Protecting People and the Environment

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

October 2011–March 2012

Note: The period of performance covered by this report includes activities occurring from the first day of October 2011 to the last day of March 2012. 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.

Enclosure

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I Implementing Risk-Informed and Performance-Based Regulations

Forty-four operating nuclear power reactors are currently 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 is also 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 reactors represented by two pilot plants, which have already transitioned, or the one plant that has not started to transition yet.

In April 2011, the Commission approved a policy paper (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) that 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 (6 reactor units) were submitted in Fiscal Year (FY) 2011, 11 more are scheduled for FY 2012 (16 reactor units), another 11 in FY 2013 (20 reactor units), and the remaining 2 in FY 2014 (2 reactor units). One licensee has informed the U.S. Nuclear Regulatory Commission (NRC) staff that it intends to start the transition to NFPA 805 at one of its sites after the agency approves its two other sites for transition. Licensees for two reactor sites that were actively transitioning have informed the staff of their intent to remain in their current licensing basis and not transition to NFPA 805. One licensee withdrew its application. Therefore, the staff is currently planning on a total of 48 reactors transitioning to NFPA 805 (including the 4 pilot plants), which is 46 percent of the current commercial power reactors licensed to operate in the United States.

The staff continues to meet with Southern Nuclear Operating Company (Southern) to discuss its plans to submit a 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. The staff also discussed Southern's plan to submit a proposal to implement risk-informed allowed outage times in Vogtle's technical specifications (TS). Implementing these voluntary risk-informed initiatives is complex. Sometimes the NRC waives its staff review fees because lessons learned from these efforts are used to improve staff guidance and the efficiency and effectiveness of future reviews and submittals. The NRC has granted Southern's request to waive review fees for an allowed outage time submittal and a 10 CFR 50.69 submittal. The NRC expects both of these submittals in 2012.

II Reactor Oversight Process

The NRC continues to implement the Reactor Oversight Process (ROP) at all 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, 2012, summarizing the 2011 annual performance assessments and associated annual assessment letters for all nuclear plants. This information is publicly available on the NRC Web site.

The staff issued RIS 2012-03, "Reintegration of Security into the Reactor Oversight Process Assessment Program," dated March 15, 2012, along with a press release. This RIS outlines the staff's plan for reintegrating the security cornerstone into the ROP assessment program. The staff plans to implement reintegration on July 1, 2012, and update the public Web site in early August 2012.

On April 8, 2012, the staff sent a paper, SECY-12-0055, entitled, "Reactor Oversight Process Self-Assessment for Calendar Year (CY) 2011," to the Commission. The self-assessment results for 2011 indicated that the ROP met program goals and achieved its intended outcomes. Furthermore, the NRC appropriately monitored operating nuclear power plant activities and focused agency resources on performance issues. On April 9, 2012, the staff also sent a paper, SECY-12-0056 entitled, "Fiscal Year 2011 Results of the Industry Trends Program for Operating Power Reactors," to the Commission. These assessments were made publicly available in April 2012 and were discussed at the Agency Action Review Meeting (AARM) on April 25, 2012, the results of that AARM will be discussed at a public Commission meeting scheduled for June 1, 2012.

The NRC hosted public meetings on October 6 and December 1, 2011; and January 19, February 23, and March 28, 2012. The ROP Working Group and other interested stakeholders attended these meetings to provide a forum for external feedback on staff initiatives. The ROP Working Group is comprised of representatives from industry and the NRC staff who work toward continuously improving the ROP and reactor safety.

The NRC staff participated in several meetings organized by the International Atomic Energy Agency and the Nuclear Energy Agency (NEA) Committee for Nuclear Regulatory Authorities. The meetings involved nuclear inspection practices and operating experience.

III Status of Issues Tracked in the Reactor Generic Issues Program

Currently, five open generic issues (GIs) are being tracked in the Generic Issues Management Control System. During the reporting period, one GI was completed and one was opened. 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"

On June 15, 2007, the NRC staff issued letters to affected licensees accepting the 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 (TI) 2515/174, "Hydrogen Igniter Backup Power Verification," have been completed at all nine affected sites. In November 2010, the staff received a commitment from the Tennessee Valley Authority (TVA) to implement measures at Watts Bar Unit 2. These measures were equivalent to those verified to have been implemented at Watts Bar Unit 1. 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 GI-189 review. This issue will

proceed to closure after concurrence from the Advisory Committee on Reactor Safeguards (ACRS).

Assessments of the Japanese March 2011 nuclear accident continue and will touch on other issues associated with hydrogen combustion through Near-Term Task Force Recommendation 6. The NRC staff considered the relationship of GI-189 with Recommendation 6 and determined that this GI and the activities for Recommendation 6 should proceed independently.

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 the related generic letter (GL 2004-02), 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 was performed, but testing and NRC evaluation are continuing because of NRC staff concerns about the testing results and related assumptions. The Commission issued a staff requirements memorandum (SRM) in December 2010. The Commission determined it was prudent to allow the nuclear industry to complete testing on in-vessel effects and zone of influence in 2011, and to develop a path forward by mid-2012. The SRM 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. The Commission further agreed that modifications should be completed within two operating cycles for smaller LOCAs and three operating cycles for larger LOCAs after development of the path forward. Closure for this GI is currently projected for 2018.

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

The action plan to resolve this GI involves an evaluation of suppression pool designs, the dynamics of air entrainment in the suppression pool, and the effects of air entrainment on ECCS pump performance. Based on a staff request, the BWR owners group provided voluntary data on the characteristics of LOCA phenomena at the earliest stages of the postulated accidents. The group also provided general information about wetwell geometries in relation to ECCS suction strainers. Staff efforts continue to estimate the maximum potential void fraction through scale experiments being conducted at Purdue University. The experiments should provide clarification on the potential for bubbles that formed during a simulated LOCA blowdown to be transported in the wetwell to the ECCS pump inlets and, consequently, ingested into the ECCS pump impellers. Testing began in mid-June 2010; both steady state and transient tests were completed in early 2011. A final report on the Purdue University test findings was received in March 2011, and the review of the test findings was completed in February 2012. Completion of the safety and risk assessment is anticipated by summer 2012.

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

While reviewing new reactor applications and updating seismic hazard information from the U.S. Geological Survey, the staff found that the estimated seismic hazard levels at some current central and eastern U.S. nuclear sites may be higher than the values used in designs and previous evaluations. For the safety and risk assessment, 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 of the GI program. The NRC issued Information Notice (IN) 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 of the issuance of the GI-199 safety and risk assessment report. The IN also stated that the NRC will follow the appropriate regulatory process to request that operating plants and independent spent fuel storage installations (ISFSIs) provide specific information about their facilities to enable the staff to complete the regulatory assessment and identify and evaluate candidate backfits. In September 2011, the NRC released to the public for comment a draft GL to request necessary data from all power reactor licensees. This GI is being addressed as part of the agency’s efforts associated with responding to the lessons learned from the Fukushima nuclear accident in Japan. The comments received on the draft GL were incorporated into the post-Fukushima orders issued to reactor licensees in March 2012.

GI-204, “Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure”

This new GI relates to potential flooding at U.S. nuclear power plant sites. It includes the effect of flooding 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 GI-204 in July 2010, and it was accepted for screening in August 2010. The screening analysis was completed. After coordination with other Federal agencies, the GI was publicly announced on March 6, 2012. This GI is being addressed as part of the agency’s efforts associated with responding to the lessons learned from the Fukushima nuclear accident in Japan.

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 surveillance requirements, 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 2012 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 GLs 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 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 requests not requiring NRC review and approval before licensees can implement them.

The FY 2012 NRC Performance Budget plan incorporates two output measures related to other licensing tasks: the number of other licensing tasks completed per year and the age of the other licensing task inventory.

The table below shows the actual FY 2009, FY 2010, and FY 2011 results and the FY 2012 goals for the two NRC performance plan output measures for operating power reactor licensing actions and other licensing tasks.

PERFORMANCE PLAN				
Output Measure	**FY 2009 Actual**	**FY 2010 Actual**	**FY 2011 Actual**	**FY 2012 Goals**
Licensing actions completed/year	1,022	988	849	660
Age of licensing action inventory	93.3% ≤ 1 year and 100% ≤ 2 years	93% ≤ 1 year and 100% ≤ 2 years	90.3% ≤ 1 year and 99.9% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years
Other licensing tasks completed/year	541	625	465	600
Age of other licensing tasks inventory	90% ≤ 1 year and 100% ≤ 2 years	94% ≤ 1 year and 100% ≤ 2 years	94.2% ≤ 1 year and 99.6% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years

V Status of License Renewal Activities

The NRC has issued renewed licenses to 71 of the 104 power reactor units licensed to operate.

Applications Currently under Review

The NRC currently has 11 license renewal applications (LRAs) for 15 units under review. The following is the status of applications currently under review. Previously issued semiannual reports describe activities that occurred before October 2011.

Pilgrim Nuclear Power Station

On January 27, 2006, Entergy Nuclear Operations (Entergy) submitted an LRA for the Pilgrim Nuclear Power Station to extend the operating license for an additional 20 years beyond the current license period. Activities related to the Atomic Safety and Licensing Board (ASLB) hearing process continued.

Indian Point Nuclear Generating, Units 2 and 3

On April 30, 2007, Entergy 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 March 2012, the NRC issued a Notice of Intent to prepare a supplement to the final supplemental environmental impact statement (SEIS) for the Indian Point LRA, which was published in December 2010. The supplement will address information identified subsequent to the publication of the final SEIS on the effects to aquatic organisms. In addition, activities related to the 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. During the reporting period, the staff continued the safety and environmental reviews of the application. A projected date for a license renewal decision is currently to be determined, pending Florida Power Corporation's final plans to repair the unit's containment and the submission of an acceptable containment aging management plan.

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 the requirements of the Coastal Zone Management Act. In addition, an admitted contention remained pending before the ASLB.

Columbia Generating Station

On January 20, 2010, Energy Northwest submitted an LRA for the Columbia Generating Station to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff continued the safety and environmental review of the application. The ASLB denied a request for admission of a contention in October 2011. The Commission subsequently denied the Northwest Environmental Advocates' appeal of this decision in March 2012, thereby concluding the hearing process.

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, the staff continued the safety and environmental reviews of the application. In addition, activities related to the ASLB hearing process remained ongoing.

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 continued the safety and environmental reviews of the application. In addition, activities related to the ASLB hearing process continued.

South Texas Project, Units 1 and 2

On October 28, 2010, South Texas Project Nuclear Operating Company (STPNOC) submitted an LRA for the South Texas Project (STP), 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.

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 audits related to the safety and environmental reviews of the application. On February 21, 2012, the ASLB heard oral arguments on the admissibility of four proposed contentions. A decision on their admissibility is pending.

Grand Gulf Nuclear Station, Unit 1

On November 1, 2011, Entergy 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 performed an acceptance review and determined that the application was acceptable for docketing and review. On January 1, 2012, the staff held public meetings near the site to provide an overview of the NRC's license renewal review process and to solicit public comments on the scope of the environmental review. During the reporting period, the staff also conducted onsite audits related to 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 performed an acceptance review and determined that the application was acceptable for docketing and review. On March 14, 2012, the staff held public meetings near the site to provide an overview of the NRC's license renewal review process and to solicit public comments on the scope of the environmental review.

Generic Environmental Impact Statement Update

The NRC is continuing 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 environmental protection regulations for renewing nuclear power plant operating licenses. In January 2012, the NRC held a public Commission meeting on the rulemaking in which the Commission heard comments from, and asked questions of, the NRC staff and invited stakeholders. The NRC plans to publish the revised generic environmental impact statement, final rule, and associated guidance documents in FY 2012.

VI Summary of Reactor Enforcement Actions

Reactor Enforcement by Region

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 that power reactor licensees committed, the significance of the 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 12	1	3	0	2	6
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	1	3	0	2	6
	FY 11 Total	4	16	1	5	26
	FY 10 Total	3	1	2	9	15
Non-Cited Severity Level IV or Green	1st Half FY 12	58	59	121	149	387
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	58	59	121	149	387
	FY 11 Total	165	113	228	260	766
	FY 10 Total	145	126	204	291	766
TOTAL Cited and Non-Cited Severity Level IV or Green	1st Half FY 12	59	62	121	151	393
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	59	62	121	151	393
	FY 11 Total	169	129	229	265	792
	FY 10 Total	148	127	206	300	781

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 12	0	0	0	0	0
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	0	0	0	0
	FY 11 Total	0	0	0	0	0
	FY 10 Total	0	0	0	0	0
Severity Level II	1st Half FY 12	0	0	0	0	0
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	0	0	0	0
	FY 11 Total	0	0	0	0	0
	FY 10 Total	0	0	0	0	0
Severity Level III	1st Half FY 12	0	1	0	1	2
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	1	0	1	2
	FY 11 Total	0	1	0	1	2
	FY 10 Total	1	0	1	0	2
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 12	0	1	0	1	2
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	1	0	1	2
	FY 11 Total	0	1	0	1	2
	FY 10 Total	1	0	1	0	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 12	0	0	0	0	0
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	0	0	0	0
	FY 11 Total	0	1	0	0	1
	FY 10 Total	0	0	0	0	0
Violations Related to Yellow Findings	1st Half FY 12	0	1	1	0	2
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	0	1	1	0	2
	FY 11 Total	0	0	0	1	1
	FY 10 Total	0	3	0	0	3
Violations Related to White Findings	1st Half FY 12	3	2	2	0	7
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	3	2	2	0	7
	FY 11 Total	2	4	5	2	13
	FY 10 Total	2	0	4	1	7
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 12	3	3	3	0	9
	2nd Half FY 12	--------	--------	--------	--------	--------
	FY 12 YTD Total	3	3	3	0	9
	FY 11 Total	2	5	5	3	15
	FY 10 Total	2	3	4	1	10

NOTE: The escalated enforcement data above reflect the violations or problems cited during the referenced time periods associated with 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. Details of security-related violations are not publicly available.

Union Electric Company (Callaway Nuclear Plant) – EA-11-178

On November 3, 2011, a Notice of Violation was issued to Union Electric Company for a violation associated with a greater-than-green SDP finding at the Callaway Nuclear Plant. The details of the finding are official use only – security-related information.

Entergy Nuclear Operations, Inc. (Waterford Steam Electric Station, Unit 3) – EA-11-142

On November 17, 2011, the NRC issued a white finding to Entergy as a result of inspections at the Waterford Steam Electric Station, Unit 3. The white SDP finding involved the failure to use effective engineering controls to prevent leakage from reactor coolant pump seals to surrounding areas. This failure resulted in high levels of contamination that caused unexpected and unintended radiation doses to plant workers during outage activities. No NRC violations were associated with the finding.

Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station) – EA-11-174

On November 21, 2011, the NRC issued a Notice of Violation to Entergy for a violation of TS 5.4, "Procedures," associated with a white SDP finding involving multiple examples of Entergy's failure to conduct safety-related activities as described in written procedures before and during a reactor startup operation. Specifically, on May 10, 2011, Pilgrim personnel failed to implement conduct of operations and reactivity control standards and procedures during a reactor startup, which resulted in a reactor scram.

Duke Energy Carolinas, LLC (Oconee Nuclear Stations, 1, 2, and 3) – EA-11-226

On December 6, 2011, the NRC issued a Notice of Violation to Duke Energy Carolinas, LLC, for a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with a yellow SDP finding involving Duke Energy's failure to perform a review for suitability of application of equipment essential to safety-related functions of structures, systems, and components. Specifically, Oconee personnel failed to maintain the standby shutdown facility pressurizer heater breakers and associated electrical components in accordance with the licensing- and design-basis of the plant. This resulted in the standby shutdown facility being inoperable from 1983 until June 1, 2011.

Tennessee Valley Authority (Watts Bar Nuclear Plant) – EA-11-217

On December 7, 2011, a Notice of Violation was issued to TVA for a violation associated with a greater-than-green SDP finding at the Watts Bar Nuclear Plant. The details of the finding are official use only – security-related information.

Exelon Generation Company, LLC (Limerick Generating Station, Unit 2) – EA-11-221

On December 8, 2011, the NRC issued a white SDP finding and Notice of Violations for two violations to Exelon Generation Company, LLC, as a result of inspections at the Limerick Generating Station, Unit 2. The white finding was based on failure to ensure that sufficient technical guidance was contained in an operating procedure. This failure resulted in two valves failing to fully shut, which rendered two reactor systems inoperable for greater than the TS-allowed outage time. The two violations are based on the licensee's failure to: 1) establish adequate procedures, and 2) exceeding TS for two reactor systems.

Progress Energy (Crystal River Nuclear Plant, Unit 3) – EA-11-208

On December 20, 2011, the NRC issued a Notice of Violation to Progress Energy for a violation of 10 CFR 50.54(q) associated with a white SDP finding involving the failure of Crystal River personnel to maintain a standard emergency classification scheme, including facility effluent parameters. Specifically, for several years before June 2011, the general emergency classification contained effluent radiation monitor threshold values greater than what the instruments could measure accurately. During an actual emergency, these monitors would have been relied upon to determine initial offsite response measures, assess the impact of the release of radioactive materials, and provide criteria for determining the need for notification and participation of local and State agencies.

Carolina Power and Light Company (Brunswick Steam Electric Plant, Units 1 and 2) – EA-11-251

On December 27, 2011, the NRC issued a Notice of Violation to Carolina Power and Light Company for a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," associated with a white SDP finding involving the failure of Brunswick personnel to identify promptly and correct a condition adverse to quality involving the external flood barrier for the emergency diesel generator fuel oil tank rooms as of April 20, 2011. Specifically, the entrance enclosures that house the emergency diesel generator fuel oil tanks had several openings, unsealed pinholes, and a narrow gap along the perimeter of the base walls, which would allow water intrusion into the emergency diesel generator fuel oil tank rooms during a design-basis external event (hurricane).

Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant) – EA-11-227

On January 3, 2012, the NRC issued a Notice of Violation to Entergy for a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," associated with a white SDP finding involving Entergy's failure to prescribe maintenance on the safety-related turbine-driven auxiliary feedwater pump, an activity affecting quality, by documented instructions appropriate to the circumstances, as well as a failure to accomplish the maintenance in accordance with its procedure. Specifically, on October 17, 2010, procedure FWS-M-6, "Auxiliary Feedwater Turbine Maintenance," failed to prescribe inspections of wear conditions on the knife edge and latch plate, or to replace the trip spring, although the turbine vendor had identified these inspections and replacements as necessary. Palisades' personnel also failed to perform a step in the surveillance procedure that required lubricating a pin and instead greased the knife edge of the mechanical overspeed and manual trip mechanism. These deficiencies resulted in the turbine-driven auxiliary feedwater pump being inoperable from October 29, 2010, to May 11, 2011.

Entergy Nuclear Operations, Inc. (River Bend Station) – EA-11-159

On January 5, 2012, the NRC issued a Notice of Violation to Entergy and proposed civil penalty in the amount of $140,000 for a Severity Level III violation as a result of an investigation at the River Bend Station. The NRC Office of Investigations conducted an investigation that determined reactor operators, on multiple occasions, willfully failed to follow an Entergy procedure prohibiting Internet access in the "at-the-controls" area of the control room, except as specifically authorized by the operations manager. These reactor operators put Entergy in violation of the River Bend Station TS.

Tennessee Valley Authority (Browns Ferry Nuclear Plant) – EA-11-252

On January 23, 2012, the NRC issued a Notice of Violation to TVA for a violation of 10 CFR 50.9, "Completeness and Accuracy of Information," associated with a Severity Level III violation involving TVA's failure to provide information to the Commission that was complete and accurate in all material respects relating to its NRC GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," testing program. Specifically, in a letter dated January 6, 1997, TVA stated, "Closure of valves FCV-74-52 and FCV-74-66 is not required by plant procedures to operate the residual heat removal (RHR) system in the suppression pool cooling mode. Therefore, these valves have no 'redundant' safety function and will not be included in the GL 89-10 program." In a letter dated May 5, 2004, TVA stated that valves FCV-74-52 and FCV-74-66 "are not in the GL 89-10 program, since the valves are normally in

their safety position." This information was inaccurate because the FCV-74-52 and FCV-74-66 valves do have a safety function to shut to operate the RHR system in the suppression pool cooling mode; therefore, they should have been included in Browns Ferry's GL 89-10 motor-operated valve monitoring program.

Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant) – EA-11-214

On January 25, 2012, an immediately effective Confirmatory Order was issued to Entergy to confirm commitments made as a result of an alternative dispute resolution (ADR) mediation session held on December 12, 2011. This enforcement action is based on an apparent TS violation. An at-the-controls reactor operator left the at-the-controls area of the control room without providing a turnover to a qualified individual and obtaining permission from the control room supervisor. Although the operator left the control room, another qualified individual resumed the at-the-controls responsibility. During the ADR session, Entergy agreed to take the following actions: 1) develop a case study related to the events that gave rise to the Confirmatory Order and present it to Entergy-licensed reactor operators fleetwide, 2) a senior Entergy nuclear executive will send a letter fleetwide to each Entergy-licensed reactor operator reemphasizing the responsibilities of his or her position and associated safety responsibilities and obligations to the public, 3) make a presentation at the appropriate industry forums based on the facts and lessons learned from this event, 4) conduct a review of the three Entergy procedures applicable to this event and address any relevant observations, findings, or recommendations in its corrective action program (CAP), 5) conduct a safety culture assessment of the Palisades Operations Department, 6) perform a review of the planning for the next refueling outage, focusing on stressful or complex work evolutions to ensure they are properly planned, and 7) inform the NRC, in writing, of its plan to monitor and manage the reactor operator associated with the event. In consideration of these commitments, and other corrective actions that Energy already has completed, the NRC agreed to refrain from proposing a civil penalty and issuing a Notice of Violation.

Entergy Nuclear Operations, Inc. (James A. FitzPatrick Nuclear Power Plant) – EA-10-090; EA-10-248; EA-11-106

On January 26, 2012, the NRC issued a Confirmatory Order (effective immediately) to Entergy to confirm commitments made as a result of an ADR mediation session held on November, 9, 2011. During three investigations, the NRC discovered information associated with violations—the majority of which were willful—related to adherence to site procedures for radiation protection. Specifically, technicians willfully failed to (1) test required individuals for respirator fit, as required by 10 CFR 20.1703, (2) maintain accurate documentation of completed respirator fit tests, as required by 10 CFR 50.9, (3) perform or accurately document independent verification of drywell continuous atmospheric monitoring system valve positions after the valves were manipulated, as required by TS and 10 CFR 50.9, (4) document a personal contamination event, as required by TS, (5) perform a contamination survey before removing an item from a radiologically controlled area, as required by TS, and (6) perform daily radiological surveys of the reactor building 326-foot elevation airlock, as required by 10 CFR 20.1501(a).

Entergy agreed to take many actions as part of this Confirmatory Order, including but not limited to: (1) committing to maintain the safety culture monitoring processes as described in NEI 09-07, "Fostering a Strong Nuclear Safety Culture," or similar processes, (2) assessing Entergy's procedure for implementing the safety culture processes described in the NEI guidance to determine if potential enhancements should be provided to NEI that would

improve licensees' ability to detect weaknesses in safety culture (if such enhancements could have prevented violations, such as those that were the subject of this action), (3) conducting an assessment of the radiation protection departments at each Entergy nuclear power plant to ensure activities are being conducted in accordance with NRC regulations, (4) preparing and presenting case studies at each Entergy nuclear power plant, and (5) delivering a presentation to industry representatives in each NRC geographical region that will discuss these events, including lessons learned and corrective actions. In addition, Entergy took several corrective actions before the ADR mediation session. In recognition of Entergy's proposed extensive corrective actions, in addition to corrective actions already taken, the NRC issued a Notice of Violation, associated with the violations discussed above, with no civil penalty assessed.

Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant) – EA-11-241

On February 14, 2012, the NRC issued a Notice of Violation to Entergy for violations of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and Criterion XVI, "Corrective Action," which were categorized as one white SDP finding. Specifically, in December 2007, the licensee failed to verify the adequacy of the safety-related service water pump (SWP) coupling design to confirm that the coupling material was adequate for its environment and working conditions. As a result, the licensee failed to identify and evaluate a new failure mechanism introduced into the system in the form of intergranular stress-corrosion cracking (IGSCC). In addition, on August 9, 2011, the licensee failed to preclude repetition of a significant condition adverse to quality when an SWP coupling failed because of IGSCC.

Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant) – EA-11-243

On February 14, 2012, the NRC issued a Notice of Violation to Entergy for a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which was categorized as a yellow SDP finding. The licensee failed to ensure that the work performed on electrical bus D11-2 was prescribed by documented instructions or procedures of a type appropriate to the circumstances and accomplished in accordance with the instructions or procedures. Specifically, on September 25, 2011, the work order instructions did not provide critical steps and lacked proper step progression. The work order instructions also included action steps to "Insulate or support load side bus bars to ensure they do not fault," which were not implemented. Finally, the electricians performing work in the field attempted to remove a positive horizontal bus bar in bus D11-2, which was not a prescribed step in the work order instructions. As such, these performance deficiencies resulted in an electrical fault that caused the loss of the left train 125-volt direct current (dc) safety-related system and loss of both preferred alternating current sources associated with the left train dc system.

Northern States Power Company, Minnesota (Prairie Island Nuclear Generating Plant) – EA-11-203

On February 16, 2012, a Notice of Violation was issued to Northern States Power Company, Minnesota, for a violation associated with a greater-than-green SDP finding at the Prairie Island Nuclear Generating Plant. The details of the finding are official use only – security-related information.

Public Service Electric and Gas Nuclear, LLC (Salem and Hope Creek Generating Stations) – EA-11-269

On March 20, 2012, a Notice of Violation was issued to Public Service Electric and Gas Nuclear, LLC, for a violation associated with a greater-than-green SDP finding at the Salem and Hope Creek Generating Stations. The details of the finding are official use only – security-related information.

VII Power Reactor Security and Emergency Response Regulations

The NRC continues its security inspection and oversight activities, as well as its rulemaking activities, to incorporate applicable security and emergency preparedness (EP) enhancements into the regulations.

The NRC is continuing force-on-force inspections at each nuclear power reactor and Category I fuel cycle facility on a normal 3-year frequency. The purpose of the force-on-force inspections is to assess the defensive strategies in place at licensed facilities and to highlight areas that need improvement. The current 3-year force-on-force cycle began in January 2011. Since that time, 27 force-on-force inspections have been completed. The NRC remains committed to working with industry to improve the realism and effectiveness of the force-on-force inspection program.

Following the terrorist attacks on September 11, 2001, the NRC supplemented the security measures required for protection against the design-basis threat at nuclear power reactor facilities through a series of security orders. These orders established new requirements for specific training enhancements, access authorization enhancements, and enhancements to defensive strategies, mitigative measures, and integrated responses. Subsequently, the NRC amended 10 CFR Parts 50, 52, 72, and 73, including Appendices B and C to Part 73, through a final rule ("Power Reactor Security Requirements") published in the *Federal Register* on March 27, 2009 (74 FR 13925). The rulemaking codified generically applicable security requirements previously issued by orders and updated the existing power reactor security requirements. The rule became effective on May 26, 2009. Licensees were required to be in compliance with the final rule no later than March 31, 2010. The NRC has determined that the generically applicable security requirements set forth in the orders have been adequately captured in the applicable NRC regulations, with a few exceptions. Based on this determination, on November 28, 2011, the NRC rescinded the requirements of two orders in their entirety (Orders EA-03-039 and EA-02-261), and one order in part (EA-02-026).

The NRC is completing the final rule amending the requirements associated with enhanced weapons and firearms background checks in 10 CFR Part 73, "Physical Protection of Plants and Materials," to implement the statutory authority provided by Section 161A of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2201a). The revised regulation would require new firearms background checks for armed security personnel and would permit certain NRC licensees to obtain enhanced weapons (preempting individual State laws prohibiting private entities from obtaining such weapons). In the proposed rule (published in the *Federal Register* (76 FR 6200) on August 2, 2011), the NRC informed the public that it would consider granting preemption authority and the authority to possess certain enhanced weapons under Confirmatory Orders in advance of a final rulemaking. The NRC has received applications from three power reactor licensees and one Category 1 fuel cycle facility for preemption authority under Section 161A. The Commission is currently reviewing staff recommendations outlined in SECY-12-0027, "Preemption Authority pursuant to Section 161A, 'Use of Firearms by Security Personnel,' of the

Atomic Energy Act of 1954, as amended." These licensees are requesting the NRC to grant them preemption authority because certain Federal and State laws would prohibit the possession, use, purchase, and maintenance of weapons and large-capacity ammunition feeding devices that these licensees currently are using to protect their facilities.

The NRC continues to work closely with Federal partners to identify state-of-the-art approaches for determining that each person granted unescorted access to a U.S. nuclear power plant is trustworthy and reliable and does not constitute an unreasonable risk to public health and safety or the common defense and security to commit radiological sabotage. Among the current practices are licensee implementation procedures for processing fingerprints for Federal Bureau of Investigation (FBI) identification and criminal history checks, the NRC's access to the industrywide information sharing database commonly known as the Personnel Access Data System, and periodic submittals of biographical information for all individuals who have been granted unescorted access to the Nation's nuclear power plants to the FBI's Terrorist Screening Center for evaluation.

Consistent with the President's 2011 National Drug Control Strategy, the NRC continues to coordinate with Federal partners and NRC licensees to enhance the identification and deterrence of substance abuse at NRC licensees and affected contractor and vendor organizations to help provide reasonable assurance that the Nation's commercial nuclear power industry maintains drug-free work environments staffed with personnel fit for duty to safely and competently perform assigned duties. Testing and behavioral observation programs are not limited to drugs; they also include random alcohol testing and fatigue management regulations to evaluate safety and security personnel's ability to perform their responsibilities optimally.

The NRC continues to make progress implementing a comprehensive revision to EP regulations and associated guidance. The staff delivered the draft final EP rule package to the Commission on April 8, 2011. The draft final rule was discussed at a public Commission meeting on May 3, 2011. The Commission voted to approve the draft final rule on August 30, 2011. Throughout this process, the NRC staff continued to engage with internal and external stakeholders on the status of the EP rulemaking and developed an integrated transition and implementation plan for the final rule and associated guidance. The Commission approved the EP final rule on August 30, 2011, and it was published in the *Federal Register* (76 FR 72560) on November 23, 2011, with an effective date of December 23, 2011. The final rule codifies requirements similar to those that Commission orders previously imposed. It also updated the EP regulations to include requirements previously and voluntarily initiated by nuclear power plant licensees and amended other licensee EP requirements based on a comprehensive review of the NRC's EP regulations and guidance.

Several NRC and Federal Emergency Management Agency (FEMA) guidance documents were issued in conjunction with the EP final rule. Five forums were held following publication of the final rule (from December 2011 through February 2012) to review NRC and FEMA staff expectations for implementing the EP rule and guidance changes with licensees and offsite response organizations.

To date, all EP and physical security program licensing reviews are 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 140 power uprates to date. Approximately 18,584 megawatts thermal (MWt) or 6,194 megawatts electric (MWe) in electric generating capacity (the equivalent of about six large nuclear power plant units) have been gained through the implementation of power uprates at existing plants. The NRC currently has 20 plant-specific power uprate applications under review, which would add an additional 4,478 MWt or 1,493 MWe to the Nation's electrical grid.

In December 2011, 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 15 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 the licensing and construction activities necessary to support near-term-build applications (i.e., plants expected to begin operation in 2016–2017). It is also 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 is actively engaged in several international cooperative activities to promote enhanced safety in new reactor designs, to strengthen reactor siting reviews, and to 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 SRM-SECY-12-0025, the staff ordered Vogtle Electric Generating Plant Units 3 and 4, and Summer Units 2 and 3, to address 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 capabilities functions indefinitely and to enhance the capabilities of spent fuel pool instrumentation. 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 for operating reactor licensees. For DCs 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 is requesting all COL applicants to provide the required information by orders and request for additional information (RAI) letters through the review process.

Major accomplishments for the new reactor licensing program during this reporting period include the following:

- COLs for Vogtle Units 3 and 4 and for Summer Units 2 and 3 were issued.
- The Commission affirmed the Westinghouse AP1000 DC amendment final rule and it became effective.
- The Advanced Boiling-Water Reactor (ABWR) Aircraft Impact DC amendment was approved and the rule became effective
- The draft environmental impact statement (DEIS) for the Fermi COL was issued.
- The DEIS for the William States Lee COL was issued.
- Staff testimony and exhibits on environmental contentions were presented at the contested hearing for the South Texas Project COL.
- The safety evaluation with open items for the EPR design certification was completed.

The NRC is making good progress on the 10 CFR Part 52 applications currently under review, as discussed below.

Early Site Permit Reviews

Victoria County Station

On June 7, 2010, Exelon Nuclear Texas Holdings, LLC (Exelon), submitted an ESP application for the Victoria County Station site. On December 1, 2011, the NRC staff issued a revised schedule. The staff plans to issue the final safety evaluation report (FSER) in April 2014 and final environmental impact statement (FEIS) in March 2014. The applicant is planning to submit Revision 1 to its application in the near future. The staff conducted an alternative sites audit in December 2011, and an environmental site audit in January 2012.

PSEG Power, LLC, and PSEG Nuclear, LCC

PSEG Power, LLC, and PSEG Nuclear, LLC, submitted an ESP application on May 25, 2010. This ESP uses the plant parameter envelope approach, which includes in its scope four of the designs discussed below. The staff issued a letter on December 23, 2011, revising the review schedule's public milestones for the safety and environmental reviews. The staff plans to issue the FSER in April 2014, and the FEIS in June 2014.

Design Certification Reviews

The NRC is preparing the final rule package for the General Electric Hitachi Nuclear Energy (GEH) economic simplified boiling-water reactor (ESBWR). The Westinghouse Electric Company, LLC (Westinghouse), AP1000 DC amendment rule and the U.S. ABWR amendment rules were approved. The NRC is currently reviewing two DC applications (for the U.S. evolutionary power reactor (EPR) and the U.S. advanced pressurized-water reactor (US-APWR)). The NRC received two ABWR DC renewal requests. The sections below describe the status of the work accomplished during this reporting period.

Economic Simplified Boiling-Water Reactor

The NRC staff issued the FSER and final design approval on March 9, 2011. The agency published the proposed rule in the *Federal Register* (76 FR 16549) on March 24, 2011. The NRC received 10 public comment submissions; all public comment submissions will be addressed in the final rule. On January 19, 2012, the staff informed GEH that issues relevant to the conclusions in the staff's March 9, 2011, FSER have been identified. 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 several of GEH's modeling parameters. The 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 conducted an audit of the steam dryer analysis at the GEH offices in March 2012, and issued RAIs to GEH in May 2012. The staff will reestablish a rulemaking schedule after GEH responds to the staff RAIs.

AP1000 Design Certification Amendment

The AP1000 DC amendment rule was affirmed by the Commission on December 22, 2011, and published in the *Federal Register* (76 FR 82079) on December 30, 2011. The rule became effective on December 30, 2011.

U.S. Evolutionary Power Reactor Design Certification

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

In February 2012, the staff completed safety evaluation reports with open items (Phase 2) for all chapters. Significant open items under review include digital instrumentation and control (I&C), fuel assembly mechanical design, seismic and structural, and Fukushima lessons learned. On February 21, 2012, AREVA submitted a new schedule that delayed the response to open items until August 2013. The NRC staff will evaluate and issue a revised review schedule by April 30, 2012, that will reflect AREVA's February 21 2012, open item closure schedule.

On December 7, 2011, the staff held a public meeting with AREVA at which the company presented a proposal for a path forward to address Fukushima-related concerns. AREVA stated that the U.S. EPR design is robust enough to withstand Fukushima-like beyond-design-basis earthquake and flooding events. AREVA plans to submit a closure plan to address the Near-Term Task Force Recommendations following the staff's issuance of RAIs.

U.S. Advanced Pressurized-Water Reactor Design Certification

MHI submitted its US-APWR DC application on December 31, 2007. MHI has been implementing plans to address seismic and structural design changes and completion of the sump design and generic safety issue (GSI)-191 requirements.

MHI has changed the design-basis seismic model and analysis methodology for the reactor building complex, which requires additional staff review. On October 27, 2011, the staff issued a schedule change letter to MHI, with an approximate 1-year slip in schedule because of MHI's change in seismic design bases. The applicant submitted a plan to update the completion plan for the seismic and structural analysis on January 5, 2012. The staff will assess the impact of the revised seismic completion closure plan on the current review schedule and plans to update the review schedule in May 2012.

MHI issued a GSI-191 closure plan letter to the NRC in May 2011, and it has completed additional strainer head loss testing and core inlet blockage testing. The staff audited and inspected the additional sump head loss testing in June 2011, and audited and inspected the additional core inlet blockage testing in July 2011. The applicant submitted an updated closure plan in December 2011. The updated closure plan includes the resolution of debris transport time, additional testing if necessary, and revisions to technical reports. A proposed schedule is included in the updated closure plan for future submittals and planned interactions with the NRC staff to facilitate closure of the remaining issues related to GSI-191. The NRC staff held a public meeting in February 2012 to discuss MHI's progress to date and MHI's plans to perform two additional tests by July 2012.

Advanced Boiling-Water Reactor Design Certification Rule Amendment for Aircraft Impact

On June 30, 2009, the South Texas Project Nuclear Operating Company (STPNOC) submitted an application to amend the ABWR DC rule to address the requirements of the aircraft impact rule. The Commission affirmed the amendment on November 1, 2011. The final rule became effective on January 17, 2012.

Design Certification Renewals

On May 12, 1997, the NRC issued the ABWR DC rule in Appendix A to 10 CFR Part 52, which is effective for 15 years.

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.

On December 8, 2010, GE-Hitachi Nuclear Energy Americas, LLC (GEH), tendered an ABWR DC renewal application. The NRC staff has informed the applicant that it believes additional amendments should be included in the ABWR renewal. In accordance with the applicant's request, the staff will share a list of additional amendments with the applicant to consider for incorporation into the application. The NRC staff plans to issue a letter to the applicant describing the changes in May 2012.

Combined License Application Activities

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

Plant Vogtle Combined License Application

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

On March 25, 2011, the staff issued the final SEIS ahead of the published public milestone. The staff completed the FSER on August 5, 2011. The mandatory hearing for this review took place on September 27–28, 2011. On February 9, 2012, the Commission issued its decision on the mandatory hearing. The Commission found the staff's review adequate to make the necessary regulatory safety and environmental findings. On February 10, 2012, the NRC staff issued the COLs and limited work authorizations (LWAs) for Vogtle Units 3 and 4.

Virgil C. Summer Combined License Application

On March 27, 2008, South Carolina Electric & Gas submitted a COLA for two AP1000 units to be located at its Virgil C. Summer site in Fairfield County, South Carolina.

The NRC published the FEIS in April 2011 and the FSER on August 17, 2011. The mandatory hearing on the COL review was held on October 12–13, 2011. On March 30, 2012, the Commission issued a decision finding the staff's review adequate to make the necessary regulatory safety and environmental findings and the NRC staff issued the COLs.

Levy County Combined License Application

On July 30, 2008, Progress Energy Florida, Inc., submitted a COLA for two AP1000 units to be located at its site in Levy County, Florida. The NRC staff has completed all technical reviews for the Levy County COLA and has issued all safety evaluation chapters without open items to the applicant. ACRS subcommittee meetings were completed on October 18–19, 2011. The ACRS full committee meeting was held December 1, 2011. The FSER is scheduled for issuance in April 2012. On August 6, 2010, the NRC issued the DEIS, and on April 27, 2012, the staff issued the FEIS.

On March 15, 2012, the staff requested the applicant to provide additional information required by the orders and the RAI letters approved by the Commission in SRM to SECY-12-0025. By letter dated March 28, 2012, the applicant indicated that it will provide responses in August 2012. The NRC staff is preparing its approach on how it will address the new information received after issuance of the FSER and FEIS.

William States Lee III Combined License Application

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

The NRC issued the DEIS on December 13, 2011. The DEIS comment period ended on March 6 2012, and the NRC staff will be responding to comments through May 2012.

The ACRS subcommittee is currently scheduled to review the advanced FSER without open items the week of June 5, 2012.

Turkey Point Combined License Application

On June 30, 2009, Florida Power & Light submitted a COLA for AP1000 units to be located at the existing Turkey Point Nuclear Generating site in Miami-Dade County, Florida.

The NRC staff is finalizing followup RAIs and continuing to prepare the preliminary DEIS. These tasks are expected to be completed in the third quarter of FY 2012. Significant issues under review include the regional geology/seismology review, which involves a first-time review of various seismology parameters and models for the Caribbean region, and the site selection process.

The responses to two RAIs related to tsunamis are expected in July 2012. Upon receipt and review of the responses to the RAIs, the NRC staff will revise the review schedule, as necessary.

Shearon Harris Combined License Application

On February 19, 2008, Progress Energy Carolina, Inc., submitted a COLA for two AP1000 units to be located at its Shearon Harris Nuclear Power Plant site, near New Hill in Wake County, North Carolina.

The NRC staff, working with the U.S. Army Corps of Engineers (USACE) as a cooperating agency, has identified several issues that remain unresolved for the environmental review. The NRC staff anticipates that clarifying resolution strategies for these issues will lead to a revised environmental review schedule. The review team (the NRC and USACE staff) is working with the applicant and relevant Federal and State agencies to determine necessary actions and schedules for resolving these issues.

Bellefonte Combined License Application

On October 30, 2007, TVA submitted a COLA 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. The completion and operation of Unit 1 (and potentially Unit 2) would necessitate additional site studies and significant revisions to the environmental report and the site safety analysis report supporting the COLA for Units 3 and 4.

In a letter dated September 29, 2010, TVA requested that the NRC defer most of its review of the COLA for Bellefonte Units 3 and 4. The NRC agreed to defer most of its review, but it stated that the staff will review hydrology topics after it receives critical hydrology studies. TVA estimates that these studies may take up to 15 months to complete.

South Texas Project Combined License Application

On September 20, 2007, STPNOC submitted a COLA for two ABWR units to be located at its site near Bay City in Matagorda County, Texas.

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.

In Revision 6 to the COLA, the staff was informed that Toshiba Corporation could obtain up to 90 percent ownership of the applicant. On December 13, 2011, the staff issued a letter to the applicant informing it that it does not meet the requirements of 10 CFR 50.38, "Ineligibility of Certain Applicants." On February 23, 2012, the applicant revised the general financial information to state that NRG Energy (a Delaware corporation) would retain about 90 percent ownership of Nuclear Innovation North America and further project funding would be in the form of loans from Toshiba.

Significant open items remain in the areas of seismic analysis, flow induced vibration, and spent fuel pool criticality and structural evaluation.

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 COLA for a U.S. EPR to be located at the Calvert Cliffs site near Lusby in Calvert County, Maryland. The COLA 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. UniStar has not provided a schedule yet for submittal of the updated ownership information.

The schedule for the FSER will be reevaluated based on (1) the pending submittal of information on seismic analyses, (2) delayed response dates for RAIs, and (3) not meeting the foreign ownership, control, or domination requirements contained in 10 CFR 50.38. In addition, the referenced combined license (RCOL) schedule must remain sequenced with the EPR DC review schedule. On February 21, 2012, the applicant submitted its schedule for responding to the outstanding RAIs, delaying the critical path RAI responses to July 2013. In coordination with the development of the new DC schedule, the NRC staff will issue a new schedule for the COLA and the contested and mandatory hearings by April 30, 2012.

Bell Bend Combined License Application

On October 10, 2008, PPL Bell Bend, LLC (PPL), submitted a COLA 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 USACE's need for a Section 404 permit under the Clean Water Act. The NRC staff will revisit large portions of the geology, seismic design, and hydrology reviews based on the revised submittals. The applicant submitted a complete revised environmental report on December 19, 2011. An application revision was received on March 23, 2012, and the schedule for the associated RAI responses was received on March 14, 2012. The full scope of the changes is currently projected for submission by July 2012.

The Susquehanna River Basin Commission (SRBC) has informed the applicant that it does not intend to approve water withdrawal during low-flow periods unless there is low-flow augmentation (water storage). The applicant is developing a pooled assets approach among its facilities within the Susquehanna River Basin so that overall water withdrawal from the Susquehanna River remains at current levels. This plan is being discussed with the SRBC, which could make a final decision on the applicant's permit application by December 2012.

USACE and the U.S. Environmental Protection Agency (EPA) have concerns about PPL's alternative sites analysis. USACE is requesting a detailed description of environmental impacts at all candidate sites to inform its least-environmentally-damaging-practicable-alternative decision. The applicant performed a sensitivity analysis on several criteria in the alternative site analysis to satisfy USACE concerns. This analysis was submitted in May 2011, and USACE and EPA currently are reviewing it.

The NRC staff plans on completing the sufficiency review for the revised environmental report and restarting the EIS scoping in May 2012. The NRC staff is revising the safety review schedule, taking into account the newly submitted information and evolving changes in the DC and RCOL schedules.

Nine Mile Point Combined License Application

On September 30, 2008, Nine Mile Point Nuclear Project, LLC, and UniStar Nuclear Energy submitted a COLA 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 temporarily suspend the COLA review, including any supporting reviews by external agencies, until further notice. The review remains suspended. On December 9, 2010, the Nine Mile Point COL applicants requested an exemption from annual submission requirements 10 CFR 50.71(e)(3)(iii) and proposed delaying the submittal of updates to the FSAR until December 31, 2012.

Callaway Combined License Application

On July 28, 2008, Ameren UE submitted a COLA 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 a letter dated November 22, 2010, Ameren Missouri, a subsidiary of Ameren Corporation, notified the NRC that it anticipates that an ESP application will be submitted in FY 2012, but that it intends to maintain the present COLA as a suspended application and plans to provide further correspondence on any future direction related to its status. Union Electric Company, doing business as Ameren Missouri, would be the applicant and license holder. Ameren Missouri stated that it would keep the NRC informed of its progress and any changes to its plans.

Comanche Peak Combined License Application

On September 19, 2008, Luminant submitted a COLA 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 COLA 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 2 open item because of the possibility of future changes in foreign ownership for the Comanche Peak Nuclear Power Plant.

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 applicant intends to provide a revised ground water analysis that includes a site-specific ground water model.

On December 7, 2011, the NRC staff issued a letter to Luminant containing a change to the safety review schedule. This schedule change was the result of delays from the US-APWR DC review schedule.

North Anna Combined License Application

On November 27, 2007, Dominion Virginia Power (Dominion) submitted a COLA for an ESBWR to be located at its North Anna Power Station site near Richmond in Louisa County, Virginia. The applicant subsequently publicly announced a decision to switch from ESBWR to US-APWR technology. On June 28, 2010, Dominion submitted its revised application to reference the US-APWR design. The NRC will supplement the EIS completed in February 2010, which originally was based on the ESBWR design.

In November 2011, Dominion notified the NRC staff, under 10 CFR Part 21, that the August 23, 2011, earthquake near the North Anna site exceeded at low frequencies the safe-shutdown earthquake (SSE) response spectra established in the North Anna ESP. Dominion stated that the data also exceeded the site 250-foot elevation ground motion response spectrum and the hard rock SSE developed for the North Anna Unit 3 COLA based on the ESP SSE spectra. Dominion is assessing if any changes should be made to the North Anna Unit 3 COLA. Dominion plans to complete its assessment by the end of July 2012.

Fermi Combined License Application

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

The staff published the DEIS in October 2011 and the public comment period ended on January 11, 2012. All public comments have been reviewed and first drafts of comment responses have been completed. The NRC staff has started the process of determining what changes will be incorporated into the FEIS. The NRC staff plans to issue an RAI requesting the applicant to address design changes in response to lessons learned from Fukushima as described in SECY-12-0025. The staff will assess the impact on the review schedule after discussing with the applicant its proposed schedule for responding to this RAI.

Victoria Combined License Application

On September 2, 2008, Exelon Generation Co., LLC, submitted a COLA for two ESBWR units to be located at its Victoria County Station site near Victoria City in Victoria County, Texas. Exelon requested that the COLA for Victoria Units 1 and 2 be withdrawn upon docketing of the Victoria ESP application. On July 20, 2010, the NRC accepted Exelon's request to withdraw the Victoria COLA. On June 7, 2010, Exelon submitted an ESP application for the Victoria site. Details about the Victoria ESP application were presented earlier in this report.

Grand Gulf Combined License Application

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

In a letter dated January 9, 2009, Entergy asked the NRC to suspend, until further notice, its review of the docketed COLAs 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 COLA. 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 Nuclear Operations, Inc. submitted a COLA for an ESBWR to be located at its River Bend Station site near St. Francisville, Louisiana. In a letter dated January 9, 2009, Entergy requested a suspension, until further notice, of the NRC's review of the docketed COLAs for River Bend Station, Unit 3, and Grand Gulf Unit 3. The review remains suspended.

Expected Application Submittals to the NRC

The staff anticipates the submittal of two ESP applications during FY 2012 (Callaway and Blue Castle).

Regulatory Infrastructure

The NRC continues to enhance the effectiveness and efficiency of the review processes for new reactor applications. This includes 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 are described below.

Rulemaking for Inspections, Tests, Analyses, and Acceptance Criteria Maintenance

The NRC staff developed the final rulemaking to amend the regulations related to the verification of nuclear power plant construction activities through inspections, tests, analyses, and acceptance criteria (ITAAC) under a COL. The NRC staff provided the final rulemaking package to the Commission for review in SECY-12-0030, "Final Rule: Requirements for Maintenance of Inspections, Tests, Analyses, and Acceptance Criteria (RIN 3150-AI77)," on February 23, 2012. The new provisions in the amended rule require a licensee to report new information materially altering the basis for determining that inspections, tests, or analyses were performed as required or that acceptance criteria are met, and to notify the NRC of completion of all ITAAC activities. These licensee notifications support the finding that the Commission must make under 10 CFR 52.103(g), which states that all ITAAC in the COL are met allowing fuel load and operation. These notifications also ensure that interested persons have access to information on ITAAC at a sufficient level of detail to address the Atomic Energy Act threshold for requesting a hearing on ITAAC closure. The final rule was affirmed by the Commission on May 11, 2012. The NRC staff expects to publish a revision to RG 1.215 "Guidance for ITAAC Closure under 10 CFR Part 52," (DG-1250), during the third quarter of FY 2012.

Changes During Construction Under 10 CFR Part 52

Interim Staff Guidance (ISG) COL/ISG-025, "Changes during Construction Under 10 CFR Part 52," was published in the *Federal Register* (77 FR 1749) for use and comment on January 11, 2012. The public comment period ended on March 26, 2012. The ISG discusses the Preliminary Amendment Request (PAR) review process that is established through a license condition in the initial COL licenses. The PAR process enables the COL licensee to request to proceed with the installation and testing of certain proposed plant changes that require a license amendment while the NRC is reviewing that LAR. Following closure of the comment period, the staff will evaluate the comments received and prepare the ISG for final concurrence and issuance.

Design Certification with Multiple Vendors

In June 2009, STPNOC submitted a request to amend the ABWR DC to comply with the Aircraft Impact Assessment (AIA) rule. The staff completed its review of the STPNOC amendment to the ABWR DC concerning AIA and submitted the associated proposed rule to the Commission. In that proposed rule, the staff recommended an approach for the treatment of multiple vendors for a single certified design. The Commission approved the proposed rule, including the staff's proposal to address multiple vendors for a single design. The NRC published the notice of the proposed rule in the *Federal Register* (76 FR 3540) on January 20, 2011, which sought public

comment on the staff's recommendation. The public comment period ended on April 5, 2011. The NRC received three comment letters on the proposed rule. The final rule was published in the *Federal Register* (76 FR 78096) on December 16, 2011.

International Activities

During this period, the NRC participated in bilateral activities and multilateral activities as part of the Multinational Design Evaluation Program (MDEP). The NRC actively participates in MDEP by chairing the MDEP Steering Technical Committee, chairing the AP1000 Working Group, chairing the Digital I&C Working Group, and participating in the EPR, Vendor Inspection Cooperation, and Codes and Standards Working Groups. The NRC also chairs the Nuclear Energy Agency's Working Group on the Regulation of New Reactors.

In 2011, NRC began sharing its insights on the integrity of the nuclear supply chain with the international community. In particular, the NRC proposed and was successful in obtaining the NEA Committee on Nuclear Regulatory Activities' (NEA/CNRA) approval for the establishment of a task group to focus on counterfeit, fraudulent, and suspect Items (CFSI). The NRC Office of New Reactors leads this task group, which is expected to complete its report on regulatory approaches to CFSI in 2012.

The NRC continues to enhance cooperation with other regulators through staff exchanges. For example, in late 2011, an NRC vendor inspector began a 3-month inspector exchange program with the Chinese regulator, NNSA, at Sanmen Nuclear Power Plant; an NRC staff member began a 6-month assignment with the Korean regulator, KINS, at its headquarters in Daejon, South Korea; and an NRC staff member began a 9-month assignment with the French nuclear regulator, the Autorité de sûreté nucléaire (ASN), at its headquarters in Paris, France.

Construction Inspection Program Developments

The NRC has the infrastructure in place to support FY 2012 inspection activities to verify quality construction and the completion of ITAAC. Safety-related construction officially began at Vogtle Units 3 and 4 on March 8, 2010, with the start of engineered backfill operations authorized under an LWA. Construction inspectors from the NRC Region II Center for Construction Inspection (CCI) and NRC Headquarters technical staff have conducted multiple inspections on the ITAAC included in the LWA for Vogtle Units 3 and 4. The staff also has conducted multiple inspections of the quality assurance program associated with LWA activities, in accordance with Inspection Procedure 35007, "Quality Assurance Program Implementation During Construction and Pre-Construction Activities." CCI opened the Vogtle construction resident inspector's office with a construction senior resident inspector and resident inspector in 2010. The latest construction milestone was the completion of the basemat/mudmat for the Unit 3 nuclear island in April 2011. Installation of the rubber waterproof membrane has been completed in Unit 3 and is ongoing in Unit 4. CCI has conducted LWA ITAAC inspections on the activities noted above. Summer continues with its site preparation and preconstruction activities.

The NRC recently increased the staff at both Vogtle and Summer construction resident inspector offices. Each office now has a construction senior resident inspector and two construction resident inspectors. CCI issued a quarterly inspection report for Vogtle Units 3 and 4 covering October 2011 through December 2011. No findings were identified in the report. Following the issuance of the Vogtle Units 3 and 4, and Summer Units 2 and 3, COLs in early 2012, the Vogtle and Summer construction resident inspection staffs began to execute the

full Inspection Manual Chapter (IMC) 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)," program.

The staff continues to refine concepts for ITAAC closure and the maintenance of closed ITAAC. In July 2011, the staff completed a simulated ITAAC closure and verification demonstration project. As a next step, the staff is collaborating with internal and external stakeholders to expand the example set of ITAAC closure notifications collected in NEI 08-01 "Industry Guideline for the ITAAC Closure Process under 10 CFR Part 52." The industry is developing and will add 27 additional closure notifications, representing 327 ITAAC, to NEI 08-01. The example closure notifications will then cover approximately 80 percent of the AP1000 ITAAC, which will provide licensees with more examples for preparing ITAAC closure notification submittals.

During the demonstration exercise, the staff and industry identified that further clarification and guidance was needed for the AP1000 "functional arrangement" ITAAC. Specifically, the scope of structures, systems, and components covered by this ITAAC was questioned. The staff worked very closely with internal and external stakeholders in several public workshops to reach a shared understanding of the scope of inspection that will be required to successfully complete these ITAAC. As a result, a detailed section describing the scope of "functional arrangement" and a "functional arrangement" example closure notification are expected to be added to the next revision of NEI 08-01. The staff also worked to gain a common understanding with industry on expectations for completing the design reliability assurance program (D-RAP) ITAAC, and continue to resolve issues involving the intent of specific ITAAC.

In support of construction at Vogtle and V.C. Summer, the staff is developing office instructions describing the process for the staff's recommendation to the Commission on the 10 CFR 52.103(g) finding and the ITAAC closure verification process.

In SRM-SECY-10-0140, "Options for Revising the Construction Reactor Oversight Process Assessment Program," dated March 21, 2011, the Commission directed the staff to develop a construction assessment program that includes a regulatory framework, the use of a construction SDP 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. The pilot also will be conducted at the Summer construction site. The staff will provide updates to the Commission and brief the ACRS as directed in the SRM.

Vendor Inspections

The NRC staff continued its participation in several quality assurance and inspection outreach activities, including meetings related to the Nuclear Procurement Issues Committee; American Society of Mechanical Engineers, Section III and Nuclear Quality Assurance; as well as the Nuclear Energy Institute. The NRC staff continues to make progress on actions in response to the Office of the Inspector General audit of the vendor inspection program. In addition, the NRC staff progressed with the implementation of the Vendor Inspection Program Plan, including use of the vendor selection prioritization strategy, initiation of the knowledge management and training activities, and planning and coordination for the Third Biennial Vendor Oversight Workshop. The NRC staff also has initiated actions to create and manage an internal database of vendor information to use in preparing for and facilitating inspection activities. The staff

continued with its plans for improving 10 CFR Part 21, “Reporting of Defects and Noncompliance,” through development of several regulatory bases to support proposed rulemaking activities (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,’” dated September 29, 2011). The NRC staff is also very active in the MDEP Vendor Inspection Cooperation Working Group.

Operator Licensing

Efficient and effective licensed operator training and examination will be critical to ensure that an adequate number of licensed operators are available to meet new reactor schedules. The industry has developed schedules for training and licensing operators. The NRC is working to have all of the necessary tools ready to support these schedules. Additionally, the staff has been working on a new examination format for highly integrated control rooms. During the training of industry instructors, mock exams will be developed and administered to the trainees by a consensus group of NRC staff and industry training personnel. The experience gained during the administration of the mock exams will be assessed to determine what changes to the current operator licensing exam format are necessary. Staff will incorporate these into NUREG-1021, “Operator Licensing Examination Standards for Power Reactors.” NUREG-1021 also will be modified to allow design-specific written exams to large numbers of operators. This approach will substantially reduce the number of NRC examiners needed to conduct the examination, and these examinations will be given to a large number of candidates by sharing resources from all of the Regions. The industry recognized that the current Knowledge and Abilities Catalogs need to be modified to include the new highly integrated control room environment. The staff issued the draft AP1000 catalog in November 2011, and the draft ABWR catalog in December 2011.

Advanced Reactors

The NRC staff has undertaken a variety of activities to prepare for applications for small modular reactors (SMRs) that may arrive as early as calendar year (CY) 2013. The NRC staff has evaluated past advanced reactor experience and communicated with stakeholders to identify issues that should be addressed to support design and licensing reviews of SMR designs and deployment. Although approached by vendors and advocates for a variety of reactor technologies, the NRC staff has focused its attention on the Next Generation Nuclear Plant (NGNP) program and on integral pressurized-water reactors (iPWRs).

Next Generation Nuclear Plant

In a letter dated October 17 2011, the Secretary of Energy forwarded the recommendations of the U.S. Department of Energy (DOE) Nuclear Energy Advisory Committee (NEAC) on readiness to proceed with Phase 2 of the NGNP Project per the Energy Policy Act of 2005.

The Secretary of Energy, Steven Chu, stated that DOE will not proceed with Phase 2 design activities at this time, given current fiscal constraints, competing priorities, projected cost of the prototype, and the inability to reach agreement on cost-sharing arrangements with the industry. The October 17, 2011, letter stated that the NGNP project will focus on high-temperature gas-cooled reactor (HTGR) research and development, interactions with the NRC on the licensing framework and the establishment of a public-private partnership.

The staff issued two reports on February 15, 2012, documenting the agency's NGNP Working Groups' assessments of five white papers that the NGNP project submitted. The white papers discussed fuel qualification, mechanistic source terms, defense-in-depth approach, licensing-basis event selection, and safety classification of systems, structures, and components. The Working Groups did not identify any fundamental issues that would prevent development of related licensing submittals that meet regulatory requirements. The assessment reports reflect the considered opinions of the members of the Working Groups but are not formal staff positions in the context of future licensing activities.

On February 15, 2012, the staff also issued a letter to DOE with a proposed outline of the scope of NGNP activities to be completed by the staff during CY 2012 that will support Secretary Chu's interest in making progress with the NRC on a licensing framework. Activities will focus on policy and technical issues associated with source term, containment functional performance, licensing-basis event selection, and emergency planning. The NRC is addressing some topics, such as emergency planning and modular plant licensing, as part of its resolution of generic SMR issues.

Integral Pressurized Water Reactors (iPWRs)

NuScale Power, LLC

In response to Regulatory Issue Summary (RIS) 2011-02 Revision 1, "Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs," dated December 27, 2011, NuScale Power, LLC, announced a new DC application submittal date with an objective to obtain design certification from the NRC under 10 CFR Part 52, Subpart B. The new date is being withheld as proprietary information.

On February 29–March 1, 2012, a closed meeting was held between the NRC and representatives from NuScale Power (NuScale). NuScale presented technical information related to its Topical Reports on Dynamical System Scaling Methodology and Loss-of-Coolant Accident Phenomena Identification and Ranking Table (LOCA PIRT). They also presented an overview of the NuScale testing programs, which include the integral tests at the ⅓ height and length scale test facility at Oregon State University (OSU) in Corvallis, Oregon, the helical coil steam generator testing in Italy, and the fuel critical heat flux test program in Canada. Testing is scheduled to begin in FY 2012 at the OSU facility. It will provide scaled prototypic integral test data for codes and methods development. The facility will be available for NRC-directed tests.

NuScale is in the process of building a full-scale control room mockup/simulator at its Corvallis office for a 12-module plant. The facility is scheduled to be ready for a demonstration to the NRC in the third quarter of 2012.

Babcock and Wilcox (B&W) mPower™

In response to RIS 2011-02, Revision 1, B&W announced a new DC application submittal date of the fourth quarter of CY 2013 in support of the TVA Clinch River construction permit application.

The NRC staff has been engaged in pre-application activities with B&W since mid-2009. To date, the NRC has received technical reports on the following topics: quality plan for the DC, plant design overview, critical heat-flux test and correlation development plan, core nuclear design codes and methods qualification, integrated system test (facility description and test plan), instrument setpoint methodology, control rod drive mechanism design and development, and the security design assessment and program plan.

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

Tennessee Valley Authority

In a November 5, 2010, letter, TVA described six key assumptions for possible licensing and construction of up to six B&W mPower SMR modules at the Clinch River site in Roane County, Tennessee. TVA described a plan to request a construction permit under 10 CFR Part 50 and also discussed plans for concurrent review of a 10 CFR Part 52 design certification application. The NRC sent a letter to TVA on January 31, 2011, stating that there are no legal or licensing issues that would prevent TVA from applying for a construction permit and operating license under 10 CFR Part 50.

On February 10, 2012, TVA responded to RIS 2011-02, Revision 1, stating that it currently plans to apply for a construction permit between the fourth quarter of CY 2013 and the fourth quarter of CY 2014.

Other iPWR Vendors

Two other vendors have contacted the NRC to propose submitting small light-water reactor designs for NRC review. Holtec is developing the Holtec Inherently Safe Modular Underground Reactor design and is also planning to submit a DC application. On July 21, 2011, Holtec representatives presented their plans for submitting a future licensing application. The NRC staff intends to meet with Holtec, as resources allow, to learn more about the vendor's design.

Westinghouse is developing an SMR design and is planning to submit a DC application. The NRC staff met with Westinghouse on April 11, 2011, to discuss the schedule and plans. In addition, on July 12, 2011, NRO staff held another meeting with Westinghouse representatives at Westinghouse headquarters in Cranberry, Pennsylvania, to discuss plans for its SMR—an iPWR approximately 225 MWt.

Other Reactor Technologies

The NRC staff has occasional interactions with potential applicants using other advanced reactor designs, such as sodium-cooled fast reactors, lead-bismuth-cooled fast reactors, and fluoride salt-cooled high-temperature reactors. The NRC staff activities related to these designs is limited to low-level efforts (e.g., knowledge management) and non-resource intensive interactions with vendors (e.g., occasional meetings).

Regulatory Framework Development

Generic Policy Issues

The NRC staff continues to focus on identifying and resolving policy and key technical issues and developing guidance for both the iPWRs and the NGNP Program. The NRC staff has developed and is executing specific resolution plans for the issues identified in SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," dated March 28, 2010. The NRC staff is also working on a number of key technical issues associated with these technologies. The industry also formed groups to discuss and coordinate issues associated with SMRs. NEI and the American Nuclear Society have established various working groups to develop position papers on many of the generic issues identified in SECY-10-0034. To ensure close coordination between the NRC and its stakeholders, as well as timely resolution of the issues, the NRC and NEI have established routine public meetings to discuss generic approaches to resolving the policy, licensing, and key technical issues for the spectrum of advanced reactor technologies.

During the last 6 months, the NRC staff made significant progress toward implementing policy issue resolution plans in support of conducting future licensing reviews.

The NRC staff completed an information paper (SECY-11-0152, "Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors") in October 2011, which described offsite EP requirements that could be scaled to be commensurate with the SMR accident source term, fission product release, and associated dose characteristics.

The NRC staff issued an information paper to the Commission, SECY-11-0178, "Insurance and Liability Regulatory Requirements for Small Modular Reactors," dated December 22, 2011. This paper describes a staff-identified potential inequality in the SMR insurance requirements related to one particular SMR design

The NRC staff issued a paper to the Commission, SECY-11-0181, "Decommissioning Funding Assurance for Small Modular Reactors," dated December 22, 2011, discussing its planned approach, both in the near- and long-term, for ensuring that SMR licensees provide reasonable assurance that funding will be available for decommissioning SMRs.