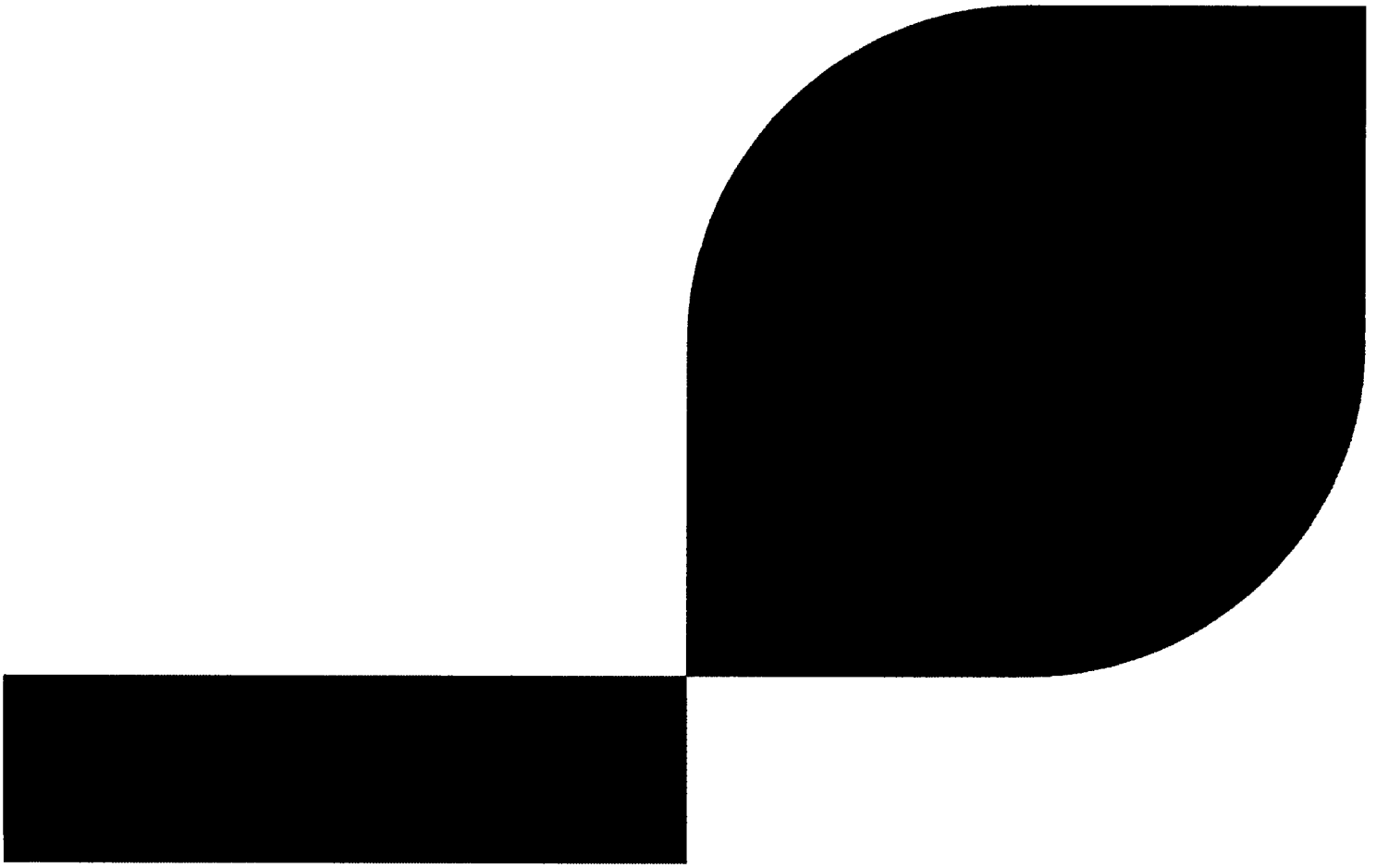

ANP-EMF-93-177NPA
Revision 1
Supplement 1Q1NP
Revision 0

Mechanical Design for BWR Fuel Channels
Supplement 1: Advanced Methods for New Channel Designs
Responses to NRC Request for Additional Information

August 2012

AREVA NP Inc.

AREVA

AREVA NP Inc.

ANP-EMF-93-177NPA
Revision 1
Supplement 1Q1NP
Revision 0

Mechanical Design for BWR Fuel Channels
Supplement 1: Advanced Methods for New Channel Designs
Responses to NRC
Request for Additional Information

AREVA NP Inc.

ANP-EMF-93-177NPA
Revision 1
Supplement 1Q1NP
Revision 0

Nature of Changes

Item	Page	Description and Justification
1.	All	This is a new document

Contents

Introduction 1

Question 1 1

Question 2 3

AREVA Response 2: 3

Question 3 3

AREVA Response 3: 3

Reference 4

This document has a total of 9 pages.

INTRODUCTION

AREVA NP Inc. (AREVA) received RAI questions from the NRC on January 25, 2012 (Reference 1), regarding the acceptance review of Licensing Topical Report EMF-93-177PA Revision 1 Supplement 1(P) Revision 0. This document provides AREVA's response to those RAI questions.

QUESTION 1

Section 2 states that: [

] What is considered 'adequate structural strength'? Also please provide a figure similar to Figure 5.1 from EMF-93-177(P) Rev. 1 that shows fuel channel differential pressure versus axial location representative of a 120% EPU.

AREVA Response 1:

Adequate structural strength implies that all design requirements listed in Reference 2 are met. If the material is too thin, the fuel channel will fail deformation limits and/or stress limits. The deformation limits are typically more limiting than stress limits. The requested fuel channel differential pressure information is provided in Figure 1. The 120% EPU increased differential pressure by approximately [ ] in the sample case evaluated here.

Figure 1 Fuel Channel Differential Pressure versus Axial Location Under 120% EPU Conditions

QUESTION 2

Section 2 refers to previous experience with channel wall thicknesses of less than [ ]. Please provide information detailing this experience including any bow or bulge data collected on such channels.

AREVA RESPONSE 2:

The previous experience with channel walls less than [ ] is for the interior water channels in the 9x9 and 10x10 ATRIUM fuel designs. The ATRIUM-9 and ATRIUM-10 have a water channel with a wall thickness of [ ]. The ATRIUM 10XM/XP water channel wall thickness is [ ]. The water channels are functionally similar to fuel channels and are manufactured with a similar process and material.

Due to the similarity between the fuel channel and water channel, the ATRIUM water channel bulge evaluation uses the methods approved for fuel channels in Reference 2. [

]. There has never been an indication that bulge in excess of predictions has occurred.

QUESTION 3

Because this is a new fuel channel design, [ ], does AREVA NP have a surveillance program to monitor the performance of these new fuel channels?

AREVA RESPONSE 3:

AREVA routinely performs surveillance to ensure that fuel channels are performing as predicted by the approved methods. This is in alignment with the Standard Review Plan Section 4.2.II.4 discussion on post-irradiation surveillance to confirm expected performance. This surveillance may include control blade settle tests, SCRAM insertion tests, post-irradiation measurement of

channel bow and bulge, and other visuals and measurements (i.e., growth and oxide). As described in item five of Reference 3, AREVA will resubmit [

]. This commitment applies to any channel design and is not limited to the ATRIUM 11 or new designs.

The performance of new features of the ATRIUM 11 fuel assembly will be validated in lead test assemblies prior to being introduced in reload quantities. Consistent with previous communication on this subject (Response 3 of Reference 4), the particulars of a lead fuel assembly surveillance program depend on the specifics of the new fuel design features and are developed on a case-specific basis in cooperation with the utility in whose reactor the lead fuel assemblies are irradiated.

REFERENCE

1. 38-9189334-000, e-mail, Holly Cruz (NRC) to Gayle Elliott (AREVA), subject: "EMF-93-177 RAIs," August 2012 *(NRC ADAMS Accession Number ML12222A219)*; and 38-9189335-000, e-mail Holly Cruz (NRC) to Gayle Elliott (AREVA), subject: "Revised RAI Response Date for TRs BAW-10247PA, Rev. 0, Suppl. 1P, Rev. 0 and EMF-93-177(P)(A), Rev. 1, Suppl. 1(P), Rev. 0.," August 2012 *(NRC ADAMS Accession Number ML12194A524)*.

2. Framatome ANP Inc. Topical Report, EMF-93-177(P)(A) Revision 1, "Mechanical Design for BWR Fuel Channels," August 2005.

3. Letter from J. S. Holm (AREVA) to Document Control Desk (NRC), "Additional Information – EMF-93-177(P) Revision 1, "Mechanical Design for BWR Fuel Channels," NRC:05:028, April 22, 2005.

4. Letter from D. E. Hershberger (Siemens) to R. C. Jones (NRC), "Responses to Request for Additional Information Regarding Topical Report ANF-89-98 Revision 1," DEH:93:005, January 28, 1993.

Attachment C

Notarized Affidavit

AFFIDAVIT

STATE OF WASHINGTON)
) ss.
COUNTY OF BENTON)

1. My name is Alan B. Meginnis. I am Manager, Product Licensing, for AREVA NP Inc. 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 the Attachments to Letter Number NRC:12:045, entitled "Response to a Request for Additional Information Regarding EMF-93-177(P)(A), Revision 1, Supplement 1(P), Revision 0, "Mechanical Design for BWR Fuel Channels Supplement 1: Advanced Methods for New Channel Designs"," dated August 2012 and referred to herein as "Documents." Information contained in these Documents 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. These Documents contain information of a proprietary and confidential nature and are 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 these Documents as proprietary and confidential.

5. These Documents have been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in these Documents 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 these Documents is considered proprietary for the reasons set forth in paragraphs 6(b), 6(d) and 6(e) above.

7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in these Documents have 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 28th day of August, 2012.

Susan K. McCoy
NOTARY PUBLIC, STATE OF WASHINGTON
MY COMMISSION EXPIRES: 1/14/2016