

October 17, 2011

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

FROM: Michael R. Johnson, Director */Gary Holahan for/*  
Office of New Reactors

SUBJECT: QUARTERLY REPORT ON THE STATUS OF NEW REACTOR  
LICENSING ACTIVITIES – JULY 1 TO SEPTEMBER 30, 2011

In response to the U.S. Nuclear Regulatory Commission's staff requirements memorandum for COMJSM-00-0003, "Staff Readiness for New Nuclear Plant Construction and the Pebble Bed Reactor dated February 13, 2001, and SRM-09-0064, "Staff Requirements—SECY-09-0064 - Regulation of Fusion-Based Power Generation Devices," dated July 16, 2009, the enclosed report provides the status of new reactor licensing activities for the quarter beginning July 1, 2011, and ending September 30, 2011. The report contains 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  
OCA  
OPA  
CFO

CONTACT: Christian Araguas, NRO/ARP  
(301) 415-3637

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Memorandum to Commission from Michael R. Johnson dated October 17, 2011

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ACTIVITIES – JULY 1 TO SEPTEMBER 30, 2011

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Office of New Reactors  
Quarterly Report on the Status of New Reactor  
Licensing Activities  
July 1 to September 30, 2011

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# STATUS OF NEW REACTOR LICENSING ACTIVITIES JULY 1 TO SEPTEMBER 30, 2011

## Introduction

### *New Reactor Program Overview*

Since its inception in 2006, the U.S. Nuclear Regulatory Commission's (NRC's) Office of New Reactors (NRO) has continued to successfully serve 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 advanced reactor activities, 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) as part of an ESP.

In the prior quarter, the 75-day comment period closed on the design certification (DC) rulemaking packages for the AP1000 DC amendment and the economic simplified boiling-water reactor (ESBWR), as well as the DC rule (DCR) amendment for the advanced boiling-water reactor (ABWR) aircraft impact assessment (AIA). During this quarter, NRO submitted to the Commission the final DCR package for the ABWR AIA DC and has made substantial progress in addressing public comments and preparing the final rule packages for the AP1000 and ESBWR DCs.

NRO has also made substantial progress in its review of several 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 key 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, use of a construction significance determination process, and adoption of a construction action matrix.

Since its creation in 2008, NRO’s Advanced Reactor Program has been dedicated to preparing for the review of the next generation nuclear plant (NGNP) license application and future applications involving small modular reactors (SMRs). Recently, NRO has been engaged in significant preapplication activities with multiple SMR vendors. In addition, NRO has made substantial progress in bringing to resolution the key policy, licensing, and technical issues facing SMRs, and has begun to develop the guidance necessary to support the staff’s review efforts. Furthermore, NRO has continued to implement supporting initiatives aimed at ensuring readiness to review future SMR licensing applications. For example, similar to the design-centered working group meetings, NRO has continued to engage with the Nuclear Energy Institute (NEI), industry representatives and other stakeholders to address potential challenges facing future SMR application reviews.

The 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.

During this quarter, the NRC has also been actively engaged in follow up to the accident at the Fukushima Dai-ichi reactors. In its August 19, 2011, SRM for SECY-11-0093, “Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,” the Commission directed the staff to draft a charter for the structure, scope, and expectations for assessing the Near-term Task Force recommendations and for the NRC’s longer term review of the Fukushima accident. The Commission also directed the staff to identify and make recommendations regarding any NTTF recommendations that can, and in the staff’s judgment, should be implemented, in part or in whole, without unnecessary delay, and to prioritize all of the recommendations. In response to the SRM, the staff proposed a senior level steering committee and prepared SECY-11-0124, “Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report,” dated September 9, 2011, and SECY-11-0137, “Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned,” dated October 3, 2011. NRO provided significant support for these activities with the Director of NRO serving as a steering committee member and NRO staff participating in the working group responsible for preparing the recommendations and prioritization. NRO staff also provided continuing support to the Agency team formed to support the NRC staff members in Japan, the U.S. Embassy, and to coordinate response efforts with federal and industry partners.

#### *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 review of the DC applications and COLAs with active near-term programs for construction.

The NRC is preparing the final rule packages for both the General Electric Hitachi Nuclear Energy (GEH) Economic Simplified Boiling Water Reactor (ESBWR) and the Westinghouse AP1000 DC amendment and is currently reviewing two DC applications (EPR, US APWR). In addition, the Advanced Boiling Water Reactor (ABWR) final rule package was completed by the NRC staff and is with the Commission for action. Thorough and timely reviews of these DC applications are critical to the successful completion of the COLA reviews. In addition, the NRC received two ABWR DC renewal requests in early fiscal year (FY) 2011. As of September 30, 2011, the NRC had 12 COLAs under active review.

The agency's experience with these applications has demonstrated the success of 10 CFR Part 52 and the design-centered review approach 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, to minimize schedule uncertainty it is important that applicants limit 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 staff is focused on resolving the remaining technical issues. The NRC is moving forward on reviewing applications and is on a closure path for many issues.

For program definition and budgetary control, the NRO program elements are broken down into subprograms encompassing new reactor licensing, advanced reactors, and oversight.

During this reporting period, major accomplishments for the new reactor licensing subprogram include the following:

- final rule for ABWR DC amendment sent to Commission for action
- final safety evaluation report (FSER) for AP1000 DC amendment issued
- FSER for Vogtle COL issued
- Staff testimony and exhibits presented at September 27-28 mandatory hearing for Vogtle COL
- FSER for Summer COL issued
- staff statement in support of mandatory hearing for Vogtle COL sent to Commission
- final environmental impact statement for Calvert Cliffs COL issued
- staff statement in support of mandatory hearing for Summer COL sent to Commission
- final environmental impact statement for Summer COL published
- final environmental impact statement for Comanche Peak COL issued

The staff carried out preapplication work for the impending Blue Castle application submittal and successfully conducted several international activities related to the MDEP Working Groups for the AP1000 and AREVA Evolutionary Power Reactor (EPR) designs.

During this reporting period, major accomplishments for the oversight subprogram include issuance of a *Federal Register* notice (FRN) seeking public comment on Draft Regulatory Guide (DG)-1250, "Guidance for ITAAC Closure Under 10 CFR Part 52," in conjunction with the

proposed amendment, "Requirements for Maintenance of Inspection, Tests, Analyses, and Acceptance Criteria," to 10 CFR Part 52, to incorporate the reporting requirements for licensees concerning events regarding previously closed ITAAC and associated material for their resolution. The NRO staff continues to make considerable progress on evaluating the ITAAC Closure Verification Process and preparing for the surge in ITAAC closure submittals expected during the last year of new nuclear power plant construction.

During this reporting period, major accomplishments for the Advanced Reactor Subprogram include developing a Commission paper (SECY-11-0098, "Operator Staffing for Small or Multi-Module Nuclear Power Plant Facilities") describing the staff's near-term and long-term approaches to resolving the operator staffing requirements issue for SMRs. The NRO staff also developed a Commission paper (SECY-11-0112, "Staff Assessment of Selected Small Modular Reactor Issues Identified in SECY-10-0034") providing the staff's assessment and closeout of multiple issues identified in SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs." The NRO staff completed issue identification and ranking projects (IIRP) for three subject areas relative to SMRs (source term, security, and cross organizational issues). NRC staff from several offices participated in these initiatives which supported preparing for future SMR application reviews.

This report summarizes the following areas covering the fourth 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**

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 DCR Amendment	August 5, 2011	N/A	TBD
Vogtle Electric Generating Plant, Units 3 and 4	August 5, 2011	March 2011	N/A
Summer, Units 2 and 3	August 17, 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	TBD	N/A
Shearon Harris, Units 2 and 3	September 2013	January 2014	N/A
Turkey Point, Units 6 and 7*	December 2012	TBD	N/A

\* This is under rebaselining review.

## **AP1000 Design Certification Rule Amendment**

### General Information

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

The NRC received over 13,500 public comments. The staff is in the final phase of completing responses to all comments.

### Schedule Status

The final rule package is due to the Commission in October 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*

The AP1000 DC amendment rulemaking must be completed prior to issuance of the Vogtle COLs.

### Schedule Status

#### Review Completion Dates:

Original:	FSER—December 2010	Actual: FSER— August 5, 2011 (complete)
	DSEIS—Issued September 2010	FSEIS— March 2011 (complete)

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 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 final safety evaluation report (FSER).

The NRC staff issued the draft supplemental environmental impact statement (DSEIS) on September 3, 2010 for public comment. A public meeting on the DSEIS took place on 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 milestone.

The staff issued the Vogtle 3 and 4 COL FSER on August 5, 2011. Based on the FSEIS and FSER being issued the staff provided its testimony to begin the mandatory hearing process in SECY-11-0110, "Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses and Limited Work Authorizations for Vogtle Electric Generating Plant, Units 3 and 4," dated August 9, 2011. An FRN established the date of the hearing, which was held on September 27-28, 2011.

### **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*

The AP1000 DC application rulemaking must be completed prior to issuance of the Summer COLs.

##### *Environmental Review*

The NRC published the FEIS in April 2011.

#### Schedule Status

Review Completion Date:  
Original: FSER—February 18, 2011    Current: FSER—August 17, 2011 (complete)  
          FEIS—February 3, 2011        FEIS—April 2011 (complete)

The NRC staff briefed the ACRS AP1000 subcommittee on the Summer COLA on January 10-11, 2011, and briefed the ACRS full committee on February 10, 2011. 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. The staff responded to the ACRS letter report in a letter dated March 26, 2011. The mandatory hearing phase of this review is underway.

The NRC issued the FSER on August 17, 2011. With completion of both the FEIS and the FSER, to begin the mandatory hearing process, the staff provided its testimony in SECY-11-0115, "Staff Statement in Support of the Uncontested Hearing for Issuance of Combined Licenses for the Virgil C. Summer Nuclear Station, Units 2 and 3," dated August 19, 2011. An FRN was issued establishing the date of the hearing as October 12-13, 2011.

### **Bellefonte Units 3 and 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*

On August 18, 2011, the Tennessee Valley Authority (TVA) Board approved plans for the completion of Bellefonte Unit 1, with the goal of having it completed and operational by 2020. Despite the decision on the completion of Bellefonte Unit 1, the COLA for Units 3 and 4 remains a viable option for TVA. The completion and operation of Unit 1 (and potentially Unit 2) would, however, necessitate additional site studies and significant revisions to the environmental report and the site safety analysis report (SSAR) supporting the COLA.

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 the TVA letter. By letter dated November 24, 2010, the NRC agreed 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	Current:	FSER—suspended
	FEIS—January 2010		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

The NRC staff has completed all technical reviews for the Levy County COLA, and has issued all safety evaluation chapters without open items to the applicant. The NRC staff has also forwarded the chapters to the ACRS to support a subcommittee meeting on October 18–19, 2011. The applicant will submit the FSAR revision to close out confirmatory items after the ACRS full committee meeting in November 2011.

### *Environmental Review*

#### *Least Environmentally Damaging Practicable Alternative*

The NRC is preparing an EIS for the Levy project with the U.S. Army Corps of Engineers (USACE) as a cooperating agency. USACE is required to perform its own least environmentally damaging practicable alternative (LEPDA) analysis to issue a permit under Section 401(b)(1) of the Clean Water Act. USACE determined that a LEDPA analysis developed by the applicant required additional clarification with respect to avoidance and minimization of impacts to wetlands and alternatives to ground water use. USACE issued a position letter containing RAIs on these matters to the applicant on June 23, 2011. The NRC staff subsequently met with USACE and the applicant to address the outstanding issues and associated technical analyses. The applicant plans to respond fully to all USACE RAIs by mid-November 2011.

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

The NRC requires that consultation with the U.S. Fish and Wildlife Service (FWS) be concluded before issuance of the COL. Furthermore, FWS anticipates that targeted surveys for Federally protected species will be completed before concluding consultation under Section 7 of the Endangered Species Act (ESA); and USACE expects consultation to be complete before issuance of the FEIS. The NRC and the USACE met with FWS in January and March 2011 to discuss consultations and affected plant and animal species; and the applicant met with FWS in February and April 2011 to discuss its approach for completing targeted species surveys. The applicant has initiated targeted surveys for plant and animal species, and the action agencies will continue discussions with FWS to complete a Section 7 consultation in accordance with the ESA.

### *Cultural Resources Survey for Transmission Line Corridors*

The Seminole Tribe of Florida has requested that cultural resource surveys for the transmission line corridors be completed before concluding the consultation under Section 106 of the National Historic Preservation Act. The applicant has completed its cultural resources work plan in consultation with the Florida Division of Historical Resources, and the Seminole Tribe has reviewed it. USACE held a teleconference on August 17, 2011, with the Seminole Tribe and the applicant to discuss the work plan and timing for cultural resources surveys. USACE will develop draft conditions to address the timing of cultural resources surveys, coordinate survey results with the Seminole Tribe, and provide mechanisms to address concerns that the Tribe may have after its review of the surveys. USACE will discuss the draft special conditions with the Seminole Tribe and seek acceptance of the conditions. The Seminole Tribe has also expressed interest in threatened and endangered (T&E) surveys along the transmission line corridors. After consultation with the Tribe, the applicant expects to resolve potential issues about threatened and endangered species with FWS.

#### 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—TBD  
FEIS—TBD

The staff is awaiting a new ground water analysis from the applicant and will revise the safety review schedule, as appropriate. The staff reassessed the environmental review milestones following a June 2011 audit and the applicant's submission of supplemental information; the DEIS is scheduled to be issued in December 2011.

## 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 (the NRC and USACE staff) is working with the applicant and relevant Federal and State agencies to determine necessary actions and schedules for resolving these issues. In a letter dated January 13, 2011, the NRC transmitted to the applicant three environmental review RAIs on the need for power from two proposed AP1000 units at the Shearon Harris site, alternative system needs, and geographic information system data requirements. The NRC staff received a response dated March 31, 2011, to the RAI regarding the need for power, and the response is under staff review. The applicant sent the responses to all other RAIs in documents dated September 29, 2011, and the staff is reviewing the responses.

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

USACE 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. The NRC staff reviewed 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. The USACE and Region 4 of the U.S. Environmental Protection Agency (EPA) staff have ongoing consultations and will inform the NRC upon their completion.

#### *Clean Air Act*

The Shearon Harris site is in a Clean Air Act maintenance area for ozone and carbon monoxide. 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. On August 1, 2011, the NRC staff received a copy of a letter from DAQ to EPA dated July 29, 2011, committing to revise the maintenance plan for the Raleigh-Durham-Chapel Hill 1997 8-hour ozone nonattainment area to incorporate the air emissions for building the Progress Energy Shearon Harris Nuclear Power

Plant, Units 2 and 3. The NRC staff will use the DAQ letter to EPA to satisfy the general conformity determination under 40 CFR Part 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans," which will remove this as a schedule risk.

#### *National Historic Preservation Act Consultation*

Uncertainty about 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 more in depth (Phase II and III) surveys and provides the results to the State Historic Preservation Officer (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 and submitted it to SHPO on September 22, 2010. The SHPO staff completed its review and submitted a revised draft MOA to the NRC on May 6, 2011. The staff's review of the revised draft MOA is ongoing.

#### Schedule Status:

Review Completion Dates:

Original: FSER—April 2011  
FEIS—May 2010

Current: FSER—September 2013  
FEIS— January 2014

### **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

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*

The NRC published the FRN for environmental scoping on June 15, 2010, with the scoping period closing on August 16, 2010.

The NRC staff is developing revised safety and environmental schedules based on resource constraints and FPL's delays in responding to the staff's information requests. The staff continues to experience a high level of interest and involvement in this review from numerous

Federal, State, and local agencies, because of the proximity of the site to two major national parks and to activities that support the Everglades Restoration Project.

The staff has drafted a memorandum of agreement (MOA) to coordinate the activities of the staff, the National Park Service (NPS), and the U.S. Army Corps of Engineers (USACE). Both the NPS and the USACE are cooperating agencies with the NRC in preparing the EIS.

Schedule Status

Review Completion Dates:

Current: FSER—December 2012  
 FEIS—TBD

The NRC staff is developing revised safety and environmental schedules.

**ESBWR**

<b>PROJECT</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
ESBWR DC	March 2011 (Complete)	N/A	Schedule under review
Fermi 3	May 2013	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

*Rulemaking*

The NRC staff provided the proposed DCR to the Commission on January 7, 2011, in SECY-11-0006, "Proposed Rule: Economic Simplified Boiling-Water Reactor Design Certification." The Commission issued its SRM on March 8, 2011. The NRC issued the FSER and final design approval on March 9, 2011. The NRC published the proposed rule in the FR on March 25, 2011, and received six comments during the 75-day comment period, which closed in June 2011. The NRC is developing a schedule for completing the final rule.

## Fermi 3 Combined License Application

### General Information

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

### Project Schedule Risks

#### *Soil Property Requirements*

By letter dated December 9, 2010, the applicant provided revisions to its application including additional ITAAC to reflect the incorporation of soil property requirements associated with the ESBWR DCD Revisions 7 and 8. The staff asked for additional information in this area. The RAI response, dated March 29, 2011, did not fully address the staff's concerns regarding the seismic Category I side backfill and associated ITAAC. Therefore, the staff issued an RAI on April 28, 2011, requesting that the applicant describe the side backfill that will be used and address continuing staff concerns with the proposed ITAAC.

In a letter dated May 27, 2011, the applicant indicated that, while developing responses to the RAI, it recognized that there is not a practical backfill design that would be satisfactory to the NRC staff and that would meet the DCD soil property requirements. Therefore, the applicant plans to change its approach and use a site-specific soil-structure interaction (SSI) analysis as the means for complying with the DCD. The applicant provided the response to the RAI on June 17, 2011. This is a significant change in the approach to resolving the concern regarding backfill design. The staff is reviewing the site-specific SSI analyses and has determined that there will be an impact on the review schedule for FSAR Chapters 2 and 3 resulting from the applicant's decision to change how the DCD requirements are met. On July 21, 2011, the staff held a public meeting to discuss the change in the applicant's approach to meet the DCD soil property requirements, as well as the site-specific soil structure interaction (SSI) analysis after the staff reviews this new information. By letter dated, September 26, 2011, the staff provided the applicant with the revised review schedule.

### Schedule Status

#### Review Completion Dates:

Original:	FSER—September 2012	Current:	FSER—May 2013
	FEIS—November 2012		FEIS—November 2012

The staff has been holding monthly public teleconferences with Detroit Edison Company to continue to resolve outstanding environmental issues such as the revised site layout plan, cultural resources, joint permit application, and air conformity applicability analysis. The staff, along with the USACE as a cooperating agency, have been preparing the DEIS. The DEIS is on track to be published on schedule in October 2011.

## ABWR

PROJECT	FSER	FEIS	Rulemaking
AIA DCR Amendment	Completed October 14, 2010	N/A	December 2011
South Texas Project (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 Risks

None

#### *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. The NRC received three comment letters on the proposed rule. The NRC staff submitted the final rule package to the Commission on August 4, 2011. The current public schedule for publishing the final rule is December 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: Proposed Rule FRN complete
Original: Publish Final Rule—August 2011	Current: December 2011

## South Texas Project Combined License Application

### General Information

Design: ABWR  
Application Type: RCOL  
Location: Matagorda County, TX  
Docket Date: November 27, 2007  
Revision 6 Submittal Date: August 30, 2011

### Project Schedule Risks

The staff continues to categorize the schedule milestones as “to be determined.” By letter dated August 2, 2011, the applicant provided revised schedule information. The staff is reviewing this information and plans to publish new public milestones in the near future.

### *Seismic Analysis*

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. Between August 2010 and May 2011, the NRC staff conducted several audits and meetings with the applicant, resulting in several rounds of RAIs.

The NRC staff and the applicant are continuing to resolve seismic and SSI issues, as well as issues related to the applicability of a computer code used in the evaluation of structures. However, an audit on July 27, 2011, identified additional information needed to resolve the issues related to the computer code. On September 26-30, 2011, the staff conducted an audit and identified remaining issues to be resolved related to the computer code used for the SSI.

### *Flow-Induced Vibration*

In early 2010, 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. This change required the applicant to submit a significant amount of new information, thereby delaying the review of safety analysis report Section 3.9.2. The NRC staff has conducted several audits and issued multiple RAIs in this area. The applicant submitted documentation of its Comprehensive Vibration Assessment Program in June 2011. The staff is currently reviewing the applicant’s submittal and anticipates completing this review by October 2011.

### *Spent Fuel Pool Criticality and Structural Evaluation (Chapter 9)*

The original application did not address several COL information items that require new spent fuel storage structural and criticality evaluations. Several open questions relate to the structural acceptability of the spent fuel storage racks. The NRC expected a technical report on this subject on September 15, 2011, but the report will be delayed until November 2011. The staff is assessing the effect of this delay on the completion of Chapter 9 of the SER.

### *Foreign Ownership*

In June 2011, Nuclear Innovation North America LLC (NINA) informed the staff that the percentage of Units 3 and 4 owned by Toshiba Corporation (Toshiba) (a foreign entity) could increase by accretion but that the percentage of foreign ownership would not exceed 85 percent. The applicant submitted a foreign ownership negotiation action plan to support this potential increase in the percentage of foreign ownership. The plan is currently under staff review.

### *Environmental Review*

The NRC published the FEIS on February 24, 2011, and EPA published its FRN of availability on March 4, 2011. On August 17-19, 2011, in Austin, Texas, the Atomic Safety Licensing Board (ASLB) heard testimony on one admitted environmental contention. The ASLB has scheduled a second hearing on October 31, 2011, at the NRC headquarters to hear testimony on the second environmental contention.

### *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 ABWR DCR amendment final 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

Three chapter SEs (Chapters 2, 3, and 9) without open items remain to be presented to the ACRS.

### **ABWR DESIGN CERTIFICATION RENEWAL**

<b>Project</b>	<b>FSER</b>	<b>FEIS</b>	<b>Rulemaking</b>
Toshiba ABWR DC Renewal*	TBD	TBD	TBD
GEH ABWR DC Renewal*	TBD	TBD	TBD

\*The 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 Schedule Risks

None

#### Schedule Status

On November 2, 2010, Toshiba tendered an ABWR DC renewal application. By letter dated December 14, 2010, the NRC informed Toshiba that it had completed the acceptance review for Toshiba's ABWR DC renewal application and that it had determined that the application was acceptable for docketing. 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. During a public meeting on June 23, 2011, Toshiba presented its plans for updating the probabilistic risk assessment (PRA). The NRC staff provided feedback on the scope and content of the planned PRA update. The staff performed no additional work on this application during this period.

### **General Electric Hitachi 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, GE-Hitachi Nuclear Energy Americas, LLC (GEH), tendered an ABWR DC renewal application. By letter dated February 14, 2011, the NRC informed GEH that it had completed the acceptance review for the renewal application and that the application was acceptable for docketing. The NRC staff has informed the applicant that it believes that additional amendments should be included in the ABWR renewal. In accordance with the applicant's request, the staff will share a list of additional amendments with the applicant to consider for incorporation in the application. This work has progressed this quarter and will continue in the next quarter; the staff will develop a schedule after the scope of review is clearly defined.

## U.S. EPR

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

AREVA submitted the U.S. EPR DC application on December 11, 2007.

The staff has received sufficient digital instrumental and control information from AREVA as of June 2011 and sufficient seismic and structural design information as of July 2011 to complete its safety evaluation with open items.

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." Specifically, the NRC staff believes that the analysis and tests 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 additional sump strainer testing performed in July and August 2010. The NRC staff witnessed additional strainer head loss and bypass testing in early February 2011. AREVA had committed to providing all technical information related to GSI-191, with the exception of in-vessel downstream effects testing, by March 31, 2011. With regard to in-vessel downstream effects, AREVA committed to providing a complete revision to the technical report by August 31, 2011. However, AREVA informed the NRC staff it was not able to meet the August date. In an August 18, 2011, letter to AREVA, the NRC staff asked AREVA to revise its closure plan for this topic area. AREVA submitted its

revised closure plan by letter dated August 25, 2011, committing to providing responses to all outstanding questions related to GSI-191 and the revised technical report by November 18, 2011. The Phase 2 public milestone was extended to December 23, 2011.

The U.S. EPR FSAR included a new design for spent fuel dry cask loading that has a sealed penetration at the bottom of the cask loading pit, which is directly connected to the spent fuel pool through a gate. The design has not been previously approved, and it is not currently used at U.S. operating nuclear plants. On December 8, 2010, the NRO staff held an internal stakeholder meeting with other offices to discuss the scope of reviews under 10 CFR Part 52 and 10 CFR Part 72, "Licensing Requirements for Independent Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste."

On March 15, 2011, the NRC staff held a public meeting to present the various options agreed upon in the internal meeting discussed above for the scope of the DC application and COLA reviews. AREVA informed the NRC staff that it had selected the option of providing the full design detail at the DC stage and committed to providing a revised FSAR section by the end of June 2011. The staff received responses to its questions on August 31, 2011, sufficient to write a Phase 2 safety evaluation with open items for this portion of the review.

#### Schedule Status

Review Completion Date:

Original: FSER—May 2011

Current: FSER—October 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 July 13, 2007, Calvert Cliffs Unit 3 Nuclear Project, LLC (Calvert Cliffs Unit 3), and UniStar Nuclear Operating Services, LLC (UniStar), submitted a partial COLA for a U.S. EPR to be located at the Calvert Cliffs Unit 3 site near Lusby in Calvert County, MD. The COLA was submitted in two parts and several supplements between July 13, 2007, and May 15, 2008. As of September 2011, the NRC had issued SEs with open items for 9 of the 19 chapters.

On November 3, 2010, the counsel for Calvert Cliffs Unit 3 Nuclear Project, on behalf of the applicants, filed a letter with ASLB indicating that Électricité de France, a foreign business entity, had acquired Constellation's 50-percent interest in UniStar. On November 4, 2010, Constellation filed a Schedule 13D with the U.S. Securities and Exchange Commission (SEC) confirming this transaction. Based on this information, the NRC staff issued an RAI asking the

applicants to justify how they comply with the requirements of 10 CFR 50.38, "Ineligibility of Certain Applicants." The applicants provided a response to the NRC staff's RAI on January 31, 2011. The NRC staff reviewed the RAI response and concluded that the proposed ownership structure did not comply with the requirements of 10 CFR 50.38. While the NRC will continue to review the remaining portions of the application, the agency will not issue a license until the requirements of 10 CFR 50.38 are met.

The staff issued its FEIS in May 2011, and is currently preparing for the contested hearing for the one admitted environmental contention. Because of the recent U.S. EPR DC schedule modifications, and the changes discussed above, the staff is reassessing the review schedule for the FSER.

#### *Schedule Status*

On May 20, 2011, the staff issued NUREG-1936, "Final Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3." The staff is currently preparing for the contested hearing on the one admitted environmental contention.

#### Schedule Status

##### Review completion dates

Original:	FSER—August 2011	Current:	FSER—January 2013
	FEIS—April 2010		FEIS—May 20, 2011

As of September 2011, the NRC had issued SEs 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) which requires the applicant to make annual updates to the FSAR, and proposed delaying its FSAR update submittal until December 31, 2012. The NRC granted the exemption request on May 26, 2011.

## **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. The NRC staff will 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 for the environmental review by the end of 2011 and for the safety review by April 2012.

#### *Water Storage*

The Susquehanna River Basin Commission (SRBC) issues permits for water withdrawal from the Susquehanna River. SRBC 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 applicant is developing a pooled assets approach among its facilities within the Susquehanna River Basin, such that overall water withdrawal from the Susquehanna River remains at current levels. The applicant submitted a one-dimensional in-stream flow incremental methodology (IFIM) study to SRBC on June 29, 2011, as part of the joint permit application to the USACE. The results from the IFIM study will inform SRBC’s decision on water withdrawal. The applicant’s pooled assets plan includes two mines and one hydroelectric plant owned by the applicant; this plan is being discussed with SRBC.

SRBC could make a final decision on the applicant’s permit application by December 2012.

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

USACE and EPA have concerns about PPL Bell Bend, LLC’s alternative sites analysis. USACE is requesting a detailed description of environmental impacts at all candidate sites before making its LEDPA decision. The applicant has performed a sensitivity analysis on several criteria in the alternative site analysis to satisfy USACE concerns. The applicant revised its alternative site analysis as part of the joint permit application submitted on June 29, 2011. The joint permit application contains responses to USACE and EPA concerns, and addresses open issues with SRBC on consumptive use.

Schedule Status

FSEER issue date: August 2012 (under revision)

FEIS issue date: TBD

(The staff will revise the schedules upon receipt of sufficient information on 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 Ameren UE 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 also 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**

<b>Project</b>	<b>FSEER</b>	<b>FEIS</b>	<b>Rulemaking</b>
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

### *Structural Design Changes*

The changes made by Mitsubishi Heavy Industries, Ltd. (MHI), in the design-basis seismic model and analysis methodology for the reactor building complex require additional staff review. The lumped mass stick model did not capture all seismic responses. MHI has a comprehensive approach to addressing issues identified by the staff, including seismic design-basis models, effects of concrete cracking, soil profiles, structure-soil-structure interaction, water table effects, embedment effects on seismic response, high-frequency consideration of certified seismic design response spectra, foundation analysis, sliding stability, gap between structures, steel concrete modules, and steel liner plate strain near the prestressed concrete containment vessel. MHI submitted a revised completion plan for the US-APWR seismic and structural analyses on September 1, 2011. A public meeting was held on September 22, 2011, to discuss MHI's proposed changes to the standard plant design and their updated completion plan. MHI informed the staff that it plans to increase the gap between adjacent buildings to address potential pounding issues, add shear keys to the foundation to address potential sliding, and revise the earthquake record and the supporting soil profiles to address unexpected analysis results. MHI stated that the proposed changes do not impact the analysis or design methodologies submitted to date and will only delay the completion of three technical reports by one month. The staff is evaluating the impacts of the proposed changes.

### *Sump Design*

MHI issued a GSI-191 closure plan letter to the NRC in May 2011 and has completed additional strainer head loss testing and core inlet blockage testing. The staff audited and inspected the additional sump head loss testing in June 2011 and audited and inspected the additional core inlet blockage testing in July 2011. MHI is in the process of demonstrating adequate core cooling capability to meet the requirements of 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," for containment sump design performance. The applicant will submit new sump design reports and testing results to the NRC by the middle of October 2011.

## Schedule Status—Safety Review

FSEER Completion Date:

Original: September 2011

Current: May 2013 (under review)

## **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 will affect the RCOL schedule.

### *Hydrology*

The NRC staff determined that Luminant provided inadequate responses to the staff's RAIs on watershed analysis, onsite flooding, ground water, and the postulated release of radiological effluent. In addition, Luminant discovered an error in its precipitation calculations, which will result in changes to the site grading plan. The staff conducted an audit on June 7-9, 2011, to review Luminant's ground water analysis. In August 2011, Luminant provided its supplemental response to the staff's RAIs on ground water. In September 2011, Luminant informed the staff that, by the middle of October 2011, it will provide the supplemental response to the staff's RAI on onsite flooding from potential intense precipitation.

### *Administrative and Financial Information*

The NRC staff determined that Luminant did not provide sufficient information in Part 1 of the application, "Administrative and Financial Information," with regard 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, respectively. The NRC staff reviewed Luminant's responses and determined that they did not address the negation of foreign ownership. The staff informed Luminant of this open item in January 2011. Subsequently, by letter dated July 28, 2011, Luminant requested the staff's review of foreign ownership and control be considered a Phase 2 open item because of the possibility of future changes in foreign ownership for the Comanche Peak Nuclear Power Plant. Luminant also requested that the staff suspend its review of Part 1 until Phase 4.

### *Risk-Informed Technical Specifications*

In its COLA, Luminant requested NRC staff approval to use risk-informed technical specifications (TS). The NRC staff held public meetings on November 3, 2010, and January 11, 2011, to discuss the preliminary approaches for resolving technical issues. Luminant submitted its draft TS methodology to the NRC staff for review in March 2011, which was discussed during a March 2011 public meeting. On June 30, 2011, Luminant submitted its TS for NRC staff review. The NRC staff reviewed the submittal and issued RAIs in September 2011.

## Schedule Status

By letter dated March 2, 2011, the NRC staff issued a letter to Luminant containing a change 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 (complete)

**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 (RCOLA) to facilitate the reviews of recent submittals. The new schedule for North Anna Unit 3 incorporates the review schedule changes for the DCD and RCOLA.

*Seismic and Structural Analysis*

Due to changes in design-basis seismic model and analysis methodology in the US-APWR DCD, the applicant is currently assessing the impact of the revised methodology on the North Anna 3 seismic analysis. There may be some impact on the schedule, depending on the timing of the information provided to the staff.

The NRC staff developed a supplement to the FSEIS that was completed in February 2010, which was originally based on the ESBWR design. The applicant has addressed most of the RAIs related to the environmental review, with the exception of those related to impacts from severe accidents and the analysis of severe accident mitigation design alternatives (SAMDA). Dominion plans to submit a revision in October 2011 that will contain changes affecting input to the accident impact and SAMDA analyses for the supplement to the FSEIS.

In addition, the staff is assessing the impact of the recent earthquake in Mineral, Virginia, on North Anna 3 COL application. The staff expects further discussion with Dominion about these issues.

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

\*The lack of contract funds is a result of the FY 2011 continuing resolution.

### 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, for the review of the Victoria County Station ESP application. The safety and environmental reviews began on October 1, 2010. This project has recently received additional funding to support review efforts and schedules. The staff is reassessing the impact to the overall schedule, and will issue a letter in October 2011 to revise the review schedule's public milestones.

#### Environmental Review

The NRC published the FRN for environmental scoping on November 2, 2010, with the scoping period closing on January 3, 2011. The NRC issued the FRN related to the notice of hearing and opportunity to petition for leave to intervene on November 23, 2010, with opportunity to intervene closing on January 24, 2011. Oral argument for the 23 contentions took place on March 16-17, 2011. On June 30, 2011, the Atomic Safety and Licensing Board (ASLB) admitted five environmental contentions. The NRC issued the scoping summary report on July 27, 2011

The staff made essentially no progress on this review during this quarter because funding was insufficient to support essential contractors. Sufficient funding is available for FY 2012 to make substantial progress in this review area. The staff is preparing for two site audits on December 5-9, 2011, and January 9-13, 2012.

Review completion dates:

Original: FSER—April 2013

Current: FSER—TBD

Original: FEIS— August 2013

Current: FSEIS—TBD

## **PSEG 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 staff has recently received additional contract funds that will permit this review to proceed forward. The staff is currently assessing whether this project may be able to complete the Phase A completion dates for the safety review as planned. The environmental review milestones are also being reviewed to determine if they can also be met or would require modification.

### Schedule Status

This project has recently received additional funding to support review efforts and schedules. NRC management is reassessing the impacts to the overall schedule. The staff is preparing a letter to revise the review schedule's public milestones.

## **OTHER LICENSING ACTIVITIES**

### Expected New Applications during FY 2012

The staff is anticipating two ESP application submittals during FY 2012 (Callaway, Blue Castle).

### Other Licensing Activities

None

Review schedules and other pertinent information are available on the NRC's 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 preapplication and DC review processes.

#### *Issue Management*

Issues currently under evaluation include the following:

- review of the design change during construction processes
- 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 used the updated generic model COL to develop the draft Vogtle and Summer COLs.

### Guidance Activities

#### *Regulatory Guides*

The Web site for the Office of Nuclear Regulatory Research (RES) describes its program to update the NRC's regulatory guides (RGs). The Web site also identifies those RGs for which NRO is the lead office for preparing the update. During the fourth quarter of FY 2011, NRO reviewed approximately 12 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, five were issued as a final guide in the fourth quarter.

Additionally, NRO is reviewing RG 1.215, "Guidance for ITAAC Closure Under 10 CFR Part 52." The comment period ended July 25, 2011, and the document is being finalized. The NRC has

received public comments on DG-1270 (proposed RG 1.91), "Evaluations of Explosions Postulated to Occur on Transportation Routes near Nuclear Power Plants," and the staff is currently reviewing them.

### *Interim Staff Guidance*

Interim staff guidance (ISG) documents serve as temporary sources of guidance for the 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 ISG-019, "Gas Accumulation Issues in Safety Related Systems," as a final guide and ISG-025, "Changes during Construction", was issued for comment and use.

### *Guidance on Changes during Construction under 10 CFR Part 52*

NRO continued the development of the preliminary acceptability review (PAR) process available to COL holders for plant changes or modifications during the construction phase 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 COL holder submits the license amendment requests for plant changes or modifications that were identified after the licensing basis freeze point. The NRC staff continues to work with the industry and other external stakeholders 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 has engaged in discussions with its stakeholders to establish an elective PAR process as a precursor to the license amendment request process established by a license condition, so a licensee may ask to proceed with certain proposed plant changes or modifications requiring a license amendment during the NRC's review of the license amendment request. The PAR process is contained in COL/ISG-025.

### *Enforcement Activities during Construction*

NRO continues to work with the Office of Enforcement (OE) on developing recommendations for revisions to the Enforcement Manual to establish methods of identifying, evaluating, classifying, and reporting violations during the construction phase of facilities regulated by the NRC, including the new nuclear power plants licensed under 10 CFR Part 52. The NRC published the proposed revisions to the Enforcement Manual developed by the joint OE/NRO working group in the FR (76 FR 48919; August 9, 2011) for the solicitation of public comments and held a public meeting to introduce and explain the proposed revisions to the public and industry stakeholders. The staff will provide to the Commission the final recommendations for revisions to the Enforcement Manual related to construction activities during the fourth quarter of calendar year (CY) 2011.

### *Topical Reports*

The staff created a comprehensive list of all the topical reports (TRs) under NRO review. The list was later converted to a searchable database and placed on a SharePoint site that NRO developed jointly with the Office of Nuclear Reactor Regulation (NRR). NRR and NRO have also begun regular meetings to discuss emerging TR issues. The development of a joint presubmittal TR checklist was the result of close coordination between NRR and NRO.

### *Standard Review Plan*

The 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 program to review and update the SRP 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. Preliminary results indicate that approximately 220 sections may require technical updates for the agency offices (NRR, Office of Nuclear Security and Incident Response, RES, and NRO). The staff is currently estimating resources for this update and formulating plans for updating the SRP guidance in a timely manner. These plans will also take into account the requirement to develop guidance for the Advanced Reactor Program.

The staff completed Revision 1 to OI NRO-REG-300 titled, "Maintaining and Updating the Standard Review Plan," and it is in the concurrence process. The Committee to Review Generic Requirements has approved the document. The staff is developing an office instruction (OI) titled "Preparing, Maintaining, and Updating Design-Specific Review Plan Documents for Integral Pressurized Water Reactors."

### Late-Filed Allegations

Management Directive (MD) 8.8, "Management of Allegations," dated November 15, 2010, Section II.P is entitled, "Handling Allegations That May Impact Licensing or Certification Decisions or Allegations That Are Filed Late." Current guidance (MD 8.8, the Allegations Manual, and the NRO allegations OI) do not provide details on an expedited process to address and resolve allegations received late in the rulemaking or licensing process. The staff has mapped out an expedited process against the nominal review phase or rulemaking schedule used by NRO. The goal is to develop an interface process between allegations and licensing staff that can be used to make coordinated decisions and take timely actions based on input criteria noted in MD 8.8. The staff has completed a final draft of the process and briefed NRO management. The staff will share the new process with the other program offices and will begin to implement it in December 2011.

Concurrently, NRO is working with the OE to draft an allegation guidance memorandum (AGM) to provide additional guidance on implementing Section P, "Handling Allegations That May Impact Licensing or Certification Decisions or Allegations That Are Filed Late," of MD 8.8, incorporating revised language. The goal is to complete and issue the AGM and use it as a basis for updating NRO-ADM-120 to incorporate guidance or a process for handling late-filed allegations.

OE will issue final revisions to the AGM and MD 8.8. NRO will update NRO-ADM-120 (Allegations). In addition, NRO will brief other NRC offices on the process to obtain stakeholder input.

### 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 the rule 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, "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts."

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 for the U.S. EPR and US-APWR are planned for the first half of FY 2012. The NRC staff presented the AIA review and inspection results for both the ESBWR 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 into the AIA guidance documents the lessons learned during these early reviews and inspections.

#### *ITAAC Maintenance Rulemaking*

The NRC 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," on August 30, 2010. The NRC issued the proposed rule for public comment on May 13, 2011 (76 FR 27925). New provisions 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 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. These notifications also 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. The NRC staff expects to issue the final rule, as well as the revision of Regulatory Guide (RG) 1.215 "Guidance for ITAAC Closure under 10 CFR Part 52," during the third quarter of FY 2012.

#### *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 posted the request for quotation on the U.S. General Services Administration's eBuy system on May 27, 2011, with a closing date of July 6, 2011. The contract was awarded in the fourth quarter of FY 2011.

#### *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 in the FR on January 20, 2011. The NRC received three comment letters on the proposed rule. Of those comments, one commenter, NINA, was in favor of the proposed amendment to the ABWR; one commenter, GEH, was against the proposed amendment and one commenter, addressed issues unrelated to the proposed amendment. The staff submitted the final rule to the Commission on August 4, 2011.

## **CONSTRUCTION INSPECTION ACTIVITIES**

### **Construction Inspection Program**

The NRC has begun executing construction-related inspection activities for Vogtle Units 3 and 4. The infrastructure is in place to support FY 2011 and FY 2012 inspection activities to verify quality construction and the completion of ITAAC. On March 8, 2010, safety-related

construction officially began at Vogtle Units 3 and 4, with the start of engineered backfill operations authorized under the LWA. Construction inspectors from the NRC Region II Center for Construction Inspection (CCI) and Headquarters technical staff were present to observe the licensee's initial activities and conduct the first onsite ITAAC inspection. CCI opened the Vogtle construction resident inspector's office with a construction senior resident inspector and resident inspector in 2010. CCI has conducted multiple inspections of the quality assurance program associated with LWA activities, in accordance with Inspection Procedure 35007, "Quality Assurance Program Implementation during Construction." The Vogtle construction assessment process under Inspection Manual Chapter 2505, "Periodic Assessment of Construction Inspection Program Results," started on July 1, 2010, and covered the period between July 1, 2010, and July 1, 2011. Plant performance for Vogtle Units 3 and 4 for this period was within the Baseline Program column of the NRC's Construction Action Matrix. The latest construction milestone is completion of the basemat/mudmat for the Unit 3 nuclear island; that level was reached in April 2011. Installation of the rubber waterproof membrane has been completed in Unit 3 and is ongoing in Unit 4. CCI has conducted LWA ITAAC inspections on the activities noted above. V.C. Summer continues with its site preparation and preconstruction activities.

#### Inspection, Tests, Analyses, and Acceptance Criteria

NRO staff worked collaboratively with internal and external stakeholders to simulate ITAAC closure and verification activities. The exercise included an action to evaluate and address the surge in ITAAC closure submittals expected during the last year of a new nuclear power plant construction and to ensure staff readiness. The NRC documented the results of the simulated ITAAC closure and verification demonstration project, lessons learned, and next steps in a summary report issued July 15, 2011. The NRC also completed an evaluation of the expected ITAAC surge to identify potential mitigation strategies. As a next step, the NRC will develop additional ITAAC closure notification examples to cover approximately 80 percent of the AP1000 ITAAC types.

Moving forward, the staff is developing OIs for its recommendation to the Commission on the 10 CFR 52.103(g) finding, and for the ITAAC closure verification process. Additionally, the staff conducted internal training on ITAAC prioritization by assembling mock expert panels to prioritize the ESBWR Revision 9 ITAAC. The staff has finished the complete ITAAC lists for Vogtle Units 3 and 4 to be included in the COL for each unit, as well as revised the AP1000 complete ITAAC list to reflect changes in the final revision to the DCD.

On August 15, 2011, the staff submitted the 2011 ITAAC annual update SECY paper to the Commission. In the future, the staff plans to inform the Commission of developments involving ITAAC and construction experience, if any, in the annual construction reactor oversight process (cROP) assessment.

#### Construction Reactor Oversight Process

The Commission directed the NRC staff in December 2009 to develop construction assessment program options for Commission consideration. In response to this direction, the staff formed the cROP working group. 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 it forwarded to the Commission as SECY-10-0140, "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 construction reactor oversight program (cROP) on December 16, 2010.

In SRM SECY-10-0140, "Options for Revising the Construction Reactor Oversight Process Assessment Program," 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 adoption of a construction action matrix to determine the appropriate NRC response to degrading licensee performance. During this quarter, the staff routinely met with external stakeholders to finish the developmental work for this task and will continue to work with them to pilot the new construction assessment program in parallel with the current assessment process for 12 months beginning January 1, 2012. The staff will provide updates to the Commission and brief ACRS as directed in the SRM.

#### Quality Assurance and Vendor Inspections

During this quarter, the NRC staff conducted seven vendor inspections and two quality assurance implementation inspections. The NRC staff continued its participation in several quality assurance and inspection outreach activities including meetings related to the committee activities of the Nuclear Procurement Issues Committee, American Society of Mechanical Engineers, Section III, and Nuclear Quality Assurance. The NRC staff continues to make progress on actions in response to the Office of the Inspector General (OIG) audit of the vendor inspection program and continues to develop an agency wide approach for addressing the potential for counterfeit, fraudulent, and suspect items to enter the nuclear supply chain.

During the fourth quarter, the NRC staff issued a report that contains the results of the first engineering design verification inspection of the AP1000 reactor design. The purpose of the inspection was to assess the implementation of the Westinghouse processes for completing the detailed design of the AP1000 reactor and for transferring the design requirements contained in the DCD into engineering, procurement, and construction documents. The inspection scope included a review of both system-level and component-level design information. The team found that some calculations and analyses associated with the systems and components selected for review were still incomplete or undergoing revision. Therefore, the team was not able to complete its inspection and additional NRC inspections will be required once the calculations and analyses are complete.

#### Operator Licensing

Efficient and effective licensed operator training and examination will be critical to ensure that an adequate number of licensed operators are available to meet new reactor schedules. The industry has developed schedules for the training and licensing of operators. NRC is working to have all the tools needed to support these schedules. Additionally, the staff has been working

on a new examination format for highly integrated control rooms. During the training of industry instructors, mock exams will be developed and administered to the trainees by a consensus group of NRC staff and industry training personnel. The experience gained during the administration of the mock exams will be assessed to determine what changes to the current operator licensing exam format are necessary. Staff will incorporate those into NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." Additionally, the industry recognized that the current Knowledge and Abilities Catalogs needed to be modified to include the new highly integrated control room environment. Staff is currently reviewing these new catalogs for AP1000 and ABWR, and expects them to be issued in draft form and available for use for examinations in October 2011.

In order to meet the needs of licensees to operate the new reactors, NUREG-1021 will be modified to allow design-specific written exams to large numbers of operators. This approach will substantially reduce the number of NRC examiners needed to conduct the examination, and these examinations will be given to the large number of candidates by sharing resources from all the Regions.

### **ADVANCED REACTORS**

The NRC staff has undertaken a variety of activities to prepare for applications for small modular reactors (SMRs) that may arrive as early as FY 2013. 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 Plant**

The NRC is coordinating research and preapplication activities related to the NGNP Program with the staff of the U.S. Department of Energy (DOE). The NRC staff communicates often with DOE and the lead laboratory, Idaho National Laboratory (INL), about research and development activities, as well as the efforts to support the future licensing of the Next Generation Nuclear Plant (NGNP) prototype and subsequent commercial units.

The NRC staff is currently reviewing white papers submitted by INL that address topics such as 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 (MST); modular plant licensing; and emergency planning. These white papers are intended to serve as a basis for initial discussions between DOE and the NRC on 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 has issued extensive RAIs 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.

The DOE Nuclear Energy Advisory Committee (NEAC) has reviewed progress in NGNP research, design, and preapplication licensing discussions (project Phase 1, as described in the Energy Policy Act of 2005). The committee's recommendations include accelerating efforts to form a public-private partnership to provide end-user input into design and licensing activities and continuing interaction with the NRC on regulatory framework development. NEAC recommends that licensing under 10 CFR Part 50 be adopted, as opposed to the existing plan to license the facility using a COL issued under 10 CFR Part 52. The NRC is expecting a decision by the Secretary of Energy early in FY 2012 relative to recommendations and a planned path forward.

### Integral Pressurized-Water Reactors

#### *NuScale Power, Inc.*

On March 18, 2011, NuScale submitted a letter to the NRC requesting that all preapplication review efforts be suspended due to NuScale's financial challenges. On May 16, 2011, the NRC received a progress status report from NuScale indicating that it has been successful in attracting additional investors, including a lead investor who has the means and the commitment to provide the stable long-term funding that will allow NuScale to completely develop the NuScale Power SMR design, including submitting a DC application to the NRC. NuScale has started to bring back its employees. NuScale expects to be able to resume preapplication activities with the NRC by the end of CY 2011.

#### *Babcock and Wilcox (B&W) mPower™*

In response to Regulatory Issue Summary (RIS) 2011-02, "Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs," dated February 2, 2011, B&W announced a new DC application submittal date of the fourth quarter of CY 2013 in support of the TVA Clinch River construction permit application.

The NRC staff has been engaged in preapplication activities with B&W since mid-2009. To date, the NRC has received technical reports on the following topics: quality plan for the 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, control rod drive mechanism design and development, and the security design assessment and program plan.

The NRC staff 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 the mPower™ emergency core cooling system design and accident analysis methodology, the application of

ASME Code Sections III and XI to the mPower™ plant, an update on the process and procedures associated with software development, and an overview of the human factors engineering program plan. The next meeting with B&W is tentatively scheduled for October 27, 2011, to discuss the mPower™ cyber security program and the reactor coolant pump design.

The NRC staff has begun development of a design-specific review standard (DSRS) for the mPower™ design to identify the review plan for the mPower™ DC application anticipated by the NRC. The DSRS will function like the SRP and will identify safety and risk categorization for the systems, structures, and components associated with the mPower™ design. The staff will engage public stakeholders period before issuing the final mPower™ DSRS.

#### *Tennessee Valley Authority*

By letters dated October 8 and November 5, 2010, TVA stated that it was evaluating submittal of an SMR licensing application 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 up to 6 mPower™ SMR modules at the Clinch River site in Roane County, TN.

On January 31, 2011, the NRC staff responded to TVA's assumptions letters, concluding that no legal or licensing issues 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. On September 20, 2011, the NRC staff met with representatives from TVA for the first in a series of public meetings to discuss TVA's development of their Regulatory Framework Document associated with a Part 50 construction permit (CP) application for the Clinch River site. During that meeting, TVA announced that the Clinch River CP application, initially planned for fall of 2012, would be delayed until CY 2013. TVA noted that they expect to complete their schedule development to support an announcement of a specific date next month. Related activities are anticipated to continue through FY 2012 and FY 2013. These include visits to the Clinch River site by the NRC staff to observe site preparation activities and preliminary environmental review efforts.

#### *Other iPWR Vendors*

Two other vendors have contacted the NRC to propose submitting small light-water reactor designs for NRC review. Holtec is developing the Holtec Inherently Safe Modular Underground Reactor (HI-SMUR) design and is also planning to submit a DC application. On July 21, 2011, Holtec representatives presented their plans for submitting a future licensing application. The NRC staff intends to meet with Holtec, as resources allow, to gain an understanding of the vendor's design. Westinghouse is developing its SMR design and is planning to submit a DC application late in CY 2012. The NRC staff met with Westinghouse to discuss the schedule and plans on April 11, 2011. In addition, on July 12, 2011, NRO staff held another meeting with Westinghouse representatives at Westinghouse headquarters in Cranberry, Pennsylvania, to discuss plans for their SMR – an integral PWR approximately 225 MWe. Subsequently, on July 18, 2011, Westinghouse senior managers met with the NRC Commissioners to discuss the SMR.

### *Other Reactor Technologies*

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. The 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). NRO has had no interactions or development progress for fusion technologies during this reporting period (SRM SECY-09-0064, "Regulation of Fusion-Based Power Generation Devices").

### Generic Policy Issues

In SECY-10-0034 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 issued SECY-11-0079, "License Structure for Multi-Module Facilities Related to Small Modular Nuclear Power Reactors," dated June 12, 2011, to describe the different license structure alternatives and to present the NRC staff's recommendations. The staff considered papers on this topic submitted by the NGNP Program and NEI in developing 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*

Under current NRC regulations, the NRC may approve an application for a manufacturing license authorizing the manufacture of nuclear power reactors offsite and their shipment to a location that has been issued a construction permit or COL. The staff has not identified any policy issues with the regulations governing manufacturing licenses or their implementation; however, in SECY-10-0034, the staff indicates that potential manufacturing license applicants could face a number of licensing issues. The staff intends to develop a SECY paper to inform the Commission regarding this issue.

#### *Risk-Informed Licensing Approaches*

In SRM COMGBJ-10-0004/COMGEA-10-0001, the Commission directed the staff to develop a framework to apply risk insights in the licensing of SMRs to improve the efficiency and safety

focus of its 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. The proposed design-specific review plans would be derived from the framework and be prepared for the anticipated near-term iPWR design applications. In its recommendations in SECY-11-0024, the staff incorporated issues described in SECY-10-0034, related to defense-in-depth, licensing-basis event selection, and PRAs.

The staff also proposed 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. In the SRM for SECY-11-0024, dated May 11, 2011, the Commission approved the staff's use of the risk-informed and integrated review framework for staff preapplication and application review activities pertaining to iPWR design applications, as well as consolidating current risk-informed regulatory structure activities into the staff's plan for longer-term development of a new risk-informed regulatory structure. The staff is currently developing the first design-specific review standard for the mPower<sup>TM</sup> design using this new framework.

In addition, the SRM requested that the staff provide the Commission with a paper that explores the feasibility (e.g., regulatory infrastructure changes, resource requirements, and timing for implementation) of including risk information in categorizing systems, structures and components (SSCs) as safety-related and nonsafety-related for the design-specific SMR review plans in both the short and long term. The staff was chartered to determine if there are legal obstacles to this approach, namely to determine if this can be done without a rule change. Additionally, the Commission requested that the paper address its potential application to the overall regulatory framework and not be limited to SMRs. A draft SECY paper has been prepared and is due to the Commission in October 2011.

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

The NRC staff continued activities regarding a mechanistic source term (MST) for applicability to small modular reactors and the NGNP project. The MST working group completed meetings and issued a report documenting the group's results in September 2011.

During the quarter, the staff shifted the focus of source term activities to support the staff's plans for informing the Commission regarding a proposed approach for scalable emergency planning zones (EPZs). The staff developed an approach for dose consequence evaluation to determine scalable EPZs as input to the emergency planning/preparedness SECY paper.

#### *Appropriate Requirements for Operator Staffing for Small or Multimodule Facilities*

Given the low power output, modular nature, and passive design of advanced reactors, the NRC staff is engaged in addressing the appropriateness of proposed changes to staffing requirements set forth in 10 CFR 50.54(m) for these reactors. The NRC staff 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. In the near term, the NRC staff is focusing on developing the technical basis and guidance to support the review of submittals related to human factors engineering. In addition, the staff is focusing on providing 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 issued SECY-11-0098, "Operator Staffing for Small or Multi-Module Nuclear Power Plant Facilities," in July 2011 to inform the Commission of the staff's ongoing efforts and plans for resolution regarding on-site licensed operator staffing requirements for SMRs. 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 extensive experience and an existing framework.

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

The NRC staff discussed this issue at several public meetings on SMR generic topics and is reviewing position papers, including NGNP's proposal, 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 that identified possible policy and key technical issues associated with EP requirements and has identified 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 offsite EP requirements that could be scaled to be commensurate with the SMR accident source term, fission product release, and associated dose characteristics. The SECY paper is due to the Commission by October 28, 2011.

#### *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. The NRC staff has begun addressing this topic during routine meetings with the SMR community and is in contact with vendors to solicit more detailed information on certain aspects of their designs. The NRC staff expects a position paper from NEI in the first quarter of FY 2012. The NRC staff has completed the first draft of an information paper that addresses the regulatory framework for security reviews with a focus on iPWR designs. The NRC staff is continuing to work with Sandia National Laboratories to put contracts in place for preliminary vital equipment identification, target set analysis, and source term evaluation. The NRC staff is also working with the Naval Surface Warfare Center on research related to underwater explosions that will help inform the staff during the evaluation of shared pool designs. 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 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 conducted internal meetings and has met with the NEI working group evaluating possible approaches to address SMR insurance and liability requirements, including those requirements related to the Price-Anderson Act. This issue has been discussed at several public workshops throughout 2010 and 2011, and NEI issued a position paper on insurance and liability on June 6, 2011. The NRC staff has reviewed this white paper and is currently developing a Commission paper discussing potential options for ensuring that all configurations of SMRs that are expected for consideration in the near-term are required to have adequate insurance coverage. The staff expects to complete this Commission paper by the end of the CY 2011.

#### *Decommissioning Funding Requirements*

The NRC staff's working group assessed an industry position paper submitted by NEI on November 2, 2011, that addressed requirements for decommissioning funding assurance for SMR facilities. The NRC staff is currently developing a Commission paper discussing its planned approach, both in the near- and long-terms, for ensuring that adequate funds for decommissioning will be available for these new reactors. The staff expects to complete this Commission paper by the end of the CY 2011.

### **INTERNATIONAL ACTIVITIES**

During this period, NRO participated in multilateral and bilateral activities as part of the Multinational Design Evaluation Program by 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 (MDEP) and Bilateral Cooperative Activities

The NRO staff chaired or participated in the following MDEP meetings:

- On June 27-29, 2011: A meeting of the Digital I&C Working Group was held in Paris to discuss and finalize common positions in the area of digital I&C.
- On September 15-16, 2011: The NRC Chairman and NRC staff participated in the second MDEP conference on New Reactor Design Activities, attended by senior level officials of the Organization for Economic Cooperation and Development, and regulatory agencies from numerous countries and vendors.
- On September 27-28, 2011: NRC staff participated in an MDEP EPR working group meeting on technical specifications at NRC headquarters.

NRO staff and managers also participated in several other cooperative activities:

- On July 18-23, 2011: NRO staff participated in and co-chaired an IAEA meeting on Tsunami Hazards. Tasks, work plans, and schedules were discussed for the development of an IAEA Tsunami Hazard Safety guidance document. The next meeting will be held in Japan (in late November or early December 2011).
- On July 11-16, 2011: NRO staff participated in and co-chaired an IAEA meeting on Seismic Hazards. This meeting focused on establishing working plans for the IAEA Seismic Hazards Work Group Leaders. Specifically, the meeting focused on the details of the working plans developed to date, identified technical experts to be consulted, and determined specific expectations from these experts. The next meeting is scheduled to be held in Japan in September.
- On July 30- August 13, 2011: NRO staff traveled to Taejon, Korea, and met with the regulatory authority, KINS, and exchanged information related to PRA, Fukushima lessons, 10 CFR 50.46 rulemaking, Small Modular Reactor licensing process, and severe accidents.
- On August 16, 2011: NRO staff and management participated in a bilateral meeting with representatives from the Polish national and regional governments. The meeting focused on regulatory requirements for the siting of nuclear power plants and public/stakeholder involvement in the process.
- On August 17, 2011: NRO staff and management participated in a bilateral meeting with regulatory officials from Hong Kong. This meeting focused on criteria for siting and stakeholder involvement.
- On August 18, 2011: NRO staff participated in a bilateral meeting with KINS, the regulatory authority of the Republic of Korea. Topical issues related to piping integrity were discussed at the meeting.

- On August 22-26, 2011: NRO staff and management visited the United Kingdom (UK) and Czech Republic and met with respective regulators. A central theme for meetings in both countries was the cooperation on the AP1000 design review and regulatory approaches to Counterfeit, Fraudulent, and Suspect Items (CFSI). In addition to the discussion on CFSI, the meetings with the UK's Office of Nuclear Regulation also focused on coordination under MDEP.
- On August 23-25, 2011: NRO staff represented the NRC at the second IAEA Consultancy Meetings on Design Safety Margin Evaluation (DSME) Program related to post-Fukushima actions.
- On August 5-13, 2011: NRO staff observed the Duke Power operating crew perform multiple scenarios on the Halden digitalized simulator in Oslo, Norway. This observation enabled the staff to determine the modifications needed to the existing operator competency worksheets of NUREG-1021 to create a valid tool for evaluating individual/crew performance in a simulator operating examination setting during performance of a simulator scenario.
- On September 8-16, 2011: NRO staff conducted a team inspection of the Obayashi manufacturing facility in Japan. Obayashi is an international vendor contracted for the civil and structural design of the AP1000 for the U.S. market.
- On September 14, 2011: NRO staff met with representatives of the Belgium nuclear regulatory authority to discuss regulatory approaches for advanced nuclear reactor designs.
- On September 9-19, 2011: NRO staff conducted a vendor inspection and vendor audit at the Westinghouse Electric Sweden Nuclear Fuel Facility in Vasteras, Sweden. The inspection and audit focused on the implementation of quality activities associated with the development and maintenance of evaluation models for emergency core cooling system, transient, fuel, and core evaluation models.
- On September 12-23, 2011: NRO staff participated in the CNRA Working Group on the Regulation of New Reactors in Paris, France.
- On September 19-24, 2011: NRO staff represented the NRC at the third IAEA Consultancy Meetings on DSME Program related to post-Fukushima actions.
- On September 22-26: NRO staff participated in an IAEA mission to Jakarta, Indonesia, to review the work plan for site evaluation studies for selection of a nuclear power plant site in that country.
- On September 24-30, 2011: NRO staff participated in the working group meetings on IAEA/ISSC working area 8: site evaluation and external events safety assessment in Madrid, Spain. This IAEA/ISSC activity involves several countries and organizations.

- On September 23-28, 2011: NRO staff participated in a meeting with the Indonesian Regulator to discuss future cooperation on siting and environmental reviews.
- On September 26-30, 2011: NRO staff participated in an annual bilateral meeting with India. NRO staff also participated in an American Nuclear Society conference in India.

### FUNDING

#### Committed and Obligated Funding

The tables below reflect the FY 2011 committed and obligated funding by fiscal year 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>3<sup>rd</sup> Quarter</b>	<b>4<sup>th</sup> Quarter</b>	<b>Cumulative</b>
Commitments	\$1,445,794	\$5,421,935	\$1,555,528	\$10,225,368	\$18,648,625
Obligations	\$856,372	\$5,821,257	\$1,698,028	\$10,272,968	\$18,648,625

#### NRO — TOTAL FUNDS

<b>FY 2011 Funding</b>	<b>1<sup>st</sup> Quarter</b>	<b>2<sup>nd</sup> Quarter</b>	<b>3<sup>rd</sup> Quarter</b>	<b>4<sup>th</sup> Quarter</b>	<b>Cumulative</b>
Commitments	\$4,937,603	\$10,198,520	\$4,477,951	\$22,090,817	\$41,704,891
Obligations	\$2,593,566	\$12,132,848	\$3,879,793	\$23,098,684	\$41,704,891