Protecting People and the Environment

SEMIANNUAL STATUS REPORT ON THE LICENSING ACTIVITIES AND REGULATORY DUTIES OF THE UNITED STATES NUCLEAR REGULATORY COMMISSION

October 2013 – March 2014

Note: The period of performance covered by this report includes activities that occurred from the first day of October 2013 to the last day of March 2014. The transmittal letter to Congress accompanying this report provides additional information to keep Congress fully and currently informed of the licensing and regulatory activities of the U.S. Nuclear Regulatory Commission.

CONTENTS

I Implementing Risk-Informed and Performance-Based Regulations

Currently, 38 operating nuclear power reactors have committed to transition to the risk-informed, performance-based fire protection licensing basis permitted under Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.48(c). This licensing basis is also known as National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants." This number does not include the four reactor units represented by two pilot plants or the four reactor units represented by three non-pilot plants that have already made the transition.

In April 2011, the Commission approved a policy paper (see SECY-11-0033, "Proposed NRC [U.S. Nuclear Regulatory Commission] Staff Approach To Address Resource Challenges Associated with Review of a Large Number of NFPA 805 License Amendment Requests," dated March 4, 2011), which allowed submittal of the remaining license amendment requests (LARs) on a staggered basis, similar to the approach used for license renewal applications (LRAs). Correspondingly, the Commission changed the Enforcement Policy (see SECY-11-0061, "A Request to Revise the Interim Enforcement Policy for Fire Protection Issues on 10 CFR 50.48(c) To Allow Licensees to Submit License Amendment Requests in a Staggered Approach," dated April 29, 2011) to match this staggered approach. Five LARs (for six reactor units) were submitted in fiscal year (FY) 2011; one licensee (one reactor unit) withdrew its application. Nine LARs (for 13 reactor units) were submitted in FY 2012. One licensee's application, submitted in FY 2012, was not accepted for review (one reactor unit). Eleven LARs (for 19 reactor units) were submitted in FY 2013. Two of the three LARs (for three of the four reactor units) that are scheduled to be submitted in FY 2014 have been received. One additional LAR (for two reactor units) is scheduled to be submitted in FY 2017. One licensee (for one reactor unit) has informed the NRC that it intends to start the transition to NFPA 805 at one of its plants after the agency approves its two other plants for transition. Licensees for five reactor plants that were actively transitioning have informed the staff that they will not transition to NFPA 805, including three plants that have announced plans to decommission. Therefore, the staff is currently planning on a total of 46 reactor units transitioning to NFPA 805 (including the four pilot reactor units), which represents 46 percent of the current commercial power reactor units licensed to operate in the United States.

On November 5, 2012, the Commission directed the staff to develop an approach for allowing licensees to propose to the NRC a prioritization of the implementation of regulatory actions as an integrated set and in a way that reflects their risk significance on a plant-specific basis for Commission review and approval. During the current reporting period the staff made significant progress on the proposed initiative to improve nuclear safety and regulatory efficiency with external stakeholders and conducted two public meetings in November and December 2013 to develop a process to present o the Commission for future approval. This process is now referred to as the risk prioritization initiative (RPI). In February and March 2013, the NRC staff, in collaboration with external stakeholders and the industry observed the implementation of the RPI process, which was useful to support the NRC staff understanding how the process could work. The NRC staff will continue to evaluate and assess RPI and will present a proposal for the Commission's review and approval.

Southern Nuclear Operating Company (Southern) submitted its proposal to implement 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," for Vogtle Electric Generating Plant (VEGP), Units 1 and 2, on August 31, 2012. Southern submitted a second proposal to implement risk-informed allowed outage times for VEGP's technical specifications on September 13, 2012. These two

submittals are currently under staff review and a number of Requests for Additional Information (RAIs) have been issued by the NRC staff. The implementation of these voluntary risk-informed initiatives is complex. The NRC sometimes waives its staff review fees because lessons learned from the efforts are used to improve staff guidance and to contribute to the efficiency and effectiveness of future reviews and submittals. The NRC has granted Southern's request to waive review fees for both the allowed outage time and the 10 CFR 50.69 submittals.

II Reactor Oversight Process

The NRC continues to implement the Reactor Oversight Process (ROP) at all nuclear power plants and to meet with interested stakeholders periodically to collect feedback on the effectiveness of the process, which is then considered in making future refinements to the ROP. Additionally, the NRC is making progress on their ROP Enhancement Project, which is NRC's internal self-assessment project to enhance the effectiveness of the ROP. Recent activities included issuing a *Federal Register* Notice (FRN) that requested input from external stakeholders and holding a day-long public meeting with external stakeholders. Responses to the FRN and information provided at the public meeting are being considered in the staff's review.

The agency's most recent performance assessments show that all plants continue to operate safely. The NRC's Office of Public Affairs issued a press release on September 6, 2013, summarizing the 2013 mid-cycle performance assessments for all nuclear plants and associated mid-cycle assessment letters, which are publicly available on the NRC Web site.

III Status of Issues Tracked in the Reactor Generic Issues Program

The Generic Issues Program is tracking four open generic issues (GIs). The status of each open issue is described below:

GI-191, "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance"

This GI concerns the possibility that, following a loss of coolant accident (LOCA) in a PWR, debris accumulating on the emergency core cooling system sump screen may result in clogging and restrict water flow to the pumps.

As a result of this GI and a related Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004, all PWR licensees increased the size of their containment sump strainers, significantly reducing the risk of strainer clogging. A related issue, which needs to be resolved to close GI-191, is the potential for debris to bypass the sump strainers and enter the reactor core. In 2008, the NRC staff determined that additional industry-sponsored testing was necessary to resolve this issue. Some testing was performed, but continued testing and NRC evaluation of the testing are ongoing. In December 2010, the Commission determined it was prudent to allow the nuclear industry to complete testing on in-vessel effects and zone of influence and to develop a path forward by mid-2012. The Commission directed the staff to evaluate alternative approaches, including risk-informed approaches, for resolving GI-191 and to present them to the Commission by mid-2012.

Based on the interactions with stakeholders and the results of the industry testing, the NRC staff in 2012 developed three options for licensees to resolve GI-191. These options were

documented and proposed to the Commission in SECY-12-0093, "Closure Options for Generic Safety Issue 191, 'Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance,'" dated July 9, 2012. All options require licensees to demonstrate compliance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." The options allow industry alternative approaches for resolving GI-191. The Commission issued a Staff Requirements Memorandum on December 14, 2012, approving the options for closure of GI-191. Licensees have since notified the NRC of the option that they have selected, and are developing proposed technical resolutions based on the option selected. The staff is reviewing the proposed technical resolutions as they are submitted by licensees. To date, two sites have successfully resolved GI-191.

GI-193, "Boiling-Water Reactor (BWR) Emergency Core Cooling System (ECCS) Suction Concerns"

This GI is evaluating possible failure (or degraded performance) of the ECCS pumps caused by noncondensable gas in the suction piping that could cause gas binding, vapor locking, or cavitation.

Early work on this issue resulted in a basic understanding of the overall phenomena and a preliminary assessment that continued work on the GI is warranted. The next phase will attempt to quantify the gas void fraction present at different locations in the suppression pool as a function of time following a LOCA. Ultimately, this may identify the possible need for a post-LOCA suppression pool ECCS pump suction strainer "exclusion zone." An "exclusion zone" is the volume below or around the downcomer exhaust, which is expected to contain a large concentration of noncondensable gas from the drywell. If a suction strainer is located in an "exclusion zone," the ECCS pump may be vulnerable and the suction strainer may be required to be moved.

NRC staff has access to test data from two previously performed test programs. Scaling analyses used to design these two test programs are not available or incomplete. Consequently, analysis efforts are being performed to scale the test results to full scale geometry. Simultaneously, computational fluid dynamic (CFD) models and analyses for several tests from the two test programs are being performed. Following completion of the scaling activities, the scaling method will be applied to extend the test data to full-scale geometry, and compared to the CFD analysis of the full-scale suppression pool geometry.

GI-199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States for Existing Plants"

This GI addresses estimated seismic hazard levels at some current central and eastern U.S. nuclear sites that may be higher than the values used in designs and previous evaluations.

The NRC evaluated the effects of new seismic hazard data and methods on U.S. nuclear plants, and it collaborated with the Electric Power Research Institute to ensure a sound technical approach. The Safety/Risk Assessment Panel issued its report on September 2, 2010. The panel recommended that further actions be taken to address GI-199 outside the GI program. The NRC issued Information Notice 2010-18, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," on September 2, 2010, to inform stakeholders that the GI-199 Safety/Risk Assessment Report had been issued. The information notice also stated that the NRC will follow the appropriate regulatory process to request that operating plants and independent spent fuel storage

installations provide specific information about their facilities to enable the staff to complete the regulatory assessment and identify and evaluate candidate backfits. The agency incorporated GI-199 into the work done by the Japan Lessons-Learned Project Directorate in response to the March 2011 Japan nuclear event. The NRC has requested that all nuclear power plants reevaluate seismic hazards using present-day guidance and methods. For plants in the central and eastern United States, the seismic hazard reevaluations were required to be completed by March 31, 2014. Plants in the western United States will complete their seismic hazard reevaluations by March 2015. In addition, some plants will be required to complete a risk assessment if the reevaluated hazard exceeds the plant's design basis. If required, those risk assessments must be completed in June 2017 or December 2020, depending on the amount of ground motion exceedance.

GI-204, "Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures"

This GI relates to potential flooding effects from upstream dam failure(s) on nuclear power plant sites, spent fuel pools, and sites undergoing decommissioning with spent fuel stored in spent fuel pools. The Office of Nuclear Reactor Regulation proposed this GI in July 2010, and the GI Program accepted it for screening in August 2010. The NRC completed the screening analysis and, after coordination with the other Federal agencies, it publicly announced the GI on March 6, 2012.

This GI is being addressed as part of the agency's efforts associated with responding to the lessons learned from the Fukushima nuclear accident in Japan. Licensees must submit their flood hazard reevaluations to the NRC in three prioritized categories with deadlines in March 2013, March 2014, and March 2015.

Out of the 25 sites that must submit their flood hazard reevaluation reports (FHRRs) by March 2014, 14 sites have submitted the FHRR on time. The remaining 11 sites have requested extensions, many of which are related to obtaining information from the United States Army Corps of Engineers. The NRC will consider the other requests for extensions on a case by case basis. The NRC is currently reviewing the FHRRs that were received in March 2013 and in March 2014.

IV Licensing Actions and Other Licensing Tasks

Operating power reactor licensing actions are defined as orders, license amendments, exemptions from regulations, relief from inspection or component testing, topical reports submitted on a plant-specific basis, notices of enforcement discretion, or other actions requiring NRC review and approval before they can be implemented by licensees. The FY 2014 NRC Performance Budget plan incorporates two output measures related to licensing actions: the number of licensing actions completed per year and the age of the licensing action inventory.

Other licensing tasks for operating power reactors are defined as (1) licensee responses to NRC requests for information through generic letters or bulletins, (2) NRC responses to petitions filed under 10 CFR 2.206, "Requests for Action under this Subpart," (3) NRC review of generic topical reports, (4) responses by the NRC's Office of Nuclear Reactor Regulation to NRC regional office requests for assistance, (5) NRC review of licensee analyses under 10 CFR 50.59, "Changes, Tests and Experiments," (6) final safety analysis report (FSAR) updates, or (7) other licensee actions not requiring NRC review and approval before licensees can implement them. The FY 2014 NRC Performance Budget plan incorporates two output

measures related to other licensing tasks: the number of other licensing tasks completed each year and the age of the other licensing task inventory.

The table below shows the actual FY 2011, FY 2012, and FY 2013 results, FY 2014 goals and the FY 2014 results for the NRC Performance Budget plan output measures for operating power reactor licensing actions and other licensing tasks. The Fukushima Tier 1 activities continue to be worked on aggressive schedules that will require continued close monitoring to ensure that implementation of the activities is successful. Beginning in Fiscal Year 2013, additional resources were directed to support these activities. In doing so, the inventory of operating reactor licensing actions has been increasing and some licensing actions are being completed after a longer duration. The staff has worked closely with other offices to identify resources and critical skills that could be transferred to NRR to alleviate the backlog and is planning to apply additional resources to stabilize and reduce the licensing action backlog.

PERFORMANCE BUDGET PLAN					
Output Measure	**FY 2011 Actual**	**FY 2012 Actual**	**FY 2013 Actual**	**FY 2014 Goals**	**FY 2014 YTD**
Licensing actions completed per year	849	770	668	900	217
Age of licensing action inventory	90.3% ≤ 1 year and 99.9% ≤ 2 years	95.8% ≤ 1 year and 100% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 99% ≤ 2 years
Other licensing tasks completed per year	465	674	529	500	402
Age of other licensing tasks inventory	94.2% ≤ 1 year and 99.6% ≤ 2 years	94.6% ≤ 1 year and 100% ≤ 2 years	97.6% ≤ 1 year and 100% ≤ 2 years	97.6% ≤ 1 year and 100% ≤ 2 years	90% ≤ 1 year and 99% ≤ 2 years

V Status of License Renewal Activities

The NRC has issued renewed licenses to 73 power reactor units licensed to operate.

Waste Confidence Decision

Since the inception of the NRC's reactor license-renewal program, NRC reactor-license-renewal environmental reviews have relied on the Commission's Waste Confidence Decision and Rule (10 CFR 51.23, "Temporary Storage of Spent Fuel after Cessation of Reactor Operation—Generic Determination of No Significant Environmental Impact") to address the environmental impacts of continued on-site spent-fuel storage following the licensed period of operation. As a result of the 2012 vacatur and remand of the 2010 update to the Waste Confidence Rule, final issuances of renewed licenses are currently on hold.

The NRC staff continues its review of license renewal applications (LRAs) and continues to issue draft and final supplemental environmental impact statements (SEISs) (license renewal environmental impact statements are supplements to NUREG-1437, Rev. 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants") consistent with

Commission direction. The staff has developed explanatory text for use in SEISs that addresses ongoing Waste Confidence activities and their relationship to license renewal environmental reviews. In addition, as part of the license renewal process, the NRC staff continues to perform its safety evaluation work on each application for license renewal and to issue safety evaluation reports (SERs). After the NRC appropriately addresses the Waste Confidence remand—and after adjudicatory contentions in individual licensing actions (including those related to Waste Confidence, where applicable) have also been appropriately resolved—the NRC will be able to resume issuing final renewed licenses.

Applications Currently under Review

The NRC currently has 10 LRAs for 18 reactor units under review. The following is the status of each application currently under review. Previously issued semiannual reports describe activities that occurred before October 2013.

Indian Point Nuclear Generating, Units 2 and 3

On April 30, 2007, Entergy Nuclear submitted an LRA for Indian Point Nuclear Generating, Units 2 and 3, to extend the operating licenses for an additional 20 years beyond the current license periods. In June 2013, the staff issued a final supplement to the December 2010 final SEIS to address information regarding the plants' effect on aquatic organisms that was identified subsequent to the publication of the final SEIS. Additionally, activities related to the Atomic Safety and Licensing Board (ASLB) hearing process continued.

On September 28, 2013, Indian Point Nuclear Generating, Unit 2, entered a period of extended operation. Given the timely submittal of the LRA, Unit 2 continued operation is permitted under NRC regulations until the NRC makes a final determination on whether to issue a renewed license. A final determination will be made once the ASLB hearing is concluded and a final Waste Confidence Rule is issued. During the Unit 2 period of extended operation, the licensee has voluntarily made regulatory commitments regarding the establishment and use of aging management programs, as described in the LRA, and the NRC continues normal reactor oversight to ensure safe operations.

Diablo Canyon Nuclear Power Plant, Units 1 and 2

On November 24, 2009, Pacific Gas and Electric Company (PG&E) submitted an LRA for the Diablo Canyon Power Plant, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license periods. PG&E requested that the NRC put its review of the LRA on hold in April 2011 because of a delay in PG&E's ability to satisfy requirements of the Coastal Zone Management Act, for which PG&E needs to complete a seismic study. The anticipated completion date for the seismic study is to be determined, and thus, the NRC's review remains on hold. In addition, an admitted contention remained pending before the ASLB.

Seabrook Station, Unit 1

On June 1, 2010, NextEra Energy Seabrook, LLC, submitted an LRA for the Seabrook Station, Unit 1, to extend the operating license for an additional 20 years beyond the current license period. In April 2013, the staff issued a second draft SEIS, which included a revised Severe Accident Mitigation Alternatives (SAMA) analysis and updates pursuant to compliance with NRC's revised environmental protection regulations at 10 CFR Part 51, "Environmental

Protection Regulations for Domestic Licensing and Related Regulatory Functions." During the reporting period, the staff also worked toward resolution of the open items identified in the staff's June 2012 SER with Open Items. Additionally, activities related to the ASLB hearing process continued.

Davis-Besse Nuclear Power Station, Unit 1

On August 30, 2010, FirstEnergy Nuclear Operating Company submitted an LRA for the Davis-Besse Nuclear Power Station, Unit 1, to extend the operating license for an additional 20 years beyond the current license period. The staff issued the Final SER in September 2013. The staff issued the draft SEIS in December 2013. Additionally, activities related to the ASLB hearing process continued.

South Texas Project, Units 1 and 2

On October 28, 2010, South Texas Project Nuclear Operating Company submitted an LRA for the South Texas Project, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license periods. During the reporting period, the staff issued the final SEIS in November 2013. The safety review for this application, which had been temporarily paused at the request of the applicant, resumed in January 2014.

Limerick Generating Station, Units 1 and 2

On June 22, 2011, Exelon Generating Co., LLC, submitted an LRA for the Limerick Generating Station, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license periods. In April 2013, the staff issued the draft SEIS, and the safety review continued during the reporting period. Additionally, activities related to the ASLB hearing process continued.

Grand Gulf Nuclear Station, Unit 1

On November 1, 2011, Entergy Nuclear submitted an LRA for the Grand Gulf Nuclear Station, Unit 1, to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff continued work toward resolution of the open items identified in the staff's January 2013 SER with Open Items. The staff issued the draft SEIS in February 2014.

Callaway Plant, Unit 1

On December 19, 2011, Union Electric Company submitted an LRA for Callaway Plant, Unit 1, to extend the operating license for an additional 20 years beyond the current license period. The staff published the SER with Open Items in April 2013. During the reporting period, the staff issued the draft SEIS in February 2014.

Sequoyah Nuclear Plant, Units 1 and 2

On January 15, 2013, Tennessee Valley Authority submitted an LRA for Sequoyah Plant, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license periods. During the reporting period, the staff continued work on the environmental and safety reviews. Additionally, activity related to the ASLB hearing process continued.

Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2

On May 29, 2013, Exelon Generation Company, LLC, submitted an LRA for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current licensing periods. During the reporting period, the staff conducted onsite audits related to the environmental and safety reviews of the application.

VI Summary of Reactor Enforcement Actions

The reactor enforcement statistics in the tables below are arranged by region, first half-year, second half-year, FY to date, and two previous FYs for comparison purposes. Separate tables provide the non-escalated and escalated reactor enforcement data, as well as the escalated enforcement data associated with traditional enforcement and the ROP. The severity level assigned to the violation (i.e., traditional enforcement) generally reflects the significance of a violation. For most violations, the significance of a violation is assessed using the significance determination process (SDP) under the ROP, which uses risk insights, where appropriate, to assist the NRC in determining the safety or security significance of inspection findings identified within the ROP.

These tables are followed by brief descriptions of the escalated reactor enforcement actions associated with traditional enforcement and those associated with the ROP (as well as any other significant actions) taken during the applicable calendar half-year.

NON-ESCALATED REACTOR ENFORCEMENT ACTIONS						
		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1st Half FY 14	4	2	2	0	8
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	4	2	2	0	8
	FY 13 Total	6	8	1	4	19
	FY 12 Total	4	8	1	8	21
Non-Cited Severity Level IV or Green	1st Half FY 14	58	43	94	108	303
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	58	43	94	108	303
	FY 13 Total	155	117	201	203	676
	FY 12 Total	143	151	227	296	817
TOTAL Cited and Non-Cited Severity Level IV or Green	1st Half FY 14	62	45	96	108	311
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	62	45	96	108	311
	FY 13 Total	161	125	202	207	695
	FY 12 Total	147	159	228	304	838

NOTE: The non-escalated enforcement data above reflect the cited and non-cited violations either categorized at Severity Level IV or associated with green findings during the referenced

time periods. The numbers of cited violations are based on Enforcement Action Tracking System data that may be subject to minor changes following verification. The monthly totals generally lag by 30 days because of the time needed for inspection report and enforcement development. These data do not include green findings that do not have associated violations.

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH TRADITIONAL ENFORCEMENT						
		Region I	Region II	Region III	Region IV	TOTAL
Severity Level I	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
	FY 12 Total	0	0	0	0	0
Severity Level II	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
	FY 12 Total	0	0	0	0	0
Severity Level III	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	1	6	1	2	10
	FY 12 Total	0	2	0	2	4
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	1	6	1	2	10
	FY 12 Total	0	2	0	2	4

NOTE: The escalated enforcement data above reflect the Severity Level I, II, or III violations or problems cited during the referenced time periods.

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS						
		Region I	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
	FY 12 Total	0	0	0	1	1
Violations Related to Yellow Findings	1st Half FY 14	0	0	0	0	0
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	0	0	0
	FY 13 Total	0	1	1	0	2
	FY 12 Total	0	1	1	1	3
Violations Related to White Findings	1st Half FY 14	0	0	2	2	4
	2nd Half FY 14	--------	--------	--------	--------	--------
	FY 14 YTD Total	0	0	2	2	4
	FY 13 Total	2	7	7	2	18
	FY 12 Total	4	5	3	0	12
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 14	0	0	2	2	4
	2nd Half FY 14	0	0	0	0	0
	FY 14 YTD Total	0	0	2	2	4
	FY 13 Total	2	8	8	2	20
	FY 12 Total	4	6	4	2	16

NOTE: The escalated enforcement data above reflect the violations or problems cited during the referenced time periods that were associated with either red, yellow, or white findings. These data do not include red, yellow, or white findings that do not have associated violations.

Reactor Escalated Enforcement Actions and Other Significant Actions Taken

The list below includes security-related actions and confirmatory actions not included in the tables above. The NRC does not make details of security-related violations publicly available.

Exelon Generation Company, LLC (Dresden Nuclear Power Station) EA-13-068

On October 28, 2013, the NRC issued a Confirmatory Order (CO) to Exelon Generating Company, LLC (Exelon), to formalize commitments made as a result of an alternative dispute resolution (ADR) mediation session held on September 18, 2013. The commitments were made as part of a settlement agreement between Exelon and the NRC regarding the apparent violation of 10 CFR 73.56, “Personnel Access Authorization Requirements for Nuclear Power

Plants." The agreement resolves the apparent violation that involved the failure of several Dresden Nuclear Power Station (Dresden) individuals to immediately inform a reviewing official of the questionable behavior of a now former Dresden senior reactor operator (SRO). This individual, along with another former Dresden SRO, planned and attempted to recruit another former employee to commit a violent off-site crime. As part of the ADR settlement agreement, Exelon completed or intends to complete a number of corrective actions. These actions include fleet-wide procedure revisions and training, fleet-wide briefings, a presentation at an appropriate industry forum, and submittal of an operating experience summary to an industry-wide organization.

Aerotest Operations, Inc. (Aerotest Radiography and Research Test Reactor) EA-13-108

On December 18, 2013, the NRC issued a Severity Level III notice of violation to Aerotest Operations, Inc. involving the failure to implement Technical Specification (TS) 10.2. Specifically, for an indeterminate period of time, beginning at a point after the last full fuel inspection in 2006 and lasting until October 15, 2010, when the facility ceased reactor operation, the licensee operated the reactor with significant defects in the fuel elements. During fuel inspections conducted following reactor shutdown, 22 fuel elements were identified as having varying degrees of cracking in the aluminum cladding, representing a significant defect in the fuel elements and loss of the integrity of a fission product barrier.

NextEra Energy Duane Arnold, LLC (Duane Arnold Energy Center) EA-13-182

On December 18, 2013, the NRC issued a notice of violation to NextEra Energy Duane Arnold, LLC for a violation of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with a White SDP finding involving the failure of Duane Arnold personnel to prescribe a work instruction of a type appropriate to the circumstances for the re-assembly of the 'A' standby diesel generator lube oil heat exchanger. Specifically, on October 18, 2012, the licensee completed a work order that replaced the 'A' standby diesel generator lube oil heat exchanger tube bundle. The work order did not contain a specific and detailed sequence for re-assembly of the heat exchanger and connected piping system to achieve uniform and appropriate compression of the tube bundle-to-shell gasket. This contributed to the catastrophic failure of the tube bundle-to-shell gasket during a maintenance run of the engine on March 8, 2013, rendering the 'A' standby diesel generator unavailable.

Southern California Edison Company (San Onofre Nuclear Generating Station) EA-13-083

On December 23, 2013, the NRC issued a notice of violation associated with a White SDP finding identified during an inspection of the San Onofre Nuclear Generating Station, Unit 3. This White finding involves the failure of San Onofre personnel to verify the adequacy of the thermal-hydraulic and flow-induced vibration design of the Unit 3 replacement steam generators, which resulted in significant and unexpected steam generator tube wear and the loss of tube integrity on Unit 3 Steam Generator 3EO-88 after 11 months of operation.

NextEra Energy Duane Arnold, LLC (Duane Arnold Energy Center) EA-13-223

On February 11, 2014, the NRC issued a notice of violation to NextEra Energy Duane Arnold, LLC, for a violation of TS 3.5.3, "Reactor Core Isolation Cooling (RCIC) System," associated with a White SDP finding involving the failure of Duane Arnold personnel to perform an immediate operability determination in accordance with NextEra's procedures. Specifically, on

June 21, 2013, Duane Arnold personnel failed to consider the degraded speed indication's impact on RCIC operability. As a result, the RCIC system was inoperable from June 21, 2013, to August 24, 2013.

Wolf Creek Operating Corporation (Wolf Creek Generating Station) EA-13-199

On March 6, 2014, a notice of violation was issued to Wolf Creek Operating Corporation, for a violation associated with a Greater-than-Green Significance Determination Process finding at the Wolf Creek Generating Station. The details of the finding are official use only–security-related information.

South Carolina Electric & Gas Company (Summer Nuclear Station) EA-12-140

On March 10, 2014, the NRC issued a confirmatory order (CO) to South Carolina Electric & Gas Company (SCE&G) to formalize commitments made as a result of an alternative dispute resolution (ADR) mediation session held on October 8, 2013. The commitments were made as part of a settlement agreement between SCE&G and the NRC regarding two violations of NRC requirements. As part of the ADR settlement agreement, SCE&G agreed that the two violations resulted in an individual inappropriately being granted unescorted access to Summer Nuclear Station, which was inconsistent with the requirements of 10 CFR 73.56(c), "Personnel Access Authorization Requirements for Nuclear Power Plants," and 10 CFR 50.9, "Completeness and Accuracy of Information." SCE&G did not agree that the two violations were committed willfully. However, the NRC determined these violations to be willful. The NRC concluded that the corrective actions and enhancements SCE&G implemented were prompt and comprehensive and addressed the causes. In consideration of the commitments delineated in the CO, the NRC agreed to fully mitigate a civil penalty and issue a notice of violation.

Entergy Operations, Inc. (Waterford Steam Electric Station) EA-13-233

On March 28, 2014, the NRC issued a notice of violation to Entergy Operations, Inc. for a violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," associated with a White SDP finding involving the failure of Waterford personnel to establish an adequate test program to demonstrate that a safety-related component associated with the train B emergency diesel generator would perform satisfactorily in service. Specifically, before May 26, 2013, Waterford personnel failed to identify and perform adequate testing on the train B emergency diesel generator exhaust fan to demonstrate that the exhaust fan would perform satisfactorily in service. As a result, the train B emergency diesel generator was determined to be inoperable for a period of 25 days.

VII Power Reactor Security and Emergency and Incident Response Activities

The NRC continues to maintain an appropriate regulatory infrastructure and perform its licensing and oversight functions to ensure protection of public health and safety, promote the common defense and security, and protect the environment. NRC Security and Emergency Preparedness (EP) programs provide important contributions to fulfilling this mission.

The NRC continues to conduct force-on-force (FOF) inspections at each nuclear power reactor and Category I fuel cycle facility on a regular 3-year cycle. Each FOF inspection includes both tabletop drills and exercises that simulate combat between a mock adversary force and the licensee's security force. FOF inspections assess the ability of power reactor facilities to defend against the design basis threat (DBT) to design safeguards systems to protect against

radiological sabotage. They also provide valuable insights that enable the NRC to evaluate the effectiveness of licensee security programs. At Category I fuel cycle facilities, a similar process is used to assess the effectiveness of the licensees' protective strategy against two DBTs—one for radiological sabotage and a second DBT to prevent the theft or diversion of special nuclear material.

The NRC is developing a final rule that amends security requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," to implement the new statutory authority provided to the Commission under Section 161A of the Atomic Energy Act of 1954, as amended. The revised regulation will allow certain classes of NRC licensees to apply for NRC authorization to use enhanced weapons and large capacity ammunition feeding devices, notwithstanding State, local, and other Federal firearms laws. In advance of the rulemaking, the NRC has designated, through orders, seven power reactor licensees and one Category I fuel facility licensee as being eligible to apply for stand-alone preemption authority. The NRC has taken these actions in consultation with the U.S. Department of Justice staffs in the Federal Bureau of Investigation and the Bureau of Alcohol, Tobacco, Firearms, and Explosives.

The NRC is also developing a final rule that amends the drug testing requirements of 10 CFR Part 26, "Fitness-for-Duty Programs," to better align NRC drug testing requirements with those of the U.S. Department of Health and Human Services' "Mandatory Guidelines for Federal Workplace Drug Testing Programs." Specifically, the proposed changes will broaden the panel of drugs to be tested during required drug testing, enhance Medical Review Officer guidance, and improve the clarity in the organization and language of the rule.

In accordance with 10 CFR Part 73.54, "Protection of Digital Computer and Communication Systems and Networks," nuclear power plant licensees and combined license (COL) applicants are required to implement a cyber security program to provide high assurance that safety, important-to-safety, security, and emergency preparedness functions are protected from cyber attacks. As a result of the significant amount of work and lead time required to fully implement the provisions called for in the licensees' NRC-approved cyber security plans, interim milestones were established to focus efforts on the highest priority activities. Licensees completed the highest priority activities in December 2012.

The NRC has developed an oversight program for cyber security that includes inspector training, an inspection program, and a process for evaluating the significance of inspection findings. This was accomplished collaboratively with stakeholders, including members of industry, and representatives from the U.S. Department of Homeland Security, the Federal Energy Regulatory Commission, and the National Institute of Standards and Technology. The NRC has begun inspecting activities related to the interim milestones and will complete these inspections at 44 facilities in calendar year (CY) 2014.

The NRC has developed and is implementing a cyber security roadmap (SECY-12-0088, "The Nuclear Regulatory Commission Cyber Security Roadmap") to evaluate the need for cyber security requirements for fuel cycle facilities, non-power reactors (NPRs), independent spent fuel storage installations (ISFSIs), and byproduct materials licensees. Implementation of the roadmap will help ensure that appropriate levels of cyber security actions are implemented in a timely and efficient manner at all NRC-licensed facilities. Additionally, implementation of the roadmap will identify if, or to what extent, the program needs to be improved.

The NRC has developed and is implementing a path forward on emergency preparedness (EP) communications and staffing issues identified in NRC's assessment of the Japan Earthquake

and accident at the Fukushima Dai-ichi nuclear power plant (Near-Term Task Force Recommendation 9.3). The NRC has received and reviewed responses to information requests concerning licensee EP staffing and communications capabilities during severe accidents. The staff completed its reviews of the communication assessments submitted to the NRC by licensees and determined that proposed interim actions (e.g., portable satellite phones) combined with long-term enhancements (e.g., new radio systems, utilizing sound-powered telephones, battery-powered radio repeaters, and satellite phone systems) will help to ensure that licensees can effectively communicate during a station blackout event affecting multiple units. The staff has also completed its review of staffing assessments submitted by licensees and determined that the onsite minimum staff, as described in their emergency plans, is sufficient to support required plant actions and emergency plan functions. Additionally, the staff has received and reviewed licensee submittals regarding current and planned multi-unit/multi-source dose assessment capabilities and all licensees plan to implement an automated multi-unit/multi-source dose assessment capability by the end of CY 2014. The NRC is continuing to conduct public meetings and work to develop guidance regarding the implementation of facilities and equipment, training and exercises (drills), and multiunit dose assessment.

The NRC revised EP regulations in 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” effective December 23, 2011. This was the first significant revision to the EP rules in over 30 years, and implementation continues into FY 2014. Specifically, during this reporting period, the staff was focused on its next key action under EP rule implementation, which is to conduct hostile action-based exercises at all nuclear power reactor sites.

In April 2012, the NRC and the Federal Emergency Management Agency (FEMA) began a multi-year initiative to revise NUREG-0654/FEMA-REP-1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” one of the key guidance documents for developing and evaluating onsite and offsite emergency plans for nuclear power plants and State and local governments. This initiative continue in FY 2014. Extensive stakeholder involvement will be provided throughout the revision process, including public meetings that solicited stakeholder input on emergency planning guidance topics that should be addressed in the revised document.

Consistent with the Commission’s policy to provide States with potassium iodide upon request, the NRC continues to work with States to replenish potassium iodide supplies for use as a supplement to public protective actions within the 10-mile emergency planning zones around nuclear power plants.

All physical security and EP program licensing reviews for new power reactor applications remain on schedule. The NRC staff is using its established licensing process to ensure the safety and environmental reviews meet all milestones and provide appropriate opportunities for stakeholder input.

VIII Power Uprates

There are three types of power uprates. A measurement uncertainty recapture power uprate is a power uprate of less than 2 percent and is based on the use of more accurate feedwater flow measurement techniques. Stretch power uprates are power uprates that are typically up to 7 percent and are within the design capacity of the plant. Stretch power uprates require only minor plant modifications. Extended power uprates are power uprates beyond the original design capacity of the plant; therefore, they require major plant modifications.

Licensees have applied for and implemented power uprates since the 1970s as a way to increase the power output of their plant's. The NRC staff has reviewed and approved 154 power uprates to date. Approximately 21,105 megawatts thermal (MWt) or 7,035 megawatts electric (MWe) in electric generating capacity (the equivalent of about seven large nuclear power plant units) have been gained through the implementation of power uprates at existing plants. The NRC currently has 3 power uprate applications under review, which would add an additional 2,482 MWt or 827 MWe to the Nation's electrical grid, if approved.

In December 2013, the NRC staff conducted its most recent survey of nuclear power plant licensee's plans to submit power uprate applications over the next 5 years. This latest information indicates that licensees plan to request power uprates for 3 nuclear power plants during the next 5 years.

IX New Reactor Licensing

The NRC is focusing on licensing and construction activities that support large, light-water reactor applicants and licensees and is positioning itself for success in the advanced reactor program by investing in activities to establish the necessary regulatory framework and infrastructure for advanced reactors. The NRC's new reactor program also is actively engaged in several international cooperative activities to promote enhanced safety in new reactor designs, strengthen reactor siting reviews, and improve the effectiveness and efficiency of inspections and the collection and sharing of construction experience.

Large, Light-Water Reactor Application Reviews

The NRC expects to review the applications for most new large, light-water reactor nuclear power plants using 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," which governs the issuance of standard design certifications (DCs), early site permits (ESPs), and combined licenses (COLs) for nuclear power plants. The NRC is making progress on the 10 CFR Part 52 applications currently under review as discussed below.

Early Site Permit Reviews

PSEG Power, LLC, and PSEG Nuclear, LCC

PSEG Power, LLC, and PSEG Nuclear, LLC, submitted an ESP application on May 25, 2010. This application uses the plant parameter envelope approach, which includes design parameter information from four reactor designs, namely, the U.S. Evolutionary Power Reactor (U.S. EPR), the Advanced Boiling-Water Reactor (ABWR), the U.S. Advanced Pressurized-Water Reactor (US-APWR), and the Advanced Passive 1000 (AP1000).

On March 5, 2014, the NRC staff issued a letter to PSEG that identified technical issues that need to be resolved in order for the staff to complete its review of the applicant's first-of-a-kind storm surge analysis. PSEG intends to submit a letter to the NRC describing its detailed plan for closure. Once the applicant submits its plan for closure, the NRC staff will develop a revised review schedule.

The NRC staff expects to issue the draft environmental impact statement (DEIS) for the PSEG ESP application by the end of 2014, followed by the final environmental impact statement (FEIS) in May 2015.

Design Certification Reviews

Economic Simplified Boiling-Water Reactor

The NRC staff issued the final safety evaluation report (FSER) and final design approval for the ESBWR on March 9, 2011, and published the proposed rule in the *Federal Register* on March 25, 2011. On January 19, 2012, the staff informed GE Hitachi Nuclear Energy (GEH) that it had identified issues relevant to the conclusions in the staff's March 9, 2011, FSER. Specifically, errors were identified in the benchmarking that GEH used as a basis for determining fluctuating pressure loading on the steam dryer, and errors were also identified in a number of GEH's modeling parameters. In 2012, the NRC staff audited GEH's steam dryer analysis and issued requests for additional information (RAIs). The NRC staff issued supplemental RAIs in March and November 2013 and has received responses from GEH. The steam dryer issues are now resolved and the NRC plans to publish a supplemental proposed rule in the *Federal Register* in May 2014, issue the final supplemental FSER in June 2014, and deliver the final rule to the Commission in July 2014. If the Commission affirms the final rule, the NRC would publish the final rule in the *Federal Register* in September 2014.

U.S. Evolutionary Power Reactor Design Certification

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

In December 2011, the NRC staff issued the safety evaluation with open items. Significant open items that remain unresolved include seismic and structural analysis, fuel seismic design and methodology, digital instrumentation and controls and Fukushima lessons learned. On July 2, 2013, the staff issued a letter informing AREVA that it has not demonstrated sufficient independence and diversity in its current U.S. EPR digital instrumentation and controls (I&C) design to meet the regulatory requirements. The staff asked AREVA to provide a resolution plan that reflects an integrated approach across all areas of the design that are impacted by AREVA's I&C design.

On October 21, 2013, AREVA issued a letter to the NRC stating that it is reevaluating its U.S. EPR DC closure strategy. AREVA has organized all review areas into 3 groups (Groups A, B, and C) and prioritized each area based on short, medium, and long term completion. AREVA submitted its closure plan for Group A chapters in December 2013 and the closure plans for Groups B and C in March 2014. In its March 20, 2014, letter to the NRC, AREVA stated that it plans to finalize all sections of its application by the end of September 2016. The NRC staff's schedule for completing the FSER is currently under review.

U.S. Advanced Pressurized-Water Reactor Design Certification

Mitsubishi Heavy Industries Ltd. (MHI) submitted its US-APWR DC application on December 31, 2007. On November 5, 2013, MHI issued a letter informing the NRC of its plans to implement a coordinated slowdown of licensing activities related to the US-APWR design certification application review. MHI stated that the slowdown is necessary in order to focus its resources on supporting Japanese utilities in restarting Mitsubishi designed pressurized-water reactors (PWRs) in Japan. On March 24, 2014, the NRC staff began limiting its review of the US-APWR design to individual review areas identified by MHI and within MHI's budgetary allowance for this review.

U.S. APR1400 Design Certification

Korea Hydro and Nuclear Power Company (KHNP) and Korea Electric Power Corporation (KEPCO) submitted an application for a standard design certification (DC) of the Advanced Power Reactor 1400 (APR1400) on September 30, 2013. The NRC's 60-day acceptance review of the DC application took place between October 17, 2013 and December 17, 2013. By letter dated December 19, 2013, the NRC informed KHNP and KEPCO of the staff's decision not to accept the APR1400 DC application for docketing and regulatory review. In response, KHNP and KEPCO expressed interest in continuing interactions with the NRC to resolve the issues identified by the NRC. KHNP and KEPCO plan to resubmit the APR1400 application in late 2014.

Design Certification Renewals

Advanced Boiling-Water Reactor Renewal (Toshiba)

On November 2, 2010, Toshiba tendered an ABWR DC renewal application. 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. Toshiba submitted Revision 1 of its ABWR DC renewal application on June 22, 2012.

On October 22, 2012, the NRC staff sent a letter to Toshiba requesting consideration of additional amendments to address potential backfits and other technical issues. In response, Toshiba stated in a letter dated December 14, 2012, that it would carefully consider each of the desired amendments. In a letter to the NRC dated December 13, 2013, Toshiba stated that they plan to submit Revision 2 of the renewal application no sooner than mid 2016 and requested that the NRC postpone its review of the application until it submits Revision 2.

Advanced Boiling-Water Reactor Renewal (GEH)

On December 7, 2010, GEH tendered an ABWR DC renewal application. The NRC staff issued a letter to the applicant on July 20, 2012, that described certain design changes that the staff believes the applicant should consider for amendments to the application. NRC staff requested that GEH identify the design changes that it intends to incorporate into its application and to provide a schedule for submitting a revised application. By letter dated March 17, 2014, GEH informed the NRC that it plans to submit a revised application no sooner than May 2015.

Combined License Application Activities

As of March 31, 2013, the NRC had received 18 COL applications for review. Six of the reviews have been suspended because of changes in the applicants' business strategies. The Victoria COL application was withdrawn following docketing of the Victoria ESP application. (The Victoria ESP application was subsequently withdrawn on August 28, 2012). On January 9, 2014, PPL Bell Bend, LLC (PPL), requested that NRC withhold further review of the safety portion of the Bell Bend COL application. The NRC is continuing with the environmental review for the Bell Bend application. On November 7, 2013, Luminant, the applicant for Comanche Peak, announced it will suspend activities as of March 31, 2014. On November 26, 2013, UniStar submitted a letter to the NRC announcing withdrawal of the COL application for the Nine Mile Point 3 Nuclear Power Plant (this review was previously suspended). COLs were issued for the Vogtle and V.C. Summer sites in 2012. The NRC is actively reviewing 8 COL applications for a total of 12 units, as discussed below.

Levy County Combined License Application

On July 30, 2008, Progress Energy Florida, Inc. submitted a COL application for two AP1000 units to be located at its site in Levy County, FL.

The NRC staff completed all technical reviews for the Levy County COL application and issued all safety evaluation chapters with no open items to the applicant in September 2011. The staff issued the FEIS on April 27, 2012.

On March 15, 2012, the staff requested the applicant to provide additional information related to Fukushima recommendations. On July 31, 2012, the applicant submitted Revision 5 to its COL application, which contained additional information to address the Fukushima recommendations and seismic reevaluation. The NRC staff completed its review of the applicant's seismic results and issued its SER in December 2012.

The applicant subsequently revised its application to reflect a design modification to the containment condensate return system. This design change extended the schedule for completion of the FSER. The NRC staff is currently performing audit activities and issuing additional requests for information to the applicant regarding the design change. The NRC is also reevaluating the review schedule for completion of the FSER and expects to issue a revised schedule letter in April 2014.

William States Lee III Combined License Application

On December 13, 2007, Duke Energy Carolinas, LLC (Duke), submitted a COL application for two AP1000 units to be located at its Lee site near Charlotte in Cherokee County, SC.

The NRC issued the FEIS on December 27, 2013.

Ongoing technical issues with the safety review include; a seismic reevaluation as a result of Fukushima; the applicant's decision to relocate the nuclear island approximately 15 meters (50 feet) to the east and 20 meters (66 feet) to the south; and to raise the base elevation by 1 meter (3 feet). The NRC staff expects to issue the FSER for the Lee COL application in December 2015.

Turkey Point Combined License Application

On June 30, 2009, Florida Power & Light (FPL) submitted a COL application for two AP1000 units to be located at the existing Turkey Point Nuclear Generating site in Miami–Dade County, FL.

Technical issues remain with the geology, seismology, and geotechnical engineering reviews. Issues also remain with the applicant's proposed deep well injection of liquid radiological waste effluents. The NRC staff is currently awaiting the applicant's responses to requests for additional information on these topics.

The NRC staff has determined that the applicant sufficiently addressed inconsistencies related to the site-selection process of alternative sites and the staff can move forward with completing its draft environmental impact statement. The NRC staff issued a revised environmental review schedule on April 17, 2014, which projects a target FEIS date of February 2016.

South Texas Project Combined License Application

On September 20, 2007, South Texas Project (STP) Nuclear Operating Company submitted a COL application for two ABWR units to be located at its site near Bay City, in Matagorda County, TX. Subsequently, Nuclear Innovation North America LLC (NINA) became the lead applicant for STP, Units 3 and 4. The NRC published the FEIS on February 24, 2011.

The NRC staff expects to issue the FSER for the STP COL application in September 2015. A significant open issue remains regarding the financial qualification of the applicant to receive a license.

Calvert Cliffs Combined License Application

On July 13, 2007, and March 14, 2008, Calvert Cliffs Unit 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC (UniStar), submitted a two-part COL application for a U.S. EPR to be located at the Calvert Cliffs site near Lusby, in Calvert County, MD.

The NRC staff's review of the Calvert Cliffs COL application is expected to be impacted by AREVA's revised U.S. EPR DC application closure plans. The NRC staff will complete the COL application reviews sequentially after the DC reviews of the corresponding review areas.

Bell Bend Combined License Application

On October 10, 2008, PPL Bell Bend, LLC, submitted a COL application for a U.S. EPR to be located at a new site adjacent to its Susquehanna Steam Electric Station, in Luzerne County, PA.

On January 9, 2014, PPL Bell Bend, LLC (PPL), submitted a letter to the NRC requesting NRC withhold further review of the safety portion of the Bell Bend COL application until further notice. PPL has requested that NRC continue to support the necessary work leading to the issuance of the FEIS. PPL also requested that the NRC continue to complete its review regarding Part 5, "Emergency Planning" of the COL application. The NRC staff has suspended its review of the safety portion of the COL application as requested by the applicant.

The NRC staff is currently working with the U.S. Army Corps of Engineers, as well as State and other Federal agencies, to determine the sufficiency of the applicant's consumptive water use plan. Once this sufficiency is determined, the NRC staff can proceed with issuing a revised environmental review schedule and completion of the DEIS.

Fermi Combined License Application

On September 19, 2008, Detroit Edison Company (DTE) submitted a COL application for an ESBWR to be located at its Fermi site near Newport City, in Monroe County, MI.

The staff published the FEIS in January 2013. Contested hearing activities occurred in late October and early November 2013. The NRC staff expects to issue the FSER in July 2015.

North Anna Combined License Application

On November 27, 2007, Dominion Virginia Power (Dominion) submitted a COL application for an ESBWR to be located at its North Anna Power Station site near Richmond, in Louisa County,

VA. The Final Supplemental Environmental Impact Statement (FSEIS) was issued in February 2010. On June 28, 2010, Dominion submitted a revised application to reference the US-APWR design. However, on April 25, 2013, Dominion notified the NRC of its intent to revert back to the ESBWR design. Dominion submitted its partially revised COL application in July 2013 to reflect its revised nuclear technology decision and submitted all remaining application sections to the NRC in December 2013. The NRC staff issued a new review schedule on April 7, 2014. The NRC staff expects to issue the FSER in March 2016. The staff will determine by the end of 2014, whether a supplemental EIS is required based on the revised application.

Comanche Peak Combined License Application

On September 19, 2008, Luminant submitted a COL application for two US-APWR units to be located at its Comanche Peak site near Glen Rose, in Somervell County, TX. The FEIS was issued in May 2011.

On November 7, 2013, Luminant submitted a letter to the NRC requesting that all review activities associated with the Comanche Peak Units 3 and 4 COL application be suspended by March 31, 2014. The NRC staff has suspended all review activities for this COL application.

Bellefonte Combined License Application

On October 30, 2007, the Tennessee Valley Authority (TVA) submitted a COL application for two AP1000 units (Units 3 and 4) to be located at its Bellefonte site near Scottsboro, in Jackson County, AL.

On August 18, 2011, the TVA board approved plans for the completion of Bellefonte Unit 1, with the goal of having it completed and operational by 2020. By letter dated December 19, 2011, TVA reaffirmed that the Bellefonte Units 3 and 4 COL applications continue to be deferred indefinitely.

Nine Mile Point Combined License Application

On September 30, 2008, Nine Mile Point Nuclear Project, LLC, and UniStar Nuclear Energy submitted a COL application for a U.S. EPR (Unit 3) to be located at its Nine Mile Point Nuclear Station site in Oswego, NY. On December 1, 2009, UniStar Nuclear Energy submitted a letter asking the NRC to suspend the COL application review, including any supporting reviews by external agencies, until further notice. On November 26, 2013, UniStar Nuclear Energy submitted a letter withdrawing its COL application for Nine Mile Point, Unit 3, and on March 31, 2014, the NRC responded to UniStar, approving the withdrawal request.

Callaway Combined License Application

On July 28, 2008, Ameren UE submitted a COL application for a U.S. EPR to be located at its Callaway plant site in Callaway County, MO. The NRC suspended the Callaway review at the request of the applicant in June 2009, and it remains suspended. On April 19, 2012, Ameren Missouri issued a press release announcing that it has entered into an agreement with Westinghouse, as part of the NexStart Small Modular Reactor (SMR) Alliance. On July 3, 2012, Ameren Missouri informed the NRC that on May 18, 2012, Ameren Missouri and Westinghouse Electric submitted an application to the U.S. Department of Energy (DOE) in response to DOE's funding opportunity announcement (FOA) for design and licensing of small modular reactors. In November 2012, DOE announced their selection of the Babcock and Wilcox (B&W) mPower™

as the awardee and in December 2013, DOE announced the selection of NuScale as the second FOA awardee. In January 2014, Westinghouse and Ameren jointly stated that they continue to pursue SMR design development activities to include a DC application and a COL application for the Callaway site. However, Westinghouse and Ameren have not determined projected application submittal dates and will continue to update the NRC of its decisions.

Grand Gulf Combined License Application

On February 27, 2008, Entergy submitted a COL application for an ESBWR to be located at its Grand Gulf Nuclear Station site near Port Gibson, in Claiborne County, MS.

By letter dated January 9, 2009, Entergy asked the NRC to suspend, until further notice, its review of the docketed COL applications for the River Bend Station, Unit 3, and Grand Gulf Unit 3. Entergy plans to reconsider the GEH ESBWR reactor technology, which was the basis for the COL application. The NRC responded to the request and suspended the review; the review remains suspended.

River Bend Station Combined License Application

On September 25, 2008, Entergy submitted a COL application for an ESBWR to be located at its River Bend Station site near St. Francisville, LA. By letter dated January 9, 2009, Entergy requested a suspension, until further notice, of the NRC's review of the docketed COL applications for River Bend Station, Unit 3, and Grand Gulf Unit 3. The review remains suspended.

Expected Application Submittal to the NRC

The NRC staff anticipates the resubmittal of Korea Hydro & Nuclear Power's APR-1400 DC application later in 2014 and submittal of one ESP application (Blue Castle) during 2015.

Regulatory Infrastructure

The NRC continues to enhance its regulatory infrastructure to support planning, licensing, and oversight of new reactor applications, and future reviews of advanced reactor designs, by implementing timely and effective policy decisions, enhancing and updating regulatory guidance for light-water reactors, and introducing more efficiency into the application review process. The NRC has emphasized the timely identification and resolution of potential policy and regulatory issues identified in construction and in the licensing of new and advanced reactor designs, by updating affected guidance documents and developing guidance for new regulatory requirements, pursuing changes to regulations where needed, engaging potential applicants early in the pre-application phase, and further solidifying inspection procedures and programs surrounding new construction activities.

Examples of infrastructure activities completed during the reporting period are described below.

New Reactor Licensing Process Lessons Learned Review: 10 CFR Part 52

Following the issuance of the combined licenses for Vogtle Units 3 and 4, and Summer Units 2 and 3, the NRC initiated a lessons learned review to identify potential enhancements to the 10 CFR Part 52 licensing process. The report identified seven key items and associated potential actions to enhance the licensing process and improve the efficiency of future licensing

reviews. These items include enhancing the application acceptance review process, updating pertinent new reactor review guidance, addressing potential technical issues associated with the approach to standardization, enhancing the NRC's management system that tracks NRC questions to the applicants, streamlining the rulemaking approach to design certifications, and updating 10 CFR Part 52 and other pertinent regulations to further simplify and enhance the reviews of future applications. The NRC staff applied draft acceptance review guidance to the acceptance review of the U.S. APR1400 Design Certification application discussed above. The staff is currently in the process of finalizing the acceptance review guidance.

NUREG-0800 Standard Review Plan (SRP) Updates (January 2014)

The NRC staff continues its systematic SRP update, to support combined license, design certification, early site permit, and limited work authorization application reviews.

The staff revised several sections of NUREG-0800, the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." The staff issued the final revision of "Introduction—Part 2: Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: Light-Water Small Modular Reactor Edition." The scope of the introduction now covers all parts of 10 CFR Part 52 and the term "integral pressurized water reactor" (iPWR) is now replaced with the more generic "small modular reactor" (SMR).

The staff is currently revising several sections covering multiple technical areas of the SRP to reflect lessons learned from previous light-water reactor reviews. The staff issued 40 SRP sections as proposed revisions last year, including sections on site characteristics and parameters (Ch. 2), design of structures, components, equipment, and systems (Ch. 3), radiation protection (Ch. 12), quality assurance (Ch. 17), and severe accidents (Ch. 19). The final revisions will be issued in 2014, as the staff completes development of final guidance for each section.

SECY-13-0033: "Allowing Interim Operation under Title 10 of the Code of Federal Regulations Section 52.103"

This paper informed the Commission on several issues associated with interim operation of the facility while inspections, tests, analyses, and acceptance criteria (ITAAC) hearings are pending. The paper also presents options that the NRC may take in order to make the 10 CFR 52.103(g) finding that the acceptance criteria in the ITAAC are met, regardless of the pendency of a hearing, and recommended that the Commission delegate the 10 CFR 52.103(g) finding to the staff. The Commission issued a staff requirements memorandum for SECY-13-0033 on July 19, 2013, approving the staff's recommendation and further directing the staff to develop a range of options for ITAAC hearing formats for Commission review and approval. The staff has developed draft proposed hearing procedures and will solicit public stakeholder comments on these draft procedures during 2014.

Draft COL-ISG-025: Interim Staff Guidance on Changes during Construction under 10 CFR Part 52

The NRC reissued Draft COL-ISG-025 for use and comment to provide the methods for NRC staff to respond to a preliminary amendment request (PAR) from a licensee by performing a review of the PAR's impact on ITAAC and verifying that the PAR accurately reflects the license amendment request. The PAR submittals are progressing as intended and no public stakeholder comments were received during the comment period. The PAR process was

established during the construction phase of the initial COL licensees with a license condition to allow the staff to issue a notice of no objection for the construction of a plant modification while the related license amendment was reviewed by the staff.

Draft COL/ESP-ISG-026: Environmental Issues Associated with New Reactors (September 2013)

This guidance is intended to assist staff in conducting environmental reviews associated with early site permit and combined license applications. This interim staff guidance (ISG) complements existing NRC guidance included in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan (with Supplement 1 for Operating Reactor License Renewal)," including the 2007 draft revisions. Use of this guidance will assist the staff in addressing certain aspects of the environmental reviews for ESP and COL applications that: (1) have evolved since the last update to NUREG-1555, (2) were identified during ESP and COL reviews as needing updating, or (3) involve the U.S. Army Corps of Engineers (USACE) as a cooperating agency. Specific topics discussed include updated guidance to the staff on the assessment of construction impacts, greenhouse gases and climate change, socioeconomics, environmental justice, need for power, alternatives, cumulative impact assessments, and historic and cultural resource issues.

Draft COL/ESP-ISG-027: Specific Environmental Guidance for iPWR Reviews (September 2013)

The purpose of this ISG is to clarify the NRC guidance and application of the Environmental SRP to environmental reviews for applications to construct and operate an integrated pressurized-water reactor (iPWR). This guidance applies to applications for limited work authorizations, construction permits, and operating licenses as well as applications for ESPs and COLs. Specific topics discussed include purpose and need, alternatives, cumulative impacts, the need for power, and benefit-cost. This ISG is complementary to Draft COL/ESP-ISG-026 discussed above.

The NRC published in the *Federal Register* draft ESP/COL ISG 026 and draft ISG ESP/COL-ISG-027 for use and comment on September 13, 2013. The NRC staff is currently resolving comments received from stakeholders, and preparing to finalize the ISGs.

Construction Oversight

Construction under 10 CFR Part 50

Watts Bar Nuclear Plant Unit 2 (WB2) is the only nuclear power plant currently being constructed under 10 CFR Part 50. The Tennessee Valley Authority received a construction permit for Watts Bar Nuclear Plant Units 1 and 2 in 1973. Because of the identification of a large number of deficiencies, WB2 construction was suspended in the mid 1980's, with major structures in place and equipment such as reactor coolant system piping installed. TVA resumed construction on Unit 2 in late 2007. TVA estimates that the unit will be complete and ready for operation between September and December of 2015.

Many of the required NRC construction inspections for WB2 were completed or partially completed before suspension of construction in the mid-1980s. When construction resumed, the NRC staff reassessed the inspection program for WB2 and identified over 500 items that required inspection and closure. Over the past year, construction inspections have continued

and 383 of the 547 inspection items have been closed. The inspections were conducted by the four permanently assigned construction resident inspectors and inspectors from the NRC regional office in Atlanta, GA. As TVA has completed construction on individual safety-related systems, NRC inspections of pre-operational testing have commenced. The majority of pre-operational testing inspections are anticipated in 2014 with startup testing inspections taking place in 2015.

Construction under 10 CFR Part 52

The NRC issued COLs to Southern Nuclear Operating Company on February 10, 2012, for two AP1000 units at the Vogtle site near Augusta, GA, and to South Carolina Electric & Gas Company on March 30, 2012, for two AP1000 units at the V.C. Summer site near Columbia, SC. As construction progresses, the NRC has increased the pace of construction inspections to verify compliance with the agency's regulations and ensure that the new plants are constructed in accordance with their combined licenses. The inspections are conducted by three permanently assigned construction resident inspectors at each site and by teams of inspectors from the NRC regional office in Atlanta, GA.

Safety related construction activities at Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3 have focused on the construction of the nuclear island basemats, fabrication of steel containments, and fabrication of structural modules for the auxiliary building. In addition, both licensees have a wide variety of non-safety related construction activity ongoing. Recent NRC inspections have focused on activities such as welding, fitness-for-duty, civil/structural engineering activities, and digital instrumentation and control system engineering. NRC inspection activities will continue to increase as licensees broaden the scope of construction activities.

The NRC staff continues to implement and refine the processes and guidance developed for closure verification of ITAAC. The staff has facilitated several public workshops to solicit input, exchange views, and reach consensus on several construction inspection issues, including the development of additional ITAAC closure notification (ICN) examples. Members of the public, the Nuclear Energy Institute (NEI), industry representatives, and other external stakeholders participated in these public workshops. The NRC staff has reviewed the NEI guidance document on the ITAAC closure process and is evaluating the need to update the associated NRC-endorsement document.

A total of 13 ICNs have been submitted for Vogtle Units 3 and 4, and V.C. Summer Unit 2. The staff reviews all ICNs to determine whether they contain sufficient information to demonstrate that the ITAAC have been successfully completed by the licensee, as required by 10 CFR 52.99(c)(1). The staff has completed its review of all submitted ICNs and, as required by 10 CFR 52.99(e)(1), has published notices in the *Federal Register* to document the NRC staff's verification that the associated ITAAC have been completed.

The NRC fully implemented the Construction Reactor Oversight Process (cROP) at the four new reactor units on July 1, 2013. Similar to ROP practices, the NRC will continue to periodically meet with interested stakeholders to collect feedback on the effectiveness of the process, which is then considered in making future refinements to the cROP. The agency's most recent performance assessments show that reactor construction is being conducted safely as all four units are in the licensee response band of the construction action matrix. Plant assessments and the latest cROP-related information are publicly available on the NRC Web site.

Vendor Inspections

The NRC staff continued to implement a Vendor Inspection Program of vendors supporting both new and existing reactor licensees. The vendor inspections have identified issues related to design control, control of purchased material, equipment and services, test control, and corrective actions. Significant examples of findings include the qualification of explosive actuated valves that perform a key safety function in the AP1000 reactor design and issues associated with the design of the digital control system. These inspection findings represent instances where vendors supplying goods and services were not implementing quality assurance requirements necessary to assure their products fully bound all of the necessary design requirements. As part of efforts to improve industry performance, the NRC staff continued its participation in several quality assurance and inspection outreach activities, including: biennial vendor oversight workshops; meetings related to the Nuclear Procurement Issues Committee; American Society of Mechanical Engineers, Section III and meetings with NEI. The vendor inspection program also participates internationally to leverage the work of international regulators through the Multinational Design Evaluation Program Vendor Inspection Cooperation Working Group.

The NRC staff continues its rulemaking efforts to clarify 10 CFR Part 21, "Reporting of Defects and Noncompliance," consistent with its proposal in Commission paper SECY-11-0135, "Staff Plans to Develop the Regulatory Basis for Clarifying the Requirements in 10 CFR Part 21." The draft regulatory basis was made public in December 2012 to solicit early stakeholder feedback and the staff subsequently hosted a series of public meetings.

Advanced Reactors

Although vendors and advocates have approached the NRC for a variety of reactor technologies, the NRC staff has focused its attention on light-water small modular reactors (SMRs) because of expected near-term application submittals. The NRC staff has undertaken a variety of activities to prepare for applications for SMRs that may arrive in 2015. Reactors that do not use conventional fuels and moderators are referred to as advanced reactors. Below is a status update of the pre-application activities that the NRC has engaged in with SMRs and advanced reactor designers.

Next Generation Nuclear Plant

The staff has been working with DOE on resolving policy issues identified within the Next Generation Nuclear Plant (NGNP) program. Resolution of these issues is intended to support licensing of any future high-temperature gas-cooled reactor designs that might be submitted or licensing of other advanced reactor technologies.

In a letter dated October 17, 2011, former Secretary of Energy Steven Chu informed Congress that, given current fiscal constraints, competing priorities, projected cost of the NGNP prototype, and inability to reach agreement with industry on cost share, DOE would not proceed with the Phase II NGNP design activities at this time. The project would continue to focus on high-temperature reactor research and development activities, interactions with the NRC to develop a licensing framework, and establishment of a public-private partnership until conditions warrant a change in direction.

On February 15, 2012, the NRC staff issued a letter to DOE outlining the scope of remaining activities that would support DOE's interest in making progress on a licensing framework.

Subsequent interactions accordingly focused on four key issues previously highlighted in the NGNP Licensing Strategy Report that DOE and the NRC jointly issued to Congress in 2008. These issues concern: (1) licensing basis event selection; (2) radionuclide release source terms; (3) containment functional performance; and (4) emergency preparedness.

The staff will summarize the results from these NGNP interactions, along with supporting technical observations, in updated assessment reports on DOE's proposed approaches to these key issues. The updated assessment reports were reviewed by the NRC Advisory Committee on Reactor Safeguards in 2013 and will be publicly issued to DOE in 2014.

Light-Water Small Modular Reactors (SMRs)

NuScale Power, LLC

On March 10, 2014, NuScale Power, LLC (NuScale), provided a letter to the NRC entitled, "NuScale Power Updated Response to Regulatory Information Summary (RIS) 2013-18 for Design Certification Application Submittal Date," which modified their design certification (DC) application date previously provided in their response to RIS 2012-12, "Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs," dated December 28, 2012. NuScale announced a new DC application submittal date of the second half of CY 2016.

NRC and NuScale personnel continue to meet to discuss various aspects of the design such as steam and power conversion systems, electrical systems, control room and plant staffing, source term, auxiliary systems, instrumentation and controls, severe accident analysis, and containment design.

Generation mPower LLC and Tennessee Valley Authority (TVA)

While Babcock and Wilcox (B&W) has said publicly that they anticipate an application in early CY 2015, the NRC has not yet received a response to the NRC's RIS 2013-18, "Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs," dated November 15, 2013

The NRC staff has been engaged in pre-application activities with B&W, since mid-2009, and the NRC has received numerous technical reports and position papers on various aspects of the B&W mPower™ design. Through these early interactions, the NRC staff anticipates many of the most critical technical issues will have success paths before the application is received.

The NRC staff has developed the first design-specific review standard (DSRS) for the mPower design. The DSRS will function like the standard review plan and will consider safety and risk categorization for the systems, structures, and components during the reviews associated with the mPower design. The DSRS has allowed the staff to identify and work through complex technical issues in advance of the application, allowing the applicant to provide a more complete product that will be easier to review. The staff issued the draft version of the mPower DSRS in May 2013 for interim use and comment through the *Federal Register* and is developing the response to comments received on 154 technical documents associated with the draft DSRS. The staff held two public meetings in late 2013 to discuss selected sections while preparing the final mPower DSRS. The staff is continuing to move forward with the development of the Final mPower DSRS Sections and the Responses to the Draft DSRS Public Comments in preparation

for briefings of the NRC's Advisory Committee on Reactor Safeguards. The staff expects to issue the final guidance before the tendering of the mPower design certification application.

On December 30, 2013, TVA responded to RIS 2013-18, stating that it currently plans to apply for a 10 CFR Part 50 construction permit for up to four mPower reactors at the Clinch River site in Tennessee in the second quarter of CY 2015. The NRC staff will be conducting meetings with TVA to discuss site safety and environmental issues in preparation for this application. TVA's application schedule is dependent on the mPower design certification submittal, so their application plans are expected to shift if the application from Generation mPower is delayed.

Westinghouse and Ameren

Westinghouse is developing a 225 MWe power output SMR (WSMR) design and has stated that the smaller scale features of the WSMR are analogous to those of the AP1000 design certified under 10 CFR Part 52. The NRC staff met with Westinghouse at NRC headquarters on several occasions during this time period, on topics such as seismic issues, soil and structures; piping; and safety analysis. In addition, the NRC staff is conducting a technical review of a topical report regarding Westinghouse's identification and ranking of small break loss-of-coolant accident phenomena. Westinghouse responded to RIS 2013-18 and stated that it intends to submit a design certification for the WSMR sometime in the future but did not specify a date. Ameren Missouri had previously stated that it intended to submit a COL application for multiple WSMR units to be located at the existing Callaway site but is now evaluating other SMR options.

Holtec

Holtec is developing the Holtec SMR-160 design, which features a 160-MWe power output. On January 30, 2014, Holtec International provided a response to RIS 2013-18. In the response, Holtec noted that current SMR-160 project work is focused on those engineering and analysis activities necessary to complete the plant design specification and underpinning engineering records, in advance of preparing a design certification application. Holtec had previously communicated plans to submit a design certification application in the fourth quarter of CY 2016 in their RIS 2012-12 response; however, they are now reevaluating this date.

Other Reactor Technologies

Several private industry reactor designers and vendors have held discussions with the NRC regarding different non-light-water reactor (non-LWR) designs. In addition, the NRC staff maintains awareness of DOE's research programs for non-LWR technologies and the development of non-LWRs within the international community.