

## ArevaEPRDCDocsPEm Resource

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As requested.

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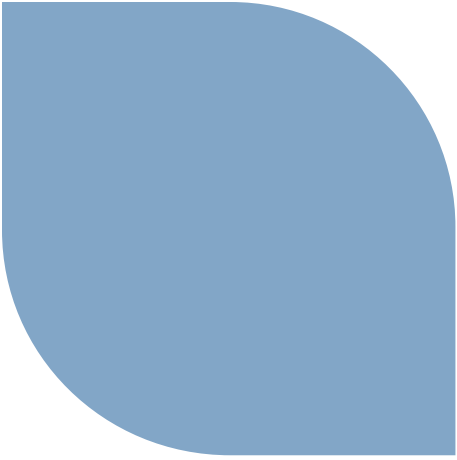
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# **U.S. EPR – FSAR Group B Chapter Closure Plans**

November 21, 2013

U.S. EPR Design Certification





## Meeting Purpose

- ▶ Continuation of closure plan discussions for the U.S. EPR design certification application
- ▶ Identify AREVA and NRC activities required for closure of Group B FSAR chapters (4, 6, 9, 15, 18) and agreement on the list of Group B chapters
- ▶ Today's discussion will not address schedules for remaining Group B activities
- ▶ Agreement on remaining activities will be documented in closure plan letters



# Meeting Agenda

- ▶ **Introductory Remarks**
- ▶ **Project planning status**
- ▶ **Group B chapter closure activities**
  - ◆ Chapter 4 – Reactor
  - ◆ Chapter 6 – Engineered Safety Features
  - ◆ Chapter 9 – Auxiliary Systems
  - ◆ Chapter 15 – Transient and Accident Analyses
  - ◆ Chapter 18 – Human Factors Engineering
- ▶ **Next Steps**
- ▶ **Meeting Summary**

# Project Planning Status

- ▶ Closure plan meetings will establish a common agreement on remaining activities to close FSAR chapters. Results of these meetings and subsequent schedule discussions will be documented in closure plan letters that will govern project execution.
- ▶ Goal is to have initial meeting on all FSAR chapters by end of 2013 as a first step toward alignment on review schedule.
- ▶ Grouping supports “safe closure” of FSAR chapters beginning in early 2014.
- ▶ Group A chapters
  - ◆ Meeting on remaining activities Oct 24, 2013 (C)
  - ◆ Meeting on schedule Nov 15, 2013 (C)
  - ◆ Closure plan letter Dec 2013
- ▶ Group B chapters
  - ◆ Meeting on remaining activities Nov 21, 2013
  - ◆ Meeting on schedule To be discussed Nov 21
- ▶ Group C chapters
  - ◆ Meeting on remaining activities Dec 17, 2013 (tentative)



## Group B FSAR Chapters

- ▶ **Group B includes chapters with open items remaining but generally well understood paths forward and that require a moderate level of effort to complete**
- ▶ **This meeting will identify remaining RAIs, open technical issues, audits, and significant pending FSAR changes.**
- ▶ **Less significant pending FSAR changes and future FSAR changes will be managed through periodic meetings on closure plan progress and dedicated meetings on non-RAI FSAR changes. As Group B chapters advance toward closure, focus on all FSAR changes will increase.**
- ▶ **Material incorporated by reference (e.g., technical reports) will be revised and submitted as necessary prior to Group B chapter closure**

# Chapter 4 – Reactor

- ▶ **Key Technical Issues**
  - ◆ **Fuel seismic**
- ▶ **RAIs – AREVA response pending**
  - ◆ **RAI 600 Question 04.02-19 – Demonstrate that Service Level C ensures control rod insertability**
    - AREVA plans to perform guide tube testing to ensure acceptability of Service Level C for guide tube stresses
  - ◆ **Letter summarizing impact of revised input to fuel assembly seismic analysis from building structural analysis**
    - AREVA will verify that ANP-10285P and FSAR Chapter 4 are not impacted by the Chapter 3 reanalysis



# Chapter 4 – Reactor

## ► RAls – In NRC evaluation

- ◆ **ANP-10285P RAI 72 (Eighth RAI) – Damping assumptions**
  - AREVA submitted final response 10/30/2013. 10/21/13 telecon discussed AREVA's resolution of NRC comments on advanced response.
- ◆ **RAI 571 Question 04.02-18 – Fuel bundle loss coefficients**
  - AREVA submitted RAI response 5/16/2013. Corresponding FSAR markups were submitted 5/31/2013 and were incorporated into FSAR Rev. 5.
  - AREVA placed two supporting calculations in electronic reading room on 8/2/2013. AREVA requests an update on the review status of RAI 571.
- ◆ **RAI 339 Question 04.02-17 – ANP-10285P under review**
  - RAI to track open item associated with topical report review. No action required.

## ► RAls – Closed

- ◆ **RAI 441 Questions 04.04-62-66 – Ex-core detectors**
  - AREVA submitted RAI response 5/20/2011. Response required no FSAR changes. AREVA requests confirmation that this RAI is closed.
- ◆ **RAI 367 Question 04.06-14 – Verification of limitations in ANP-10287P**
  - AREVA submitted RAI response 6/7/2011. Corresponding FSAR markups were incorporated into FSAR Rev. 3. AREVA requests confirmation that this RAI is closed.
- ◆ **RAI 544 Question 4.4-67, 68 – DNBR for partial pump operation (ACRS)**
  - AREVA submitted final response 6/17/2013. Response required no FSAR changes. AREVA requests confirmation that this RAI is closed.

## Chapter 4 – Reactor

- ▶ **Significant pending FSAR changes**
  - ◆ Potential changes resulting from finalization ANP-10287P (SPND)
- ▶ **Audits, inspections, or public meetings required for Phase 4**
  - ◆ None expected

# Chapter 6 – Engineered Safety Features

- ▶ **Key Technical Issues**
  - ◆ GSI-191
  - ◆ ECCS pump NPSH
  - ◆ Severe accident evaluation
- ▶ **RAIs – AREVA response pending**
  - ◆ **RAI 553 Question 06.03-18 – ECCS pump NPSH**
    - AREVA is supplementing the RAI response and associated markups to ANP-10293NP to clarify the results of sump strainer testing and how the results were used in the NPSH evaluation.
    - Consistent with the response to RAI 553, AREVA is making conforming changes to the following RAI responses:
      - **RAI 340 Question 06.02.01-57** – Supplemental response will restore an ITAAC to verify acceptable containment water retention
      - **RAI 524 Question 06.02.02-127** – Supplemental response will provide Chapter 19 markup addressing the risk associated with CAP credit. AREVA will provide basis for why long-term makeup to the IRWST is not required in RAI 524 or one of the related RAIs.
      - **RAI 475 Questions 06.02.02-86, 87** – Supplemental response to conform to approach described in RAI 553 Question 06.03-18

# Chapter 6 – Engineered Safety Features

- ▶ **RAIs – AREVA response pending (continued)**
- ◆ **RAI 553 Question 06.02.05-31 – Combustible gas control**
  - AREVA will supplement RAI response to address mixing, consistent with proposed changes discussed at L2 PRA audit.
- ◆ **RAI 566 Question 06.02.05-32 – Hydrogen generation in containment**
  - AREVA submitted final RAI response 11/19/2013.
- ◆ **RAI 597 Question 06.02.05-35 – Equipment survivability**
  - AREVA will include a COL Information Item or ITAAC related to equipment survivability requirements
  - RAI 597 addresses outstanding issue in RAI 473 Question 06.02.05-24
- ◆ **RAI 598 Question 06.02.01-106 – Extended loss of AC power**
  - AREVA will address the questions in RAI 598 and revise ANP-10329 accordingly

# Chapter 6 – Engineered Safety Features

- ▶ The following RAIs are identified as “In evaluation” according to the eRAI database as of 9/24/2013. AREVA requests confirmation that these RAIs are closed, based on resolution of comments on advanced responses and submittal of final responses.
  - ◆ RAI 511 Questions 06.02.02-125, 126 – Passive flooding lines (3/29/13)
  - ◆ RAI 568 Question 06.02.04-13 – Outside containment isolation valve location (2/28/13)
  - ◆ RAI 574 Questions 05.02.05-33, 34 – PAR qualification (6/14/13)
  - ◆ RAI 480 Question 06.03-17 – ECCS gas accumulation (11/9/11)
- ▶ The following RAIs are identified as “Confirmatory action” in eRAI database. AREVA requests confirmation that these RAIs are closed, based on FSAR markups being incorporated into FSAR Rev. 5.
  - ◆ RAI 575 Question 06.02.01-105 - Containment heat structures (6/18/13)
  - ◆ RAI 569 Question 06.02.02-138 – Post-LOCA SSC wear rates (4/11/13)
  - ◆ RAI 462 Question 06.02.03-8 – Containment leak-off system (5/17/13)
  - ◆ RAI 511 Question 06.04-9 – Containment bypass leakage (5/17/13)
  - ◆ RAI 511 Question 06.04-10 – Control room habitability (5/10/13)

# Chapter 6 – Engineered Safety Features



- ▶ **Significant pending FSAR changes**
  - ◆ Changes to FSAR and ANP-10293P to address ACRS action items
    - Additional break locations
    - Downstream effects
  - ◆ SBLOCA containment M&E release
- ▶ **Audits, inspections, or public meetings required for Phase 4**
  - ◆ ACRS meeting on GSI-191 and long-term core cooling
    - Address follow-up actions from 2013 ACRS meeting

# Chapter 9 – Auxiliary Systems

- ▶ **Key Technical Issues**
  - ◆ Spent fuel cask transfer facility
  - ◆ Fuel racks (seismic analysis addressed in Chapter 3)
- ▶ **RAIs – AREVA response pending**
  - ◆ **RAI 578 Question 09.04.03-7 – Ventilation system design changes**
    - AREVA submitted an advanced response 5/24/2013, including numerous FSAR markups. NRC comments on the advanced response were received 6/14/2013. At the time, NRC indicated that additional comments were expected. AREVA requests any additional comments on the advanced response so that RAI 578 response can be finalized.
  - ◆ **RAI 398 Question 09.01.04-18 and RAI 525 Question 09.01.04-23 – SFCTF radiological concerns**
    - RAI responses will be supplemented as a result of resolution of Chapter 12 RAIs on radiological sources and zones
  - ◆ **RAI 595 Question 09.01.02-42 – SFCTF barrier leakage technical specifications**
    - AREVA plans to supplement TS 3.7.23 to address NRC concerns.

# Chapter 9 – Auxiliary Systems

- ▶ **RAIs – AREVA response pending (continued)**
  - ◆ **RAI 601 Question 09.02.01-52 – Impact of EPGBVS design changes**
    - Information related to the EPGBVS cooler will be added to the FSAR as requested and Tier 1 inconsistency will be corrected.
  - ◆ **RAI 602 Question 09.02.05-39 – Typographical errors**
    - AREVA submitted RAI response 10/21/2013.
  - ◆ **RAI 603 Question 09.02.02-123 – Power supplies for CCWS valves**
    - Information will be added to the FSAR as requested and inconsistencies will be corrected.
  - ◆ **RAI 604 Question 14.03.07-40 – CCWS and SCWS ITAAC inconsistencies**
    - AREVA will correct Tier 1 and Tier 2 inconsistencies.
  - ◆ **RAI 614 Question 14.03.07-41 – SCWS chiller temperature range**
    - AREVA will specify an appropriate temperature in Tier 1 and Tier 2 Section 9.2.8.
  - ◆ **Draft RAI 620 Question 09.01.05-25 – Crane classifications and design standards**
    - A clarification call on the draft RAI is pending.



## Chapter 9 – Auxiliary Systems

- ▶ The following RAls are identified as “In evaluation” according to the eRAI database as of 9/24/2013. AREVA requests confirmation that these RAls are closed, based on resolution of comments on advanced responses and submittal of final responses.
  - ◆ RAI 513 Questions 09.01.01-58, 59 – SFP criticality outside storage racks (7/12/13)
  - ◆ RAI 513 Questions 09.01.01-61, 62 – SFP boron enrichment (6/27/13)
  - ◆ RAI 526 Question 09.01.02-40, 41 – SFCTF barriers and drain-down prevention (5/23/13)
  - ◆ RAI 534 Question 09.01.04-39 – SFCTF design features (5/24/13)
  - ◆ RAI 530 Question 09.01.05-24 – SFCTF heavy load handling (2/28/13)
  - ◆ RAI 556 Question 09.03.04-27 – RCS hydrogen limits (3/4/13)

## Chapter 9 – Auxiliary Systems

- ▶ The following RAIs are identified as “Confirmatory action” or “Issued/Waiting for response” in eRAI database. AREVA requests confirmation that these RAIs are closed, based on FSAR markups being incorporated into FSAR Rev. 5.
  - ◆ RAI 550 Question 09.01.03-16 – Reliable SFP instrumentation (10/25/12)
  - ◆ RAI 525 Questions 09.01.04-21-37 – SFCTF (Feb-May 2013)
  - ◆ RAI 525 Question 09.01.04-38 – Seismic qualification of SFCTF safety devices and seals (3/14/13)
  - ◆ RAI 518 Question 09.02.05-38 – UHS cooling capability (6/25/12)
  - ◆ RAI 558 Question 09.04.05-5 – Containment low flow purge exhaust subsystem technical specifications (2/5/13)
  - ◆ RAI 519 Question 09.05.01-88 – Fire barrier ratings in ITAAC (3/12/12)
  - ◆ RAI 559 Question 09.03.04-28 – pH calculation program (1/17/13)



## Chapter 9 – Auxiliary Systems

- ▶ **Significant pending FSAR changes**
  - ◆ Potential for changes resulting from ongoing Chapter 11/12 consistency reviews and fuel rack design
- ▶ **Audits, inspections, or public meetings required for Phase 4**
  - ◆ Audit of SFCTF drainage evaluation and resulting leakage rates

# Chapter 15 – Transient and Accident Analyses

- ▶ **Key Technical Issues**
  - ◆ GSI-191 (downstream effects)
  - ◆ Single failed SPND
- ▶ **RAIs – AREVA response pending**
  - ◆ **RAI 17 Question 15.00.03-1 – ORIGIN code and N-16 concentration**
    - AREVA submittal on 6/14/2013 increased N-16 concentrations based on ORIGIN-S calculations.
    - NRC provided 8 comments related to calculation on N-16 concentration and impact on plant dose rates
    - AREVA will supplement RAI 17 response and re-submit.

# Chapter 15 – Transient and Accident Analyses

- ▶ **RAIs – AREVA response pending (continued)**
  - ◆ **RAI 573 Question 15.06.05-116 – GSL-191 downstream effects – pressure drops**
    - NRC provided verbal comments on advanced response on 8/15/2013, indicating that S-RELAP5 analyses would be required to validate acceptance criteria.
    - AREVA plans to perform additional S-RELAP5 analyses.
    - AREVA plans to schedule meeting with NRC prior to submittal of a revised ANP-10293P Appendix F to discuss changes.
    - AREVA plans to make conforming changes to responses to RAIs 191, 362, 428, and 493.
  - ◆ **RAI 521 Question 15.00.03-39 – Unbuffered pools of water in containment**
    - AREVA submitted final response 6/28/2013. Response required no FSAR changes. AREVA requests confirmation that this RAI is closed.
  - ◆ **ANP-10287P RAI 31-36 (Fourth request) – Complex trip functions**
    - AREVA submitted advanced response 6/28/2013. AREVA requests an update on the review status.
  - ◆ **RAI 505 Question 07.01-33 – Single failed SPND (Ch. 7 RAI but related to Ch. 15)**
    - AREVA submitted advanced response 6/28/2013. NRC requested an audit. AREVA will support the public meeting and audit request when activities resume on this issue.

# Chapter 15 – Transient and Accident Analyses

- ▶ **RAIs – In NRC evaluation**
  - ◆ **RAI 582 Question 15.08-1 – ATWS**
    - AREVA submitted final response 11/11/2013 that addressed NRC comments on advanced response.
    - Supporting calculations placed in electronic reading room 10/29/2013.
- ▶ **RAIs – Closed**
  - ◆ **RAI 573 Question 15.06.05-117 – GSI-191 downstream effects – AIOOH precipitate**
    - AREVA submitted final response 7/19/2013 with ANP-10293P markups. AREVA requests confirmation that this RAI is closed.
  - ◆ **RAI 403 Question 15.6.5-61, 62, 63 – SBLOCA boron dilution**
    - AREVA submitted final response 7/18/2013. Corresponding FSAR markups were incorporated into FSAR Rev. 5. AREVA requests confirmation that this RAI is closed.
- ▶ **Significant pending FSAR changes**
  - ◆ None
- ▶ **Audits, inspections, or public meetings required for Phase 4**
  - ◆ Single failed SPND (RAI 505) – AREVA will inform NRC when ready for this audit activity
  - ◆ GSI-191 - AREVA recommends a public meeting on ANP-10293P Appx. F (downstream effects) changes prior to submittal

# Chapter 18 – Human Factors Engineering

- ▶ **Key Technical Issues**
  - ◆ None. However, RAI 586 Question 18-241 is related to the on-going resolution of I&C software common cause failure, which is the driving factor for closure of Chapter 18.
- ▶ **RAIs – AREVA response pending**
  - ◆ **RAI 586 Question 18-240 – Risk-significant operator actions**
    - AREVA will clarify the relationship between the PRA and PRA based insights and the human reliability analysis, with corresponding FSAR and technical report changes.
  - ◆ **RAI 586 Question 18-241 – Use of SICS as a backup to PICS**
    - AREVA will clarify the definitions and relationship between PICS and SICS once the path forward on the digital I&C issue (software common cause failure) is established.
  - ◆ **RAI 617 Question 18-242 – Incorporation of HFE Implementation Plans into FSAR**
    - AREVA will ensure that implementation plans are appropriately incorporated into the FSAR.
- ▶ **Significant pending FSAR changes**
  - ◆ Potential changes tied to resolution of I&C issues (RAI 555 – SWCCF)
- ▶ **Audits, inspections, or public meetings required for Phase 4**
  - ◆ None



## Next Steps

- ▶ **AREVA to document Group B activities and schedules in formal closure plan letter**
- ▶ **Confirm Group C chapter activity meeting tentatively scheduled for Dec 17, 2013**



# Meeting Summary

