



January 16, 2013  
NRC:13:001

Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**ANP-10306P, Revision 1, "Comprehensive Vibration Assessment Program for U.S. EPR Reactor Internals Technical Report"**

Ref. 1: Letter, Sandra M. Sloan (AREVA NP Inc.) to Document Control Desk (NRC), "Submittal of ANP-10306P, 'Comprehensive Vibration Assessment Program for U.S. EPR™ Reactor Internals Technical Report'," NRC:09:126, December 11, 2009.

Ref. 2: E-mail, Dennis Williford (AREVA NP Inc.) to Amy Snyder (NRC), "Response to U.S. EPR Design Certification Application RAI No. 422, FSAR Ch. 3, Supplement 36," January 3, 2013.

In Reference 1, AREVA NP Inc. (AREVA NP) submitted Technical Report ANP-10306P, Revision 0, "Comprehensive Vibration Assessment Program for U.S. EPR Reactor Internals Technical Report." AREVA NP is submitting, for NRC information, the enclosed Revision 1 to this Technical Report to reflect information that has already been reviewed and approved by the NRC as part of previous RAI responses (see Enclosure 1). U.S. EPR FSAR Tier 2, Sections 1.6 and 3.9.2 have been revised to reference this revised Technical Report.

While performing a review of the revision to ANP-10306P, AREVA NP identified an error in Section A.2.3.3 of Appendix A, which erroneously stated that orientation of elbows is inconsequential with respect to acoustic resonance detection methods. This error has been corrected in the enclosed Revision 1 of ANP-10306P, and a revised response to RAI 422, Question 03.09.02-144 was submitted to NRC (Reference 2). An additional error was discovered in Sections 4.3.3.2, 4.3.4.2, 4.7.3 of ANP-10306P regarding the endurance limit for the fatigue curves (see Enclosure 2, page 2-2). However, this error did not affect the response to any previous RAIs, other than the markups to ANP-10306P provided in RAI 422 Supplement 33, Question 03.09.02-107 and RAI 422 Supplement 5, Question 03.09.02-128. The corrections have been made in the enclosed Revision 1 of ANP-10306P. These errors have been entered into the AREVA NP Corrective Action Program.

Other changes to ANP-10306P that were made for grammatical or clarity purposes, and were not provided in a previous RAI response, are described in Enclosure 2. The remaining changes described in Enclosure 2 do not technically affect any previous RAI responses.

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

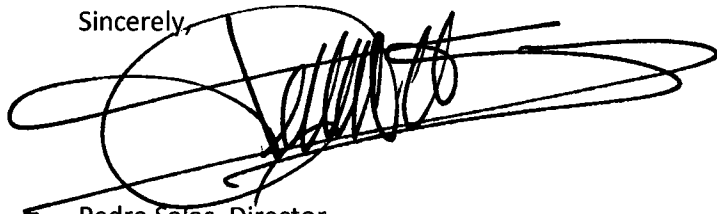
**AREVA NP INC.**

3315 Old Forest Road, P.O. Box 10935, Lynchburg, VA 24506-0935  
Tel.: 434 832-3000 - [www.aveva.com](http://www.aveva.com)

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If you have any questions related to this submittal, please contact Mr. Len Gucwa by telephone at 434-832-3466, or by e-mail to [Len.Gucwa.ext@areva.com](mailto:Len.Gucwa.ext@areva.com).

Sincerely,

A handwritten signature in black ink, appearing to be 'Pedro Salas', written over a large, loopy circular flourish.

Pedro Salas, Director  
Regulatory Affairs  
AREVA NP Inc.

Enclosures:

1. List of Affected RAIs and Affected Sections of ANP-10306P.
2. List of Other Changes Not Provided in a Previous RAI Response.
3. Proprietary and Non-Proprietary versions of ANP-10306, Revision 1.
4. Notarized Affidavit.

cc: A. M. Snyder  
Docket No. 52-020

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
331	03.09.02-65	8.0 A.2.1	
384	03.09.02-068	N/A	See RAI 522 Question 03.09.02-170.
407	03.09.02-069	N/A	
407	03.09.02-070	N/A	
407	03.09.02-071	N/A	
407	03.09.02-072	N/A	
407	03.09.02-073	N/A	
407	03.09.02-074	N/A	See RAI 522 Question 03.09.02-170.
407	03.09.02-075	N/A	
407	03.09.02-076	N/A	
407	03.09.02-077	4.2.2.3	
407	03.09.02-078	4.2.7.2	Section 4.2.7.2 was moved to 4.2.7.1.2.
407	03.09.02-079	N/A	
407	03.09.02-080	N/A	
407	03.09.02-081	N/A	
422	03.09.02-082	N/A	
422	03.09.02-083	N/A	Question number not used.
422	03.09.02-084	N/A	
422	03.09.02-085	A.2.3.3 8.0	
422	03.09.02-086	N/A	
422	03.09.02-087	5.5 5.6	
422	03.09.02-088	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-089	N/A	
422	03.09.02-090	B.3.1 Figure B-9	
422	03.09.02-091	N/A	
422	03.09.02-092	N/A	

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
422	03.09.02-093	N/A	
422	03.09.02-094	B.3.2.2 Table B-3	
422	03.09.02-095	B.3.1	
422	03.09.02-096	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-097	N/A	
422	03.09.02-098	N/A	
422	03.09.02-099	4.2.5.2.2	
422	03.09.02-100	N/A	
422	03.09.02-101	4.5.1	
422	03.09.02-102	N/A	
422	03.09.02-103	5.3.1	
422	03.09.02-104	N/A	
422	03.09.02-105	N/A	
422	03.09.02-106	4.6.5 Figure 4-61 Figure 4-62 Figure 4-63 Figure 4-64 Figure 4-65 Figure 4-66 Figure 4-67 Figure 4-68 Figure 4-69 Figure 4-70 Figure 4-71	
422	03.09.02-107	4.7.1 4.7.2 4.7.3 4.7.4 Table 4-35 Table 4-36 Figure 4-41 Figure 4-42	

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
422	03.09.02-108	4.2.7.1.3	This information was moved from Section 4.2.7.3 to 4.2.7.1.3 and Section 4.2.7.2 was moved to 4.2.7.1.2.
422	03.09.02-109	4.2.1.2 Table 4-28 Table 4-29 Figure 4-43 Figure 4-44 Figure 4-45 Figure 4-46 Figure 4-47 Figure 4-48 Figure 4-49	
422	03.09.02-110	N/A	
422	03.09.02-111	N/A	
422	03.09.02-112	N/A	
422	03.09.02-113	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-114	N/A	
422	03.09.02-115	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-116	N/A	
422	03.09.02-117	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-118	Table 4-4	
422	03.09.02-119	Table 4-4 Figure 4-17 Table 4-10	
422	03.09.02-120	N/A	
422	03.09.02-121	Table 4-3 Table 4-4 Table 4-9 Table 4-10	
422	03.09.02-122	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-123	N/A	See RAI 522 Question 03.09.02-170.
422	03.09.02-124	N/A	
422	03.09.02-125	N/A	

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
422	03.09.02-126	4.3.2 4.3.2.1.1 Figure 4-28 Figure 4-29 4.3.4.1 4.3.4.1.1 Table 4-13 Table 4-14 Table 4-15 Table 4-16 Figure 4-30	
422	03.09.02-127	N/A	
422	03.09.02-128	4.3.2 4.3.2.1 4.3.2.1.2 Figure 4-29 4.3.3.2 4.3.4.1 4.3.4.2 Table 4-13 Table 4-14 Table 4-15 Table 4-16 Table 4-16A 4.3.5	
422	03.09.02-129	N/A	
422	03.09.02-130	N/A	

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
422	03.09.02-131	4.5.1 4.5.1.1.2 4.5.1.1.3 4.5.1.1.4 4.5.2.2 4.5.2.3 4.5.3 Table 4-19 Table 4-20 Figure 4-50 Figure 4-51 Figure 4-52 Figure 4-53 Figure 4-54 Figure 4-55 Figure 4-56 Figure 4-57 Figure 4-58	
422	03.09.02-132	N/A	
422	03.09.02-133	N/A	
422	03.09.02-134	N/A	
422	03.09.02-135	N/A	
422	03.09.02-136	Table 4-21 Figure 4-60	Figure 4-60 was previously Figure 4-29-A.
422	03.09.02-137	N/A	
422	03.09.02-138	N/A	
422	03.09.02-139	N/A	
422	03.09.02-140	6.2 Table 6-6	
422	03.09.02-141	N/A	
422	03.09.02-142	N/A	
422	03.09.02-143	N/A	

Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
422	03.09.02-144	Section A.2.3.3	See RAI 522 Question 03.09.02-170 regarding Table 4-20.  AREVA NP identified an error in Section A.2.3.3 of Appendix A, which erroneously stated that orientation of elbows is inconsequential with respect to acoustic resonance detection methods. This error has been entered into the AREVA NP Corrective Action Program, and a revised response to RAI 422 Question 03.09.02-144 was submitted to NRC.
422	03.09.02-145	N/A	
458	03.09.02-146	N/A	
458	03.09.02-147	4.6.3.1 Table 4-34	
458	03.09.02-148	4.7.2	
458	03.09.02-149	Table 4-19 Table 4-32	
458	03.09.02-150	N/A	See RAI 522 Question 03.09.02-170.
458	03.09.02-151	4.5.1 4.5.1.1.5 4.5.2.3 Table 4-20 Table 4-30 Table 4-31 Table 4-33 Figure 4-59	
458	03.09.02-152	N/A	
458	03.09.02-153	N/A	
458	03.09.02-154	N/A	
467	03.09.02-155	N/A	
467	03.09.02-156	N/A	
467	03.09.02-157	N/A	
467	03.09.02-158	N/A	
467	03.09.02-159	N/A	



Enclosure 1 List of Affected RAIs and Affected Sections of ANP-10306P			
FSAR RAI	Question No.	Affected Section(s) of ANP-10306P	Comments
467	03.09.02-160	N/A	
467	03.09.02-161	N/A	
467	03.09.02-162	N/A	
467	03.09.02-163	N/A	
467	03.09.02-164	N/A	
467	03.09.02-165	N/A	
467	03.09.02-166	N/A	
467	03.09.02-167	N/A	
503	03.09.02-168	N/A	
508	03.09.02-169	4.5.3 Figure 4-72	
522	03.09.02-170	4.2.2.3 Table 4-1 4.2.3 4.2.4 4.2.7 4.2.8 Table 4-20 Table 4-37 7.0 8.0 A.2.3.3 A.2.4 B.5 Appendix C	The revision to Table 4-20 supersedes the one provided in the Response to RAI 422, Supplement 26, Question 03.09.02-131. Also, as noted in Enclosure 2, the first paragraph of Section 4.2.3 was revised to add clarity to the methodology. The technical content of the paragraph was not altered.

<p align="center"><b>Enclosure 2</b> <b>List of Other Changes Not Provided in a Previous RAI Response</b></p>		
<b>Page Number</b>	<b>Affected Section(s) of ANP-10306P</b>	<b>Description of Change</b>
	All	Grammatical changes, including verb tense, were made for consistency.
	All	Updated references to figures and tables (e.g., in Section 4.2.1.2, the references to Figures 4-44 through 4-50 were changed to Figures 4-43 through 4-49, respectively)
3-2	Figure 3-1	This figure was edited by adding pointers to show additional clarity and consistency with the Vibration Analysis Program (performed prior to the pre-operational tests) of the Regulatory Guide 1.20.
4-17	4.2.2.3	The first paragraph under the heading titled "Differences between the Wet and Dry Testing," was revised for clarity and to resolve ambiguity. The technical content was not altered.
4-97	4.2.7.1.3	The last paragraph under the heading titled "Uncertainty of the Level of Response of the CB at the LSP Elevation" was revised for clarity and to resolve ambiguity. The technical content was not altered.
4-111 4-113 4-164	4.3.3.2 4.3.4.2 4.7.3	<p>In the markups to ANP-10306P, attached to the Response to RAI 422, Supplement 33, Question 03.09.02-107 and RAI 422, Supplement 5, Question 03.09.02-128, the high cycle fatigue limit was defined incorrectly. Sections 4.3.3.2, 4.3.4.2, and 4.7.3 have been revised to be consistent with Figure 4-21 (the ASME fatigue curve). In Section 4.7.3, the allowable displacement limit was revised.</p> <p>These changes do not affect the text responses to RAI 422, Supplement 33, Question 03.09.02-107 and RAI 422, Supplement 5, Question 03.09.02-128; therefore, no change to these RAI responses is required. This error has been entered into the AREVA NP Corrective Action Program.</p>
8-1	8.0	Reference 13, which was originally in Revision 0 of ANP-10306P, was added back in A.2.1.
	Appendix A	Renumbered the equations in Appendix A.

<b>Enclosure 2</b> <b>List of Other Changes Not Provided in a Previous RAI Response</b>		
<b>Page Number</b>	<b>Affected Section(s) of ANP-10306P</b>	<b>Description of Change</b>
A-3	A.2.1	The first paragraph and Equation 4 were revised to provide clarity, and to incorporate resolution to RAI 331, Question 03.09.02-65 and RAI 422, Question 03.09.02-138. The Equation 4 coefficient was also revised to be consistent with Strouhal number criterion of 0.63.
A-6	A.2.3.3	In the description of Equation 9, the word “arbitrary” was eliminated for magnitudes of sound waves because these are the actual amplitudes used in that equation.
C-1	Appendix C	In the first paragraph, the reference to RAI 522 was deleted.

## A F F I D A V I T

COMMONWEALTH OF VIRGINIA            )  
  ) ss.  
COUNTY OF CAMPBELL                 )

1.       My name is Gayle F. Elliott. I am Manager, Product Licensing, for AREVA NP Inc. (AREVA NP) and as such I am authorized to execute this Affidavit.

2.       I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3.       I am familiar with the AREVA NP information contained in ANP-10306P, Revision 1, entitled, "Comprehensive Vibration Assessment Program for U.S. EPR Reactor Internals Technical Report," and referred to herein as "Document." Information contained in this Document has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

4.       This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by AREVA NP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5.       This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be 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 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(b) and 6(c) 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.

A handwritten signature in black ink, appearing to be 'D. R. [unclear]', written over a horizontal line.

SUBSCRIBED before me this 15<sup>th</sup>  
day of January, 2013.

A handwritten signature in black ink, appearing to be 'Sherry L. McFaden', written over a horizontal line.

Sherry L. McFaden  
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA  
MY COMMISSION EXPIRES: 10/31/14  
Reg. # 7079129

