AREVA

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NRC:11:092

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

**Closure Plan for Resolution of Issues Associated with GSI-191 for U.S. EPR Design Certification**

Ref. 1: Letter, Sandra M. Sloan (AREVA NP Inc.) to Document Control Desk (NRC), "Closure Plan for Issues Associated with GSI-191 for the U.S. EPR Design Certification," NRC:10:111, December 14, 2010.

Ref. 2: Letter, Sandra M. Sloan (AREVA NP Inc.) to Document Control Desk (NRC), "Closure Plan for Issues Associated with GSI-191 for U.S. EPR Design Certification and Submittal of Revision 3 to Technical Report ANP-10293P, 'U.S. EPR™ Design Features to Address GSI-191," NRC:11:035, March 31, 2011.

Ref. 3: Letter, Sandra M. Sloan (AREVA NP Inc.) to Document Control Desk (NRC), "Plan for Resolution of GSI-191 In-Vessel Downstream Effects for U.S. EPR Design Certification," NRC:11:037, April 28, 2011.

Ref. 4: Letter, David B. Matthews (NRC) to Tony Robinson (AREVA NP Inc.), "AREVA NP, Inc. – Review Schedule for the U.S. EPR Standard Design Certification Application," August 18, 2011.

In Reference 1, AREVA NP Inc. (AREVA NP) provided a closure plan for resolution of issues associated with GSI-191 supporting U.S. EPR design certification. On March 31, 2011, AREVA NP provided a revision to technical report ANP-10293P, "U.S. EPR™ Design Features to Address GSI-191" (Reference 2) and responses to requests for additional information regarding GSI-191 issued prior to March 17, 2011 (with the exception of those related to in-vessel downstream effects). In Reference 2, AREVA NP also committed to providing the path forward for resolution of in-vessel downstream effects by April 30, 2011.

In Reference 3, AREVA NP provided a plan for the resolution of issues associated with GSI-191 in-vessel downstream effects supporting U.S. EPR design certification. AREVA NP has executed the Reference 3 plan and has also performed further engineering evaluations and additional downstream effects testing.

In Reference 4, the NRC indicated it was now appropriate for AREVA to revise and update the GSI-191 closure plan. The purpose of this letter is to provide an updated plan for resolution of issues associated with GSI-191, including a schedule for submittal of remaining responses to NRC Requests for Additional Information (RAIs) and associated documentation.

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Since the submittal of Reference 3, two sets of fuel assembly separate effects tests were performed using the same U.S. EPR-specific simulated fuel assembly and the same test facility as in previous U.S. EPR testing. The first set of tests was performed from May 23 to June 14, 2011. NRC staff was present to audit and observe portions of this testing. As a result of the first set of tests, AREVA NP analyzed test results and decided to revise the U.S. EPR latent debris source term by reducing its fractional fiber composition. The basis for the revised source term has been discussed with NRC technical staff. The revised source term will be incorporated into the next revision to technical report ANP-10293P, "U.S. EPR™ Design Features to Address GSI-191." This change in source term necessitated an additional round of verification testing that was not considered in Reference 3.

A second set of downstream effects tests, with the revised source term, was performed from July 18 to August 11, 2011. These tests included both cold leg injection and hot leg injection simulations for post-LOCA conditions that are both conservatively representative and design basis prototypical. Each test demonstrated compliance with pre-determined test acceptance criteria with considerable margin. In addition, each test was successfully replicated by a second test under the same conditions to demonstrate repeatability of test results.

AREVA NP is evaluating the test results from the second set of tests and preparing the associated test reports. Those test reports will be made available for NRC inspection upon completion. The test results will be summarized in the next revision to technical report ANP-10293P.

AREVA NP has now completed all planned testing associated with resolution of GSI-191 issues for U.S. EPR design certification. AREVA NP notes that a large number of fuel assembly tests were conducted to support U.S. EPR design certification, including some performed for the PWR Owners Group by AREVA NP. The testing has expanded the downstream effects knowledge base to provide confidence, through conservatisms and performance margin, of long-term core coolability.

Attachment 1 to this letter contains a list of RAIs received to date that are directly related to GSI-191 issues for which AREVA NP must provide a response or an updated response. These RAIs pertain to a range of GSI-191 topics, including in-vessel and ex-vessel downstream effects; sump strainer/retaining basket design; Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC); and Combined License (COL) items. AREVA NP will provide responses to these RAIs, as well as a revision to technical report ANP-10293P, by November 18, 2011.

Attachment 2 to this letter contains a timeline of activities to resolve questions associated with in-vessel downstream effects, beginning with the testing conducted in May 2011 and culminating in submittal of RAI responses and the revised technical report by November 18, 2011.

AREVA NP is committed to continuing the frequent communications with the NRC staff and appreciates the ongoing engagement of the NRC staff to reach closure on questions associated with GSI-191.

If you have any questions related to this information, please me by telephone at (434) 832-2369 or by e-mail at sandra.sloan@areva.com.

Sincerely,

Sandra M. Sloan

Sandra M. Sloan, Manager
New Plants Regulatory Affairs
AREVA NP Inc.

Enclosures

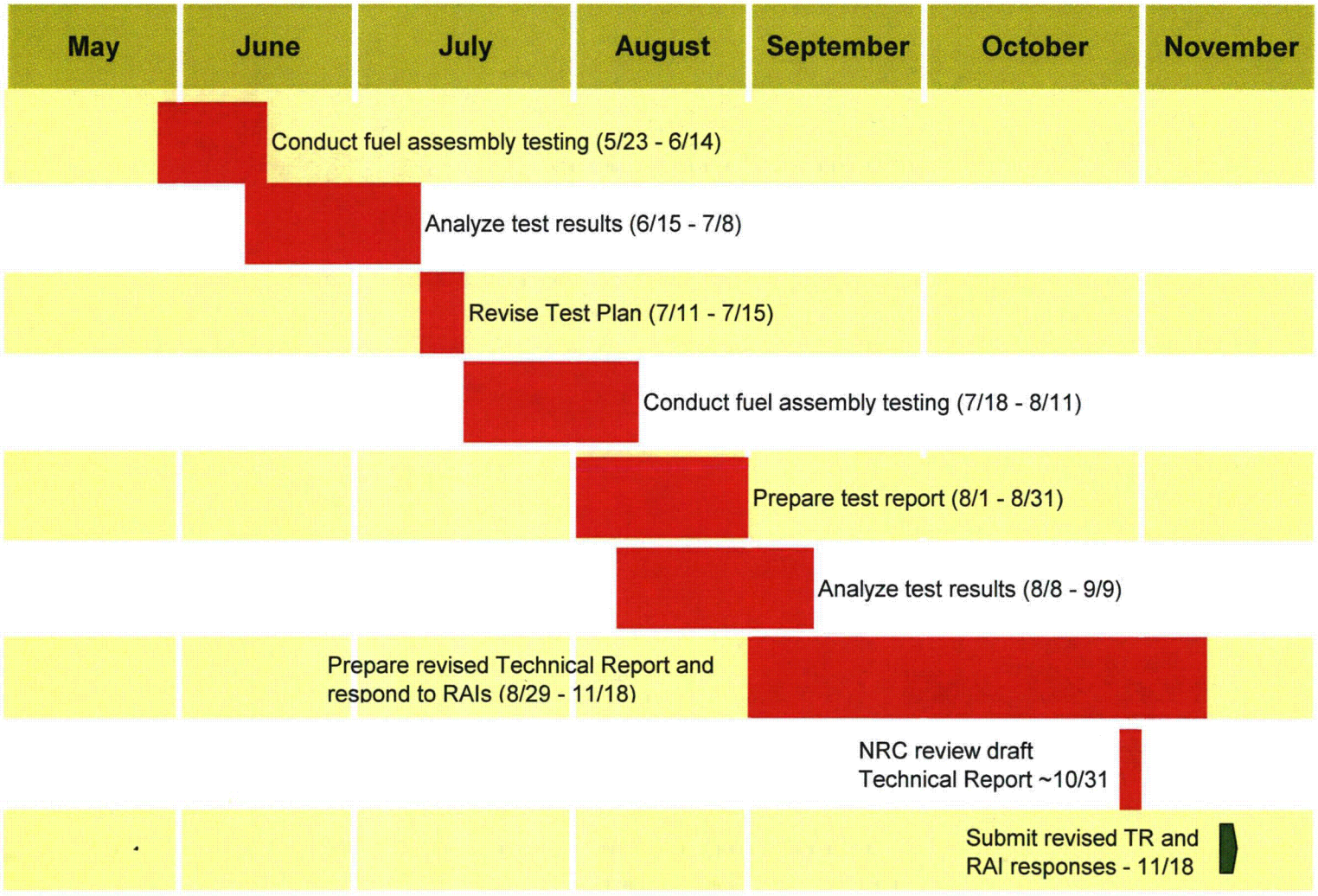
cc: G. Tesfaye
Docket 52-020

## Attachment 1

Outstanding GSI-191 Requests for Additional Information

| RAI | Questions |
|---|---|
| 30[1] | 15.6.5-4, 15.6.5-7, 15.6.5-18, 15.6.5-19 |
| 111[1] | 6.2.2-8 |
| 191 | 15.6.5-43, 15.6.5-44, 15.6.5-45, 15.6.5-46, 15.6.5-47, 15.6.5-49 |
| 362 | 15.6.5-56, 15.6.5-57, 15.6.5-58, 15.6.5-59, 15.6.5-60 |
| 428 | 15.6.5-85, 15.6.5-86, 15.6.5-87, 15.6.5-88, 15.6.5-95 |
| 429[1] | 6.2.2-67 |
| 480 | 6.1.2-10, 6.1.2-11, 6.2.2-89, 6.3-17 |
| 483 | 6.2.2-90 |
| 488 | 6.2.2-91, 6.2.2-92, 6.2.2-93, 6.2.2-94, 6.2.2-95, 6.2.2-96, 6.2.2-97, 6.2.2-98, 6.2.2-99 |
| 490 | 6.2.2-100, 6.2.2-101, 6.2.2-102, 6.2.2-103, 6.2.2-104, 6.2.2-105, 6.2.2-106, 6.2.2-107, 6.2.2-108, 6.2.2-109 |
| 493 | 15.6.5-98, 15.6.5-99, 15.6.5-100, 15.6.5-101, 15.6.5-102, 15.6.5-103, 15.6.5-105, 15.6.5-106, 15.6.5-107, 15.6.5-108, 15.6.5-109, 15.6.5-110 |
| 498 | 6.2.2-110, 6.2.2-111, 6.2.2-112, 6.2.2-113, 6.2.2-114, 6.2.2-115, 6.2.2-116, 6.2.2-117, 6.2.2-118, 6.2.2-119 |

Notes:

[1] – Revised responses to be provided

**Attachment 2**