May 31, 2013

The Honorable Thomas R. Carper
Chairman, Subcommittee on Clean Air
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

On behalf of the Commission, I am pleased to submit the U.S. Nuclear Regulatory Commission's (NRC's) semiannual report on the status of our licensing and other regulatory activities. The enclosed report covers activities conducted by the NRC during the period from October 2012 through March 2013.

The fiscal year (FY) 2013 full-year continuing resolution appropriation was enacted on March 26, holding NRC funding to the FY 2012 level. Included in this appropriation is a requirement that the NRC fund an unbudgeted $15 million Integrated University Program. Further, a 5 percent sequestration went into effect March 1, and a subsequent 0.2 percent rescission was allocated to the NRC's budget as part of a larger Federal budget rescission necessary to meet the requirements of the sequestration. The combined effects of these actions result in an $83 million dollar reduction to the programs budgeted in the NRC's FY 2013 request. Impacts will include elimination of grants to universities (separate from those required above) and the Minority Serving Institutions program, delays to new reactor licensing reviews, reductions in several long-term research activities, delays in infrastructure upgrades and staff training, and delays to fuel cycle and uranium recovery environmental reviews. However, the NRC will be able to continue its safety and security mission for existing licensees, including new reactor and fuel cycle facility construction activities. In addition, we do not plan any employee furlough actions because of the sequestration.

The NRC response to the lessons learned from the Fukushima accident in Japan continues. The NRC's most significant efforts to implement lessons learned from Fukushima have continued to focus on the high priority Tier 1 activities, but work on the Tier 2 and Tier 3 activities also is progressing in line with our established schedules. At the time of the last report, the staff had just issued guidance for implementation of three NRC orders. Since then, the NRC also has issued several guidance documents for acceptable ways to conduct the seismic and flooding hazard reevaluations that were requested in a March 2012, letter. Now that guidance has been issued for all of the Tier 1 orders and request for information items, the NRC has provided licensees with clear expectations for implementation, and licensees are currently in the process of carrying out the NRC's requirements. In March 2013, the Commission instructed the staff to expand the existing NRC Order on reliable hardened containment vents to ensure the vents will be capable of working under conditions of a severe accident (i.e., reactor core damage). The staff plans to update implementation guidance by September 2013 to reflect the expansion of this Order. The Commission further instructed the

staff to undertake rulemaking to evaluate filtering strategies that would help limit potential releases of radioactive material to the environment in the event of a severe accident, which goes beyond the layers of protection already in place.

The progress made to date on Post-Fukushima lessons learned efforts is already yielding safety enhancements at nuclear power plants. For example, licensees have begun procuring equipment (e.g., portable pumps, generators, hoses, etc.) that, in accordance with the NRC Order on "mitigating strategies," can be used to mitigate a prolonged loss of electrical power at a nuclear power plant, which was the primary challenge to workers at Fukushima. While this equipment must still be integrated into site procedures, it is nonetheless increasingly present at reactor sites and reflects significant progress toward enhancing safety. As another example, last year, all plants completed plant walkdown inspections of structures, systems, and components that are designed for protection against seismic and flooding hazards. Reports from these inspections are currently under detailed review by NRC staff, and issues identified during the inspections by licensees and by NRC resident inspectors are being addressed through licensee corrective action programs. Resolution of these issues is being monitored by the NRC's resident inspectors through the agency's Reactor Oversight Process.

In February 2013, the NRC received "integrated plans" from each licensee providing the detailed, site-specific plans for fully implementing each of the NRC Orders. The NRC staff is reviewing these plans in detail and will issue a written safety evaluation for each plant. In March 2013, the NRC received the first set of flooding hazard reevaluations from approximately one-third of the plants. The other two thirds are due within the next two years based on an NRC prioritization. The staff is reviewing these hazard analyses in detail to determine if further action is needed to improve safety. The first set of seismic hazard reevaluations are due to the NRC in March 2014.

With regard to activities prioritized as Tier 2 and Tier 3, many depend upon completion of Tier 1 activities or require further evaluation before the need for regulatory action can be determined. Nevertheless, the NRC is making progress where practical. For example, all of the Tier 2 items related to supplying makeup water to spent fuel pools have been consolidated into near-term actions for implementing the mitigating strategies. Therefore, these items are now being addressed.

For all of the Tier 1, 2, and 3 activities, the NRC continues to place a high level of importance on public and stakeholder interaction. In FY 2012, the NRC held 82 public meetings related to Fukushima lessons learned, and these open collaborations have improved the quality and thoroughness of the NRC's actions. The agency's interactions continue at similar levels this year. Finally, the agency continues to balance the importance of implementing lessons learned from Fukushima with the need to ensure that our efforts do not displace ongoing work of greater safety benefit, work that is necessary to maintain safety, or other high-priority work.

The agency continues to make progress in addressing the issues raised in the June 8 ruling by the U.S. Court of Appeals for the District of Columbia Circuit that struck down the agency's 2012 update to the waste confidence decision and temporary storage rule. The Commission directed the NRC staff to prepare an environmental impact statement to support an updated waste confidence rule. The NRC conducted an environmental scoping process and solicited comments on the scope of the waste confidence generic environmental impact

statement (GEIS) from October 25, 2012, to January 2, 2013. The scoping process, which included four public meetings, was the first step in the development of a GEIS to support the proposed waste confidence rulemaking, and it helped inform the scope of the NRC's environmental review. The staff conducted three additional public meetings to continue the dialogue and maintain transparency. On March 5, 2013, the NRC staff completed and published the waste confidence GEIS scoping process summary report. The NRC is on schedule to issue the draft environmental impact statement and proposed waste confidence rule for public comment by September 2013.

During the period of October 2012 through March 2013, nine license renewal applications covering 14 reactors were under active review. The staff is reviewing 10 new reactor combined license applications for 16 proposed new reactor units. On March 1, the NRC issued the final license amendments necessary to authorize changes to the design details of shear reinforcement of the nuclear island basemat to allow pouring of the first nuclear concrete by South Carolina Electric & Gas Company and Southern Nuclear Operating Company at the V.C. Summer and Vogtle new AP1000 plant sites, respectively. Both of those concrete pours have since taken place.

On February 20, 2013, Florida Power Corporation provided written certification to the NRC of the permanent cessation of power operations at Crystal River, Unit 3, near Crystal River, FL. It also stated in writing that all fuel assemblies have been permanently removed from the reactor. On February 25, 2013, Dominion Energy Kewaunee certified that permanent cessation of power operations for the Kewaunee Power Station near Green Bay, WI, was scheduled to occur on May 7, 2013, with permanent defueling of the reactor vessel anticipated to be completed before the end of May. Once fuel has been removed, Kewaunee will join Crystal River in transitioning into decommissioning.

San Onofre Nuclear Generating Station (SONGS), Units 2 and 3, remain shut down to investigate the causes of unusual steam generator tube wear on the replacement steam generators. On October 3, 2012, Southern California Edison (SCE) submitted its response to the NRC's March 27, 2012, confirmatory action letter. Subsequently, the NRC staff issued requests for additional information to SCE on December 26, 2012, and February 1, 2013. In addition, during the period covered by this report, the NRC met with SCE in multiple public meetings to discuss SCE's proposal to restart Unit 2. Since the close of this reporting period, SCE has filed a license amendment request to restrict operation of Unit 2 to 70% of rated thermal power. The NRC continues its independent and detailed review of the issues at SONGS, and it has made no decision to authorize restart.

As of December 13, 2011, Fort Calhoun Station, near Omaha, NE, has been under the oversight of Inspection Manual Chapter 0350, "Oversight of Reactor Facilities in a Shutdown Condition Due to Significant Performance and/or Operational Concerns." This situation is the result of numerous problems at the site, including significant regulatory findings, a significant operational event (fire in electrical breakers) and Missouri River floodwaters affecting the site from May to September 2011. The NRC has established a special oversight panel to coordinate the agency's regulatory activities associated with assessing the performance issues at Fort Calhoun. In September 2011, the NRC issued a confirmatory action letter with a list of approximately 450 action items that must be addressed before startup. On February 26, 2013, the NRC issued an updated confirmatory action letter outlining three additional actions that

Omaha Public Power District officials have agreed to take before restarting the Fort Calhoun nuclear plant.

In preparation for Hurricane Sandy in October 2012, the agency sent additional inspectors to the nuclear power plants that the storm could potentially affect. The inspectors independently verified that plant operators were making proper preparations, following relevant procedures, and taking appropriate actions to ensure plant safety before, during, and after the storm. The NRC also monitored the storm from the Incident Response Center at the Region I office in Pennsylvania and the Emergency Operations Center at NRC headquarters. Three reactors experienced shutdowns during the storm (two automatic and one manual), and one nuclear power plant declared an alert due to high intake water levels. An alert is the NRC's second lowest level of four emergency levels. The safety systems for all impacted plants performed as expected. The NRC coordinated with other Federal and State agencies before restart of the affected plants.

On November 16, 2012, the NRC issued its Performance and Accountability Report for Fiscal Year 2012. This report describes the agency's program and financial performance, reflects the agency's achievement of both its safety and security strategic goals and all of its performance measures. A congressionally mandated report that summarizes much of this same information, also called the Citizen's Report, was issued in February 2013, to provide key financial and performance information for Congress and the public to assess how well the agency has carried out its mission.

Also in November 2012, the NRC issued its final State-of-the-Art Reactor Consequence Analyses Report. This effort used computer models and simulation tools to estimate realistic public health consequences of very unlikely accidents at two U.S. reactor sites representative of different reactor and containment designs. The results of the analyses indicate that accident scenarios progress more slowly and release much less radioactive material than previously calculated, and that the calculated risks of public health consequences from the modeled severe accidents are very small.

The NRC convened an International Regulators Conference on Nuclear Security in December 2012 that served as a first-ever event to promote discussion on a wide range of activities relevant to enhancing regulatory approaches for security at civilian facilities. It also offered an excellent opportunity to build relationships with counterpart regulatory entities with responsibility for nuclear and radioactive materials security.

In January 2013, the NRC hosted a multi-agency Federal workshop on improving extreme flood event hazard assessment. Participants included the U.S. Department of Energy, the Federal Energy Regulatory Commission, the Army Corps of Engineers, the Bureau of Reclamation, and the U.S. Geological Survey. The workshop was part of a research effort to incorporate event probabilities into a risk-informed approach for external hazards, such as flooding. The workshop was separate from ongoing NRC requirements for U.S. nuclear power plants to re-examine flooding hazards following the accident at Fukushima.

In March 2013, the NRC issued its annual assessment letters to the Nation's operating commercial nuclear power plants. As noted earlier, the Fort Calhoun Station in Nebraska is being monitored under a process for plants in an extended shutdown with significant performance issues; therefore, the licensee did not receive an annual assessment letter. Of the

99 highest-performing reactors, 81 met all safety and security performance objectives. Eighteen reactors were assessed as needing to resolve one or two items of low safety significance and will receive additional NRC inspection and attention to followup on corrective actions. Three nuclear reactors were in the third performance category, with a degraded level of performance and will receive additional NRC inspections, senior management attention, and oversight focused on the cause of the degraded performance. One reactor, Brown's Ferry Unit 1, in Alabama, is in the fourth performance category and requires increased oversight because of a safety finding of high significance. Over the course of the coming spring and summer, the NRC will host public meetings or other events in the vicinity of each plant to discuss the details of the annual assessment results.

The NRC's 25th annual Regulatory Information Conference was held March 12–14, 2013. The conference brings together participants from the United States and nations around the world and includes numerous technical presentations, as well as technical posters and tabletop presentations. It provides a unique forum for government, the nuclear industry, international agencies, and the public to meet and discuss nuclear safety topics and significant regulatory activities. Over 3,000 individuals from more than 30 countries registered for this year's event.

During this reporting period, the NRC submitted two events to the International Atomic Energy Agency for inclusion in the International Nuclear and Radiological Event Scale. The International Nuclear and Radiological Event Scale is a worldwide tool for member nations to communicate to the public, in a consistent way, the safety and significance of nuclear and radiological events. One event involved an overexposure of members of the public in Phillipsburg, New Jersey, in October 2011. In this case, a shutter of a gauge fell off, allowing non-radiation workers to access an area without a source being shielded. Four non-radiation workers received a dose greater than 1 rem, which is 10 times greater than the public dose limit of 100 millirem. The facility has taken actions to prevent recurrence. The other event involved the overexposure of a radiation worker in Tulsa, Oklahoma, in January 2013. In this case, the worker's annual dose of 5.9 rem exceeded the 5 rem occupational dose limit. The facility is investigating the cause of this incident. Both of these events were rated as 2 on the International Nuclear and Radiological Event Scale of 1 to 7.

Over the past six months, the agency has sought public comment on ongoing or proposed regulatory activities and has issued new final regulations through the use of *Federal Register* notices. These notices included requests for public comment on possible changes to the spent nuclear fuel storage and transportation regulatory framework and the FY 2013 Proposed Fee Rule. They also included publication of amended regulations regarding distribution of uranium and thorium and security regulations for risk-significant radioactive materials. In addition, in December 2012, the Decommissioning Planning Rule became effective, which is intended to improve decommissioning funding financial assurance and identification of contamination for future decommissioning. On March 12, 2013, the Commission approved actions to implement process enhancements to the rulemaking process to address the cumulative effects of regulation and requested the staff to consider the overall impacts of multiple rules. Orders, generic communications, advisories, and other regulatory actions on licensees and their ability to focus effectively on items of greatest safety importance.

From October 2012 through March 2013, the agency conducted approximately 500 public meetings, in the Washington, D.C. area and around the country, addressing a full range

of NRC issues. The meetings included Commission, Advisory Committee, Licensing Board, and staff-sponsored events. Also during this time, the NRC received 219 Freedom of Information Act (FOIA) requests and closed 174 FOIA requests. Of particular note, the agency has continued to process FOIA requests regarding the Fukushima Dai-ichi accident, several of which requested any and all documents relating to the accident. Since March 11, 2011, the NRC has received 47 such FOIA requests and released 117,217 pages of records to the public, including more than 20,000 pages released during the period covered by this report.

Finally, I am pleased to report that the NRC continued to post top scores in four key measures of organizational success in the Office of Personnel Management's annual Federal Employee Viewpoint Survey. The agency ranked first among the 37 largest Federal agencies in the categories of talent management and leadership and knowledge management, second in job satisfaction, and third in results-oriented performance culture. The NRC also ranked third among 22 mid-sized agencies in the "Best Place to Work" listing developed by the nonprofit Partnership for Public Service.

Please contact me for any additional information you may need.

Sincerely,

/RA/

Allison M. Macfarlane

Enclosure:
As stated

cc: Senator Jeff Sessions

Identical letter sent to:

The Honorable Thomas R. Carper
Chairman, Subcommittee on Clean Air
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator Jeff Sessions

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator David Vitter

The Honorable Fred Upton
Chairman, Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Henry Waxman

The Honorable Ed Whitfield
Chairman, Subcommittee on Energy and Power
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Bobby L. Rush

The Honorable John Shimkus
Chairman, Subcommittee on Environment
and the Economy
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Paul Tonko

The Honorable Rodney Frelinghuysen
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
United States House of Representatives
Washington, D.C. 20515
cc: Representative Marcy Kaptur

The Honorable Dianne Feinstein
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510
cc: Senator Lamar Alexander

Protecting People and the Environment

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

October 2012–March 2013

Note: The period of performance covered by this report includes activities that occurred from the first day of October 2012 to the last day of March 2013. 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, 43 operating nuclear power reactors are committed to transition to a risk-informed, performance-based fire protection licensing basis permitted under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(c). This licensing basis also is known as National Fire Protection Association (NFPA) 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 that have already made the transition or one plant that has not committed to transition yet but is likely to do so.

In April 2011, the Commission approved a policy paper (see SECY-11-0033, "Proposed NRC Staff Approach To Address Resource Challenges Associated with Review of a Large Number of NFPA 805 License Amendment Requests," dated March 4, 2011), which allows 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). Twelve LARs (for 21 reactor units) are scheduled to be submitted in FY 2013, and the remaining three LARs (for four reactor units) are scheduled to be submitted in FY 2014. One licensee has informed the U.S. Nuclear Regulatory Commission (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 three reactor plants that were actively transitioning have informed the staff of their intent to remain in their current licensing basis and not transition to NFPA 805. 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 45 percent of the current commercial power reactor units licensed to operate in the United States.

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, Units 1 and 2 (VEGP) 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. Implementing 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 operating nuclear power plants. The NRC also continues 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.

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 March 7, 2013, which

summarized the 2012 end-of-cycle performance assessments and associated annual assessment letters for all operating nuclear power plants. Plant assessments and the latest ROP-related information are publicly available on the NRC Web site.

The staff continues to make program improvements based on feedback and lessons learned. For example, based on feedback from NRC management and external stakeholders, the staff initiated an ROP enhancement effort to take a fresh look at several key areas of the ROP. While the staff was commencing its ROP enhancement efforts, the Commission directed the staff to pursue an independent review of the ROP's objectives and implementation in its staff requirements memorandum (SRM) to SECY-12-0081, "Risk--Informed Regulatory Framework for New Reactors," dated October 22, 2012. As a result, the staff initiated an independent assessment of the program to identify potential enhancements or areas for further examination. In addition, the staff is in the process of finalizing its annual self-assessment of the ROP and the Industry Trends Program, which has been forwarded to the Commission and will be discussed at a public Commission meeting.

The NRC hosted public meetings on the ROP on October 17 and November 29, 2012, and on January 17 and February 21, 2013. The ROP working group and other interested stakeholders attended these meetings to provide a forum for external feedback on staff initiatives and to discuss and resolve frequently asked questions regarding interpretation of performance indicator guidance. The ROP working group comprises representatives from industry and the NRC staff who work toward continuously improving the ROP and reactor safety.

III Status of Issues Tracked in the Reactor Generic Issues Program

The Generic Issues Management Control System is tracking five open generic issues (GIs). The status of each open issue is described below:

GI-189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion during a Severe Accident"

This GI involves the early containment failure probability of ice condenser containments, which are dominated by nondirect containment heat hydrogen combustion events. The staff subsequently extended the issue to include boiling-water reactor (BWR) Mark III containments because their relatively low free volume and strength are comparable to pressurized-water reactor (PWR) ice condensers.

The NRC staff reviewed proposals from licensees affected by GI-189 and concluded that the proposed modifications will resolve GI-189 and provide benefit for some separate security scenarios identified during the course of the GI-189 review. On June 15, 2007, the NRC staff issued letters to affected licensees accepting their commitments to changes that enhance plant capabilities to mitigate the potential for early containment failure from hydrogen combustion. Since that time, licensee implementation and NRC verification inspections performed under NRC Temporary Instruction 2515/174, "Hydrogen Igniter Backup Power Verification," dated February 12, 2008, have been completed at all nine affected sites. In November 2010, the staff received a commitment from the Tennessee Valley Authority to implement measures at Watts Bar Unit 2 equivalent to those carried out at Watts Bar Unit 1.

Assessments of the March 2011 nuclear accident in Japan continue and may touch on other issues associated with hydrogen combustion under Near-Term Task Force Recommendation 6. The NRC Japan Lessons-Learned Project Directorate will proceed independently to address

other hydrogen combustion issues, if required. On January 31, 2013, the staff transmitted a technical report supporting closure of GI-189 to the Advisory Committee for Reactor Safeguards (ACRS) for review. The staff expects to proceed with closure of GI-189 in April 2013 following ACRS endorsement.

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. An associated 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 has been performed. Additional testing and NRC evaluation are continuing to resolve NRC staff concerns about the earlier testing results and related assumptions. In December 2010, the Commission determined that 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.

In December 2012, Commission endorsed the staff's proposed options for resolving GI-191. As part of the resolution process, licensees have the flexibility to choose one of several proposed options to resolve GI-191. When implemented, licensees (including those choosing the risk-informed option) will mitigate the potential for debris blockage of the strainer or debris entry into the reactor core. Closure for this GI is projected for 2018.

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

This GI involves an evaluation of suppression pool designs, in particular the possibility of air, which is discharged into the pool following a LOCA, being ingested into ECCS piping and affecting the ECCS pumps.

Based on a staff request, the BWR owners group provided voluntary, proprietary data on the characteristics of LOCA phenomena at the earliest stages of the postulated accidents, along with its general assessment of the issue. The Purdue University Multi-Dimensional Integral Test Assembly (PUMA) test facility conducted experiments to confirm the potential for bubbles to be formed during a simulated LOCA blowdown and transported widely in the pool. An updated literature review completed in January 2013 provides the acceptable and unacceptable void fraction ranges at the ECCS pump intake to support pump operation. Review of the findings continues, and the NRC is evaluating the potential for use of sophisticated analytical tools, such as computational fluid dynamics.

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 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 it had issued the GI-199 Safety/Risk Assessment Report. 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 their site’s seismic hazards using present-day guidance and methods. For plants in the central and eastern United States, the seismic hazard reevaluations will be completed by March 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 within 3 or 4 years of the submittal date of the seismic hazard reevaluations, 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 response to the lessons learned from the Fukushima nuclear accident in Japan. Licensees must submit their flood hazard reevaluations to the NRC in one of three prioritized categories by either March 2013, March 2014, or March 2015.

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 2013 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 2013 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 and FY 2012 results, FY 2013 goals and the FY 2013 mid-year results for the NRC Performance Budget plan output measures for operating power reactor licensing actions and other licensing tasks.

PERFORMANCE BUDGET PLAN				
Output Measure	**FY 2011 Actual**	**FY 2012 Actual**	**FY 2013 Goals**	**FY2013 Mid-Year Actual**
Licensing actions completed per year	849	770	802	348
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	93% ≤ 1 year and 100% ≤ 2 years
Other licensing tasks completed per year	465	674	577	239
Age of other licensing tasks inventory	94.2% ≤ 1 year and 99.6% ≤ 2 years	94.6% ≤ 1 year and 100% ≤ 2 years	90% ≤ 1 year and 100% ≤ 2 years	95.5% ≤ 1 year and 100% ≤ 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 1984, NRC licensing reviews have considered the long-term storage and disposal of spent nuclear fuel as a generic issue, which was addressed by the Commission's Waste Confidence Decision and Rule (10 CFR 51.23, "Temporary Storage of Spent Fuel After Cessation of Reactor Operations – Generic Determination of No Significant Environmental Impact"). In June 2012, the U.S. Court of Appeals for the District of Columbia vacated the 2010 update to this rule. In response, the Commission has directed staff to complete a revised, final Waste Confidence Decision and Rule by September 5, 2014.

The NRC staff continues its review of LRAs and continues to issue draft and final supplemental environmental impact statements (SEISs) (license renewal environmental impact statements are supplements to NUREG-1437, "Generic Environmental Impact Statement for License

Renewal of Nuclear Plants," with the appropriate explanatory text and continues to issue safety evaluation reports (SERs). The staff will not issue renewed licenses, until the promulgation of a final revision to the Waste Confidence Decision and Rule.

Applications Currently under Review

The NRC currently has nine LRAs for 14 reactor units under review, not including one LRA that was withdrawn by the applicant. The following is the status of applications currently under review. Previously issued semiannual reports describe activities that occurred before October 2012.

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 period. In June 2012, the staff issued a draft 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. In addition, activities related to the Atomic Safety and Licensing Board (ASLB) hearing process continued.

Crystal River Nuclear Generating Plant, Unit 3

On December 16, 2008, the Florida Power Corporation submitted an LRA for Crystal River Nuclear Generating Plant, Unit 3, to extend the operating license for an additional 20 years beyond the current license period. This application was withdrawn by the applicant in February 2013, reflecting its decision to permanently cease operations, and is no longer under review.

Diablo Canyon 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. The staff's review of the application is currently on hold, with the exception of ongoing consultations with the California State Office of Historic Preservation, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. PG&E requested the hold because of a delay in its 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. In addition, an admitted contention remained pending before the ASLB.

Seabrook Station

On June 1, 2010, NextEra Energy Seabrook, LLC, submitted an LRA for the Seabrook Station to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, in June 2012, the staff issued the SER with Open Items and issued a Notice of Intent to prepare a supplement to the August 2011 draft SEIS. The draft supplement is scheduled to be issued in April 2013. In addition, activities related to the ASLB hearing process continued.

Davis-Besse Nuclear Power Station

On August 30, 2010, FirstEnergy Nuclear Operating Company submitted an LRA for the Davis-Besse Nuclear Power Station to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff issued the SER with Open Items in July 2012 and continued the safety and environmental reviews of the application.

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 license for an additional 20 years beyond the current license periods. During the reporting period, the staff continued the safety and environmental reviews of the application. The safety review for this application has been voluntarily suspended by the applicant for 1 year, and is currently on hold.

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 license for an additional 20 years beyond the current license periods. During the reporting period, the staff conducted onsite inspections related to the safety review of the application and continued the safety and environmental reviews of the application. The staff issued the SER with open items in July 2012, and issued the final SER in January 2013. In addition, activities relating 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 issued the SER with open items in January 2013 and continued the safety and environmental reviews of the application.

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. During the reporting period, the staff conducted onsite audits related to the safety and environmental reviews of the application.

Sequoyah Nuclear Plant, Units 1 and 2

In January 2013, Tennessee Valley Authority submitted an LRA for Sequoyah Plant, Units 1 and 2, to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff conducted onsite audits related to the safety and environmental reviews of the application.

Generic Environmental Impact Statement Update

The NRC continued the process of revising NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants,” issued in May 1996, and the associated guidance documents in support of a rulemaking to amend and update the environmental

protection regulations for renewing nuclear power plant operating licenses. The NRC plans to publish the revised generic environmental impact statement, final rule, and associated guidance documents in FY 2013.

VI Summary of Reactor Enforcement Actions

The reactor enforcement statistics in the tables below are arranged by region, half year, most recent 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. However, 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 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 13	4	5	0	4	13
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	4	5	0	4	13
	FY 12 Total	4	8	1	8	21
	FY 11 Total	4	16	1	5	26
Non-Cited Severity Level IV or Green	1st Half FY 13	67	70	98	155	390
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	67	70	98	155	390
	FY 12 Total	143	151	227	296	817
	FY 11 Total	165	113	228	260	766
TOTAL Cited and Non-Cited Severity Level IV or Green	1st Half FY 13	71	75	98	159	403
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	71	75	98	159	403
	FY 12 Total	147	159	228	304	838
	FY 11 Total	169	129	229	265	792

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 13	0	0	0	0	0
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	0	0	0	0
	FY 12 Total	0	0	0	0	0
	FY 11 Total	0	0	0	0	0
Severity Level II	1st Half FY 13	0	0	0	0	0
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	0	0	0	0
	FY 12 Total	0	0	0	0	0
	FY 11 Total	0	0	0	0	0
Severity Level III	1st Half FY 13	0	2	0	1	3
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	2	0	1	3
	FY 12 Total	0	2	0	2	4
	FY 11 Total	0	1	0	1	2
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 13	0	2	0	1	3
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	2	0	1	3
	FY 12 Total	0	2	0	2	4
	FY 11 Total	0	1	0	1	2

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 13	0	0	0	0	0
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	0	0	0	0
	FY 12 Total	0	0	0	1	1
	FY 11 Total	0	1	0	0	1
Violations Related to Yellow Findings	1st Half FY 13	0	0	0	0	0
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	0	0	0	0	0
	FY 12 Total	0	1	1	1	3
	FY 11 Total	0	0	0	1	1
Violations Related to White Findings	1st Half FY 13	1	2	3	2	8
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	1	2	3	2	8
	FY 12 Total	4	5	3	0	12
	FY 11 Total	2	4	5	2	13
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 13	1	2	3	2	8
	2nd Half FY 13	--------	--------	--------	--------	--------
	FY 13 YTD Total	1	2	3	2	8
	FY 12 Total	4	6	4	2	16
	FY 11 Total	2	5	5	3	15

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.

Carolina Power and Light Company (Shearon Harris Nuclear Power Plant)—EA-12-132

On October 3, 2012, the NRC issued a notice of violation associated with a white SDP finding and a Severity Level III violation to Carolina Power and Light Company (CP&L). The white finding was issued for the failure of Shearon Harris personnel to maintain adequate emergency facilities and equipment to support emergency response, as required by 10 CFR 50.54(q) and

10 CFR 50.47(b)(8), and the Severity Level III violation was issued for CP&L's failure to make an 8-hour report of the occurrence of a major loss of emergency assessment capability, as required by 10 CFR 50.72(b)(3)(xiii). Specifically, between August 4, 2009, and November 9, 2011, CP&L failed to maintain adequate emergency facilities and equipment to support emergency response when the Emergency Operations Facility normal and emergency ventilation system was in a degraded state or removed from service for extended periods of time. CP&L failed to report this condition as required between August 4, 2009, and November 9, 2011.

FirstEnergy Nuclear Operating Company (Beaver Valley Power Station)—EA-12-158

On October 4, 2012, the NRC issued a notice of violation to FirstEnergy Nuclear Operating Company for a violation associated with a greater-than-green SDP finding at the Beaver Valley Power Station. The details of the finding are official use only–security-related information.

Duke Energy Carolinas, LLC (Catawba Nuclear Station) —EA-12-153

On October 11, 2012, the NRC issued a Notice of Violation to Duke Energy Carolinas, LLC (DEC) for a violation of Technical Specification (TS) 3.8.1, "AC Sources - Operating," associated with a White Significance Determination Process finding involving DEC's failure to maintain two qualified circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System operable when operating in MODES 1, 2, 3 or 4. Specifically, from July 23, 2011, until November 11, 2011, when operating in MODE 1, one qualified circuit between the offsite transmission network and the Onsite Essential Auxiliary Power System was inoperable, and from November 11, 2011, until April 4, 2012, when operating in MODES 1, 2, 3, or 4, two qualified circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System were inoperable.

Energy Northwest (Columbia Generating Station)—EA-12-092

On October 24, 2012, the NRC issued two white findings with associated violations and a notice of violation (NOV) for a Severity Level III violation to Energy Northwest as a result of an inspection at the Columbia Generating Station. The first white finding involved the failure to maintain a standard emergency action level scheme in accordance with 10 CFR 50.47(b)(4). The second White finding involved the failure to maintain adequate methods for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition in accordance with 10 CFR 50.47(b)(9). A Severity Level III violation was assessed for the licensee's failure to recognize that their identified inaccuracies in the dose projection system constituted a major loss of emergency assessment capability and failure to report it to the NRC in accordance with 10 CFR 50.72(b)(3)(xiii). The licensee has informed the NRC that multiple corrective actions are in place and/or planned.

FirstEnergy Nuclear Operating Company (Davis-Besse Nuclear Power Station)—EA-12-179

On November 8, 2012, the NRC issued a Notice of Violation to FirstEnergy Nuclear Operating Company for a violation associated with a greater-than-green SDP finding at the Davis–Besse Nuclear Power Station. The details of the finding are official use only security-related information.

NextEra Energy Point Beach, LLC (Point Beach Nuclear Plant, Unit 1—EA-12-220

On January 2, 2013, the NRC issued a Notice of Violation to NextEra Energy Point Beach, LLC for a violation of Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with a White Significance Determination Process finding involving the failure of Point Beach personnel to prescribe maintenance on the safety-related turbine driven auxiliary feedwater (TDAFW) pump, an activity affecting quality, by documented instructions of a type appropriate to the circumstances. Specifically, Work Order 40101094 used to perform maintenance on the TDAFW pump specified a first time evolution of unbolting the steam exhaust piping to the turbine, aligning the turbine to the pump, and then re-bolting the steam piping to the turbine. The documented instructions were not appropriate to the circumstances in that they did not ensure the final turbine-to-pump alignment was performed after the bolting of the steam exhaust piping to the turbine flange. This led to the failure of the turbine-to-pump coupling on May 21, 2012.

FirstEnergy Nuclear Operating Company (Beaver Valley Power Station)—EA-12-254

On February 20, 2013, a confirmatory order was issued to the FirstEnergy Nuclear Operating Company (FENOC), confirming FENOC's commitment to submit a license amendment request to transition its two units to the NFPA Standard 805. FENOC had originally planned to submit its application on September 30, 2012. The NRC reviewed FENOC's justification for the delay, and accepted the proposed new submittal date of December 31, 2013.

Southern Nuclear Operating Company, Inc. (Farley Nuclear Plant, Units 1 and 2)—EA-12-240

On March 4, 2013, an NOV was issued to Southern Nuclear Operating Company, Inc., for a Severity Level III problem for the failure to implement: (1) 10 CFR 50.48, "Fire Protection," and (2) 10 CFR 50.9(a), "Completeness and Accuracy of Information." Between September and December 2011, four contract employees willfully failed to complete fire watch rounds required to ensure that Farley remained in compliance with 10 CFR 50.48. In addition, these same employees falsified fire watch logs by annotating that hourly fire watches were completed when, in fact, they had not been performed. These actions caused Farley to be in violation of 10 CFR 50.48 and 10 CFR 50.9(a).

Entergy Operations, Inc. (Arkansas Nuclear One, Unit 1)—EA-13-031

On March 20, 2013, a confirmatory order was issued to Entergy Operations, Inc. (Entergy), confirming Entergy's commitment to submit a license amendment request to transition Arkansas Nuclear One, Unit 1 to NFPA Standard 805. Entergy had originally planned to submit its application on August 31, 2012. The NRC reviewed Entergy's justification for the delay, and accepted the proposed new submittal date of January 31, 2014.

Northern States Power Company (Prairie Island Nuclear Generating Plant)—EA-12-273

On March 26, 2013, the NRC issued an NOV to Northern States Power Company, Minnesota, for a violation of 10 CFR 50.54, "Conditions of Licenses," and risk significant planning standards 10 CFR 50.47(b)(4) and (b)(8) associated with a white significance determination process finding. The finding involved the failure to recognize that the 1R-50 shield building high range vent gas radiation detector at Prairie Island Nuclear Generating Plant (Prairie Island) was a single piece of equipment necessary for emergency preparedness action levels and failure to

recognize its importance to the emergency preparedness program. Specifically, from July 24, 2011, to May 18, 2012, the 1R-50 high range detector was inoperable, which degraded Prairie Island's ability on Unit 1 to classify and declare general emergencies or site area emergencies. Prairie Island did not take timely corrective actions to restore the monitor, which is a piece of equipment necessary to support the emergency preparedness program.

VII Power Reactor Security and Emergency and Incident Response Activities

The NRC continues its security inspection and oversight activities, as well as its rulemaking activities to incorporate applicable security and emergency preparedness enhancements into the regulations. Licensee compliance with the NRC's emergency preparedness requirements provide reasonable assurance that adequate measures can and will be taken to mitigate plant events, minimize possible radiation doses to members of the public, and ensure that the agency can respond effectively to events at licensee sites.

The NRC is continuing force-on-force inspections at each nuclear power reactor and Category I fuel cycle facility on a normal 3-year cycle. The force-on-force inspections assess the defensive strategies in place at licensed facilities and highlight areas that need improvement. The current 3-year force-on-force cycle began in January 2011. Since that time, the NRC has completed 46 force-on-force inspections at power reactor sites and one force-on-force inspection at a Category I fuel cycle facility. The NRC also has conducted three force-on-force reinspections at power reactor sites as followups to previous inspections. The NRC remains committed to working with industry to improve the realism and effectiveness of the force-on-force inspection program.

The NRC is continuing the development of a final rule amending security requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," to implement the new statutory authority provided by Section 161A of the Atomic Energy Act of 1954, as amended. The revised regulation will enable certain NRC licensees to apply to the NRC for permission to use certain standard weapons or enhanced weapons and large capacity ammunition feeding devices, notwithstanding local, State, and certain Federal firearms laws (referred to as preemption authority and enhanced weapons authority, respectively). Almost all NRC licensees were previously restricted from obtaining such weapons or devices. The NRC has received requests from four power reactor licensees and one Category I fuel facility for preemption authority under Section 161A. The NRC is continuing its review of the technical and policy issues raised by these applications, and it is coordinating its actions with the U.S. Department of Justice.

In accordance with 10 CFR 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 amount of work and significant lead time required to fully implement all the provisions called for in licensees' NRC-approved cyber security plans, interim milestones were established to focus efforts on the highest priority activities, which were completed by December 31, 2012.

The NRC developed an oversight program that includes cyber security inspector training, an inspection program, and a process for evaluating the significance of inspection findings. The inspection program includes developing temporary instructions to be used in inspections for both the interim milestones and the full implementation of licensees' cyber security programs. 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 will inspect the interim milestones at 44 facilities in calendar year (CY) 2013 and 2014. The remaining facilities being inspected for full cyber security program implementation in CY 2015.

The NRC developed and issued 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, nonpower reactors (NPRs), independent spent fuel storage installations (ISFSIs), and byproduct materials licensees. The NRC is presently implementing the activities set forth in the roadmap. To date, the staff has conducted assessments at fuel cycle facilities, NPRs, and ISFSIs, and a working group is being established for byproduct materials licensees. The implementation of this roadmap will ensure that appropriate levels of cyber security actions are implemented in a timely and efficient manner at all NRC-licensed facilities and identify if any program improvements are needed.

The NRC's Office of Nuclear Security and Incident Response continues to focus on emergency preparedness (EP) activities related to the Fukushima Dai-ichi response, in particular addressing the NRC's Near-Term Task Force Recommendation 9.3 concerning communication and staffing. The NRC issued letters to all licensees to better understand the existing capabilities and plans for staffing during an event involving multiple reactor units and for being able to maintain communication during a prolonged station blackout. The staff now is evaluating the responses to these letters and will determine the need for further regulatory action.

The revised EP rule became effective on December 23, 2011. This was the first significant revision to the rule in over 30 years, and its implementation continues into FY 2013. 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. Among other changes, the EP regulations were amended to require licensees to include hostile action scenarios and other scenario variations in drills and exercises to ensure that licensees undertake more challenging exercises.

In April 2012, the NRC and the Federal Emergency Management Agency (FEMA) began a multiyear 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 continues in FY 2013. Extensive stakeholder involvement will be provided throughout the revision process, including several public meetings and FEMA working group meetings that will focus on gathering and dispositioning stakeholder inputs on emergency planning guidance topics that should be addressed in the revised document.

Consistent with its policy to provide States with potassium iodide, as requested, 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.

The NRC completed its modernization of its Emergency Response Data System, which transmits real-time information from nuclear power plants to the NRC and State operations

centers during declared emergencies. The modernization of this system enhances cyber security and reliability and includes improvements to the user interface.
All emergency preparedness and physical security program licensing reviews continue to be on schedule for new power reactor applications. The NRC continues to work with the U.S. Department of Homeland Security and FEMA to ensure that milestones are accomplished in accordance with the predetermined schedules.

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 plants. The NRC staff has reviewed and approved 146 power uprates to date. Approximately 20,470 megawatts thermal (MWt) or 6,823 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 16 power uprate applications under review, which would add an additional 3,116.6 MWt or 1038.39 MWe to the Nation's electrical grid.

In December 2012, the NRC staff conducted its most recent survey of nuclear power plant licensees to obtain information on whether they planned to submit power uprate applications over the next 5 years. This latest information indicates that licensees plan to request power uprates for 10 nuclear power plants during the next 5 years.

IX New Reactor Licensing

The new reactor program consists of three subprograms: licensing, construction inspection, and advanced reactors. The NRC is focusing on licensing and construction activities that support large light water reactor applicants and licensees. The NRC 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.

Application Review

The NRC expects to review the applications for most new 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.

As part of the agency's response to the Fukushima accident, the new reactor program is addressing the Fukushima Near-Term Task Force recommendations as approved by the Commission. Consistent with the Commission direction provided in Staff Requirements

Memorandum SECY-12-0025, "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," dated March 9, 2012, the staff ordered Vogtle Electric Generating Plant Units 3 and 4, and Summer Units 2 and 3, to address the portions of Tier 1 Recommendations 4.2 and 7.1 not already covered by the referenced certified design or COL review. The orders required the licensees, before fuel load, to address requirements for mitigation strategies to sustain core cooling, containment, and spent fuel pool cooling functions indefinitely. The applicable Commission-approved Fukushima actions not already addressed as part of the licensing process are being addressed for new reactors in the same manner as operating reactor licensees. For design certifications and COL applications submitted under 10 CFR Part 52 that are currently under active staff review, the staff plans to ensure that the Commission-approved Fukushima actions are addressed before certification or licensing. The staff has requested all COL and ESP applicants to provide the information required by orders and request-for-information letters through the review process.

The NRC is making progress on the 10 CFR Part 52 applications currently under review as discussed below. Major accomplishments for the new reactor licensing program during this reporting period include issuance of the final environmental impact statement (FEIS) for the Fermi COL and issuance of license amendments to the V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4 COLs authorizing changes to the design details of shear reinforcement of the nuclear island basemats to allow for pouring of first nuclear-grade concrete at these sites. The NRC staff issued revised schedules for the U.S. EPR and US APWR design certification reviews and for the Levy County, Fermi 3 and STP combined license application reviews.

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). The NRC staff is currently assessing schedule impacts resulting from the applicant's delays in submitting complete responses to requests for additional information. The staff plans to issue a schedule revision letter during the second quarter of 2013.

Design Certification Reviews

Economic Simplified Boiling-Water Reactor

The NRC staff issued the final safety evaluation report (FSER) and final design approval on March 9, 2011. The NRC published the proposed rule in the *Federal Register* on March 25, 2011. The NRC received 10 public comment submissions, and all 10 public comment submissions will be addressed in the final rule. On January 19, 2012, the staff informed GE Hitachi Nuclear Energy (GEH) that issues have been identified that are 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 have been identified in a number of GEH's modeling parameters. The NRC staff informed GEH that these errors may affect the conclusions in the staff's FSER and

need to be addressed before the staff completes the ESBWR DC. The staff audited the steam dryer analysis at the GEH offices in March 2012 and issued requests for additional information (RAIs) to GEH in May 2012. GEH plans to submit remaining RAI responses to the NRC in April 2013. The NRC staff will reestablish a rulemaking schedule after GEH provides its RAI responses.

U.S. Evolutionary Power Reactor Design Certification

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

In May 2012, the NRC staff completed Phase 3, the ACRS review of 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 May 10, 2012, AREVA submitted a new schedule that delayed its response to certain open items until August 2013. While AREVA's timing for submittal of its responses has not significantly changed since May 2012, AREVA has proposed or made multiple changes in methodology and design in several prominent technical areas that have impacted, or will impact, the staff's review. On March 5, 2013, the NRC staff issued a revised schedule letter to AREVA. The NRC staff now expects to issue the FSER in November 2014 and complete the EPR Rulemaking by June 2015. This revised schedule assumes AREVA's ability to provide quality and timely information to the NRC in order to complete the 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 August 29, 2012, MHI informed the staff of its plans to make changes to the seismic and structural design. On September 13, 2012, the NRC issued a letter to MHI identifying the staff’s concern about ongoing design changes, staff expectations, and the use of acceptance reviews for future submittals. As a result, MHI reevaluated the submission schedule included in its August 29, 2012, closure plan. During a public meeting on October 10, 2012, MHI presented the status of its US-APWR seismic review. MHI summarized the seismic design changes, described an integrated approach for establishing the design basis for seismic and structural analyses, and outlined the actions taken to minimize additional seismic-related design changes. MHI also described the future actions that MHI management will be taking to ensure high quality, technically complete and timely submittals to the NRC.

MHI submitted the first set of revised technical reports on December 4, 2012 and January 7, 2013. On January 21, 2013, the staff completed its acceptance review of MHI’s two technical reports, MUAP-10006 Rev 3, “Soil-Structure Interaction Analyses and Results for the US-APWR Standard Plant,” and MUAP-11007 Rev 2, “Ground Water Effects on SSI.” On February 28, 2013, the NRC staff issued a revised schedule letter to MHI with a Final Safety Evaluation Report completion date of September 2015 and a final US-AWPR Rulemaking date of February 2016.

MHI has begun design enhancements to provide assurance that “Fukushima-like” event mitigation capabilities and enhanced safety margins are incorporated into the US-APWR standard design. The NRC staff has issued RAIs concerning implementation of some of the Fukushima Near-Term Task Force recommendations. On January 9, 2013, in a public meeting with the NRC staff, MHI provided an update to its US-APWR Fukushima response strategy.

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 by late 2013 and submit Revision 2 no sooner than fourth quarter of CY 2014. In order to avoid duplicate reviews, Toshiba requested that the NRC delay reviewing its application until it submits Revision 2. In a letter to Toshiba dated January 31, 2013, the staff agreed to recommence the review after Revision 2 is submitted.

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, describing 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 September 17, 2012, GEH indicated that it plans to submit a revised application by the second quarter of 2014.

Combined License Application Activities

As of March 31, 2013, the NRC had received 18 COL applications for review. Five of the reviews have been suspended because of changes in the applicants' business strategies, as described below. The Victoria COL application was withdrawn following docketing of the Victoria ESP application. (The Victoria ESP application was subsequently withdrawn on August 28, 2012.) COLs were issued for the Vogtle and Summer sites. The NRC is actively reviewing 10 COL applications.

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, Florida.

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. ACRS subcommittee meetings were completed October 18–19, 2011. The ACRS full committee meeting was held December 1, 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 Safety Evaluation Report (SER) in December 2012.

In November 2012, the NRC staff completed its review of the applicant's RAI response related to NRC Bulletin 2012-01, "Design Vulnerability in Electric Power System" dated July 27, 2012, to 10 CFR Part 50 and 52 licensees. The NRC staff held an industry-wide public meeting on February 28, 2013 to discuss industry responses to NRC Bulletin 2012-01 and to obtain feedback regarding industry actions to resolve the electric power system design vulnerability. The NRC staff is currently considering regulatory actions, including actions specific to the AP1000 design that would be applicable to the Levy County COL application.

On November 12, 2012, Progress Energy Florida submitted a revised Emergency Plan and proposed license condition to address the revised EP Rule, promulgated in 2011. The NRC staff is reviewing the applicant's submittals related to the revised EP Rule and plans to issue a revised SER in July 2013.

The NRC staff issued a revised schedule letter to Progress Energy Florida on January 24, 2013. The NRC staff expects to issue its Final Safety Evaluation Report for the Levy County COL application in September 2013.

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, South Carolina.

The NRC issued the draft environmental impact statement (DEIS) on December 13, 2011, and the DEIS comment period ended on March 6, 2012.

On April 25, 2012, The NRC staff issued Fukushima-related RAIs to the applicant. On October 17, 2012, the NRC staff received a letter from Duke Energy stating that it will not incorporate its seismic analysis into its FSAR submittal until January 2014. The applicant's delayed response will result in a significant shift to the currently published schedule for completion of the NRC staff's safety evaluation.

In its October 17, 2013 letter, Duke also informed the NRC that it intends to move the nuclear island approximately 50 feet to the east and 66 feet to the south, and to raise the base elevation by 3 feet. During a February 7, 2013 public meeting with the NRC, Duke presented the changes to their application resulting from the nuclear island relocation. The applicant's changes will impact the NRC staff's schedule for completing both the SER and the FEIS. The NRC staff is currently reviewing the scope of additional work required in order to issue a revised schedule for the Lee COL review.

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, Florida.

Significant issues include the regional geology and seismology review that involves a first-time review of various seismology parameters and models for the Caribbean region, and the site selection process. In a letter dated May 4, 2012, the NRC staff informed the applicant that the NRC staff's review of the geology, seismology, and geotechnical engineering sections of the Turkey Point COL application would not continue until the applicant provides the needed

detailed technical information. The NRC staff has now received all of the applicant's RAI responses related to the geology, seismology and geotechnical engineering review and the staff is evaluating whether it can resume its review in these technical areas.

The NRC staff issued RAIs on the alternative site selection process in July 2012 and November 2012. The NRC staff held public meetings with the applicant on December 7, 2012 and on February 1, 2013. The NRC staff has determined that the information provided by the applicant to date regarding the viability of the inland sites is inconsistent with NRC guidance and with related case law. The NRC staff issued a letter on February 28, 2013, to inform FPL that the alternative sites review is suspended until the NRC staff and the U.S. Army Corps of Engineers (USACE) are satisfied that the proposed alternative sites meet all applicable requirements.

Shearon Harris Combined License Application

On February 19, 2008, Progress Energy Carolinas, Inc. submitted a COL application for two AP1000 units to be located at its Shearon Harris Nuclear Power Plant site, near New Hill in Wake County, North Carolina. On July 1, 2012, Duke Energy and Progress Energy Carolinas, Inc. merged to form one company.

On November 14, 2012, the applicant informed the NRC staff that it would not submit its need for power and Fukushima-related seismic responses until later in 2013. The NRC is staff is waiting for the applicant's response submittal.

South Texas Project Combined License Application

On September 20, 2007, STPNOC submitted a COL application for two ABWR units to be located at its site near Bay City, in Matagorda County, Texas. As of January 24, 2011, Nuclear Innovation North America LLC (NINA) became the lead applicant for South Texas Project (STP), Units 3 and 4. As such, NINA assumed responsibility for design, construction, and licensing of STP, Units 3 and 4. STPNOC will retain responsibility for operation of the units. As lead applicant, NINA will act on behalf of all applicants for STP, Units 3 and 4.

The NRC published the FEIS on February 24, 2011. The ASLB heard testimony on two admitted environmental contentions in August and October 2011 and has ruled in favor of the NRC staff on both.

By letter dated May 31, 2012, NINA informed the NRC that, as a merchant power plant, it would be difficult to secure funding before the issuance of a COL. By the same letter, NINA requested that the Commission provide guidance to the NRC staff regarding financial qualification of merchant plants.

Based on the staff’s review of the information submitted by NINA to date, the applicant does not appear to meet the requirements of 10 CFR Part 50.33, “Contents of Applications; General Information,” for financial qualification to receive a license. The NRC is not prepared to issue its determination; however, until the issues raised by the applicant’s May 31, 2012, letter are addressed. Two public workshops were held on October 11, 2012 and on January 8, 2013 to discuss generic issues raised by NINA in their May 31, 2012 letter. Representatives from three firms with experience in energy financial qualifications participated in the workshops, along with representatives from NINA and the NRC staff.

The NRC staff is continuing to work toward resolution of technical issues in the areas of seismic analysis, flow-induced vibration, and spent fuel pool structural and seismic stability.

Calvert Cliffs Combined License Application

On July 13, 2007, Calvert Cliffs Unit 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC (UniStar), submitted a partial COL application for a U.S. EPR to be located at the Calvert Cliffs site near Lusby, in Calvert County, Maryland. The COL application was submitted in two parts and several supplements between July 13, 2007, and May 15, 2008.

On November 3, 2010, the counsel for Calvert Cliffs Unit 3 Nuclear Project, on behalf of the applicants, filed a letter indicating that Électricité de France, a foreign business entity, had acquired Constellation's 50-percent interest in UniStar. The NRC staff concluded that the proposed ownership structure did not comply with the requirements of 10 CFR 50.38, "Ineligibility of Certain Applicants." By letter dated January 30, 2013, UniStar informed the NRC staff that it identified a target date of November 30, 2013, to submit updated ownership information to the NRC.

On September 24, 2012, UniStar filed a petition to the Commission for review of the ASLB's decision on foreign ownership. On March 11, 2013, the Commission filed a memorandum and order denying UniStar's petition. In a Staff Requirements Memoranda, SECY-12-0168, dated March 11, 2013, the Commission directed the staff to complete a fresh assessment on issues relating to foreign ownership including recommendations on any proposed modifications to guidance or practice on foreign ownership, domination, or control that may be warranted. As part of the generic review, the Commission also directed the staff to obtain stakeholder input and provide a voting paper to the Commission no later than December 31, 2013.

The schedule for the FSER is currently being re-evaluated to account for the applicant's delays in responding to RAIs related to (1) the seismic and structural analyses, (2) the loss of large areas (LOLA) review, (3) Fukushima NTTF Recommendations, (4) and the ultimate heat sink system design changes.

Bell Bend Combined License Application

On October 10, 2008, PPL Bell Bend, LLC (PPL), 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, Pennsylvania.

The applicant proposed site layout changes to reduce impacts to "exceptional value" wetlands to satisfy the USACE need for a Section 404 permit under the Clean Water Act. The NRC staff will need to revisit large portions of the geology, seismic design, and hydrology reviews based on the revised submittals. Another issue being addressed in the environmental review involves water withdrawal permits issued by the Susquehanna River Basin Commission. The schedule for completion of the FSER and FEIS are currently under review.

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, Texas. Luminant submitted Revision 1 to the COL application on November 20, 2009.

The NRC staff determined that Luminant did not provide sufficient information in its application on negation of foreign ownership. In its December 7, 2011, revised schedule letter, the NRC approved Luminant's request that foreign ownership and control be considered a phase two open item because of the possibility of future changes in foreign ownership for the Comanche Peak Nuclear Power Plant. Luminant plans to submit the information the NRC staff requested by mid-2013.

The NRC staff determined that the applicant provided inadequate responses to the staff's RAIs on watershed analysis, onsite flooding, ground water, and the postulated release of radiological effluent. The staff recently learned that the applicant's submittal of a revised ground water analysis, which includes a site-specific groundwater model, would be delayed beyond March 2013.

On June 25, 2012, the NRC staff issued RAIs pertaining to Fukushima Near-Term Task Force Recommendations 2.1 (flooding and seismic hazard reevaluation), 7.1 (enhanced spent fuel pool instrumentation), and 9.3 (emergency preparedness). By letter dated July 24, 2012, Luminant informed the staff that it plans to submit its responses to these RAIs by the end of May 2013.

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, Virginia. 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 to the ESBWR design and plans to submit a revised COL application in July 2013.

In November 2011, Dominion notified the NRC staff, under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that the August 23, 2011, earthquake near the North Anna site exceeded at low frequencies the safe-shutdown earthquake response spectra established in the North Anna ESP. Dominion stated that the data also exceeded the site 250-foot elevation ground motion response spectra (GMRS) and the hard rock safe-shutdown earthquake developed for the North Anna Unit 3 COL application based on the early site permit safe-shutdown earthquake spectra.

The NRC staff is progressing on the draft supplement to the Supplemental Environmental Impact Statement (DSSEIS) to address new and significant information.

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, Michigan.

The staff published the FEIS in January 2013.

On February 15, 2013, the NRC staff issued a revised schedule for the completion of the Fermi 3 COL application. Under the new schedule, the NRC staff expects to issue the FSER in January 2015. This date represents a 20-month schedule delay associated with the review of the soil-structure interaction analysis.

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, Alabama.

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. Despite the decision on the completion of Bellefonte Unit 1, the COL application for Units 3 and 4 remains a viable option for TVA. However, the completion and operation of Unit 1 (and potentially Unit 2) would create the need for additional site studies and significant revisions to the environmental report and the site safety analysis report supporting the COL application. 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, New York. 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. The review remains suspended. In January 2013, the Nine Mile Point COL applicant requested an exemption from annual submission requirements contained in 10 CFR 50.71(e)(3)(iii), and proposed delaying the submittal of updates to the FSAR until December 31, 2013. The NRC granted the applicant's request for exemption.

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, Missouri.

The NRC suspended the Callaway review at the request of the applicant in June 2009, and it remains suspended. In December 2012, Union Electric Company, doing business as Ameren UE, requested an exemption from the annual submission requirements in 10 CFR 50.71(e)(3)(iii) and proposed delaying the submittal of updates to the FSAR until December 31, 2014. The NRC granted that request for exemption. 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 for design and licensing of small modular reactors. In November 2012, DOE announced their selection of mPower™ as the awardee. Ameren Missouri plans to provide the NRC with its updated plan for the Callaway site.

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, Mississippi.

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, Louisiana. 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 in suspension.

Expected Application Submittals to the NRC

The NRC staff anticipates the submittal of one DC application for the APR-1400 design during FY 2013 and one ESP application (Blue Castle) during FY 2014.

Regulatory Infrastructure

The NRC continues to enhance the effectiveness and the efficiency of the review processes for new reactor applications and prepare for future reviews of advanced reactor designs. This includes the identification and resolution of policy issues, pursuing changes to regulations, updating key guidance documents for NRC activities and application preparation, developing strategies and work products for optimizing the review of applications, and creating an inspection program for new construction activities.

Examples of recent infrastructure activities over the last 6 months are described below.

Interim Staff Guidance (ISG) for the Implementation of Regulatory Guide 1.221 on Design-Basis Hurricane and Hurricane Missiles

On October 22, 2012, Interim Staff Guidance DC/COL-ISG-024, "Implementation of Regulatory Guide 1.221 on Design-Basis Hurricane and Hurricane Missiles," was published in the *Federal Register* (77 FR 64564) as proposed staff guidance. This ISG discusses the process for analyzing the effect of hurricane winds and their associated wind-generated missiles to ensure that sufficient information exists in the application to demonstrate that the site characteristics fall within the site parameters specified in the design certification. The NRC staff has evaluated comments received on the proposed ISG-024 and is preparing it for final concurrence and issuance.

Interim Staff Guidance (ISG) for Assessing Radiological Consequences of Accident Releases from Liquid Waste Tanks

On January 29, 2013, Interim Staff Guidance DC/COL-ISG-013, "Assessing the Radiological Consequences of Accidental Releases of Radioactive Materials from Liquid Waste Tanks for Combined License Applications," and Interim Staff Guidance DC/COL-ISG-014, "Assessing the Radiological Consequences of Accidental Releases of Radioactive Materials from Liquid Waste Tanks in Ground and Surface Waters for Combined License Applications" were published in the *Federal Register* (78 FR 6149) as final documents. These ISGs describe guidance on defining the mechanism of assumed tank failures, development of the radioactive source term,

assumptions and level of conservatism used in the analyses, and the approach applied in assessing the radiological impacts at the assumed location of the dose receptor. *NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition."*

The staff continued to update NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." This includes incorporating lessons learned from completed licensing reviews in preparation for the review of future applications such as the APR1400 design certification and anticipated applications for SMR designs.

In this reporting period, the staff has issued a number of proposed and final sections of the Standard Review Plan (SRP). Specifically, the staff issued the following proposed revised guidance: Sections 3.7 and 3.8 for the review of seismic analysis and structural design; Chapter 12, "Radiation Protection"; Section 13.6.4 "Access Authorization—Operation Program," and Section 19.0, "Probabilistic Risk Assessment and Severe Accident Evaluation for New Reactors." New SRP Section 19.3, "Regulatory Treatment of Non-Safety Systems for Passive Advanced Light Water Reactors," was also issued to incorporate lessons learned from the review of the ESBWR and AP1000 reactor designs to support future reviews of SMR designs incorporating passive features. Lastly, new proposed guidance was issued in the "SRP Introduction—Part 2: Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: Integral Pressurized Water Reactor Edition" in support of future reviews of SMR applications.

Construction Inspection

The NRC issued COLs to Southern Nuclear Operating Company (SNC) on February 10, 2012, for two AP1000 units at the Vogtle site near Augusta, Georgia, and to South Carolina Electric & Gas Company on March 30, 2012, for two AP1000 units at the V.C. Summer site near Columbia, SC. Over the past year, 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 the approved design. The inspections are conducted by the three permanently assigned construction resident inspectors at each site and by teams of inspectors from the NRC regional office in Atlanta, GA.

The 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 primary 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. NRC inspections over the past year have focused on activities such as welding, fitness for duty, and civil/structural engineering activities. 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 of the inspections, tests, analyses, and acceptance criteria (ITAAC). The staff 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, NEI, industry representatives, and other external stakeholders participated in these public workshops.

To document ITAAC process developments, the staff issued two key office instructions to define staff roles and responsibilities, and clearly outline each process. "Prioritization of Inspections,

Tests, Analyses, and Acceptance Criteria for Inspection," issued on November 6, 2012 provides the instructions and associated methodology to prioritize (i.e., "target") NRC inspection resources for performing ITAAC inspections. "Inspections, Tests, Analyses, and Acceptance Criteria Closure Verification Process" was issued on November 13, 2012 to provide guidance for verifying the completion of ITAAC pursuant to 10 CFR Part 52.

The first ITAAC Closure Notification (ICN) was submitted on November 6, 2012 by SNC for the backfill compaction under the Seismic Category 1 structures. The staff completed its review of the ICN and determined that it did not contain sufficient information to demonstrate that the ITAAC had been successfully completed by the licensee, as required by 10 CFR 52.99(c)(1). On January 8, 2013, the staff issued a Notice of Insufficient Information that provided feedback on the level of detail contained in the ICN and explained what additional information was needed. On February 1, 2013, SNC resubmitted the ICN with the additional information. The staff found the revised ICN to be acceptable.

In Staff Requirements Memorandum 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. The staff completed development of the new assessment process and began a 12-month pilot of the new program on January 1, 2012 at the Vogtle construction site, and on March 30, 2012 at the V.C. Summer construction site. The pilot was successfully completed at the end of CY 2012, and the staff expects to fully implement the construction reactor oversight process by July 2013.

Vendor Inspections

The NRC staff continued the implementation of the Vendor Inspection Program. This included inspections 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. 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 Nuclear Quality Assurance; as well as meeting with NEI.

The NRC staff continues to make progress on actions in response to the OIG audit of the vendor inspection program. At the conclusion of 2012, the staff completed the self assessment activities outlined in the vendor inspection program plan. The NRC staff continues to manage an internal database of vendor information to use in preparing for inspection activities. The NRC staff is using the vendor selection prioritization strategy to identify vendors for inspection.

The NRC staff continues to make progress on its rulemaking efforts to clarify 10 CFR Part 21, consistent with its proposal in Commission paper SECY-11-0135, "Staff Plans To Develop the Regulatory Basis for Clarifying the Requirements in Title 10 of the *Code of Federal Regulations* Part 21, 'Reporting of Defects and Noncompliance.'" In December 2012, the NRC staff issued

the “Draft Regulatory Basis to Clarify 10 CFR Part 21 ‘Reporting of Defects and Noncompliance.’” The draft regulatory basis was made public to solicit early stakeholder feedback on how to best modify the regulations and align regulatory guidance for 10 CFR Part 21.

Advanced Reactors

The NRC staff has undertaken a variety of activities to prepare for applications for SMRs that may arrive as early as CY 2014. 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 SMRs. Although vendors and advocates have approached the NRC for a variety of reactor technologies, the NRC staff has focused its attention on small light-water reactors. In addition, to a limited extent, 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 other advanced reactor technologies.

Below is a status update of the pre-application activities that the NRC has engaged in with advanced reactor designers.

Next Generation Nuclear Plant

In letters dated October 17, 2011, Secretary of Energy 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 (i) licensing basis event selection, (ii) radionuclide release source terms, (iii) containment functional performance, and (iv) emergency preparedness.

The staff will summarize the results from these NGNP pre-application interactions, along with supporting technical observations and discussions of potential policy issues for the Commission’s future consideration, in updated assessment reports on DOE’s proposed approaches to these key issues. The updated assessment reports will be issued following ACRS review in May 2013.

Integral Pressurized Water Reactors (iPWRs)

NuScale Power, LLC

In response to Regulatory Issue Summary (RIS) 2012-12, “Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs,” dated December 28, 2012, NuScale Power, LLC, announced a new DC application submittal date of the third quarter of

CY 2015, with the objective of obtaining design certification from the NRC under 10 CFR Part 52, Subpart B, "Standard Design Certifications."

Interaction with NuScale has been ongoing since the last report. NRC and NuScale personnel met several times to discuss various aspects of the design such as: instrumentation and controls protection system; safety analysis codes and methods to be used for analyzing transients and accidents, core neutronics, core thermal hydraulics, system thermal hydraulics, and control rod ejection accident analysis methodology; fuel design, fuel analyses, and fuel testing methods; seismic analyses; containment design functional requirements and capabilities; and NuScale's ITAAC program.

Babcock and Wilcox (B&W) mPower™

In response to RIS 2012-12, Babcock and Wilcox (B&W) mPower, Inc., announced a new DC application submittal date of the third quarter of CY 2014 in support of the TVA Clinch River construction permit application.

The NRC staff has been engaged in pre-application activities with B&W mPower, Inc., 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, the physical security design and program considerations, reactor fuel system mechanical design criteria, and five human factors program reports. In addition, B&W mPower, Inc., presented position papers on radiological source-term methodology and the approach to satisfy GSI-191 for the mPower™ reactor design.

The NRC staff is developing a 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 associated with the mPower™ design. The staff expects to issue the draft version of the mPower™ DSRS in mid 2013 for interim use and comment through the *Federal Register*. The staff also will engage public stakeholders through meetings to discuss selected sections before issuing the final mPower™ DSRS.

Tennessee Valley Authority

On February 11, 2013, TVA responded to RIS 2012-12, stating that it currently plans to apply for a 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 is conducting meetings with TVA to discuss the regulatory framework and expectations for this submittal.

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 in 2012, and provided feedback on its WSMR Small Break Loss of Coolant Accident (LOCA) Phenomena Identification and Ranking Table Topical Report as well as to its WSMR plant security design and site layout. In early 2013, the NRC staff continued discussions related to the WSMR PIRT test plans and specifications. The NRC staff continues with limited

meetings with Westinghouse, as resources allow. Westinghouse intends to submit a DCA for the WSMR in the second quarter of CY 2014 and subsequently Ameren Missouri intends to submit a COL application for multiple WSMR units to be located at the existing Callaway site.

Holtec

Holtec is developing the Holtec Inherently Safe Modular Underground Reactor SMR-160 design that has a 160 MWe electrical power output. On March 20, 2013, Holtec responded to RIS 2012-12 informing the NRC of their intention to submit a Design Certification Application during the fourth quarter of 2016. The NRC staff will continue meeting with Holtec, as resources allow, to gain a better understanding of its SMR-160 design.

Other Reactor Technologies

Several private industry reactor designers and vendors have held discussions with the NRC regarding different non-light-water reactor (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.

International Activities

The NRC leverages the resources and knowledge of the international community both in bilateral and multilateral settings on information related to the design, siting, and construction of new reactors.

Multilaterally, the NRC staff engages counterparts under the Multinational Design Evaluation Program (MDEP), the International Atomic Energy Agency, and the Nuclear Energy Agency (NEA) Committee on Nuclear Regulatory Activities. The NRC actively participates in MDEP by chairing the MDEP Policy Group; co-chairing the MDEP Steering Technical Committee; chairing the AP1000 Working Group; chairing the Digital I&C Working Group; and participating in the EPR, APR 1400, Vendor Inspection Cooperation, and Codes and Standards Working Groups. Under the MDEP Vendor Inspection Cooperation Working Group, the NRC participated in numerous vendor inspections that included participation or observation by foreign counterparts from China, Korea, France, and Japan. The NRC also participates in the NEA's Working Group on Regulation of New Reactors.

Bilaterally, the NRC continues to meet individually with nuclear safety regulatory authorities for the new reactor programs in Canada, China, the Czech Republic, Finland, France, India, Japan, Korea, the United Arab Emirates, and the United Kingdom. The NRC also provides assistance to countries such as Indonesia, Lithuania, Poland, Vietnam, and various countries in Africa, all of which are on a path to develop or expand their nuclear programs.