEO fuel performance code in ANP-10323P contains a nuclear fuel thermal conductivity model which accurately reflects the impact of irradiation.

AREVA NP considers some of the material contained in the enclosed document to be proprietary. As required by 10 CFR 2.390(b), an affidavit is enclosed to support the withholding of the information from public disclosure. Proprietary and non-proprietary versions of the report are enclosed.

In support of the Office of Nuclear Reactor Regulation's prioritization efforts, the prioritization scheme matrix is attached.

AREVA NP would appreciate the NRC approval of this topical report by September 30, 2015.

Q 004  
NRR

**AREVA NP INC.**

If you have any questions related to this submittal, please contact Ms. Gayle F. Elliott, Product Licensing Manager at 434-832-3347 or by e-mail at [gayle.elliott@areva.com](mailto:gayle.elliott@areva.com).

Sincerely,



Pedro Salas, Director  
Regulatory Affairs  
AREVA NP Inc.

Attachment:

- A. NRC Prioritization Matrix

Enclosures:

1. Proprietary Version of ANP-10323P, "Fuel Rod Thermal Mechanical Methodology for Boiling Water Reactors and Pressurized Water Reactors"
2. Non-Proprietary Version of ANP-10323NP, "Fuel Rod Thermal Mechanical Methodology for Boiling Water Reactors and Pressurized Water Reactors"
3. Notarized Affidavit

cc: J.G. Rowley  
Project 728

Attachment A

<b>TR Prioritization Scheme Matrix for Metric and Resources</b>			
<b>Title: ANP-10323P, "Fuel Rod Thermal Mechanical Methodology for Boiling Water Reactors and Pressurized Water Reactors"</b>			
<b>Expect submitting FY</b>	<b>TAC</b>	<b>PM</b>	<b>Today's Date: 8/1/2013</b>
<b>Technical Review Division(s)</b>		<b>Technical Review Branch(s)</b>	
<b>Factors</b>	<b>Select the Criteria That the TR Satisfies</b>	<b>Points can be Assigned for Each Criteria</b>	<b>Assigned Points</b>
<b>TR Classification</b> (Select one only)	Resolve Generic Safety Issue (GSI).	6	3
	Emergent NRC Technical Issue.	3	
	New technology improves safety.	2	
	TR Revision reflecting current requirements or analytical methods.	2	
	Standard TR.	1	
<b>TR Applicability</b> (Select one only)	Potential industry-wide applications.	3	2
	Potentially applicable to entire groups of licensees.	2	
	Intended for only partial groups of licensees.	1	
<b>TR Implementation Certainty</b> (Select one only)	Industry-wide Implementation expected.	3	0
	Expected implementation by an entire group of licensees (BWROG, PWROG, BWRVIP, ect.) who sponsored the TR.	2	
	Docketed intent by U.S. plant(s) but no formal LAR schedule yet.	1	
	No U.S. plant(s) have indicated strong intent on docket to implement yet.	0	
<b>Tie to a LAR</b> (Select if applicable)	A SE is requested by a certain date (less than two years) to support a licensing activity or renewal date (note it in Comments).	3	0
<b>Review Progress</b> (Points are cumulative as applicable)	Accepted for review.	0.3	0
	RAI issued.	0.5	0
	RAI responded.	1.2	0
	SE drafted.	2.0	0
<b>Management (LT/ET) discretion adjustment</b>		-3 to +3	
<b>Total Points (Add the total points from each factor and total here):</b>			<b>5</b>
<b>Comments:</b> The emergent technical issue is fuel thermal conductivity degradation.			



requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information":

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:


- (a) The information reveals details of AREVA NP's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

The information in the Document is considered proprietary for the reasons set forth in paragraphs 6(c) and 6(d) above.

7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside AREVA NP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA NP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.



SUBSCRIBED before me this 18<sup>th</sup>  
day of August 2013.



Sherry L. McFaden  
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA  
MY COMMISSION EXPIRES: 10/31/2014  
Reg.#7079129

