ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Friday, July 23, 2010 3:52 PM
To: BRYAN Martin (EXTERNAL AREVA)
Cc: GUCWA Len (EXTERNAL AREVA); Carneal, Jason; ArevaEPRDCPEm Resource
Subject: Final Audit Plan for EPR GSI-191 By-Pass Testing
Attachments: FINAL EPR Downstream AUDIT PLAN 7-26-2010.docx

Importance: High

Marty,
Attached please find the final audit plan to review AREVA, NP's documentation and testing related to GSI-191 downstream effects in support of U.S. EPR design certification review. The test is scheduled to take place the week of July 26, 2010.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 1724

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Subject: Final Audit Plan for EPR GSI-191 By-Pass Testing
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From: Tesfaye, Getachew

Created By: Getachew.Tesfaye@nrc.gov

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AUDIT PLAN TO REVIEW AREVA NP, INC. DOCUMENTATION AND TESTING RELATED TO DOWNSTREAM EFFECTS IN SUPPORT OF THE U.S. EPR DESIGN CERTIFICATION REVIEW.

APPLICANT:	AREVA NP, Inc.
APPLICANT CONTACTS:	Martin Bryan Len Gucwa
TIME:	Documentation Review: 8:30 am to 4:30 pm on 07/23/2010 Testing visitation: 9:30 am to 5:30 pm on 07/26/2010 9:30 am to 5:30 pm on 07/27/2010 9:30 am to 5:30 pm on 07/28/2010 9:30 am to 5:30 pm on 07/29/2010
LOCATION:	07/23/2010: AREVA NP, Inc., Rockville, MD 07/26 -07/29/2010: Alden Labs, Holden, MA
REVIEWERS:	Fred Forsaty (NRO, Audit Lead) Jason Carneal (NRO) Clint Ashley (NRO) Vesselin Palazov (ISL, Inc.)

BACKGROUND

AREVA NP, Inc. (AREVA) has submitted to the U.S. Nuclear Regulatory Commission (NRC) a Final Safety Analysis Report (FSAR) for its application of the U.S. EPR in December 2007. NRC staff initiated the design certification review on March 19, 2008. To address GSI-191 downstream effects for the U.S. EPR Design Certification Application, AREVA submitted Technical Report ANP-10293 Revision 0 "U.S. EPR Design Features to Address GSI-191" in February 2008. In a public meeting held on July 8, 2009, AREVA announced its U.S. EPR sump performance strategy including the conduct of plant specific testing. Fuel assembly blockage testing was performed at Continuum Dynamics, Inc. (CDI) on October 27 and 28, 2009 and again in March 2010. Debris bypass was investigated as part of U.S. EPR plant specific sump testing (strainer/retaining basket) that was performed in December 2009.

During the initial technical review of ANP-10293 Revision 0, the staff issued a set of requests for additional information (RAIs) considering downstream effects. RAI 30, Questions 15.06.05-18 and 15.06.05-19 were issued to the applicant on July 29, 2008. RAI 191, Questions 15.06.05-43 through 15.06.05-49 were issued to the applicant on March 11, 2009. The responses to these RAIs are currently under staff evaluation. In addition, the staff conducted audits in areas related to U.S. EPR FSAR 15.6.5 GSI-191 downstream effects at AREVA's Twinbrook office in Rockville, MD in April 2009 and in April 2010. The staff also witnessed fuel assembly blockage

testing performed at CDI on October 27, 2009, and March 2010. Following the initial fuel assembly blockage testing, the staff issued RAI 362, Questions 15.06.05-56 to 15.06.05-60 on fuel blockage testing on January 29, 2010. The responses to these RAIs are currently under staff evaluation. In April 2010, the staff audited the U.S. EPR GSI-191 EPRDM debris deposition model and analysis results presented by AREVA. Following the audit, the staff formulated potential RAI questions, which were discussed with the applicant at a teleconference on May 10, 2010. The staff held a subsequent audit on June 8 to 10, 2010, at the AREVA office in Rockville, Maryland to review detailed documentation regarding testing of debris blockage of fuel assemblies, sump strainer bypass testing, EPRDM debris deposition analysis, and chemical effects evaluation. A public meeting was held on July 7, 2010 to discuss the path forward for in-vessel downstream effects testing and to communicate the staff's concerns with AREVA's proposed approach. Draft RAIs regarding staff concerns were issued to the applicant on July 21, 2010.

In order to cover important review areas handled by the Office of New Reactors Reactor Systems, Nuclear Performance, and Code Review Branch (SRSB), the staff proposes an audit to be held on July 23 to July 29, 2010, at the AREVA office in Rockville, Maryland and at bypass testing facilities in Holden, MA. The review of additional technical documents, specifically test plans and protocols, made available by AREVA at its local office, will be facilitated by the presence of AREVA personnel at the audit. The requested documentation includes test plans and protocols relating to bypass testing for the U.S. EPR design. The audit is needed to resolve existing questions in accomplishing the U.S. EPR review schedule in an efficient manner and to support the review in conformance with standard review plan (SRP) Section 15.6.5.

PURPOSE AND APPROACH

The purpose of this audit is to review test protocols and plans relating to bypass testing for the U.S. EPR design, and to witness bypass testing at Alden Labs in Holden, MA. A proposed agenda is provided in Attachment A. The topics to be covered in the audit specifically focus on testing and analysis performed in support of the applicant's downstream effects submittal.

To achieve the review goals in an efficient manner, the staff has assembled an interdisciplinary audit team. The audit team includes experts from NRC and consulting organizations. The testing portion of this audit will be attended by representatives from AREVA, who will be able to provide answers to the staff's questions on site.

AUDIT ACTIVITIES AND SCHEDULE

The NRC staff will conduct the review over a period of five business days. NRC may request an ad-hoc extension of the audit at the same location if findings during the ongoing audit reveal the need for additional time. It is currently anticipated that additional time will be required to adequately address staff concerns in the case that testing is delayed or extended. Such an extension will be requested before the meeting is adjourned on 07/26/2010 by the NRC staff responsible for the audit.

Following the audit, each technical reviewer and consulting organization will prepare a separate audit report with specific findings and will send the report to Jason Carneal by 08/02/2010. The NRC staff responsible for the audit will assemble and prepare a final audit

report. The final report will be made available to all contributors for their concurrence by 08/13/2010. Any final notes by the contributors will be communicated to Jason Carneal no later than 08/11/2010.

A proposed agenda for the audit is presented in Attachment A. A list of interest areas identified by the staff is provided in Attachment B. If necessary, any circumstances related to the conductance of the audit will be communicated to Jason Carneal (NRC) at 301-415-3813 or at Jason.Carneal@nrc.gov.

Attachment A

AGENDA
AUDIT TO REVIEW AREVA NP, INC. DOCUMENTATION AND TESTING RELATED TO DOWNSTREAM EFFECTS IN SUPPORT OF THE U.S. EPR DESIGN CERTIFICATION REVIEW

AREVA NP, Inc., Rockville, MD
July 23, 2010

Friday, July 23, 2010: AUDIT - proprietary

8:30-4:30 Downstream Effects Documentation Review: Test Plans and Protocols ..... [NRC]

Alden Labs, Holden, MA
July 26 to 29, 2010

Monday, July 26, 2010: AUDIT - proprietary

9:30-9:45 Entrance / Introduction of Facility ..... [NRC/AREVA NP]
9:45-12:00 Observation of Bypass Testing ..... [AREVA NP]
12:00 Lunch
13:00-17:30 Observation of Bypass Testing ..... [AREVA NP]
17:30 Adjourn

Tuesday, July 27, 2010: AUDIT - proprietary

9:30-12:00 Observation of Bypass Testing ..... [AREVA NP]
12:00 Lunch
13:00-17:30 Observation of Bypass Testing ..... [AREVA NP]
17:30 Adjourn

Wednesday, July 28, 2010: AUDIT - proprietary

9:30-12:00 Observation of Thin Bed Testing ..... [AREVA NP]
12:00 Lunch
13:00-17:30 Observation of Thin Bed Testing ..... [AREVA NP]
17:30 Adjourn

Thursday, July 29, 2010: AUDIT - proprietary

9:30-12:00 Observation of Thin Bed Testing ..... [AREVA NP]
12:00 Lunch
13:00-17:00 Observation of Thin Bed Testing ..... [AREVA NP]
17:00-17:30 Audit Exit / Summary
17:30 Adjourn

Attachment B

Audit Areas of Interest – Holden, MA July 26 to 29, 2010

1. Fiber Debris Surrogate Material Preparation

    - Selection of fiber material
    - Processing of fiber material and pre-mixing measurement
    - Fiber and water mixture preparation
    - Fiber debris mass scaling calculation and determination

2. Testing Facility and Instrumentation

    - Retention basket and strainer surface area scaling factor
    - Pump flow rate and scaling from actual ECCS pumps with LHSI and MHSI all operating
    - Total flow measurement and the strainer/basket flow surface velocity measurement and verification
    - Pump flow control and volume flow rate measurement and equipment calibration

3. By-pass Fiber Mass Measurement Device

    - Installation location of this new device and the capability to capture by-pass fiber from down-stream flow of the strainer
    - Filter mesh size and the supporting structure
    - DP measurement across the filter if it exists

4. Testing Procedures

    - Initial clean strainer head loss testing
    - Fiber debris introduction sequence and flow turn-over frequency between the debris addition
    - Determination of by-pass fiber mass with ¼ load and full load case

5. Post-test Fiber By-pass Mass Measurement

    - Procedures to collect these by-pass fiber on the filter
    - Drying and mass measurement process
    - Storage and the potential use for fuel assembly head loss testing