



March 13, 2017  
NRC:17:012

PRD10728

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

**Response to Request for Comment on Draft Safety Evaluation for AREVA Inc. Topical Report BAW-10247PA, Revision 0, Supplement 1P, Revision 0, "Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding"**

In Reference 1, the NRC issued a draft safety evaluation (SE) for BAW-10247(P)(A), Revision 0, Supplement 1P, Revision 0, "Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding" requesting that AREVA Inc. (AREVA) review the document for proprietary material and for factual errors.

AREVA reviewed the draft SE and determined that the draft SE contains information that was identified in the topical report (Reference 2) and RAI responses (Reference 3 through Reference 6) as being proprietary information. A number of editorial or technical corrections were also identified as needed. Attachment 1 to this letter provides a list of the suggested changes to the SE. Attachment 2 includes the proposed wording for Section 4.0 of the Draft SE as noted in the list of suggested changes in Attachment 1. Attachment 3 provides a marked-up copy of the draft SE showing the proprietary information and identifying editorial and technical corrections.

AREVA considers some of the information contained in the enclosed Attachments to be proprietary. As required by 10 CFR 2.390(b), an affidavit is enclosed (Attachment 4) to support withholding the information from public disclosure.

If you have any questions related to this letter please contact Mr. Morris E. Byram, Product Licensing Manager, by telephone at 434-832-4665 or by e-mail at [Morris.Byram@areva.com](mailto:Morris.Byram@areva.com).

Sincerely,

Gary Peters, Director  
Licensing & Regulatory Affairs  
AREVA Inc.

cc: J. G. Rowley  
Project 728

T007  
YG01  
NRK

**AREVA INC.**

References:

- Ref. 1: Letter, Kevin Hsueh (NRC) to Gary Peters (AREVA Inc.), "Draft Safety Evaluation for AREVA NP Inc. Topical Report BAW-10247(P)(A), Revision 0, Supplement 1, Revision 0, 'Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding'," (CAC NO. MF5421), February 8, 2017.
- Ref. 2: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding," NRC:09:133, December 22, 2009.
- Ref. 3: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Transmittal of Revised Information for Review of Topical Report BAW-10247PA, Revision 0, Supplement 1P, Revision 0," NRC:10:093, October 22, 2010.
- Ref. 4: Letter, Pedro Salas (AREVA Inc.) to Document Control Desk (NRC), "Response to a Draft Request for Additional Information Regarding Report BAW-10247(P)(A), Revision 0, Supplement 1P, Revision 0, 'Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding'," NRC:13:016, April 19, 2013.
- Ref. 5: Letter, Pedro Salas (AREVA Inc.) to Document Control Desk (NRC), "Response to a Draft Request for Additional Information Regarding Report BAW-10247(P)(A), Revision 0, Supplement 1P, Revision 0, 'Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding'," NRC:13:084, November 20, 2013.
- Ref. 6: Letter, Gary Peters (AREVA Inc.) to Document Control Desk (NRC), "Response to a Draft Request for Additional Information Regarding Report BAW-10247PA, Revision 0, Supplement 1P, Revision 0, 'Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding'," NRC:16:013, May 9, 2016.

Attachments:

1. Summary Table of Proprietary Information and Technical Corrections
2. Excerpt A- Suggested replacement text for Section 4.0 of the Draft SE
3. Mark-up of Draft Safety Evaluation for Draft Safety Evaluation for AREVA NP Inc. Topical Report BAW-10247(P)(A), Revision 0, Supplement 1P, Revision 0, "Realistic Thermal-Mechanical Fuel Rod Methodology for Boiling Water Reactors Supplement 1: Qualification of RODEX4 for Recrystallized Zircaloy-2 Cladding"
4. Notarized Affidavit

**Attachment 1: Summary Table of Proprietary Information and Technical Corrections**

<b>Page*</b>	<b>Line start*</b>	<b>Line end*</b>	<b>Proposed Change and Reason</b>
4	13	13	Proprietary: developed coefficients- add proprietary bracketing as marked in enclosed markup.
4	30	30	Proprietary: developed values - add proprietary bracketing as marked in enclosed markup.
6	2	3	Proprietary: Table 1 and formula below -developed values - add proprietary bracketing as marked in enclosed markup.
6	6	7	Proprietary: Table 2 - developed values - add proprietary bracketing as marked in enclosed markup.
7	1	1	Proprietary: Figure 1 - developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
7	16	17	Proprietary: developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
8	20	21	Proprietary: Figure 2 - developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
8	28	28	Proprietary: developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
9	3	4	Proprietary: developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
9	6	7	Proprietary: Figure 3 - developed characteristic material properties - add proprietary bracketing as marked in enclosed markup.
10	1	1	Proprietary: Figure 4 - developed characteristic material properties
10	19	19	Editorial: "a thermal" should be "athermal"
10	27	29	Proprietary: developed material properties - mark as proprietary from "higher value" through "cladding"
11	9	9	Proprietary: Figure 5 - evaluated material properties - add proprietary bracketing as marked in enclosed markup.
11	15	15	Proprietary: number of data points in developed database - add proprietary bracketing as marked in enclosed markup.
12	1	1	Proprietary: Figure 6 - evaluated material properties - add proprietary bracketing as marked in enclosed markup.
12	3	4	Proprietary: Figure 7 - evaluated material properties - add proprietary bracketing as marked in enclosed markup.

Page*	Line start*	Line end*	Proposed Change and Reason
13	4	4	Proprietary: database evaluation- add proprietary bracketing as marked in enclosed markup.
13	19	19	Editorial: "nodular" instead of "nodulation"
14	32	32	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
15	3	4	Proprietary: model detail text - mark as proprietary starting with "linear" and ending with "range" as denoted on enclosed markup.
15	7	8	Proprietary: figure 8- developed material properties - add proprietary bracketing as marked in enclosed markup.
15	13	13	Editorial: "439" should be "436"
16	18	18	Proprietary: database details - add proprietary bracketing as marked in enclosed markup.
16	20	20	Proprietary: database details - add proprietary bracketing as marked in enclosed markup.
16	23	23	Proprietary: database details - add proprietary bracketing as marked in enclosed markup.
16	24	24	Proprietary: database details - add proprietary bracketing as marked in enclosed markup.
16	24	25	Proprietary: database details - mark as proprietary starting with "three" and ending with "available" as marked on enclosed markup.
16	28	28	Proprietary: database details - add proprietary bracketing as marked in enclosed markup.
17	1	1	Proprietary: Figure 9 -evaluated material properties - add proprietary bracketing as marked in enclosed markup.
17	10	10	Proprietary: evaluation details - add proprietary bracketing as marked in enclosed markup.
18	1	1	Proprietary: Figure 10 - evaluation details - add proprietary bracketing as marked in enclosed markup.
19	27	27	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
20	1	1	Proprietary: Figure 11 - material developed and evaluated properties - add proprietary bracketing as marked in enclosed markup.
20	5	6	Proprietary: Figure 12 - material developed and evaluated properties - add proprietary bracketing as marked in enclosed markup.
21	8	8	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
21	10	10	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.

Page*	Line start*	Line end*	Proposed Change and Reason
21	16	17	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
21	32	32	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
22	1	1	Proprietary: Figure 13 - material developed and evaluated properties - add proprietary bracketing as marked in enclosed markup.
22	11	11	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
22	15	15	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
23	48	48	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
24	1	1	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
24	2	2	Proprietary: developed material properties - add proprietary bracketing as marked in enclosed markup.
24	9	32	Editorial: Replace entire section with attached text: Excerpt A Enclosed
24	36	40	Editorial: Replace paragraph with the following text: The result of the review of the supplement to BAW-10247PA Revision 0 (Reference 1) is that the RODEX4 code and methods are acceptable for the inclusion of RX Zircaloy-2 and therefore, condition c in Section 5 of the Reference 7 SE is removed. All other limitations as discussed above in Section 4 continue to apply.
25	23	23	Editorial: Reference 4 ADAMS Accession No. should be ML13119A029.

\* The page and line number is referenced to the draft SE sent in NRC letter dated 2/8/2017, received 2/14/2017.



withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is 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 to determine whether information should be classified as proprietary:

- (a) The information reveals details of AREVA'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.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by AREVA, would be helpful to competitors to AREVA, and would likely cause substantial harm to the competitive position of AREVA.

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

7. In accordance with AREVA'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 only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA 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.

Marie E. Byrd

SUBSCRIBED before me this 13<sup>th</sup>  
day of March, 2017.

Ellen F. Carr-Payne 309873

