

April 15, 2011

MEMORANDUM TO: Chairman Jaczko  
Commissioner Svinicki  
Commissioner Apostolakis  
Commissioner Magwood  
Commissioner Ostendorff

FROM: Michael R. Johnson, Director **/RA/**  
Office of New Reactors

SUBJECT: QUARTERLY REPORT ON THE STATUS OF NEW REACTOR  
LICENSING ACTIVITIES – JANUARY 1 TO MARCH 31, 2011

In response to the Commission's February 13, 2011, Staff Requirements Memorandum for COMJSM-00-0003, "Staff Readiness for New Nuclear Plant Construction and the Pebble Bed Modular Reactor," the enclosed report provides the status of new reactor licensing activities for the quarter beginning January 1, 2011, and ending March 31, 2011. The report outlines detailed information on the status of new reactor licensing reviews for design certifications, early site permits, and combined license applications for this quarter. It also provides information on regulatory infrastructure, construction inspection, advanced reactors, and international activities.

Enclosure:  
As stated

CC: SECY  
EDO  
OGC  
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OPA  
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CONTACT: Aida Rivera-Varona, NRO/DCIP  
(301) 415-4001

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**\*via email**

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<b>DATE</b>	4/11/2011	4/11/2011	4/7/2011	4/12/2011	4/15/2011		

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Memorandum to Commission from Michael R. Johnson dated April 15, 2010.

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ACTIVITIES – JANUARY 1 TO MARCH 31, 2011

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# STATUS OF NEW REACTOR LICENSING ACTIVITIES - JANUARY 1 TO MARCH 31, 2011

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# STATUS OF NEW REACTOR LICENSING ACTIVITIES JANUARY 1 TO MARCH 31, 2011

## Introduction

### *New Reactor Program Overview*

Since its inception in 2006, the Office of New Reactors (NRO) has successfully served the public interest by enabling the safe, secure, and environmentally responsible use of nuclear power in meeting the Nation's future energy needs. The office's work is characterized by significant activities and accomplishments in its core responsibility areas of new reactor licensing, vendor and construction inspections, the agency's Advanced Reactor Program (ARP), and its growing international leadership. Specifically, NRO has completed several licensing activities, such as the review and issuance of four early site permits (ESPs) and a limited work authorization (LWA).

More recently, NRO's accomplishments include submitting to the Commission and issuing for public comment the design certification (DC) rulemaking packages for the AP1000 DC amendment and the Economic Simplified Boiling-Water Reactor (ESBWR). In addition, the office submitted to the Commission and issued for public comment the DC rule amendment for the Advanced Boiling-Water Reactor (ABWR) Aircraft Impact Assessment (AIA). Substantial progress also has been made on reviewing many of the 12 active combined license applications (COLAs), such as the completion of several safety evaluation report (SER) sections and environmental impact statements (EISs). These accomplishments demonstrate the office's commitment to fulfilling its mission, and mark the significant progress that NRO has made in implementing the licensing process under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

In addition, NRO and Region II worked together to develop an inspection program and put in place the structure and procedures required to conduct the new reactor construction oversight program for ongoing and near-term construction activities. This new inspection program incorporates the elements in 10 CFR Part 52, such as inspections, tests, analyses, and acceptance criteria (ITAAC); incorporates lessons learned from the inspection program used in the previous construction era (1970–1980) for plants licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"; and considers modular construction at remote locations. For instance, in March 2010, with the start of engineered backfill operations authorized under the LWA, safety-related construction officially began at Vogtle Unit 3; safety-related activities have also begun on Unit 4. Other recent activities include the NRC staff's participation in the simulated ITAAC closure and verification demonstration exercise described in SECY-10-0100, "Staff Progress in Resolving Issues Associated with Inspections, Tests, Analyses, and Acceptance Criteria," dated August 5, 2010, and development of a construction assessment program that includes a regulatory framework, the use of a construction significance determination process, and the use of a construction action matrix.

In 2008, NRO created ARP to provide an organization dedicated to preparing to review the Next Generation Nuclear Plant (NGNP) license application and future applications involving small modular reactors (SMRs). Recently, NRO has made significant progress in identifying key policy, licensing, and technical issues, in addition to developing resolution plans, which the NRC staff is proactively executing. Furthermore, NRO has implemented supporting initiatives aimed at ensuring our readiness to review future SMR licensing applications. For example, similar to

the design-centered working group meetings, NRO has established a recurring workshop with the Nuclear Energy Institute (NEI) and industry representatives to address potential challenges facing future SMR application reviews.

The U.S. Nuclear Regulatory Commission (NRC) has strengthened its leadership role in the international arena by cooperating with other national nuclear regulatory authorities to address new reactor design reviews and construction oversight. NRO's participation in the Multinational Design Evaluation Program (MDEP) has enhanced the NRC's effectiveness and efficiency.

### *Quarterly Status*

NRO continues to focus on the licensing reviews and construction oversight activities necessary to address industry plans for near-term applications. This includes supporting the completion of the DC applications and COLAs with active near-term programs for construction.

The NRC is currently reviewing three DC applications and is awaiting public comment for two DC amendment applications. Thorough and timely reviews of these DC applications are critical to the successful completion of the COLAs. In addition, the NRC received two ABWR DC renewal requests in early fiscal year (FY) 2011. As of March 31, 2011, the NRC has 12 COLAs under active review.

The agency's experience with these applications has demonstrated that 10 CFR Part 52 and the design-centered review approach have been successful in achieving standardization around a selected design. This standardization has resulted in a clear safety focus and resource savings. Although some reviews have been complicated by applicant revisions, the NRC staff is making progress on the applications currently under review. For all applications, it is important that applicants minimize design and siting modifications and work aggressively to resolve open issues. In addition, DC and combined license (COL) applicants are revising the submittal dates for responses to requests for additional information (RAIs), thereby causing schedule delays. The NRC is working with applicants to overcome these challenges, and the NRC staff is focused on resolving the remaining technical issues. The NRC has moved forward on reviewing applications and is on a closure path for many issues.

During this reporting period, major accomplishments for the new reactor licensing subprogram include publishing in the *Federal Register* (FR) for public comment the AP1000 amendment, ESBWR DC, and ABWR AIA amendment proposed rulemakings; and issuing the final safety evaluation report (FSER) and final standard design approval (FSDA) for the ESBWR. In addition, the NRO staff rebaselined two DC schedules and nine COL schedules. During this reporting period, the Commission received a favorable letter from the Advisory Committee on Reactor Safeguards (ACRS) for the Vogtle advanced FSER, concluding that there is reasonable assurance that Vogtle units can be built and operated without undue risk to public health and safety. NRO staff completed the Summer advanced FSER and presented it to ACRS, advancing the Summer review schedule by several months. Furthermore, NRO staff issued the final environmental impact statement (FEIS) for South Texas Project (STP) and the supplemental FEIS for Vogtle.

This report summarizes the following areas covering the second quarter of FY 2011: new reactor licensing reviews and rulemaking (organized by design center), regulatory infrastructure, construction inspection activities, advanced reactors, international activities, and funding.

## **NEW REACTOR LICENSING REVIEWS AND RULEMAKING**

The table below summarizes the status of new reactor licensing reviews and associated rulemakings, organized by design center, for the second quarter of FY 2011. At the beginning of each design center discussion, a table highlights key public milestone dates for each project.

### **AP1000**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
AP1000 DC Rule Amendment	June 2011	Not Applicable (N/A)	September 2011
Vogtle Electric Generating Plant (VEGP), Units 3 and 4	June 2011	April 2011	N/A
Summer, Units 2 and 3	June 2011	April 2011	N/A
Bellefonte, Units 3 and 4	Suspended	Suspended	N/A
Levy County, Units 1 and 2	April 2012	April 2012	N/A
William States Lee III, Units 1 and 2	August 2012	August 2012	N/A
Shearon Harris, Units 2 and 3	September 2013	January 2014	N/A
*Turkey Point, Units 6 and 7	December 2012	October 2012	N/A

\* Under rebaselining review.

### **AP1000 Design Certification Rule Amendment**

#### **General Information**

Design: AP1000  
Application Type: DC Rule (DCR) Amendment  
Location: N/A  
Docket Date: January 18, 2008

#### **Project Schedule Risks**

The NRC staff completed its technical review of the amendment application and made associated presentations to the ACRS full committee last quarter. Also, Westinghouse submitted Revision 18 of the design control document (DCD), and ACRS issued a letter on the DC amendment last quarter. Based on the NRC staff's confirmatory item closure with Revision 18, Westinghouse plans on submitting Revision 19 of the DCD by early April, 2011, to resolve all remaining confirmatory items.

On January 19, 2011, ACRS issued a letter concluding that the Westinghouse AIA for the design described in the AP1000 DC amendment application, as modified to resolve NRC inspection findings, complies with the requirements of 10 CFR 50.150, "Aircraft Impact Assessment." Analyses show that the containment remains intact following the impact of a large commercial aircraft. The reactor core remains cooled, and spent fuel pool integrity is maintained.

## *Rulemaking*

On February 24, 2011, the NRC published the proposed rule on the AP1000 DC amendment in the FR for public comment. The rule proposes to certify an amendment to the AP1000 standard plant design submitted by Westinghouse Electric Company, LLC, to (1) replace the COL information items and design acceptance criteria (DAC) with specific design information, (2) address the effects of the impact of a large commercial aircraft, (3) incorporate design improvements, and (4) increase standardization of the design. The public is invited to submit comments on the proposed rule and its supporting documents. The 75-day comment period ends on May 10, 2011. The goal is for completion of the final rule by the end of September 2011.

### Schedule Status

FSER Completion Date:

Original: March 2010

Actual: Targeted for June 2011

## **Vogtle Combined License Application Review**

### General Information

Design Type: AP1000

Application Type: Reference Combined License (RCOL)

Location: Waynesboro, GA

Docket Date: May 30, 2008

### Project Schedule Risks

#### *Design Certification*

Currently, the AP1000 DC application rulemaking is the critical path for issuance of the Vogtle COL. Any delay in the rulemaking schedule will result in a delay to the Vogtle COL schedule.

### Schedule Status

Review Completion Dates:

Original: FSER—December 2010

DSEIS—Issued September 2010

Current: FSER—June 2011

FSEIS—April 2011

On March 28, 2008, Southern Nuclear Operating Company (SNOC) submitted a COLA for two AP1000 units to be located at its Vogtle site near Augusta in Burke County, GA. The initial application also referenced the Vogtle ESP application, Revision 5, dated December 23, 2008. The NRC staff issued the SER for an ESP application for the Vogtle site in February 2009 and the ESP on August 26, 2009. Since then, it has issued three amendments to the ESP (on May 21, 2010, June 25, 2010, and July 9, 2010).

The NRC staff presented the advanced SER for Vogtle Units 3 and 4 to the ACRS AP1000 full committee on January 13, 2011. On January 24, 2011, ACRS sent a favorable letter

recommending that the Commission approve SNOC's COLA for the Vogtle site following completion of the FSER. The NRC responded to the ACRS letter on March 3, 2011.

The NRC staff issued the draft supplemental environmental impact statement (DSEIS) on September 3, 2010. A public meeting on the DSEIS took place October 7, 2010, in Waynesboro, GA. The public comment period ended November 24, 2010. On March 25, 2011, the NRC staff issued the final supplemental environmental impact statement (FSEIS), ahead of the published public milestone.

## **Summer Combined License Application Review**

### General Information

Design Type: AP1000  
Application Type: Subsequent Combined License (SCOL)  
Location: Fairfield County, SC  
Docket Date: July 31, 2008

### Project Schedule Risks

#### *Design Certification*

Currently, the AP1000 DC application rulemaking is the critical path for issuance of the Summer COL. Any delay in the rulemaking schedule will result in a delay to the Summer COL schedule.

#### *Environmental Review*

The NRC staff completed the responses to comments received on the draft environmental impact statement (DEIS) for inclusion in the FEIS. The NRC staff is revising sections of the EIS as the responses to comments dictate. The NRC staff is addressing U.S. Environmental Protection Agency (EPA) comments on the DEIS as part of its overall effort to respond to comments received on the DEIS.

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service (USFWS) submitted comments on the DEIS indicating their need for more information to complete consultations. The applicant provided revised information on transmission line routes; this information will assist the NRC staff in addressing USFWS comments. The NRC staff is reviewing this information and incorporating it into the FEIS.

### Schedule Status

#### Review Completion Date:

Original:	FSER—February 18, 2011	Current:	FSER—June 2011
	FEIS—February 3, 2011		FEIS—April 2011

On January 10–11, 2011, the NRC staff briefed the ACRS AP1000 subcommittee regarding the Summer COLA. On February 10, 2011, the NRC staff briefed the ACRS full committee regarding the Summer COLA. ACRS issued a favorable letter report on February 17, 2011,

concluding that there is reasonable assurance that Summer Units 2 and 3 can be built and operated without undue risk to public health and safety.

### **Bellefonte Units 3 & 4 Combined License Application Review**

#### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Jackson County, AL  
Docket Date: January 18, 2008

#### Project Schedule Risks

##### *Combined License Application Review Status*

In a July 21, 2009, letter, the NRC staff informed the Tennessee Valley Authority (TVA) that it will not issue a DEIS until after the TVA Board of Directors decides whether it will complete the Babcock & Wilcox (B&W) units. On August 20, 2010, the TVA Board authorized funding to proceed with engineering studies to support the completion of B&W Bellefonte Unit 1. Despite deciding to fund engineering studies of the partially constructed units, the COLA for Units 3 and 4 remains a viable option for TVA. The additional requisite site studies and changes to the COLA may be completed by the second quarter of calendar year (CY) 2013.

In a letter dated September 29, 2010, TVA requested that the NRC defer most of its review of the AP1000 COLA for Bellefonte Units 3 and 4, as detailed in the enclosure to its letter. TVA also asked the NRC to provide a plan and schedule for completing the requested work. TVA has made no decision on Bellefonte Unit 1. TVA expected Board consideration of the final approval of Bellefonte Unit 1 to occur sometime August 2011. TVA informed the NRC that, if Unit 1 completion is pursued, TVA will notify the NRC.

By letter dated November 24, 2010, the NRC informed TVA that it agrees to defer the Bellefonte Units 3 and 4 COLA reviews indefinitely. The NRC also agreed to review hydrology topics following the receipt of critical hydrology studies. TVA estimates that these studies may take up to 15 months to complete.

#### Schedule Status

##### Review Completion Dates:

Original: FSER—March 2011  
FEIS—January 2010

Current: FSER—suspended  
FEIS—suspended

## Levy County Combined License Application Review

### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Levy County, FL  
Docket Date: October 6, 2008

### Project Schedule Risks

#### *Hydrology*

The hydrology review requires resolution of open items related to tsunami flooding. The NRC issued supplemental RAIs in October 2010 for ground water, storm surge, and tsunami flooding review areas. The agency received some RAI responses in November 2010 and the remaining responses in December 2010. Applicant responses resolved all issues related to ground water and storm surge but did not resolve all tsunami flooding issues. The applicant's tsunami flooding model does not correctly approximate site bathymetry and topography. On February 11, 2011, the NRC staff issued RAIs that served as the basis for a February 25, 2011, public meeting with the applicant. The NRC expects the applicant's final tsunami flooding RAI responses to reflect discussions from this public meeting. The NRC staff will evaluate the applicant's final RAI responses on tsunami flooding, which are expected in April 2011.

#### *Foundation Design Review*

The complex geologic site characteristics result in a complicated review of the applicant's proposed Roller Compacted Concrete (RCC) foundation design. This unique design results in a complicated technical review of the site-specific seismic soil-structure interaction (SSI) analyses. In 2010, the NRC staff issued several RAIs related to RCC and SSI. In March 2011, the NRC staff completed a detailed audit of the applicant's SSI analyses. This audit resolved all issues related to SSI analyses, pending confirmation of the applicant's final RAI responses in May 2011.

#### *Environmental Review*

The U.S. Army Corps of Engineers (USACE) is a cooperating agency for developing the EIS and requires information that affects its Least Environmentally Damaging Practicable Alternative (LEDPA) decision under the Clean Water Act. USACE has identified several deficiencies in the applicant's LEDPA analysis and will coordinate with the applicant to address them. The NRC expects a preliminary indication of the USACE decision regarding the LEDPA in mid-April 2011.

#### *Targeted Surveys for Federally Listed Threatened and Endangered Species*

In its response to the NRC staff's biological assessment, USFWS stated that targeted surveys for federally protected species should be completed before the conclusion of the consultation. Such surveys could take up to a year for the applicant to complete. The NRC and USACE staff met with USFWS to discuss the timing of surveys and expectations for consultation under the Endangered Species Act. The applicant met independently with USFWS and has initiated its targeted surveys.

### Schedule Status

#### Review Completion Date:

Original: FSER—May 5, 2011  
FEIS—September 22, 2010

Current: FSER—April 2012  
FEIS—April 2012

### **William States Lee III Combined License Application Review**

#### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Cherokee County, SC  
Docket Date: February 25, 2008

#### Project Schedule Risks

None

#### Schedule Status

#### Review Completion Dates:

Original: FSER—February 2011  
FEIS—March 2010

Current: FSER—August 2012  
FEIS—August 2012

The NRC issued a letter dated January 11, 2011, to Duke Energy revising the public milestone review schedule for the Lee COLA. The NRC changed the FSER date from February 2011 to August 2012, because technical issues regarding the AP1000 DC amendment required substantial resources well beyond those originally planned. As a result, the NRC staff's efforts to complete the AP1000 DC amendment resulted in a significant impact on the review schedules for plants referencing the AP1000 design. Currently, the NRC staff is reviewing the applicant's response to follow up RAIs regarding makeup pond C.

### **Shearon Harris Combined License Application Review**

#### General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Wake County, NC  
Docket Date: April 17, 2008

#### Project Schedule Risks

#### *Issuance of Draft Environmental Impact Statement*

The NRC staff, working with USACE as a cooperating agency, has identified several issues that remain unresolved for the environmental review. The NRC staff anticipates that clarifying resolution strategies for these issues will lead to a revised environmental review schedule. The

review team (NRC staff and USACE) is working with the applicant and relevant Federal and State agencies to determine necessary actions and schedules for resolving these issues. The applicant filed an updated Integrated Resource Plan on September 13, 2010, with the North Carolina Utilities Commission, which may delay the operational need for the two new reactors at the Shearon Harris plant site until 2020 or later. In a letter dated January 13, 2011, the NRC staff transmitted RAIs to the applicant regarding the need for power based on the information in the applicant's Integrated Resource Plan. The NRC staff received a response dated March 31, 2011, to the RAI regarding the need for power. The staff expects to receive responses to all other RAIs by September 30, 2011.

#### *LEDPA Analysis and Alternative Selection Process*

USACE, a cooperating agency for development of the EIS, requires information to make its LEDPA decision under the Clean Water Act. USACE provided comments to the NRC on April 15, 2010, regarding supplemental information provided by the applicant on September 14, 2009. USACE identified deficiencies in the applicant's alternative sites analysis regarding alternative reservoir levels for the Shearon Harris site and aquatic impacts to the proposed and alternative sites. The applicant provided a revised analysis to USACE on September 22, 2010, which USACE and EPA Region 4 are reviewing. The NRC staff is reviewing the applicant's revised LEDPA analysis response for potential impact on the DEIS content and schedule with respect to the NRC's alternative siting guidance in NUREG-1555, "Environmental Standard Review Plan: Standard Review Plans for Environmental Reviews for Nuclear Power Plants," issued October 1999.

#### *Clean Air Act*

The Shearon Harris site is in a Clean Air Act maintenance area for ozone and carbon monoxide. The NRC staff must complete a Clean Air Act conformity analysis before issuing the Shearon Harris COL. Uncertainty regarding the applicant's anticipated construction schedule may affect the State of North Carolina's commitment to include project emissions in its revision to the State Implementation Plan, which would eliminate the need for the NRC staff to complete a detailed conformity analysis. The applicant submitted an updated air emissions analysis to the NRC and the State of North Carolina's Division of Air Quality (DAQ) on July 14, 2010. DAQ provided comments to the applicant on October 6, 2010. The applicant responded to the DAQ comments on November 3, 2010. The NRC staff is awaiting DAQ review of these technical comments and for the potential inclusion by DAQ of all project emissions in the State Implementation Plan.

#### *National Historic Preservation Act Consultation*

Uncertainty regarding the applicant's schedule for completing archaeological surveys could affect the NRC staff's ability to complete National Historic Preservation Act consultation. While the NRC staff can complete an impact assessment for the DEIS, it may not be possible to conclude the National Historic Preservation Act consultation until the applicant completes Phase II and III surveys and provides the results to the State Historic Preservation Office (SHPO). The NRC staff and USACE have discussed with SHPO a path forward in line with SHPO's expectations. This is likely to result in separate memoranda of agreement (MOA) for USACE and the NRC. The applicant drafted an MOA, submitted it to SHPO on September 22, 2010, for review, and provided it to the NRC staff on November 2, 2010. The NRC staff will continue discussions with USACE and SHPO regarding the development of the potential MOA.

Schedule Status:

Review Completion Dates:

Original: FSER—April 2011  
FEIS—May 2010

Current: FSER—September 2013  
FEIS— January 2014

Progress Energy Carolinas, Inc. (PEC) submitted its 2010 Integrated Resource Plan on September 13, 2010, to the North Carolina and South Carolina Utilities Commissions that contained a revised commercial operation date of 2025. On January 6, 2011, the NRC issued a letter to PEC revising the COLA review schedule to reflect the applicant's circumstances described above. The revised COLA schedule is consistent with NRO's practice of focusing resources on the completion of the review of DCs, LWAs, and COLAs needed for new nuclear projects that are expected to start operating during CY 2016-CY 2017. The NRC staff transmitted new RAIs to the applicant in a letter dated January 13, 2011. The NRC staff will continue to work on the COLA review as resources allow.

**Turkey Point Combined License Application Review**

General Information

Design Type: AP1000  
Application Type: SCOL  
Location: Homestead, FL  
Docket Date: September 4, 2009

Project Schedule Risks

*Areas That May Affect the Overall Combined License Application Review Schedule*

The NRC staff is currently developing a review schedule for the geology and seismology areas, which will involve a first-time review of various seismology parameters and models for the Caribbean region.

*Environmental Review*

Florida Power and Light has delayed delivery of much of the information requested at the June 2010 environmental site audit, but provided the balance of the information on December 15, 2010, with the exception of revisions to the ground water model. The NRC staff will continue preparation of the DEIS, review information as it becomes available, and prepare RAIs. The NRC staff will honor a request from the National Park Service to become a cooperating agency with the NRC in preparing the EIS. The National Park Service must perform a separate environmental review related to a potential land swap associated with one of the transmission lines for the proposed Turkey Point units.

Schedule Status

Review Completion Dates:

Current: FSER—December 2012  
FEIS—October 2012

The NRC published the FR notice for environmental scoping on June 15, 2010, with the scoping period closing on August 16, 2010. The NRC issued the FR notice related to the notice of hearing and opportunity to petition for leave to intervene on June 18, 2010, with the opportunity to intervene closing on August 17, 2010. Oral argument for the 20 contentions that were submitted through three petitions was held on November 19, 2010. On February 28, 2011, the Atomic Safety and Licensing Board Panel admitted portions of three contentions.

The NRC staff is developing a revised environmental schedule based on delays in responding to the NRC staff's information requests.

## ESBWR

PROJECT	FSER	FEIS	Rulemaking
ESBWR DC	March 2011 (Complete)	N/A	September 2011
Fermi 3	September 2012	November 2012	N/A

### ESBWR Design Certification Review

#### General Information

Design: ESBWR  
Application Type: DC  
Location: N/A  
Docket Date: December 1, 2005

#### Project Schedule Risks

#### *Technical Review*

None

#### *Office of Management and Budget Review of Rulemakings*

The NRC staff is working on five 10 CFR Part 52 rulemakings simultaneously. Each of these rules requires an Office of Management and Budget (OMB) approval of information collection requirements before the final rule can become effective. The NRC seeks OMB review and approval just after publication of the proposed rule and before publication of the final rule, the latter being when approval is given. OMB's electronic system only permits one rulemaking action on a given collection (e.g., 10 CFR Part 52) at a time. OMB is required to complete its action on the request (approve, disapprove or file comments) within 60 calendar days of the request. While this does not affect these rulemakings during the proposed rule phase, as OMB always files comments, this process will force the NRC staff to sequence its submittal to and subsequent approval from OMB for each rulemaking. As a result of the 60-day sequencing, considering the relative agency priorities for each rulemaking, the NRC staff estimates that OMB's approval process may delay publication of the ESBWR final rule until January 2012. The NRC staff is analyzing other near-term NRC rulemaking schedules to identify those that might compete with DC- and COL-related rulemakings for OMB's prompt action. Subsequently, NRO staff will recommend actions that might be necessary to reduce this delay.

NRC staff provided the proposed DC rule to the Commission on January 7, 2011, in SECY-11-0006, "Proposed Rule: Economic Simplified Boiling-Water Reactor Design Certification." The Commission issued its Staff Requirements Memorandum (SRM) on March 8, 2011. The NRC published the proposed rule in the FR on March 25, 2011. The current public schedule for publishing the final rule is September 2011. The NRC issued the FSER and FSDA on March 9, 2011.

## Fermi 3 Combined License Application

### General Information

Design: ESBWR  
Application Type: SCOL  
Location: Monroe County, MI  
Docket Date: November 25, 2008

### Project Schedule Risks

#### *Delays in Responses to Requests for Additional Information*

On June 28, 2010, the NRC staff issued a letter to the Detroit Edison Company (DTE) to inform the applicant that the safety and environmental review schedules (for issuance of the SER and FEIS) for the Fermi 3 COLA were now indeterminate and all remaining public milestones were to be determined (TBD). The TBD status resulted from continuing delays in receipt of complete responses to RAIs related to the environmental review and the delayed receipt of a cyber security plan.

The NRC staff is reviewing details of new site layout information for incorporation into the DEIS, which will include related findings of cooperating agency USACE personnel. DTE submitted a revised COLA on February 14, 2011, including a considerably modified environmental report that will require thorough NRC staff review and incorporation into the DEIS. The proposed site layout changes do not affect the safety review schedule.

#### *Funding*

Limited funding for contractor support, stemming from the FY 2011 Budget Continuing Resolution, presents a high risk to the environmental review schedule, which is the critical path for the project.

### Schedule Status

#### Current Phase Completion Dates:

- Safety Review
  - Phase 1 (preliminary SER)—completed August 20, 2010
  - Phase 2 (FSER)—November 2011
- Environmental Review
  - Phase 1 (scoping)—completed July 2, 2009
  - Phase 2 (DEIS)—October 2011

On December 15, 2010, the NRC staff issued a letter to DTE stating that it had reestablished public milestones for the COL review. On January 10, 2011, DTE submitted a significantly revised site layout plan to address the Detroit District USACE's concerns regarding impacts to water and wetland resources, which are critical for the USACE permit application.

On February 1, 2011, DTE presented the plan to USACE and other interested Federal and State agencies. It was noted in this meeting that some additional mitigation and adjustments might be identified before permits are issued, but participants expressed no significant concerns regarding the revised site layout.

## ABWR

PROJECT	FSER	FEIS	Rulemaking
AIA DCR Amendment	Complete October 14, 2010	NA	December 2011
STP Units 3 and 4	TBD	March 2011	N/A

### ABWR Design Certification Rule Amendment for Aircraft Impact

#### General Information

Design: ABWR  
Application Type: DCR Amendment  
Location: N/A  
Docket Date: November 23, 2009  
Revision Submittal Date: June 30, 2009

#### Project Schedule Risk

There are no risks at this time.

Current Critical Path and Near Critical Path Tasks:

The Commission approved publication of the proposed rule that will amend Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor," to 10 CFR Part 52, so that applicants or licensees intending to construct and operate an ABWR may comply with the AIA rule by referencing the amended design. The NRC published the proposed rule for public comment on January 20, 2011. The public comment period ended on April 5, 2011.

#### Schedule Status

Review Completion Dates:  
Original: Advanced SER—April 2010      Current: Advanced SER complete  
Original: Environmental Assessment (EA)—June 2010      Current: EA complete  
Original: Publish Proposed Rule—September 2010      Current: January 2011

### South Texas Project Combined License Application

#### General Information

Design: ABWR  
Application Type: RCOL  
Location: Matagorda County, TX  
Docket Date: November 27, 2007  
Revision 3 Submittal Date: October 5, 2010

## Project Schedule Risks

By letter dated January 26, 2011, the applicant for STP Units 3 and 4 changed from South Texas Nuclear Operating Company (STPNOC) to Nuclear Innovation North America, LLC. This resulted in changes to several portions of the application. However, advance notice to the NRC staff and its rapid response have avoided any significant impact on the review schedule at this time.

On February 24, 2010, STPNOC submitted a letter identifying schedule challenges in addressing staff RAIs. On March 26, 2010, the NRC responded, identifying three chapters with issues that must be resolved; until then, the schedule milestones would be characterized as TBD. These issues involve ground water hydrology models, SSI analyses requiring additional detail, the flow-induced vibration of components, and a spent fuel pool criticality and load drop analysis. Once the applicant provides the required information to resolve these issues, the NRC staff will reassess the overall schedule impacts. In a followup letter dated December 13, 2010, the NRC staff reiterated concerns with these issues in Chapters 3 and 9 and, thus, its continuing inability to develop a schedule. The safety evaluations for other chapters are continuing.

### *Surface Water – Dam Breach Analyses (Chapter 2)*

The applicant modified its design-basis flood level caused by a dam breach from 47 feet to 40 feet in Revision 3 to its application. As a result of a site audit in August 2010, the NRC staff questioned the analysis methodology used in the computer modeling. Although the NRC staff received revised responses, it continues to be concerned with the methodology used. These impacts are important, as they relate to both the design-basis flood level and the maximum ground water level. The NRC staff held a teleconference with STP on March 4, 2011, to discuss the open items related to this section of the STP COLA.

As a result of the March discussion, the applicant will revise the analysis to use a bounding analysis to prove that sedimentation and erosion will not be a factor that will cause the design-basis flood level or maximum ground water level to be exceeded. The NRC staff expects to receive the RAI response on April 4, 2011, and to complete Section 2.4 in April 2011.

### *Seismic Analysis (Chapter 3)*

Sections 3.7 and 3.8 of the application did not contain sufficient detail for the NRC staff to reach safety conclusions on issues of seismic analysis and SSI. The applicant has responded to NRC staff requests for supplementary information. Between August 2010 and February 2011, the NRC staff conducted audits and met with the licensee several times. During a February 2011 meeting the NRC staff and applicant identified four technical areas in which the two parties had significant disagreement. In an effort to clarify its position, the NRC staff, by letter dated March 8, 2011, issued an RAI on three of the four technical areas of disagreement; specifically, the scope of review required by the applicant to justify use of a new version of the American Concrete Institute Code, the use of averaging to determine out-of-plane shear forces, and the applicant's methodology for calculating soil-bearing pressures.

The NRC staff expects the applicant's response to these questions April 2011. The NRC staff discussed these questions with the applicant further at an audit during the week of

March 14, 2011. At this audit, the applicant provided input files that will allow the NRC staff to perform a confirmatory analysis to resolve the fourth technical issue; that is, whether the applicant's computer model is stable when its specific value for Poisson's ratio is used. Following its receipt of the remaining necessary information, the NRC staff will reassess its review schedule in this area.

### *Flow-Induced Vibration (Chapter 3)*

The applicant changed its approach for addressing the area of flow-induced vibration; rather than citing Kashiwazaki-Kariwa Unit 6 as the prototype, the applicant determined that STP Unit 3 should serve as the prototype. As a result, the applicant had to submit a significant amount of additional information; this caused a delay in the review of Section 3.9.2 of the final safety analysis report (FSAR).

The NRC staff has conducted multiple audits and is largely satisfied with the applicant's approach toward resolving the technical issues; however, problems remain with the steam dryer predictive analysis and with development of the Comprehensive Vibration Assessment Program (CVAP). As a result of a meeting in January 2011, the NRC staff and applicant believe they have a common understanding of how to address the remaining issues.

Resolution of the remaining issues delayed the submittal of the CVAP until late March 2011. The applicant is continuing to complete the predictive analysis for the steam dryer as described in Regulatory Guide (RG) 1.20, "Comprehensive Vibration Assessment Program for Reactor Internals during Preoperational and Initial Startup Testing." The NRC staff will meet or hold a teleconference with the applicant before the final submittal of the dryer analysis to ensure that it addresses all open items. The final submittal of the dryer analysis was expected by the end of March but has been delayed until after April.

### *Spent Fuel Pool Criticality (Chapter 9)*

The application did not address several COL information items that require a fuel storage criticality and structural load drop analysis. The applicant maintained that existing ITAAC are sufficient to address those issues. The NRC staff determined that the ITAAC do not adequately address the COL information items. The NRC conducted an audit of the criticality analysis on December 8-9, 2010. After the audit, the applicant agreed to perform a bounding criticality analysis to address enrichment contents, burnup credit, and the use of gadolinium rods in the fuel pools. The applicant resubmitted the criticality analysis on January 25, 2011. The NRC staff has completed its review of the resubmitted criticality analysis and found it to be acceptable. The applicant completed the dynamic load drop analysis and submitted it in late December 2010. The NRC staff contracted with Brookhaven National Laboratory to assist in the review. An audit of the dynamic analyses is expected to accelerate the resolution of outstanding technical issues. The NRC staff is planning this audit for May 2011.

### *Environmental Review*

The NRC published the FEIS on February 24, 2011, and EPA published its FR notice of availability on March 4, 2011.

*Advanced Boiling-Water Reactor Design Certification Rule Amendment*

Issuance of the STP COL depends on the completion of the ABWR DCR amendment. The NRC staff is working on the rule, in accordance with the schedule presented earlier.

Schedule Status

Review Completion Dates

Original: FSER—September 2011  
FEIS—March 2011

Current: FSER—TBD  
FEIS—March 2011—complete

During this reporting period, the NRC staff issued 12 of 19 chapters of the STP COL advanced FSER to ACRS and presented it at three ACRS subcommittee meetings. The NRC staff also presented to the ACRS subcommittee the adequacy of the ABWR design with regard to long-term cooling, to allow ACRS to address an SRM from the Commission on this issue.

## ABWR DESIGN CERTIFICATION RENEWAL

Project	FSER	FEIS	Rulemaking
Toshiba ABWR DC Renewal*	TBD	TBD	TBD
GEH ABWR DC Renewal*	TBD	TBD	TBD

\*NRC Staff has not yet begun its review of the applications.

### Toshiba ABWR Design Certification Renewal

#### General Information

Design: ABWR  
Application Type: DC Renewal  
Location: N/A  
Docket Date: December 14, 2010

#### Project Risk

None

#### Schedule Status

On November 2, 2010, Toshiba Corporation Power Systems Company (Toshiba) tendered an ABWR DC renewal application. By letter dated December 14, 2010, the NRC informed Toshiba that the agency had completed the acceptance review for Toshiba's ABWR DC renewal application and that it had determined that the application was acceptable for docketing. The NRC staff is developing information for a technical review schedule. However, by letter dated February 9, 2011, Toshiba notified the NRC staff of its intent to submit a revised application no later than June 30, 2012, and requested that the technical review begin after it submits the revision.

### GEH ABWR Design Certification Renewal

#### General Information

Design: ABWR  
Application Type: DC Renewal  
Location; N/A  
Docket Date: TBD

#### Project Risk

None

### Schedule Status

On December 8, 2010, General Electric-Hitachi (GEH) tendered an ABWR DC renewal application. By letter dated February 14, 2011, the NRC informed GEH that the acceptance review for its ABWR DC renewal application was complete and that it had determined that the application was acceptable for docketing. The NRC staff is developing information for a technical review schedule.

## U.S. EPR

Project	FSER	FEIS	Rulemaking	Comments
U.S. EPR DC	June 2012	N/A	February 2013	Revised schedule letter issued on January 6, 2011.
Calvert Cliffs, Unit 3	January 2013	TBD		Revised safety review schedule issued March 4, 2011
Nine Mile Point, Unit 3	TBD	TBD		Suspended at the applicant's request.
Bell Bend	August 2012	TBD		Schedule being revised based on site layout changes.
Callaway, Unit 2	TBD	TBD		Suspended at the applicant's request.

### U.S. EPR Design Certification Application

#### General Information

Design: U.S. EPR  
 Application Type: DC  
 Location: N/A  
 Docket Date: February 25, 2008

#### Project Schedule Risks

##### *Digital Instrumentation and Control*

On May 13, 2010, the NRC staff informed AREVA that it had completed the review of the U.S. Evolutionary Power Reactor (U.S. EPR) digital instrumentation and control (DI&C) design with respect to communication independence and diversity, as well as defense-in-depth. However, the NRC staff could not approve this aspect of the design because AREVA had not provided sufficient information. On October 1, 2010, AREVA submitted Revision 3 of the closure plan, addressing the NRC staff's concerns regarding a continuous connection between the nonsafety service unit and the safety division. AREVA no longer intends to pursue the continuous, bidirectional connection of the service unit. AREVA provided a scoping letter for the final closure plan on November 23, 2010, and has committed to submitting all necessary technical information by April 30, 2011.

##### *Resolution of Generic Safety Issue 191*

The applicant is trying to resolve an issue in its application related to Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR Sump Performance." Specifically, the NRC staff believes that the analysis and testing supporting the adequacy of the sump design do not sufficiently address key technical topics, such as downstream effects, and do not contain a complete evaluation of sump performance that considers the additional sump strainer testing performed in July and August 2010. AREVA did not meet its commitment to provide a revision

to the technical report by October 22, 2010. AREVA also did not meet its commitment to provide a strategy for the path forward by the end of October, but did so on December 14, 2010. The NRC staff witnessed additional strainer head loss and bypass testing in early February 2011. AREVA has provided all technical information regarding GSI-191, with the exception of in-vessel downstream effects testing. For these effects, AREVA has committed to providing a strategy for the path forward by April 30, 2011.

### *Seismic and Structural Design*

AREVA changed its analytical methodology for completing the seismic and structural design. On April 26–30, 2010, the NRC staff conducted an audit of Sections 3.7 and 3.8 (seismic and structural design) of the U.S. EPR DC FSAR. The audit identified many problems with the applicant's modeling and reanalysis. A path forward identified approximately 40 items that require revised analyses and calculations to resolve the NRC's technical concerns with the design. As a followup to this audit, the NRC conducted public meetings on June 9 and November 16, 2010, to discuss AREVA's new schedule for completing this reanalysis work and the associated RAI responses. Recently, a number of final RAI responses have slipped to the April–May 2011 timeframe.

### Schedule Status—Safety Review

The NRC staff issued a revised schedule on January 6, 2011. The NRC staff conducted a preliminary audit of AREVA's in-process progress in December 2010, and in accordance with the latest closure plan, conducted a public meeting on February 15, 2011, to discuss the current design changes as they apply to the issues for resolution. All areas appear to be progressing toward a successful resolution for the completion of a Phase 2 safety evaluation (with open items). The current schedule remains challenging because of the volume of new material to be submitted.

Review Completion Date:

Original: FSER—May 2011

Current: June 2012

## **Calvert Cliffs Combined License Application**

### General Information

Design: U.S. EPR

Application Type: RCOL

Location: Lusby, MD

Docket Date: January 25, 2008 (Part 1), and June 3, 2008 (Part 2)

### Project Schedule Risks

#### *Organizational and Financial Information*

On November 3, 2010, Calvert Cliffs 3 Nuclear Projects, LLC, made a filing with the Atomic Safety and Licensing Board stating that Eléctricité de France (EDF) had acquired Constellation's interest in UniStar. A Schedule 13D filing on November 4, 2010, with the U.S. Securities and Exchange Commission (SEC) confirmed this transaction. Based on this

information, the NRC staff issued an RAI asking the applicant to explain how UniStar complies with the requirements of 10 CFR 50.38, "Ineligibility of Certain Applicants." UniStar responded to the RAI on January 31, 2011. The NRC issued a letter to UniStar on April 6, 2011, stating that the response to the RAI did not meet the requirements of 10 CFR 50.38. While the NRC will continue to review the remaining portions of the application, a license will not be issued until the requirements of 10 CFR 50.38 are met.

#### *Seismic Information*

On December 29, 2009, UniStar submitted its package containing the seismic information for the review of FSAR Section 3.7. The applicant intends to revise this section of the FSAR again to incorporate AREVA's results of the reanalysis conducted in response to a change in the dynamic model for the nuclear island. The applicant submitted its updated FSAR section in a letter dated March 31, 2011. As a result, the NRC changed the Phase 2 completion date for the associated sections to July 29, 2011.

The supplementary package containing the seismic information is currently in review. Based on the applicant's responses to these RAIs, the NRC staff may plan an audit later this year to review the associated supporting documentation.

#### *Loss of Large Area Analysis*

UniStar submitted its loss-of-large-area (LOLA) analysis in a letter dated March 23, 2011. The NRC staff plans to finish LOLA reviews by January 3, 2012.

#### *Schedule Status – Safety Review*

The NRC staff issued its DEIS in April 2010, and is currently resolving comments to support issuance of the FEIS. The NRC staff will extend the FEIS schedule pending a USACE determination that recently provided information is sufficient to close final issues.

Because of recent U.S. EPR DC schedule modifications, the NRC rebaselined the FSER schedule on March 4, 2011, and the date for its issuance is now July 2012.

#### Schedule Status

##### Review Completion Dates

Original:	SER—August 2011	Current:	SER—January 2013
	DEIS—February 2009		DEIS—April 2010
	FEIS—April 2010		FEIS—TBD

As of March 2011, the NRC had issued safety evaluations with open items for 9 of the 19 chapters.

## **Nine Mile Point 3 Combined License Application**

### General Information

Design: U.S. EPR  
Application Type: SCOL  
Location: Oswego, NY  
Docket Date: December 12, 2008

### Status

On December 1, 2009, UniStar submitted a letter requesting that the NRC temporarily suspend the Nine Mile Point Unit 3 COLA review, including any supporting reviews by external agencies, until further notice. The NRC staff responded to UniStar on March 26, 2010, informing it of the agency's plans to discontinue all activities on the COLA review in an orderly manner and to preserve the work that had been accomplished.

On December 9, 2010, UniStar requested an exemption from 10 CFR 50.71(e)(3)(iii) and proposed delaying its FSAR update submittal until December 31, 2012. The NRC staff is currently processing this exemption request.

## **Bell Bend Combined License Application**

### General Information

Design: U.S. EPR  
Application Type: SCOL  
Location: Luzerne County, PA  
Docket Date: December 19, 2008

### Project Schedule Risks

#### *Site Layout*

The applicant proposed site layout changes to reduce impacts to "exceptional value" wetlands to satisfy USACE's need for a Section 404 permit under the Clean Water Act. These wetland avoidance issues for Bell Bend require the applicant to move the power block to avoid the currently impacted wetlands. Several technical areas will be receiving revised information to address the power block move. The agency received an updated submittal schedule from the applicant on July 16, 2010. The NRC staff will need to revisit large portions of the geology, seismic design, and hydrology reviews based on the revised submittals. The NRC is currently receiving revised portions of the application and expects the applicant to submit the full scope of the changes by April 2012.

#### *Water Storage*

The Susquehanna River Basin Commission (SRBC) issues permits for water withdrawal from the Susquehanna River. SRBC has informed the applicant that it does not intend to approve water withdrawal during low-flow periods unless there is low-flow augmentation (water storage). The impact of this decision could be significant, depending on the applicant's decision on water

storage. The EIS will need to evaluate impacts of proposed water storage and alternatives (e.g., flooding abandoned mines, building a reservoir). The applicant is developing its options and communicating with SRBC. An Instream Flow Incremental Methodology (IFIM) study is scheduled to be completed by Pennsylvania Power and Light (PPL) and approved by SRBC in April 2011. Using the results from the IFIM study, a proposed water storage and allocation plan for the Susquehanna River basin should be submitted to SRBC by June 2011. SRBC could make a decision on this plan by September 2011.

#### *LEDPA Analysis and Alternative Selection Process*

USACE and EPA have concerns about PPL's alternative sites analysis. USACE is requesting a detailed description of environmental impacts at all candidate sites to inform its LEDPA decision. The NRC staff is waiting for the applicant to respond to the USACE and EPA concerns as part of the joint permit application planned for submittal to USACE and the Pennsylvania EPA in June 2011. The joint permit application includes the Clean Water Act Section 404 application.

#### Schedule Status

FSER issue date: August 2012

FEIS issue date: TBD

(Schedules will be revised upon receipt of sufficient information regarding site layout changes.)

### **Callaway Plant Unit 2 Combined License Application**

#### General Information

Design:	U.S. EPR
Application Type:	SCOL
Location:	Callaway County, MO
Docket Date:	December 12, 2008

#### Status

The NRC has currently suspended the technical reviews on this application. The NRC staff will reevaluate all schedules issued in the letter dated May 26, 2009, if and when AmerenUE requests the resumption of reviews.

In a letter dated November 22, 2010, Ameren Missouri, a subsidiary of Ameren Corporation, notified the NRC that it now anticipates that it will submit an ESP application in the second half of 2011. Union Electric Company (doing business as Ameren Missouri) would be the applicant and license holder. Ameren stated that it would keep the NRC informed of its progress and any changes to this schedule. In its letter, Ameren stated that it intends to maintain the present COLA as a suspended application and provide further correspondence on any future direction related to its status.

## US-APWR

Project	FSER	FEIS	Rulemaking
US-APWR DC	May 2013	N/A	TBD
Comanche Peak, Units 3 and 4	June 2013	May 2011	N/A
North Anna Unit 3	July 2013	October 2012	N/A

### US-APWR Standard Design Certification

#### General Information

Design: US-APWR  
Application Type: DC  
Location: N/A  
Docket Date: February 29, 2008

#### Project Schedule Risks

##### *Digital Instrumentation and Control Issues*

In August 2009, Mitsubishi Heavy Industries, Ltd. (MHI) began addressing DI&C issues in the areas of software program manuals, independence of communications, and quality assurance (QA) for the U.S. Advanced Pressurized-Water Reactor (US-APWR). On October 13, 2010, MHI submitted to the NRC the documents identified in its closure plan to address all deficiencies. The NRC staff determined that the revised software program manuals did not resolve the deficiencies, and, in its December 22, 2010, letter to MHI, identified specific deficiencies. On January 31, 2011, MHI submitted revised manuals. The NRC established a new review schedule and, on February 22–23, 2011, conducted a public meeting on the software program manuals. The NRC staff will review the MHI submittals and conduct a public meeting in early April 2011.

##### *Structural Design Changes*

MHI made structural changes to its design that required a new seismic analysis. Also, MHI changed the SSI seismic analysis methodology for all safety-related structures from a “soil-spring” approach to a finite-element approach. The results of this seismic reanalysis affect the design of all structures, piping, equipment, and components. MHI has submitted the new seismic reanalysis technical reports, and they are under review. MHI provided a revised methodology report and, on January 31, 2011, submitted three additional reports needed to resolve the issue of “Category II over Category I” for the turbine building, auxiliary building, and access control building. The NRC is reviewing revisions to the methodology and the technical reports on this issue. MHI is scheduled to submit several remaining new, revised, and supplemental technical reports. MHI presented its seismic analysis roadmap at a public meeting on March 31, 2011.

### *Loss-of-Coolant Accident Analysis*

The review of the large-break loss-of-coolant accident (LOCA) requires (1) additional computational fluid dynamics (CFD) outputs from the advanced accumulator and (2) a revised topical report. The NRC held public meetings on January 31 and February 1, 2011, to discuss the advanced accumulator and CFD analysis and the large-break LOCA topical report. MHI submitted the revised advanced accumulator topical report, large-break LOCA topical report, and CFD analysis in March, 2011.

### *Sump Design*

MHI completed the sump head loss testing and the in-vessel downstream effects testing (also known as core inlet blockage testing). MHI submitted the test results to the NRC in December 2010. The sump head loss tests provided some unexpected results. The NRC staff is reviewing the recently submitted revision to the sump strainer performance technical report and the core inlet blockage test technical report and awaits a submittal date for the revised RAI responses regarding the debris mass value (floating fiber and particulate effects). MHI has formed a task force with Luminant and Dominion to resolve sump strainer issues. The NRC will hold a public meeting in April 2011, for MHI to address the sump design and downstream effects.

### *Nucleate Boiling Thermal-Hydraulic Testing*

MHI conducted tests regarding the departure from nucleate boiling thermal-hydraulics of the reactor fuel in August–September and October–November 2010. The NRC staff observed the tests in Germany. MHI submitted preliminary test results to the NRC in October 2010, and provided the final test report on departure from nucleate boiling on March 3, 2011. The NRC staff is reviewing the test results.

### Schedule Status—Safety Review

FSER Completion Date:

Original: September 2011

Current: May 2013

## **Comanche Peak Combined License Application**

### General Information

Design: US-APWR  
Application Type: RCOL  
Location: Somervell County, TX  
Docket Date: December 2, 2008

### Project Schedule Risks

#### *RCOL Review Schedule*

The NRC staff will evaluate any changes to the DC schedule to determine if they have an impact on the RCOL schedule.

### *Ground Water Model (FSAR, Chapter 2.4)*

The applicant's radionuclide source term characterization in Section 2.4.13 is an open issue, because of unresolved issues related to Chapter 11 of both the US-APWR DCD and the COLA. The NRC staff is working to resolve the source term characterization and is proceeding with an independent confirmatory analysis for Section 2.4.13. Development of the SER with open items is in progress and tentatively scheduled for completion by June 17, 2011, depending on the resolution of source term issues.

### *Administrative and Financial Information*

The NRC staff has determined that Luminant did not provide sufficient information in Part 1, "Administrative and Financial Information," with regards to negation of foreign ownership. The NRC staff issued RAIs in March 2010, and October 2010. Luminant provided its responses to these RAIs in June 2010, and December 2010. The NRC staff reviewed Luminant's responses and determined that Luminant's responses did not address the negation of foreign ownership. Luminant was informed of this open item in January 2011.

### *Risk Informed Technical Specifications*

Luminant has requested NRC staff approval to use Risk Informed Technical Specifications (RITS) in its COLA. The NRC staff held public meetings on November 3, 2010, and January 11, 2011 to discuss the technical issues. Luminant submitted draft technical specifications (TS) methodology for NRC staff review in March 2011. The staff conducted a public meeting in March 2011, to provide feedback on Luminant's draft TS methodology. Luminant plans to submit the final version of its TS methodology during the summer of 2011.

### *Environmental Reviews:*

On August 6, 2010, the NRC issued the DEIS. The NRC held a public meeting on September 21, 2010, in the vicinity of the site to solicit comments on the DEIS. The public comment period for the DEIS ended on October 27, 2010, and the NRC staff completed Phase 3 of the environmental review.

### Schedule Status

By letter dated March 2, 2011, the NRC staff issued a letter to Luminant containing changes to the public milestone review schedule. This schedule change was the result of delays arising from the US-APWR DC review schedule.

#### Review completion dates:

Original: FSER—December 2011  
Original: FEIS—January 2011

Current: FSER—June 2013  
Current: FEIS—May 2011

## North Anna 3 Combined License Application

### General Information

Design: US-APWR  
Application Type: SCOL  
Location: Louisa County, VA  
Docket Date: January 28, 2008

### Project Schedule Risks

None

### Schedule Status

The NRC staff has conducted its preliminary assessment of the COLA revisions and established a revised review schedule. The NRC staff has also revised the review schedules for the US-APWR DCD and Comanche Peak (reference COLA) to facilitate the reviews of recent submittals. The new schedule for North Anna Unit 3 incorporates the review schedule changes for the DCD and reference COLA. The NRC environmental staff will supplement the EIS that was completed in February 2010, based on the ESBWR design.

#### Review completion dates:

Original: FSER—February 2011  
Original: FEIS— April 2010

Current: FSER—July 2013  
Current: FSEIS—October 2012

## EARLY SITE PERMIT

PROJECT	FSER	FEIS	Rulemaking
Victoria	April 2013	August 2013	N/A
Public Service Enterprise Group (PSEG) Incorporated	TBD*	TBD*	N/A

\*Lack of contract funds as a result of the FY 2011 Budget Continuing Resolution resulted in the NRC staff's inability to conduct the geology, seismology, and geotechnical engineering audits as planned in the review schedule. The NRC staff is preparing a letter to revise the review schedule's public milestones.

### Victoria County Station Early Site Permit Application

#### General Information

Design: Plant Parameter Envelope Approach  
(no design specified at this time)

Application Type: ESP

Location: Victoria, TX

Docket Date: June 7, 2010

#### Project Risks

None

#### Schedule Status

On August 31, 2010, the NRC issued a schedule letter to Exelon Nuclear Texas Holdings, LLC (Exelon), for the review of the Victoria County Station ESP application. The safety and environmental reviews began on October 1, 2010. However, the unavailability of funds for contractor support has affected the review.

The NRC published the FR notice for environmental scoping on November 2, 2010, with the scoping period closing on January 3, 2011. It held public scoping meetings on December 2, 2010, in Victoria, TX.

#### Review completion dates:

Original:	FSER—April 2013	Current:	FSER—April 2013
Original:	FEIS— August 2013	Current:	FSEIS—August 2013

## **Public Service Enterprise Group Incorporated Early Site Permit Application**

### General Information

Design: Plant Parameter Envelope Approach  
(no design specified at this time)  
Application Type: ESP  
Location: Salem County, NJ  
Docket Date: August 4, 2010

### Project Risks

The lack of contract funds prevented the NRC staff from performing the scheduled environmental audits in March and April 2011.

### Schedule Status

The NRC staff issued a review schedule for this application on November 29, 2010, and held the environmental scoping meeting on November 4, 2010. It also conducted the hydrology audit on February 15–16, 2011. However, lack of contract funds as a result of the FY 2011 Budget Continuing Resolution resulted in the NRC staff's inability to conduct the geology, seismology, and geotechnical engineering audits as planned in the review schedule. The NRC staff is preparing a letter to revise the review schedule's public milestones.

## **OTHER LICENSING ACTIVITIES**

### **Expected New Applications Identified During the Second Quarter of FY 2011**

In response to NRC Regulatory Issue Summary (RIS) 2010-10, "Process for Scheduling Acceptance Reviews of New Reactor Licensing Applications and Process for Determining Budget Need for Fiscal Year 2013," dated November 15, 2010, the NRC received the new information described below.

In a letter dated December 14, 2010, Ameren Missouri stated that it anticipates, submitting an ESP application for the Callaway site in the second half of 2011. It stated that Union Electric Company (doing business as Ameren Missouri) will be the applicant and license holder.

In a letter dated December 15, 2010, Duke Energy stated that it expects to submit routine amendments or supplements to the Lee COLA to reflect RAI responses and routine semiannual and annual updates, as required by regulation. Additionally, Duke Energy anticipates submitting one or more COL license amendments in FY 2013, following issuance of the COL, to reflect design changes, TS changes, and updated analyses. Duke Energy anticipates the process for these additional submittals to be similar to that used following issuance of the license to the AP1000 reference plant.

In 2006, Duke Energy Carolinas announced the designation of two additional sites in Davie County, NC, and Oconee County, SC, for possible future ESP development. Duke Energy stated that, while it has conducted limited site characterization on these two sites, it does not anticipate substantive work that would require preapplication interactions with the NRC staff in the near term.

In a letter dated December 15, 2010, Duke Energy Ohio, Inc. indicated that it does not plan on submitting an ESP application in FY 2013, as previously planned.

In a letter dated December 15, 2010, STPNOC provided its anticipated submittals for FY 2012. STPNOC expects to submit one relief request regarding the use of high density polyethylene pipe in the Reactor Service Water System and seven license amendment requests (LARs) immediately after issuance of its COL. Also, STPNOC said that it anticipates four LARs in FY 2013, each of which is dependent on the acceptance or submittal of other LARs. For example, STPNOC plans to submit a LAR regarding extended power uprate after it submits a LAR requesting a change in fuel type. STPNOC anticipates two additional LARs in FY 2014.

In a letter dated December 15, 2010, UniStar Nuclear Energy stated that it is currently evaluating several potential licensing topical reports to address optional design changes within the U.S. EPR COLAs. UniStar Nuclear Energy also stated that, once the NRC approves the topical reports, it expects to submit associated LARs immediately after issuance of the Calvert Cliffs COL.

In a letter dated December 17, 2010, South Carolina Electric & Gas Co. (SCE&G) stated that it plans to submit a number of LARs in FY 2012 and 2013 after issuance of the COL. These amendment requests will involve reconciliation of design changes, TS changes, or updated analyses. Additionally, it will submit changes associated with the ongoing support of construction. It expects that many of these amendment requests will be standard with respect to the AP1000 design.

In a letter dated January 31, 2011, MHI stated that it is planning to submit seven topical reports for NRC review that, once approved, will provide US-APWR licensees with alternatives to certain design features and analytical methods. Once available, these alternative design features and analytical methods will be valuable options for US-APWR customers, providing improvements in plant economy, maintainability, and supplier availability.

#### Other Licensing Activities

Review schedules and other pertinent information are available on the public Web page at <http://www.nrc.gov/reactors/new-reactors.html>.

## LICENSING SUPPORT

### Licensing Activities

#### *Application Review Process*

The NRC staff continues to perform activities to enhance the effectiveness and efficiency of the review processes for new reactor applications. These activities include updating key guidance documents for NRC activities and application preparation, developing strategies and work products for optimizing the review of applications received, and continuing activities in the pre-application and DC review processes.

#### *Issue Management*

Issues currently under evaluation include the following:

- review of the design change processes during construction
- standardized approach to license conditions
- review of construction impacts on existing units
- DC amendment and renewal processes and standards

#### *Generic Combined License*

The NRC staff continues to develop the generic model COL that was included in SECY-00-0092, "Combined License Review Process," dated April 20, 2000, and approved by the Commission. Recent updates to this model COL have included standardized approaches to generic license conditions and the results of staff reviews of several COLAs. The NRC presented the updated generic model COL at a public meeting on February 16, 2011, and included responses to industry comments on a previous version. Additional changes prompted staff reviews of COLAs and potential new generic license conditions that the NRC staff is considering adding to the model COL. The NRC staff indicated that it is using the updated generic model COL as the basis for developing the initial drafts for the near-term COLs (i.e., Vogtle and Summer).

### Guidance Activities

#### *Regulatory Guides*

The Web site for the Office of Nuclear Regulatory Research (RES) describes its program to update the NRC's RGs. The Web site also identifies those RGs for which NRO is the lead office for preparing the update. During the second quarter of FY 2011, NRO reviewed approximately 13 draft and final RGs in preparation for their issuance for public comment, for final issuance, or for withdrawal. For those RGs for which NRO is the lead office, none were issued as a final guide in the second quarter.

Additionally, NRO is updating RG 1.215, "Guidance for ITAAC Closure Under 10 CFR Part 52," and is updating Draft RG (DG)-1176 (proposed RG 1.217), "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts." The NRC staff addressed ACRS recommendations for DG-4016 (proposed Revision 2 to RG 4.11, "Terrestrial Environmental Studies for Nuclear Power Stations") and is preparing the document to be published in the FR.

### *Interim Staff Guidance*

Interim staff guidance (ISG) documents serve as temporary sources of guidance for NRC staff during licensing reviews. These documents are also an important reference for applicants and licensees to help them understand staff expectations. The information contained in ISGs is incorporated into other permanent NRC documents, such as RGs and standard review plans, when they are periodically updated. ISGs issued by NRO are available to the public on the NRC Web site. The NRC issued DC/COL-ISG-022, "Interim Staff Guidance on Impact of Construction of New Nuclear Power Plants on Operating Units at Multi-Unit Sites," for comment in the second quarter of FY 2011. The NRC also issued final DC/COL-ISG-018, "Final Interim Staff Guidance on Standard Review Plan, Section 17.4, 'Reliability Assurance Program,'" and DC/COL-ISG-021, "Final Interim Staff Guidance on the Review of Nuclear Power Plant Designs Using a Gas Turbine Driven Standby Emergency Alternating Current Power System," in the second quarter of FY 2011.

### *Changes during Construction Under 10 CFR Part 52 Guidance*

During the second quarter of FY 2010, NRO continued efforts to clarify the processes available for plant changes or modifications during the construction of new nuclear power plants. A new reactor application is frozen during the review process with subsequent proposed modifications to the licensing basis carried forward until after the COL is issued. The new licensee submits the LARs for plant changes or modifications that were identified after the licensing basis freeze point. The NRC staff continues to work with the industry on clarifying the change processes to maintain the licensing basis during the construction period until the 10 CFR 52.103(g) finding. The NRC staff is engaged in discussions with industry to establish an elective preliminary acceptance review process (PAR) as part of the LAR process established by a license condition, so a licensee may request to proceed with certain proposed plant changes or modifications requiring a license amendment during the NRC's review of the LAR. The NRC presented the proposed process to industry in December 2010, and to the public during the 2011 Regulatory Information Conference.

### *Standard Review Plan*

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (also known as the SRP), is the primary document for the NRC staff to use in reviewing and evaluating proposed licensing actions for nuclear power plants. It contains guidelines to ensure that NRC staff evaluations lead to clear and defensible findings that demonstrate that public health and safety will be maintained.

The SRP contains approximately 250 sections covering the entire scope of a nuclear power plant. Updating the SRP and other associated guidance documents is critical to ensuring that staff evaluations reflect the latest information and knowledge related to the safe operation of nuclear power plants. The comprehensive SRP review and update program occurs on a 4-year cycle. It involves a review of all sections of the SRP to determine which sections require an update and to budget and schedule the resources necessary to perform the updates. Some SRP updates must be completed in shorter timeframes than those supported by the review and update program. The NRC is compiling the NRC staff inputs received agencywide for the update project and expects to announce the results shortly. In attending to emergent requests from NRC staff, on January 25, 2011, the NRC published an SRP update in the FR to Section 13.5.1.1 related to updated guidance to incorporate attorney comments to correct guidance

related to post-license guidance related to 10 CFR 50.54(I), Part 26. This FR notice is currently out for public comment.

## Rulemaking Activities

### *Design Certification Rulemakings*

The status of DC rulemakings can be found earlier in this document under the associated safety review of that DC application.

### *Aircraft Impact Assessment Rulemaking Implementation*

The NRC published the final rulemaking on AIAs in the FR on June 12, 2009 (74 FR 28111), and it became effective on July 13, 2009. The rule at 10 CFR 50.150, "Aircraft Impact Assessment," requires applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large commercial aircraft. The rule requires applicants to use realistic analyses to identify and incorporate design features and functional capabilities to show, with reduced use of operator actions, that either the reactor core remains cooled or the containment remains intact, and either spent fuel cooling or spent fuel pool integrity is maintained. The NRC staff proposed to endorse industry guidance on the methodology for performing an AIA for new plant designs in DG-1176.

The NRC has received information to comply with the rule for all design centers currently under NRC review. Review of the amended ABWR design is complete, and, in January 2011, the NRC issued a proposed rule for public comment certifying an amendment to the ABWR DC to comply with the AIA rule. During the first half of FY 2011, the NRC staff also completed its review of the ESBWR and AP1000 designs and began reviewing the AIA submittals for the U.S. EPR and US-APWR designs. In addition, the NRC staff issued inspection reports for the ESBWR and AP1000 AIA inspections. Inspections for the U.S. EPR and US-APWR are planned for the latter half of FY 2011. The NRC staff presented the AIA review and inspection results for both the EWBWR and AP1000 designs to ACRS in early FY 2011. In addition to performing AIA reviews and inspections in FY 2011, the NRC staff began to incorporate lessons learned during these early reviews and inspections into the AIA guidance documents.

### *10 CFR Part 21 Rulemaking*

The NRC staff identified several areas in 10 CFR Part 21, "Reporting of Defects and Noncompliance," that could be enhanced through rulemaking and issuing associated guidance. Additionally, the Office of the Inspector General recently issued an audit of the NRC's vendor inspection program, and recommended that the NRC issue guidance to help vendors implement 10 CFR Part 21. NRO is collaborating with the Office of Nuclear Reactor Regulation, the Office of Federal and State Materials and Environmental Management Programs, the Office of Nuclear Material Safety and Safeguards, and the Office of the General Counsel (OGC) to develop a Commission paper, targeted for completion in September 2011, recommending options to clarify the requirements of 10 CFR Part 21 and address the need and priority for rulemaking, guidance, and outreach efforts.

### *10 CFR Part 52 Licensing Lessons-Learned Rulemaking*

The NRC staff has identified a number of improvements to 10 CFR Part 52 as a result of lessons learned during its review of DCs and COLAs. NRO is planning to work on a proposed rule in FY 2012.

### *Access Authorization and Physical Protection Requirements for Nuclear Power Plant Construction Rulemaking*

The NRC staff developed a proposed rulemaking to establish personnel access authorization and physical protection requirements for nuclear power plants during the construction phase. Over the past several years, the NRC has held numerous meetings with the industry's New Plant Security Task Force to discuss the need for (and the scope of) security measures at nuclear power reactor construction sites. Based, in part, on this collaborative effort with the industry, the NRC developed a technical basis to pursue an access authorization and physical protection rulemaking during nuclear power plant construction. The NRC solicited input from stakeholders through public workshops during the rulemaking process.

On March 30, 2011, the Commission disapproved the proposed rule, but expressed support for industry's voluntary implementation of the controls described in NEI 09-01 "Security Measures During New Reactor Construction."

### *ITAAC Maintenance Rulemaking*

The NRC has developed a proposed rulemaking to amend the regulations related to the verification of nuclear power plant construction activities through ITAAC under a COL. The NRC staff provided the proposed rulemaking package to the Commission for review in SECY-10-0117, "Proposed Rule: Requirements for Maintenance of Inspections, Tests, Analyses, and Acceptance Criteria," dated August 30, 2010. Specifically, the NRC is proposing new provisions that apply after a licensee has completed an ITAAC and submitted an ITAAC closure letter. The new provisions would require a licensee to report new information materially altering the basis for determining that inspections, tests, or analyses were performed as required or that acceptance criteria were met, and to notify the NRC of completion of all ITAAC activities. These notifications would support the finding that the Commission must make under 10 CFR 52.103(g), that all ITAAC in the COL are met, before it allows fuel load and operation and would ensure that interested persons have access to information on ITAAC at a level of detail sufficient to address the Atomic Energy Act threshold for requesting a hearing on ITAAC closure. The NRC worked with external stakeholders to establish thresholds for determining what types of unplanned events or licensee actions would materially alter the original ITAAC determination basis and developed regulatory guidance for implementing the proposed rule. On February 4, 2011, the Commission approved publication of the proposed rule, with changes. The NRC staff expects to issue the proposed rule for public comment, as well as the draft revision of RG 1.215, in May 2011.

### *Interoffice Rulemaking Contract*

The NRC staff is working to award a single rulemaking support contract, thus preventing duplicate efforts to issue individual contracts by each of the offices within the NRC that conduct rulemaking. Each lead office, and possibly other support offices, would be able to write task orders against the contract. The Office of Administration prepared the request for proposal, with the contract scheduled to be awarded in the third quarter of FY 2011. This procurement action is also being considered for inclusion in the NRC Strategic Acquisition Practices pilot program.

### *Design Certification with Multiple Vendors*

NRO is discussing plans for addressing industry activities related to the ABWR DC. Two parties have submitted renewals for the ABWR DC. In addition, in June 2009, STP submitted an application for an amendment to the ABWR DC to comply with the AIA rule. The NRC staff issued the FSER on the AIA DC amendment and submitted the associated proposed rule to the Commission, which approved it, including the NRC staff's proposal to address the treatment of multiple suppliers for a single design. The NRC published the proposed rule, which seeks public comment on the NRC staff's recommendation, in the FR on January 20, 2011. The public comment period ended on April 5, 2011.

## **CONSTRUCTION INSPECTION ACTIVITIES**

### **Construction Inspection Program**

Construction is underway and the NRC has begun executing construction inspection activities associated with the Vogtle LWA. Infrastructure is in place to support FY 2011 and FY 2012 inspection activities to verify quality construction. On March 8, 2010, safety-related construction officially began at VEGP Unit 3, with the start of engineered backfill operations authorized under the LWA. Safety-related activities have also begun on Unit 4. NRC Region II construction inspectors were present to observe the licensee's initial activities and to begin the first onsite ITAAC inspection. Region II has selected the construction senior resident inspector and resident inspector for VEGP and opened the resident office on August 16, 2010. Region II has conducted multiple inspections, in accordance with Inspection Procedure 35007, "Quality Assurance Program Implementation during Construction," of those portions of the QA program associated with all LWA activities. The assessment process under Inspection Manual Chapter 2505, "Periodic Assessment of Construction Inspection Program Results," started on July 1, 2010, and will cover the period between July 1, 2010, and July 1, 2011. The next construction milestone, backfill to the bottom of the nuclear island, was reached in November 2010. Region II conducted a backfill ITAAC inspection in December 2010.

### **Inspections, Tests, Analyses, and Acceptance Criteria**

The NRC staff continues to refine concepts for ITAAC closure and maintenance of closed ITAAC. The NRC staff conducted numerous public meetings within the past year to provide a forum for stakeholders to participate in and comment on staff proposals for ITAAC closure, ITAAC maintenance, and other construction inspection program issues. In July 2010, the NRC staff received Revision 4 to NEI 08-01, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52," for 10 CFR Part 52 applicants and licensees on the requirements for the ITAAC closure process. The industry revised the guideline to add critical sections of ITAAC maintenance, which had been vetted through public ITAAC workshops. The ITAAC maintenance period covers the time from when the licensee submits an ITAAC closure letter to the time when the Commission authorizes the facility to operate. Using Revision 4 as the current reference point, the NRC staff is revising RG 1.215, which endorses the industry guide. The NRC staff plans to issue the draft revision to RG 1.215 for public comment in May 2011, concurrent with the publishing of the proposed ITAAC maintenance rulemaking.

The NRC staff is participating in the simulated ITAAC closure and verification demonstration exercise described in SECY-10-0100, "Staff Progress in Resolving Issues Associated with Inspections, Tests, Analyses, and Acceptance Criteria," dated August 5, 2010. The U.S. Department of Energy (DOE) sponsored the exercise. During the exercise, the applicant simulated the closure and submittal of six ITAAC samples from the Westinghouse AP1000 design. SNOC and Westinghouse, representing the industry, have completed the first stage of the demonstration by simulating the performance of ITAAC and submitting 10 CFR 52.99(c)(1) notifications for the selected ITAAC. The first stage also included staff performing a simulated inspection of the completed ITAAC by reviewing the completion packages. In the second stage of the demonstration, the NRC staff simulated closure verification through the process proposed in SECY-10-0100. The exercise also included an action to evaluate the surge in ITAAC closure submittals expected during the last year of construction of a new nuclear power plant. The exercise concluded in March 2011, and a report summarizing the lessons learned will be issued in May 2011.

The NRC staff reviewed the proposed generic ITAAC wording changes for the US-APWR DC application. These changes were a result of ITAAC issues identified in RIS 2008-05, "Lessons Learned to Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal," Revision 1, issued September 23, 2010, and from lessons learned from the AP1000 and ESBWR applications. A design center working group (DCWG) was formed for the US-APWR to proactively enhance ITAAC quality, clarity, and inspectability. The NRC staff interacted with the US-APWR DCWG at several public meetings to provide feedback on the changes. Additionally, the NRC staff completed the review of Revision 8 of the ESBWR ITAAC for inspectability.

The NRC staff continues to review AP1000, DCD Revision 18, ITAAC for prioritization and EPR, DCD Revision 2, ITAAC for certification. The NRC staff has also initiated the existing protocol to prioritize ESBWR, DCD ITAAC.

The NRC staff has drafted an office instruction (OI) on the ITAAC closure and verification process. The draft OI is in the review and concurrence stage, and the NRC staff is incorporating comments as it receives them. The NRC staff expects to issue the OI in June 2011.

The NRC staff formed the DAC task working group in November 2009 to respond to an STP request for review of DI&C DAC products related to the design of STP Units 3 and 4. The group has focused on developing a viable DAC inspection process. Elements include developing a process framework in parallel with developing DAC inspection procedures. The NRC staff's initial focus was on DI&C procedures, but it is also developing procedures to address the inspection of piping and human factors DAC. To date, the NRC staff has developed the process framework and completed drafts of the DI&C and piping DAC procedures. Inspection procedure development is continuing.

In June 2010, the Division of Construction Inspection and Operational Programs (DCIP) and Region II conducted an initial pre-COL inspection of the STP DI&C software lifecycle planning phase to assess the viability of the DI&C DAC procedure. The DAC task working group will continue to compile and assimilate lessons learned for DAC inspections. Concurrent with these efforts, elements of the STP initiative will be incorporated into a generic DAC inspection methodology that will subsequently be documented in NEI 08-01 and RG 1.215.

### Construction Reactor Oversight Process

The Commission directed the NRC staff to form the construction reactor oversight process (cROP) working group in December 2009 to develop construction assessment program options for Commission consideration. The NRC staff focused its development efforts on the inclusion in the cROP of objective elements such as construction program performance indicators and significance determination processes analogous to those used in the Reactor Oversight Process. In August 2010, the working group completed development of its initial staff proposal, which was forwarded to the Commission as SECY-2010-0140, "Options for Revising the Construction Reactor Oversight Process Assessment Program," dated October 26, 2010. The NRC staff briefed the Commission on its proposals for revising the cROP on December 16, 2010.

In SRM SECY-10-0140, dated March 21, 2011, the Commission directed the staff to develop a construction assessment program that includes a regulatory framework, the use of a construction significance determination process to determine the significance of findings

identified during the construction inspection program, and the use of a construction action matrix to determine the appropriate NRC response to degrading licensee performance. The staff will routinely meet with external stakeholders to finish the developmental work for this task, and pilot the new construction assessment program in parallel with the current assessment process for 12 months beginning October 1, 2011. The staff will provide updates to the Commission and brief the ACRS as directed in the SRM.

#### Quality Assurance and Vendor Inspections

During the first quarter, the NRC staff conducted two vendor inspections and two QA implementation inspections. Additionally, the NRC staff participated in several outreach activities including Nuclear Procurement Issues Committee (NUPIC), American Society of Mechanical Engineers (ASME) Section III and Nuclear Quality Assurance (NQA) meetings. The staff has been developing an agency approach for counterfeit, fraudulent and suspect items (CFSI) and has been coordinating the response to the Office of Investigation regarding the vendor inspection audit report recommendations, including potential 10 CFR Part 21 rulemaking.

## **ADVANCED REACTORS**

The NRC staff has undertaken a variety of activities to prepare for applications for SMRs that may arrive as early as CY 2012. The NRC staff has evaluated past advanced reactor experience and interacted with stakeholders to identify issues that should be addressed to support design and licensing reviews of SMR designs and deployment. Although approached by vendors and advocates for a variety of reactor technologies, the NRC staff has focused its attention on the NGNP Program and on integral pressurized-water reactors (iPWRs).

### **Next Generation Nuclear Plants**

The NRC and DOE staffs are coordinating research and preapplication activities related to Phase 1 of the NGNP Program. The NRC staff communicates often with DOE and the lead laboratory, Idaho National Laboratory (INL), regarding research and development activities, as well as the efforts to support the future licensing of the NGNP prototype and subsequent commercial units.

The NRC staff is currently reviewing white papers submitted by INL that address topics including the risk-informed, performance-based regulatory framework (e.g., defense-in-depth, licensing basis event selection, and safety classification and treatment of structures, systems, and components); materials that may be used in the NGNP high-temperature gas-cooled reactor (HTGR); fuel qualification; mechanistic source term; modular plant licensing; and emergency planning. These white papers are intended to serve as a basis for initial discussions between DOE and the NRC regarding the overall approach and issues associated with each topic, informing the prospective designer of issues that should be addressed in a future licensing application. The NRC staff is preparing assessment reports for these white papers and is requesting additional information, as needed, to address the objectives described by INL. The NRC is addressing some topics, such as emergency planning and modular plant licensing, as part of its resolution of generic SMR issues.

In addition to routine interactions with DOE and INL on major research and development efforts sponsored by DOE (e.g., fuels and materials testing programs), RES has activities underway to support the NGNP licensing program. The most significant of these research activities involves the development of computer codes and models to support independent NRC evaluations of the behavior of HTGR systems.

A subcommittee of the DOE Nuclear Energy Advisory Committee (NEAC) is reviewing progress in NGNP research, design, and preapplication licensing discussions (project Phase 1, as described in the Energy Policy Act of 2005). DOE is considering a means to encourage participation by private partners in project Phase 2, which includes preparation of the final NGNP design, review by the NRC of a license application, and subsequent construction and startup of the prototype facility. NEAC is expected to make a recommendation to the Secretary of Energy regarding Phase 2 sometime in FY 2012. A decision by the Secretary of Energy on Phase 2 will follow thereafter.

## Integral Pressurized-Water Reactors

### *NuScale Power, Inc.*

The NuScale Power, Inc. (NuScale) modular reactor is a 160 megawatt thermal (MWt), 45 megawatt electric (MWe), natural circulation pressurized-water reactor (PWR) design that consists of an integrated reactor vessel assembly that includes the reactor core, pressurizer, control rods, and two helical steam generators, all located within the reactor vessel. NuScale is proposing that each plant be designed to accommodate up to 12 totally independent modules (reactor vessel and containment) for a total plant electrical capacity of up to 540 MWe.

The NRC staff has been engaged in preapplication activities with NuScale since early 2008. In January 2011, SEC initiated a civil action against affiliates of the Michael Kenwood Group, NuScale's principal investor. This action has prevented the firm from meeting funding obligations to NuScale and has forced NuScale to significantly reduce its spending. The SEC has not made any allegations of improper activities by NuScale, and NuScale is not a party in the SEC action. As a result, NuScale is pursuing alternative financing strategies. On March 18, 2011, NuScale submitted a letter to the NRC requesting that the NRC suspend all pre-application activities.

The NRC has received reports on the LOCA phenomena identification and ranking table and human factors engineering (HFE) program management plan, the cyber security plan, the QA topical report, the dynamical system scaling methodology, and the HFE implementation plan. The NRC staff has reviewed the HFE, cyber security, and QA reports. Consistent with NuScale's request, the NRC staff's review efforts for other submitted reports have been suspended. On March 1 – 3, 2011, the NRC staff met with NuScale personnel at their offices in Corvallis, OR, to conduct an audit of the NuScale plant Level 1 PRA.

### *Babcock and Wilcox mPower™*

B&W, FirstEnergy, Oglethorpe Power Corporation, and TVA signed a memorandum of understanding on February 17, 2010, to form a consortium to develop an SMR demonstration plant featuring a B&W mPower™ nuclear reactor. B&W has indicated that it is continuing discussions with other interested parties, as well.

The mPower™ reactor is a 400-MWt (125-MWe) light-water reactor that consists of a self-contained module with the reactor core, reactor coolant pumps, and steam generator located in a common reactor vessel installed in an underground containment. B&W is considering designing the standard plant for two modules.

The NRC staff has been engaged in pre-application activities with B&W since mid-2009. In October 2010, B&W sent a letter to the NRC that detailed its plans to submit a total of 29 reports during pre-application before submitting its DC application, expected during the first quarter of FY 2014. To date, the NRC has received technical reports on the following topics: QA plan for DC, plant design overview, critical heat-flux test and correlation development plan, core nuclear design codes and methods qualification, integrated system test (facility description and test plan), instrument setpoint methodology, and control rod drive mechanism design and development, as well as the security design assessment and program plan.

The NRC staff is establishing review schedules and is providing feedback to B&W through meetings and other appropriate methods. During this quarter, the NRC staff held detailed technical meetings with B&W on core nuclear design codes, the critical heat-flux test plan, the security design, and the control rod drive mechanism design. The next meeting with B&W is scheduled for April 21, 2011, to discuss the mPower™ comprehensive design overview.

#### *Tennessee Valley Authority*

By letters dated October 8 and November 5, 2010, TVA stated that it was evaluating SMR activities under 10 CFR Part 50 instead of 10 CFR Part 52. In subsequent interactions with the NRC, TVA described its key assumptions to support a licensing review, under 10 CFR Part 50, for construction and operation of mPower™ SMR modules at the Clinch River site in Roane County, TN. TVA plans to develop a detailed regulatory framework for up to six SMR modules.

On January 31, 2011, the NRC staff responded to TVA's assumptions letters, concluding that there are no legal or licensing issues that would prohibit TVA from applying for a construction permit or operating license under 10 CFR Part 50 for the licensing of a new nuclear facility. The NRC staff plans to begin a series of public meetings with TVA to discuss the details associated with the regulatory framework for the Clinch River construction permit application in the near future. Related activities are anticipated to continue from FY 2011 through FY 2012, with an initial license application submittal anticipated in the fourth quarter of FY 2012.

#### Other Reactor Technologies

Two other vendors have contacted the NRC to propose submitting small light-water reactor designs for NRC review. Westinghouse is developing its SMR design and is planning to submit a DC application late in CY 2012. Holtec is developing the Holtec inherently safe modular underground reactor (HI-SMUR) design and is also planning to submit a DC application. The NRC staff intends to meet with Westinghouse and Holtec, as resources allow, to gain a basic understanding of their designs.

The NRC staff has occasional interactions with potential applicants using other advanced reactor designs, such as sodium-cooled fast reactors, lead-bismuth-cooled fast reactors, and fluoride salt-cooled high-temperature reactors. While it held no meetings during this quarter on these types of designs, NRC staff activities related to these designs are limited to low-level efforts (e.g., knowledge management) and nonresource-intensive interactions with vendors (e.g., occasional meetings). Although receiving occasional inquiries about the regulation of fusion-based energy devices, the NRC staff, as directed in the SRM dated July 16, 2009, related to SECY-09-0064, "Regulation of Fusion-Based Power Generation Devices," dated April 20, 2009, is not pursuing licensing or infrastructure development related to fusion energy until commercial deployment of the technology is more predictable, as established by successful testing.

#### Generic Policy Issues

In SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," dated March 28, 2010, the NRC staff committed to providing the Commission with periodic updates (through this quarterly report) on its development and implementation of issue resolution plans related to advanced reactors. The SRM dated August 31, 2010, "Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor

Reviews,” also instructed the NRC staff to provide an update on the issue resolution plans described in SECY-10-0034. An update on the NRC staff’s activities in this area follows.

#### *License Structure for Multimodule Facilities*

One of the policy issues being assessed is the license structure for multimodule facilities. NRO is working to develop an information paper to the Commission describing the different license structure approaches and the NRC staff’s recommendations. The NRC staff is considering papers on this topic submitted by the NGNP Program and NEI in the development of the Commission paper. The configurations of multimodule facilities are also a topic within other issue resolution plans and will need to be addressed in the proposed approaches for resolving those broader issues. Examples include the need to address risk assessments for multimodule facilities, the handling of multimodule facilities in the NRC fee structure, and the requirements for liability and property insurance.

#### *Manufacturing License Requirements for Future Reactors*

The NRC staff and various stakeholders have raised questions about using the manufacturing license provisions in 10 CFR Part 52 for SMRs. The NRC has issued only one manufacturing license, in 1982, for Offshore Power Systems’ floating nuclear plants. The first issue related to manufacturing licenses for SMRs is how the provisions could apply to a reduced scope, as compared to the total plant licensed, in the case of Offshore Power Systems, and whether the industry is actually interested in using such provisions, assuming that clarifications or changes to the requirements are pursued. The NRC staff has discussed this topic at several public meetings with the industry, requested additional information in RIS-2011-02, “Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs,” dated February 2, 2011, and plans to continue discussions with stakeholders during future interactions. The responses to RIS-2011-02 indicate limited potential interest in pursuing manufacturing licenses, but no firm commitments have been provided at this time.

#### *Risk-Informed Licensing Approaches*

The NRC staff revised the issue resolution plan for risk-informed licensing to address the Commission’s direction, in SRM COMGBJ-10-0004/COMGEA-10-0001, to develop a framework to apply risk insights in the licensing of SMRs to improve the efficiency and safety focus of the NRC staff’s reviews. In SECY-11-0024, “Use of Risk Insights to Enhance Safety Focus of Small Modular Reactor Reviews,” dated February 11, 2011, the NRC staff proposed a more risk-informed and more integrated review framework for preapplication and application review activities pertaining to iPWR designs. The proposed iPWR review framework is consistent with current regulatory requirements and Commission policy statements and builds on the NRC staff’s current application review process. Design-specific review plans derived from the framework would be prepared for the anticipated near-term iPWR design applications. The NRC staff has incorporated issues described in SECY-10-0034, related to defense-in-depth, licensing-basis event selection, and PRAs, into its recommendations in SECY-11-0024. As directed in the SRM, the NRC staff developed an approach for creating, over the longer term, a new risk-informed and performance-based regulatory structure for licensing advanced reactor designs (e.g., HTGRs and liquid-metal reactors). This regulatory structure would build on insights from iPWR reviews and ongoing interactions with the NGNP Program. The NRC staff’s activities related to the longer term initiative will be coordinated with, and possibly integrated into or subsumed by, the Task Force for Assessment of Options for More Holistic Risk-Informed,

Performance-Based Regulatory Approach, chartered by the Chairman's tasking memorandum to the Executive Director for Operations and OGC, dated February 11, 2011.

#### *Appropriate Source Term, Dose Calculations, and Siting*

The NRC staff plans to address the introduction of mechanistic source terms into the licensing process for some advanced reactor designs and has held internal meetings, formed an NRC source term working group, and completed a statement of work to the national laboratories that will provide insights into the technical, policy, and licensing issues that the NRC staff is considering. A modernization of the source term for accident consequence analysis, using a realistic and best-estimate analysis, would be the basis for an expected Commission paper in late 2011. The NRC staff source term working group has reviewed white papers submitted by the NGNP Program on the use of a mechanistic source term for HTGRs and fuel qualification. The NRC staff has issued RAIs on these topics to INL and drafted an assessment paper on the INL proposal for a mechanistic source term. The NRC staff, aware that in some cases the iPWR vendors are interested in pursuing aspects of a mechanistic source term, is waiting for specific information from them.

#### *Appropriate Requirements for Operator Staffing for Small or Multi-Module Facilities*

Given the low power output, modular nature, and passive design of advanced reactors, the NRC staff is engaged in addressing the appropriateness of staffing requirements set forth in 10 CFR 50.54(m). The NRC staff has established a working group and developed an issue resolution plan to resolve the issue for near-term applications and to inform long-term decisions, research, and potential rulemaking. The working group is currently implementing its issue resolution plan. In the near term, the NRC staff is focusing on developing the technical basis and guidance to support the review of submittals related to HFE and on giving reviewers the tools to address exemption requests to 10 CFR 50.54(m) for the first round of anticipated SMR COLAs. NRO established a user need with RES for long-term rulemaking efforts and has also contracted with the DOE national laboratories to support development of regulatory guidance documents and training with both near-term and long-term deliverables. The NRC staff is actively seeking stakeholder interaction by discussing this topic at regular SMR generic topic meetings, reviewing position papers from an American Nuclear Society special committee and NEI, and evaluating topical reports and white papers from potential vendors. The NRC staff is developing input for a SECY paper intended for summer 2011, to clearly define the problem and inform the Commission of best approaches to resolve the issue. The SECY paper will also request the Commission's view on proceeding with guidance and rulemaking that may result in appropriate staffing levels less than those prescribed in 10 CFR 50.54(m) for some plant designs and configurations. Throughout the execution of the issue resolution plan, updated user needs and priorities are communicated to RES for longer-term investigations. Since the establishment of the working group, it has become clear that requests for near-term application exemptions to 10 CFR 50.54(m) will focus on task and workload analyses to form the technical basis of the exemption. Task and workload analyses are methods following established NRC guidance and for which the agency has strong experience and an existing framework.

#### *Offsite Emergency Planning and Preparedness Requirements*

The NRC staff discussed this theme at several public meetings on SMR generic topics and is reviewing position papers along with other assessments from vendors, the NGNP Program, and other sources to develop possible approaches to establishing emergency planning and

preparedness (EP) requirements for SMRs. NEI has formed a task force that is addressing EP for SMRs. The NRC staff completed a series of internal meetings, which identified possible policy and key technical issues associated with EP requirements, and has identified emergency planning zones (EPZs) as a key issue affecting SMR EP licensing activities and programs. The NRC staff is developing and has drafted an Information SECY paper to the Commission describing possible alternatives for EP approaches for SMRs. One alternative involves establishing a graded approach to EP, which includes options for determining EPZ sizes for SMRs.

#### *Security and Safeguards Requirements*

As with EP, the NRC staff is assessing various documents related to security and possible approaches for increasing the degree to which security concerns are addressed in plant designs. This is another topic that the NRC staff will address during routine meetings with the SMR community and for which the NRC staff will solicit position papers from NEI and more detailed information from vendors. The NRC staff expects a position paper from NEI in the fourth quarter of FY 2011. The NRC staff will inform the Commission and, if appropriate, seek Commission direction on the activities and approaches being pursued by the NRC staff, vendors, and likely licensing applicants. The NRC staff is currently conducting an Issue Identification and Ranking Program to find potential issues that were not identified during earlier analyses. The NRC staff is also working with Sandia National Laboratories to put contracts in place for preliminary vital equipment identification, target set analysis, and source term evaluation. The NRC staff continues to work with vendors to provide safeguards-level information that will assist them in incorporating security elements during design development.

#### *NRC Annual Fees*

The NRC staff has assessed the public comments received in response to an advance notice of proposed rulemaking issued in 2009 that sought views on possible changes to the current NRC annual fee structure to incorporate SMRs. An NEI task force has presented a position paper to the NRC staff for consideration in the development of a possible variable fee structure for SMRs. The NRC staff assessed the industry position paper and considered it while developing a memorandum to the Commission dated February 7, 2011, which describes a variable annual reactor fee approach based on licensed thermal power. The NRC staff will prepare a proposed rule to codify the variable annual fee for reactors and expects to provide the proposed rule to the Commission in FY 2013.

#### *Insurance and Liability Requirements*

The NRC staff has conducted internal meetings and has met with the NEI working group evaluating possible approaches to address SMR insurance and liability requirements, especially those requirements related to the Price-Anderson Act. This issue was discussed at the SMR generic topics public meeting held in November 2010. NEI is preparing a position paper on this topic and expects to submit it late in FY 2011. This is primarily an industry led activity and the NRC staff is monitoring these efforts. The NRC staff will update the Commission on any future actions as appropriate.

### *Decommissioning Funding Requirements*

The NRC staff's working group assessed an industry position paper submitted by NEI, which addressed requirements for decommissioning funding assurance (DFA) for SMR facilities. The NRC staff concluded that SMRs will not introduce major DFA policy issues and has described the planned approach and the resolution of several other policy issues in a Commission paper being developed by the NRC staff.

### Infrastructure Development

Focusing the attention of staff on the NGNP Program and on iPWRs continues to enhance the effectiveness and efficiency of other advanced reactor activities by doing the following:

- providing the information necessary to develop resource estimates for reviewing the designs for advanced reactors
- allowing the NRC technical review staff sufficient time to become familiar with advanced reactor design concepts
- providing feedback to potential applicants on key design, technology, safety research, and licensing issues
- identifying interrelated or cross-cutting regulatory safety issues and reasonable resolution paths for these issues
- identifying technical skills necessary to review these designs and, as appropriate, hiring staff and contractors who possess the requisite knowledge, skills, and abilities

The NRC staff is working with the DOE laboratories for support in the resolution of generic policy and technical issues, development of guidance documents for both staff and industry, and pre-application reviews of topical reports and white papers submitted by potential applicants. The NRC staff is developing its longer term contracting strategy, which will likely involve commercial contractors for the review of actual design and licensing applications.

The NRC staff is also working with the DOE national laboratories to develop training for both HTGRs and iPWRs. During this quarter, the NRC staff was successful in coordinating preliminary training sessions for both HTGRs and iPWRs.

## **INTERNATIONAL ACTIVITIES**

The NRC is continuing to use international experience and lessons learned to ensure safe designs both domestically and internationally. All the new reactor designs under review in the United States are also under review, being constructed, or in operation in other countries. During this period, NRO participated in multilateral and bilateral activities as part of the MDEP, attending conferences and workshops, hosting assignees from other regulators, and supporting requests for expert participation by the International Atomic Energy Agency (IAEA).

### **Multinational Design Evaluation Program and Bilateral Cooperative Activities**

In January 2011, new levels of membership, as well as specific membership criteria, were established for MDEP. The new membership levels include the associate membership level, for design-specific activities only, and the candidate level, for countries with mid -to long-term plans to pursue new reactor licensing.

During the week of March 7, 2011, NRO participated in bilateral meetings with counterparts from Canada, China, the Czech Republic, Finland, France, Italy, IAEA, Korea, Japan, Russia, and the Nuclear Energy Agency's Committee on Nuclear Regulatory Activities. The main focus of discussions was cooperation on staff exchanges in the area of design review, construction, and vendor inspection. In particular, counterparts were made aware of NRO's work in the area of counterfeit, fraudulent, and suspect items.

From March 21-24, 2011, NRO management chaired a meeting of the Working Group on Regulating New Reactors, (WGRNR) in Paris, France. The WGRNR is a working group under the Committee on Nuclear Regulatory Activities (CNRA) and provides a forum to examine construction experience and the regulatory issues of the siting, licensing, and regulatory oversight of Generation III+ and Generation IV nuclear reactors.

Following the March 11, 2011, tsunami in Japan, NRO staff supported the NRC's Operations Center as part of the Agency's effort to monitor and analyze events at nuclear power plants in Japan. Additionally, NRO staff has offered its technical experts to provide on-the-ground support in Japan.

## FUNDING

### Committed and Obligated Funding

The following tables reflect the FY 2011 committed and obligated funding by FY quarter:

#### NRO CASE WORK ONLY

<b>FY 2011 Funding</b>	<b>1<sup>st</sup> Quarter</b>	<b>2<sup>nd</sup> Quarter</b>	<b>Cumulative</b>
Commitments	\$1,445,794.42	\$5,421,935.40	\$6,867,729.82
Obligations	\$856,372.42	\$5,821,257.40	\$6,677,629.82

#### NRO—ALL (NONPROGRAM MANAGEMENT, POLICY, AND ANALYSIS MANAGED WORK)

<b>FY 2011 Funding</b>	<b>1<sup>st</sup> Quarter</b>	<b>2<sup>nd</sup> Quarter</b>	<b>Cumulative</b>
Commitments	\$4,937,602.91	\$10,198,519.70	\$15,136,122.61
Obligations	\$2,593,565.86	\$12,132,848.60	\$14,726,414.46