Protecting People and the Environment

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

April 2010–September 2010

Note: The period of performance covered by this report includes activities occurring between the first day of April 2010 and last day of September 2010. The transmittal letter to Congress accompanying this report provides additional information to keep Congress fully and currently informed of the NRC's licensing and regulatory activities.

CONTENTS

I Implementing Risk-Informed and Performance-Based Regulations

The U.S. Nuclear Regulatory Commission (NRC) added Section 50.48(c) to Title 10 of the *Code of Federal Regulations* (10 CFR 50.48(c)) to allow existing nuclear power plant (NPP) licensees to voluntarily adopt a risk-informed and performance-based fire protection licensing basis, also known as National Fire Protection Association Standard 805. As of September 30, 2010, licensees for 50 reactor units have committed to adopting the new licensing basis. The licensees for two nuclear power stations, Shearon Harris and Oconee, volunteered to serve as pilot plants for this transition and submitted their license amendment requests (LARs) in May 2008. The staff issued the safety evaluation report (SER) for Shearon Harris in June 2010. The staff is continuing to review the Oconee LAR. The staff updated the regulatory guidance using lessons learned from these reviews.

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 on a periodic basis to collect feedback on the effectiveness of the process and to consider it in making future ROP refinements.

The agency's most recent performance assessments show that all plants continue to operate safely. The NRC Office of Public Affairs issued a press release on September 3, 2010, summarizing the 2010 midcycle performance assessments and associated midcycle assessment letters for all nuclear plants. This information is publicly available on the NRC Web site.

The NRC hosted monthly public meetings, which were attended by the ROP Working Group and other interested stakeholders, to provide a forum for external feedback on staff initiatives. The ROP Working Group comprises representatives from industry and the NRC staff, who work toward continuously improving the ROP and reactor safety.

The NRC staff issued the results of its annual self-assessment of the ROP in SECY-10-0042, "Reactor Oversight Process Self-Assessment for Calendar Year 2009," dated April 7, 2010.

The NRC and the Institute of Nuclear Power Operations (INPO) held an annual public coordination meeting on training-related issues. The purpose of the meeting was to discuss items of mutual interest concerning INPO's training program accreditation process.

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

Other significant areas related to the ROP are described below.

<u>Buried Piping</u>

Several NRC stakeholders have raised concerns regarding leaking buried piping at nuclear reactor facilities. NRC Chairman Jaczko requested that the staff describe the activities currently underway or planned to address the issue of leaks from buried piping. In SECY-09-0174, "Staff Progress in Evaluation of Buried Piping at Nuclear Reactor Facilities," dated December 2, 2009,

the staff provided information to the Commission describing ongoing activities related to buried piping. For all of the actual events related to the degradation of buried piping, safety systems have remained operable, and there has been no challenge to piping structural integrity. Leaks from degraded buried piping containing radioactive or other hazardous material have not exceeded NRC regulatory limits. The staff concluded that current regulations and codes and standards are adequate to ensure the function of safety-related piping. The staff will continue to participate in the American Society of Mechanical Engineers (ASME) and NACE International (formerly the National Association of Corrosion Engineers) committees to develop enhancements related to advances in technology. In addition, the staff will participate with NACE International to develop buried piping maintenance and corrosion protection standards specific to NPP applications. The industry has developed a new Buried Piping Integrity Initiative that is intended to address the degradation of buried piping. The staff has met with the industry and will continue its review of this initiative, evaluating the need for changes to NRC inspection activities related to licensee implementation. Finally, the staff has developed an action plan to track completion of activities to address the degradation of buried piping.

Groundwater Task Force

In March 2010, the Executive Director for Operations (EDO) established the Groundwater Task Force (GTF) to evaluate NRC actions to date that address buried piping leaks and whether those actions needed to be augmented. Its charter was to do the following:

- Reevaluate the recommendations made in the Liquid Radioactive Release Lessons Learned Task Force Final Report, dated September 1, 2006.

- Review the actions taken in SECY-09-0174.

- Review the actions taken in response to recent releases of tritium into groundwater by nuclear facilities.

The task force completed its work in June 2010 and provided its report to the EDO. The report characterized a variety of subjects, ranging from policy issues to opportunities to improve communications. The EDO asked the Deputy Executive Director for Reactor and Preparedness Programs to chair a group of NRC senior executives to review the report and implement its findings. Over the next few months, the Senior Management Review Force will do the following:

- Review the GTF final report, including the conclusions and recommendations and their bases.

- Identify conclusions and recommendations that do not involve policy issues and task the staff to address them.

- Identify the policy issues, develop options to address them, and send a policy paper to the Commission discussing those options.

- Determine whether the GTF conclusions or recommendations should be expanded.

- Seek feedback from external stakeholders in a public meeting (held on October 4, 2010), on how the NRC should address the conclusions and recommendations of the GTF.

III Status of Issues Tracked in the Reactor Generic Issues Program

The NRC staff is currently tracking five open generic issues (GIs) in the Generic Issues Management Control System; the status of each is described below. Previously issued semiannual reports contain a description of activities that occurred before April 2010.

GI-186, "Potential Risk and Consequences of Heavy Load Drops in Nuclear Power Plants"

The NRC staff is continuing to conduct sampling inspections to validate initial implementation of the NEI 08-05, "Industry Initiative on Control of Heavy Loads," guidelines. The staff plans to submit a closeout memorandum, for review through the Advisory Committee on Reactor Safeguards (ACRS), during the first quarter of fiscal year (FY) 2011.

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

The NRC staff issued letters in 2007 to affected licensees accepting commitments to changes that enhance plant capabilities to mitigate the potential for early containment failure from hydrogen combustion. Licensee implementation and NRC verification inspections performed pursuant to NRC Temporary Instruction 2515/174, "Hydrogen Igniter Backup Power Verification," have been completed at all nine affected sites. The staff is conducting activities to support closure of this GI by the end of 2010. These activities include evaluating methods to address this issue for Watts Bar Nuclear Plant, Unit 2, which is currently undergoing an operating license review.

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

This generic issue concerns the possibility that, following a loss-of-coolant accident (LOCA) in a pressurized-water reactor (PWR), debris accumulating on the emergency core cooling system (ECCS) 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, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004), all PWR licensees increased the size of their containment sump strainers, significantly reducing the risk of strainer clogging. An associated issue, which needs to be resolved to close GI-191, is the potential for debris to bypass the sump strainers and enter the reactor core. Additional testing, requested by the NRC, yielded unexpected results; therefore, further testing is in progress. The NRC expects to issue a safety evaluation on the topical report that will provide guidance to licensees regarding use of the industry-developed test results and the topical report. The NRC has delayed issuing this safety evaluation until December 2010 or later because of staff concerns about industry test results. Additionally, based on vendor testing, licensees have sought to assume (and take credit for) a reduced amount of debris generated following a LOCA. The NRC staff reviewed this testing and, despite numerous interactions with the industry, has been unable to conclude that the reduced generation assumption is valid. The industry plans a new test campaign to address the staff's concerns.

On April 15, 2010, the NRC staff and industry briefed the Commission regarding the current status of GI-191. Representatives from industry summarized their actions to address the issue and suggested these actions resolve the safety concern. The staff stated its position that the issue remains of concern for plants with relatively high fibrous insulation loading that have not

demonstrated adequate sump performance using methods acceptable to the NRC. Based on the information presented, the Commission directed the staff to provide the Commission with information on potential approaches for bringing GI-191 to closure. The staff sent a paper to the Commission on August 26, 2010, and presented it to the ACRS on September 9, 2010. The Commission met on September 29, 2010, and, based on its direction, the expected closure date for GI-191 will likely be adjusted.

GI-193, "Boiling-Water Reactor Emergency Core Cooling System Suction Concerns"

The task action plan to resolve this GI involves an evaluation of suppression pool designs, as well as the dynamics of air entrainment in the suppression pool and its effect on ECCS pump performance. Based on a staff request, the Boiling-Water Reactor (BWR) Owners Group provided voluntary data regarding the characteristics of LOCA phenomena at the earliest stages of the postulated accidents plus general information about wetwell geometries in relation to ECCS suction strainers. Staff efforts are underway to estimate the maximum potential void fraction through scale experiments being conducted at Purdue University. The experiments should clarify the potential for bubbles formed during a LOCA blowdown to be transported in the wetwell to the ECCS pump inlets and, consequently, ingested into the ECCS pump impellers. Steady-state tests began in mid-June 2010, and transient tests will run throughout the remainder of the year.

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/risk assessment, NRC evaluated the effects of new seismic hazard data and methods on U.S. nuclear plants and collaborated with the Electric Power Research Institute to ensure a sound technical approach. The Safety/Risk Assessment Panel issued its report on September 2, 2010. The panel recommended that further actions be taken to address GI-199 outside the GI program. The NRC issued Information Notice (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/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 provide specific information relating to their facilities to enable the staff to complete the regulatory assessment and identify and evaluate candidate backfits.

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 that require NRC review and approval before licensees can implement them. The NRC's FY 2010 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 licensee responses to NRC requests for information through GLs or bulletins; NRC responses to petitions under 10 CFR 2.206, "Requests for Action under this Subpart"; NRC review of generic topical reports;

responses by NRR to regional office requests for assistance; NRC review of licensee analyses under 10 CFR 50.59, "Changes, Tests, and Experiments"; and final safety analysis report (FSAR) updates, or other licensee requests not requiring NRC review and approval before they can be implemented by licensees. The FY 2010 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.

Table 1 shows the actual FY 2008 and FY 2009 results, the FY 2010 goals, and the FY 2010 end-of-year results for the two NRC performance plan output measures for operating power reactor licensing actions and other licensing tasks.

Table 1 Reactor Licensing Actions and Other Licensing Tasks

Output Measure	FY 2008 Actual	FY 2009 Actual	FY 2010 Goals	FY 2010 Actual
Licensing actions completed/year	1,054	1,002	≥ 950	988
Age of licensing action inventory	94.6% ≤ 1 year and 100% ≤ 2 years	93.3% 100%	90% ≤ 1 year and 100% ≤ 2 years	92.8% 100%
Other licensing tasks completed/year	678	541	600	625
Age of other licensing tasks inventory	96.6% ≤ 1 year and 100% ≤ 2 years	90.0% 100%	90% ≤ 1 year and 100% ≤ 2 years	93.6% 100%

V Status of License Renewal Activities

The NRC has issued renewed licenses to 59 of the 104 units licensed to operate. During this period (April 2010 through September 2010), the NRC issued SERs for the Duane Arnold Energy Center and Cooper Nuclear Station and final supplemental environmental impact statements (FSEISs) for Kewaunee Power Station and Cooper Nuclear Station. The NRC currently has 15 license renewal applications for 21 units under review. The status of applications currently under review is given below. Previously issued semiannual reports contain a description of activities that occurred before April 2010.

Pilgrim Nuclear Power Station

In January 2006, Entergy Nuclear Operations (Entergy) submitted a license renewal application for the Pilgrim Nuclear Power Station (Pilgrim), to extend the operating license for an additional 20 years beyond the current license period. In March 2010, the Commission remanded part of Pilgrim Watch's (intervenor) contention on severe accident mitigation alternatives (SAMA) to the Atomic Safety and Licensing Board (ASLB). On June 17, 2010, the Commission found in favor of Entergy on the buried piping and tanks contention. The Commission also denied a motion to reconsider a ruling to limit the scope of the SAMA contention. Pilgrim Watch also filed a motion to recuse an individual from serving on the ASLB for Pilgrim proceedings. This motion was denied in June 2010 and the Commission affirmed the ruling in August 2010. The ASLB estimates that it will conduct the hearing for the SAMA contention in late February or early March 2011. Pilgrim's original 40-year licensing period will expire on June 8, 2012.

Vermont Yankee Nuclear Power Station

In January 2006, Entergy submitted a license renewal application for the Vermont Yankee Nuclear Power Station (Vermont Yankee), to extend the operating license for an additional 20 years beyond the current license period. In May 2006, New England Coalition, Inc. (NEC) filed contentions related to metal fatigue, flow accelerated corrosion, and steam dryer degradation. The ASLB issued a partial initial decision on the three contentions in November 2008. The staff petitioned for Commission review of this decision with respect to the metal fatigue contention. In July 2009, the ASLB issued a full initial decision. NEC petitioned the Commission, seeking reversal of the ASLB's July 2009 full initial decision. In July 2010, the Commission granted the staff's petition for review, reversing the ASLB's partial initial decision on NEC's metal fatigue contention and remanding the case to the ASLB for NEC to revise its contention related to metal fatigue. NEC subsequently decided not to revise the metal fatigue-related contention but instead filed a motion to reopen the proceeding and add a new contention related to submerged power cables. The staff filed a response to NEC's motion to reopen, stating that it did not satisfy the Commission's requirements (in 10 CFR 2.326, "Motions to Reopen") for reopening and adding a new contention. Vermont Yankee's original 40-year licensing period will expire on March 21, 2012.

Indian Point Nuclear Generating Station, Units 2 and 3

In April 2007, Entergy submitted a license renewal application for the Indian Point Nuclear Generating Station, Units 2 and 3, to extend the operating licenses for an additional 20 years beyond the current license period. During the reporting period, the NRC staff extended the schedule for issuance of the FSEIS until November 19, 2010, to address the significant number of public comments the staff received in the course of this review. Activities related to admitted contentions continue. The ASLB will establish a schedule for hearings following issuance of the FSEIS and will provide the dates of certain related legal filings by parties in the proceeding.

Prairie Island Nuclear Generating Plant, Units 1 and 2

In April 2008, the Nuclear Management Company, now known as Northern States Power Company, a Minnesota corporation, submitted a license renewal application for the Prairie Island Nuclear Generating Plant, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license period. The Prairie Island Indian Community (PIIC) intervened and filed several contentions. Over the course of the proceeding, all but one of PIIC's contentions were settled or denied. On September 30, 2010, the Commission reversed the ASLB's admission of PIIC's remaining contention (on safety culture) and terminated the adjudicatory proceeding. During the reporting period, the staff also continued to conduct the environmental review of the application in accordance with NRC regulations.

Kewaunee Power Station

On August 14, 2008, Dominion Energy Kewaunee, Inc. submitted a license renewal application for the Kewaunee Power Station to extend the operating license for an additional 20 years beyond the current license period. The NRC issued the SER with open items in July 2010 and issued the FSEIS in August 2010.

Duane Arnold Energy Center

On October 1, 2008, Florida Power and Light (FPL) Energy Duane Arnold submitted a license renewal application for the Duane Arnold Energy Center to extend the operating license for an additional 20 years beyond the current license period. The NRC issued the SER with open items in May 2010 and the SER in September 2010.

Cooper Nuclear Station

On September 30, 2008, Nebraska Public Power District submitted a license renewal application for the Cooper Nuclear Station to extend the operating license for an additional 20 years beyond the current license period. The NRC issued the FSEIS in July 2010 and the SER in September 2010.

Palo Verde Nuclear Generating Station, Units 1, 2, and 3

On December 11, 2008, Arizona Public Service Company submitted a license renewal application for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, to extend the operating licenses for an additional 20 years beyond the current license period. The NRC issued the SER with open items and the draft supplemental environmental impact statement in August 2010. The NRC held public meetings near the site on September 15, 2010, to solicit public comments concerning the preliminary recommendations of the environmental review for license renewal. The public comment period ends on October 29, 2010.

Crystal River Unit 3 Nuclear Generating Plant

On December 16, 2008, the Florida Power Corporation submitted a license renewal application for the Crystal River Unit 3 Nuclear Generating Plant to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff continued to conduct the environmental and safety review of the application in accordance with NRC regulations.

Salem Nuclear Generating Station, Units 1 and 2

On August 18, 2009, Public Service Enterprise Group (PSEG) Nuclear LLC submitted a license renewal application for the Salem Nuclear Generating Station, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license period. During the reporting period, the staff continued to conduct the environmental and safety review of the application in accordance with NRC regulations.

Hope Creek Generating Station

On August 18, 2009, PSEG Nuclear LLC submitted a license renewal application for the Hope Creek Generating Station to extend the operating license for an additional 20 years beyond the current license period. During the reporting period, the staff continued to conduct the environmental and safety review of the application in accordance with NRC regulations. The NRC issued the SER with open items in September 2010.

Diablo Canyon Power Plant, Units 1 and 2

On November 24, 2009, Pacific Gas and Electric Company submitted a license renewal application for the Diablo Canyon Power Plant, Units 1 and 2, to extend the operating licenses for an additional 20 years beyond the current license period. During the reporting period, the staff conducted multiple onsite audits related to the safety and environmental review of the license renewal application. On August 4, 2010, the ASLB admitted contentions from the San Luis Obispo Mothers for Peace. Activities related to the admitted contentions are ongoing.

Columbia Generating Station

On January 20, 2010, Energy Northwest submitted a license renewal application 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 conducted multiple onsite audits related to the safety and environmental review of the license renewal application.

Seabrook Station

On June 1, 2010, NextEra Energy Seabrook, LLC, submitted a license renewal application for the Seabrook Station to extend the operating license for an additional 20 years beyond the current license period. The staff performed an acceptance review and determined that the application was acceptable for docketing and review. The staff is conducting the environmental and safety review of the application in accordance with NRC regulations.

Davis-Besse Nuclear Power Station

On August 30, 2010, FirstEnergy Nuclear Operating Company submitted a license renewal application for the Davis-Besse Nuclear Power Station to extend the operating license for an additional 20 years beyond the current license period. The staff is currently performing an acceptance review of the license renewal application to determine acceptability for docketing and review.

Generic Aging Lessons Learned Report Update

The NRC is updating the license renewal guidance documents, which include NUREG-1801, “Generic Aging Lessons Learned (GALL) Report,” and NUREG-1800, “Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants” (SRP). This update focuses on lessons learned from the review of recent license renewal applications, operating experience, emerging issues, and the incorporation of interim staff guidance (ISG). The NRC issued the draft documents for public comment in May 2010, and the public comment period closed in July 2010. The staff held several public meetings and a workshop to discuss the draft changes with interested external stakeholders. The staff plans to issue the final versions of these documents in December 2010.

Generic Environmental Impact Statement Update

The NRC is continuing the process of revising the generic environmental impact statement for the license renewal of nuclear plants and associated guidance documents. These documents support a rulemaking to amend and update environmental protection regulations for the renewal of NPP operating licenses. The NRC plans to publish the revised statement, final rule, and associated guidance documents in FY 2012.

VI Summary of Reactor Enforcement Actions

Reactor Enforcement by Region

For comparison purposes, the reactor enforcement statistics below are arranged by NRC Region, half-year, most recent half-year, FY to date, and two previous FYs. The statistics are also depicted in separate tables for the nonescalated and escalated reactor enforcement data, as well as separate tables for the escalated enforcement data associated with traditional enforcement and the ROP. The assessment of the significance of a violation is generally reflected by the severity level assigned to the violation (i.e., traditional enforcement). However, for most violations committed by power reactor licensees, the significance of a violation is assessed using the significance determination process (SDP) under the ROP, which uses risk insights, where appropriate, to assist the NRC in determining the safety or security significance of inspection findings identified within the ROP.

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

Table 2 Nonescalated Reactor Enforcement Actions

		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1st Half FY 10	3	1	0	4	8
	2nd Half FY 10	0	0	2	5	7
	FY 10 YTD Total	3	1	2	9	15
	FY 09 Total	4	3	0	6	13
	FY 08 Total	0	0	1	3	4
Noncited Severity Level IV or Green	1st Half FY 10	81	67	97	162	407
	2nd Half FY 10	64	59	107	129	359
	FY 10 YTD Total	145	126	204	291	766
	FY 09 Total	173	110	205	221	709
	FY 08 Total	235	218	294	316	1,063
TOTAL Cited and Noncited Severity Level IV or Green	1st Half FY 10	84	68	97	166	415
	2nd Half FY 10	64	59	109	134	366
	FY 10 YTD Total	148	127	206	300	781
	FY 09 Total	177	113	205	227	722
	FY 08 Total	235	218	295	319	1,067

NOTE: The nonescalated enforcement data above reflect the cited and noncited 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 EA 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.

Table 3 Escalated Reactor Enforcement Actions Associated with Traditional Enforcement						
		Region I	Region II	Region III	Region IV	TOTAL
Severity Level I	1st Half FY 10	0	0	0	0	0
	2nd Half FY 10	0	0	0	0	0
	FY 10 YTD Total	0	0	0	0	0
	FY 09 Total	0	0	0	0	0
	FY 08 Total	0	0	0	0	0
Severity Level II	1st Half FY 10	0	0	0	0	0
	2nd Half FY 10	0	0	0	0	0
	FY 10 YTD Total	0	0	0	0	0
	FY 09 Total	0	0	0	0	0
	FY 08 Total	0	1	0	0	1
Severity Level III	1st Half FY 10	1	0	1	0	2
	2nd Half FY 10	0	2	1	0	3
	FY 10 YTD Total	1	2	2	0	5
	FY 09 Total	1	0	2	0	3
	FY 08 Total	2	1	1	0	4
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 10	1	0	1	0	2
	2nd Half FY 10	0	2	1	0	3
	FY 10 YTD Total	1	2	2	0	5
	FY 09 Total	1	0	2	0	3
	FY 08 Total	2	2	1	0	5

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

Table 4 Escalated Reactor Enforcement Actions Associated with the ROP						
		Region I	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1st Half FY 10	0	0	0	0	0
	2nd Half FY 10	0	0	0	0	0
	FY 10 YTD Total	0	0	0	0	0
	FY 09 Total	0	0	0	0	0
	FY 08 Total	0	0	0	0	0
Violations Related to Yellow Findings	1st Half FY 10	0	0	0	0	0
	2nd Half FY 10	0	3	0	0	3
	FY 10 YTD Total	0	3	0	0	3
	FY 09 Total	0	0	0	0	0
	FY 08 Total	0	1	0	0	1
Violations Related to White Findings	1st Half FY 10	2	0	4	1	7
	2nd Half FY 10	1	4	0	0	5
	FY 10 YTD Total	3	4	4	1	12
	FY 09 Total	2	4	6	1	13
	FY 08 Total	0	1	1	4	6
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 10	2	0	4	1	7
	2nd Half FY 10	1	7	0	0	8
	FY 10 YTD Total	3	7	4	1	15
	FY 09 Total	2	4	6	1	13
	FY 08 Total	0	2	1	4	7

NOTE: The escalated enforcement data above reflect the violations or problems cited during the referenced time periods that were 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

(NOTE: This list includes security-related actions and confirmatory actions that are not included in the above tables.)

Florida Power and Light Company (**St. Lucie Nuclear Plant**)—EA-09-321

On April 19, 2010, the NRC issued a notice of violation to FPL for a violation associated with a yellow SDP finding as a result of inspections at the St. Lucie Nuclear Plant. The yellow finding involved the licensee's failure to meet the requirements of 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion XVI, "Corrective Action." In 2008, the licensee experienced an event in which air leaked into the closed cooling water system, affecting the system's ability to supply adequate cooling to

essential equipment. The licensee's troubleshooting and corrective actions failed to identify the source of the leakage, which resulted in a similar event in 2009.

Tennessee Valley Authority (**Browns Ferry Nuclear Plant**)—EA-09-307

On April 19, 2010, the NRC issued a notice of violation to Tennessee Valley Authority (TVA) for violations associated with yellow and white SDP findings as a result of inspections at the Browns Ferry Nuclear Plant. The yellow finding involved the licensee's failure to meet the requirements of 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire Protection of Safe Shutdown Capability." There were multiple examples of the licensee's failure both to provide fire protection features capable of limiting fire damage and to ensure that one train of systems or components was free of fire damage by approved methods. Compensatory measures are currently in place, and the licensee will implement long-term corrective actions. The white finding involved the licensee's failure to meet the requirements of a technical specification. This involved the inappropriate revision to a procedure that could have delayed proper operator response to a major disabling fire event. The licensee has revised the procedure to prevent such an occurrence.

FirstEnergy Nuclear Operating Company (**Davis-Besse Nuclear Power Station**)—EA-09-332

On April 30, 2010, the NRC issued a notice of violation to FirstEnergy Nuclear Operating Company for a Severity Level III violation for the failure to implement (1) 10 CFR 50.71, "Maintenance of Records, Making of Reports," and (2) 10 CFR Part 50, Appendix B, Criterion III, "Design Control." In July 1999, the licensee submitted an LAR to eliminate as-found testing criteria by using the past data for double O-ring data and the NRC approved it. However, the licensee staff did not include this fact in its updated FSAR. The licensee also changed from the double O-ring design to a flat gasket design that did not have the same history of reliability as the double O-ring and failed to incorporate this fact into the licensing basis at the time of installation.

Southern Nuclear Operating Company (**Edwin I. Hatch Nuclear Plant**)—EA-10-009

On May 12, 2010, the NRC issued a notice of violation to Southern Nuclear Operating Company, Inc., for a violation associated with a white SDP finding as a result of inspections at the Edwin I. Hatch Nuclear Plant. The white finding involved the licensee's failure to meet technical specifications. From 1988 to 2009, the licensee failed to establish and perform preventive maintenance activities on components having a specific lifetime. This resulted in a capacitor failure on a circuit card during a surveillance test of an emergency diesel generator (EDG), which caused the EDG to be declared inoperable.

Duke Energy Carolinas, LLC (**William B. McGuire Nuclear Station**)—EA-09-252

On June 2, 2010, the NRC issued an immediately effective confirmatory order to Duke Energy Carolinas, LLC (Duke), to confirm commitments made as a result of an alternative dispute resolution mediation session held on March 29, 2010. This enforcement action is based on two violations of NRC requirements at the McGuire Nuclear Station: a contract employee introduced and used marijuana inside the protected area and a contract employee failed to immediately report the event to Duke Energy management. Duke agreed to take the following actions: (1) develop a summary of lessons learned from the facts and circumstances

surrounding the apparent violations and communicate this summary to its employees fleetwide, (2) perform a self-assessment of the adequacy of the programs and processes in place to detect and deter the introduction of illegal drugs and alcohol into the protected area of Duke's nuclear stations and implement appropriate enhancements in accordance with its corrective action program, and (3) before December 31, 2010, perform an effectiveness review of the corrective actions identified in (1) and (2) above. This is in addition to several other corrective actions already completed by Duke. In consideration of these commitments, and the corrective actions already completed by Duke, the NRC agreed that the noncompliances will be characterized as a Severity Level IV violation of 10 CFR Part 26, "Fitness for Duty Programs."

Florida Power and Light Company (**Turkey Point Nuclear Plant Unit 3**)—EA-10-037

On June 21, 2010, the NRC issued to FPL a white finding with two associated violations as a result of inspections at Turkey Point Nuclear Plant, Unit 3. This white finding involves the licensee's failure to adequately address degradation of Boraflex, a fixed neutron absorber material used in the Turkey Point Unit 3 spent fuel pool. The Boraflex degradation resulted in a reduction in the boron-10 areal density of the spent fuel storage racks such that, when considering the biases and uncertainties identified in Chapter 9 of the updated FSAR, the effective neutron multiplication factor would not have been maintained less than 1.0 if the spent fuel pool had been flooded with unborated water. The NRC found that FPL had violated 10 CFR Part 50, Appendix B, Criterion XVI, which requires that conditions adverse to quality be promptly identified and corrected, and Technical Specification 5.5.1.1.a, which requires that the spent fuel storage racks be maintained with an effective neutron multiplication factor less than 1.0 if flooded with unborated water, when considering the biases and uncertainties described in the updated FSAR. The NRC also issued FPL a Severity Level III Notice of Violation with a proposed $70,000 civil penalty for failure to comply with 10 CFR 50.73, "Licensee Event Report System," which requires, in part, that licensees report any condition prohibited by the plant's technical specifications. As discussed, Boraflex degradation led to a condition prohibited by Turkey Point Unit 3 technical specifications, but FPL did not report this condition to the NRC as required by 10 CFR 50.73.

Calvert Cliffs Nuclear Power Plant, Inc. (**Calvert Cliffs Nuclear Power Plant**)—EA-10-080

On August 3, 2010, the NRC issued a white SDP finding with an associated violation to Calvert Cliffs Nuclear Power Plant. This white finding involved the licensee's failure to develop and implement scheduled preventive maintenance for the Agastat E7000 series time delay relays, as required by Technical Specification 5.4.1. Specifically, subsequent to the approval of Engineering Change Package No. ES200100067, issued in March 2001, the licensee did not replace the relays within the vendor-recommended 10-year lifetime, nor did it establish a performance monitoring program. Consequently, on February 18, 2010, an Agastat E7000 series time delay relay in the 2B EDG protective logic circuit, which had a lifetime in excess of 10 years, timed out early and failed to support a demand fast start and run of the 2B EDG. As a result, the EDG became inoperable with the resultant loss of alternating current to the 24 safeguards bus during the dual unit trip that occurred on February 18, 2010.

Duke Energy Carolinas, LLC (**Oconee Nuclear Station Units 1, 2, and 3**)—EA-10-094

On August 12, 2010, the NRC issued yellow and white findings with associated violations and a notice of violation for a Severity Level III violation to Duke as a result of inspections at the Oconee Nuclear Station, Units 1, 2, and 3. The yellow finding involved the failure to ensure that the reactor coolant makeup (RCM) subsystem standby shutdown facility (SSF) for all three units

remained operable as required by technical specifications. The white finding involved Duke's failure to identify and correct the SSF RCM letdown line degradation at Unit 2 and Unit 3 in a timely manner after it identified degradation on Unit 1, as required by 10 CFR Part 50, Appendix B, Criterion XVI. The NRC also assessed a Severity Level III violation of 10 CFR 50.9, "Completeness and Accuracy of Information," because Duke submitted materially inaccurate information. Duke provided information that described an alternate flowpath that could be used to control the pressurizer level during an SSF event. However, this flowpath was not available because of a closed manual valve inside the containment.

VII Power Reactor Security and Emergency Response Regulations

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

The NRC published its rulemaking effort pertaining to the physical protection of plants and materials requirements (10 CFR Part 73, "Physical Protection of Plants and Materials") in the *Federal Register* (FR) on March 27, 2009. It amended the requirements of 10 CFR 73.55, "Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage," and 10 CFR 73.56, "Personnel Access Authorization for Nuclear Power Plants," which includes requirements for checking criminal history records of individuals granted unescorted access, and added new requirements under 10 CFR 73.54, "Protection of Digital Computer and Communication Systems and Networks." These regulations required licensees to be in compliance no later than March 31, 2010. The NRC approved 40 requests from individual licensees for schedule exemptions from the revised 10 CFR 73.55 because of an inability to complete site reconfiguration requirements needed to achieve full compliance with certain technical aspects of the rule. These licensees have put in place appropriate compensatory actions while implementing these reconfigurations, and the NRC continues its oversight reviews and inspections to ensure that the security measures are adequate. All licensees remain in full compliance with the earlier security requirements and with most of the new requirements.

The NRC staff is reviewing licensees' plans and schedules to ensure that they meet the intent of these specific regulations. In addition to reviewing 65 cyber security plans from operating reactor licensees, the staff is reviewing 18 such plans from new reactor applicants. The NRC staff and North American Electric Reliability Corporation also have completed a memorandum of understanding on a regulatory oversight framework for cyber security to minimize the potential for overlapping regulation.

The NRC is continuing force-on-force inspections at each nuclear power reactor and Category I fuel cycle facility on a normal 3-year cycle, using the adversary characteristics that were developed as a result of the threat environment. The purpose of the force-on-force inspections is to assess licensees' defensive strategies in place at licensed facilities and highlight areas that need improvement. During the third and fourth quarters of FY 2010, the NRC completed force-on-force inspections at 13 sites. The current 3-year force-on-force cycle ends in December 2010. The NRC remains committed to working with the industry to improve the realism and effectiveness of the force-on-force inspection program.

The NRC developed a revised proposed rule amending requirements associated with enhanced weapons and firearms background checks in 10 CFR Part 73 that contains the implementing provisions for Section 161A of the Atomic Energy Act (AEA) (42 U.S.C. § 2201a). The revised

regulation would require new firearms background checks for armed security personnel and permit certain NRC licensees to obtain enhanced weapons (preempting individual State laws prohibiting private entities from obtaining such weapons). The NRC worked with the U.S. Department of Justice, including the Federal Bureau of Investigation and the Bureau of Alcohol, Tobacco, Firearms, and Explosives, to develop the firearms guidelines required by Section 161A of the AEA. The NRC published the guidelines in the FR on September 11, 2009 (74 FR 46800), and has currently scheduled publication of the proposed rulemaking in the FR by the end of calendar year (CY) 2010.

The NRC continues to make progress on implementing a comprehensive revision to EP regulations and associated guidance. During FY 2010, the NRC held five public meetings in coordination with the Federal Emergency Management Agency (FEMA) to inform stakeholders on the proposed EP rulemaking effort, which was published in the FR in May 2009, and respond to questions. The NRC received 94 submittals from various stakeholders that identified 687 individual comments. The NRC staff has considered these public comments and is preparing to submit the final rule, as well as the three associated NRC guidance documents, to ACRS in late 2010 for review.

The NRC has maintained alignment with FEMA throughout the EP rulemaking process and has begun developing an integrated transition and implementation plan for the EP final rule and associated guidance. Several milestones remain before submitting the draft EP final rule package to the Commission, including supporting the review by ACRS, holding a public meeting to discuss the EP rulemaking implementation schedule, and completing the integrated transition and implementation plan. Once the Commission approves and publishes the EP final rule, the staff will conduct public workshops on its implementation plan.

On March 31 and August 27, 2010, the NRC staff held public workshops at its headquarters in Rockville, MD, to discuss the status and schedule for the proposed rulemaking on the requirements for access authorization and physical protection during NPP construction. The meetings were to improve understanding of the proposed rule so that stakeholders could provide informed comments during the public comment period, once the rule is published. The NRC will solicit input from stakeholders at public meetings and through FR notices during the rulemaking process. The NRC has scheduled publication of the proposed rule in the FR by January 2011 and publication of the final rule is planned for January 2012.

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 (DHS) and FEMA to ensure milestones are accomplished in accordance with the predetermined schedules.

VIII Power Uprates

There are three types of power uprates. A measurement uncertainty recapture (MUR) 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 (SPUs) are power uprates that are typically on the order of less than 7 percent and are within the design capacity of the plant. SPUs require only minor plant modifications. Extended power uprates (EPUs) are power uprates beyond the design capacity of the plant and, thus, 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 135 power

uprates to date. The United States has gained approximately 17,429 megawatts-thermal, or 5,809 megawatts-electric, in electric generating capacity (the equivalent of about 5.8 NPP units) through power uprates at existing plants. The NRC currently has 10 plant-specific power uprate applications under review. The 10 applications include two MUR power uprates and eight EPUs.

In June 2010, the NRC staff conducted a survey of all NPP licensees to learn their plans for submitting power uprate applications. Based on updates to this survey, licensees plan to request power uprates for 39 NPPs over the next 5 years.

IX New Reactor Licensing

The new reactor program consists of three subprograms: licensing, construction inspection, and advanced reactors. The NRC allocates its available resources to ensure that all three subprograms are successful. The NRC's primary focus is on the licensing and construction activities necessary to support near-term-build applications (i.e., plants expected to begin operation in 2016–2017). To position itself to succeed in the advanced reactor subprogram, the NRC is also investing in activities to establish the necessary regulatory framework and infrastructure for advanced reactors. In allocating resources and scheduling reviews, the NRC will consider resource needs for the successful implementation of the subprograms, as well as information regarding an applicant's plans for construction and commercial operation and its support for issue resolution. The NRC is using international experience and lessons learned to ensure safe designs, both domestically and internationally.

The NRC expects to license the next generation of NPPs 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 NPPs. The NRC is engaged in numerous ongoing interactions with vendors and utilities regarding prospective new reactor applications and licensing activities.

The NRC has three DC applications and two DC amendments under review. Thorough and timely reviews of these DC applications are critical to the successful completion of the combined license application (COLA) reviews. As of September 30, 2010, the NRC has received 18 COLAs, 13 of which are under active review. By letter dated September 29, 2010, Tennessee Valley Authority (TVA) requested that the NRC defer most of the Bellefonte Units 3 and 4 COLA review. NRC staff's response to TVA's request is currently being developed. The NRC issued the draft environmental impact statement (DEIS) for Virgil C. Summer Units 2 and 3, and Calvert Cliffs Unit 3, in April 2010, and Comanche Peak Units 3 and 4, and Levy County Units 1 and 2, in August 2010. In addition, the NRC received the following DEIS ratings from the Environmental Protection Agency (EPA) on implementing the National Environmental Policy Act (NEPA): South Texas received the highest rating—lack of objections; the rating for Summer and Calvert Cliffs was environmental concerns-2 (EC-2), the second highest rating.

The NRC expects to complete both the safety and environmental portions of the first of these COLA reviews in FY 2011 and FY 2012. The NRC's experience with these applications has demonstrated that 10 CFR Part 52 and the design-centered review approach have been successful in achieving standardization of a selected design and have resulted in a clear safety focus and resource savings. The NRC is making good progress on the applications currently under review. The reviews have been complicated because some applicants are still revising the proposed designs while they are under NRC review. It is important for all of the applicants to minimize design and siting modifications and work aggressively to resolve open issues.

Furthermore, COL applicants are revising the submittal dates for responses to requests for additional information (RAIs), thereby causing schedule delays with resulting resource impacts.

The NRC is working with applicants to overcome these challenges and is focused on driving the remaining technical issues to resolution. The NRC has moved forward on reviewing applications and is on a closure path for many issues.

Licensing

Early Site Permit Reviews

Victoria County Station

On March 25, 2010, Exelon Nuclear Texas Holdings, LLC (Exelon), submitted an ESP application for the Victoria County Station site in Victoria County, Texas. The ESP application uses the plant parameter envelope approach, which establishes a surrogate plant in the form of a set of bounding parameters. The application does not include a limited work authorization (LWA). On June 8, 2010, the NRC sent a letter to Exelon accepting the application for docketing and, on August 31, 2010, sent an application technical review schedule. The schedule communicates milestones for both the safety and environmental reviews, which are scheduled to begin in October 2010 although some aspects began prior to this date. The review of emergency preparedness (EP) information is part of the safety review. As part of the COL application review, the NRC began the review of EP information on August 28, 2010.

PSEG Power, LLC, and PSEG Nuclear, LCC

PSEG Power, LLC, and PSEG Nuclear, LLC, submitted an ESP application on May 25, 2010. On August 4, 2010, the NRC notified the applicants that it found the ESP application for the PSEG site, in Salem County, New Jersey, acceptable for docketing. This ESP uses the plant parameter envelope approach, which includes in its scope the four designs described below. The Federal Emergency Management Agency (FEMA) and the NRC began the EP information reviews in September 2010. A full review schedule is being developed. The environmental scoping meeting was conducted on November 4, 2010.

Design Certification Reviews

The NRC is currently reviewing the following DCs: the General Electric Hitachi Nuclear Energy (GEH) Economic Simplified Boiling-Water Reactor (ESBWR), the Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive (AP)1000 DC rule amendment, the AREVA Nuclear Power (AREVA) U.S. Evolutionary Power Reactor (U.S. EPR), the Mitsubishi Heavy Industries, Ltd. (MHI) U.S.-Advanced Pressurized-Water Reactor (US-APWR), and the STP Nuclear Operating Company (STPNOC) Advanced Boiling Water Reactor (ABWR) DC rule amendment. The status of the work that has been accomplished during this reporting period is described below.

ESBWR

The NRC received the ESBWR DC application on August 24, 2005. The technical review of the DC application is complete. Safety evaluations (SEs) on all application chapters have been issued and provided to the ACRS for its review. The ACRS review is scheduled to be completed by October 2010. The staff will provide a briefing to the ACRS subcommittee on

October 6, 2010. GEH will respond to the inspection report and include changes in Revision 8 of the design control document (DCD) as needed to address the inspection findings. GEH plans on submitting the DCD, Revision 8, in October 2010. The staff is developing the draft rulemaking package.

AP1000 DC Amendment

On May 26, 2007, Westinghouse submitted an application to amend the AP1000 DC rule and also submitted Revision 16 to the AP1000 DCD. Westinghouse submitted Revision 2 of the shield building design report on May 7, 2010. Westinghouse submitted its hard rock high-frequency report (Technical Report 115) in May 2010. During a trip to Purdue University (which is under contract to Westinghouse) the week of May 25 - 28, 2010, the staff inspected the Westinghouse quality assurance program and observed the testing of structural modules. Westinghouse submitted its test summary report for the shield building module test on June 24, 2010. The staff conducted an audit on August 18 - 20, 2010, on the test summary report and the shield building information unresolved items. Westinghouse submitted Revision 3 of the report on September 30, 2010.

Westinghouse proposed some additional design changes in January 2010, and submitted additional changes in a letter dated May 10, 2010. Westinghouse submitted Westinghouse submitted additional changes during the May-July period. The staff safety evaluation was issued on October 21, 2010.

The staff has assembled a rulemaking team and is in the process of preparing the proposed rule for the DC amendment in parallel with completion of the final SE. The staff plans on submitting the proposed rule to the Commission in December 2010. The staff plans to complete the rulemaking using a streamlined process outlined in SECY-09-0018, “Streamlining Design Certification Rulemaking.”

U.S. EPR DC

AREVA submitted the U.S. EPR DC application on December 11, 2007. The staff is reviewing the application. On May 13, 2010, the staff communicated to AREVA that it had completed the review of the digital instrumentation and control (DI&C) design with respect to communication independence and diversity, and defense in depth. However, the staff could not approve this aspect of the design because AREVA had not provided sufficient information. On June17, 2010, the staff provided AREVA further detail on the major issue of data communication and clarified its expectation for a June 25, 2010, public meeting. The staff met with AREVA on June 25, 2010, to discuss the U.S. EPR DI&C design issues. The staff described underlying challenges in reviewing the design because of the complexity of the architecture, as well as AREVA’s application of the general design criteria related to independence. As a followup to the June 25, 2010, meeting, AREVA submitted a letter dated July 1, 2010, committing to provide closure plans that define the scope and schedule for design changes.

In those areas in which AREVA proposed to maintain the current design, the company requested an opportunity to meet again with the staff to present a more detailed justification for the current design. On July 22, 2010, the staff sent AREVA a response letter detailing its current position and review status for this portion of the U.S. EPR DC application review stating that the staff will continue to support ongoing dialogue with AREVA in an effort to clarify its position and evaluate additional information expeditiously to determine whether the concern has been resolved. By letters dated July 28 and August 4, 2010, AREVA submitted closure plans

for four of six areas of concern identified by the staff. The staff held a 2-day public meeting on August 30-31, 2010, to discuss these closure plans and the remaining two areas of concerns. On September 14, 2010, AREVA submitted Revision 2 of the closure plan to address the remaining two areas of concern.

AREVA submitted an incomplete version of Revision1 to the GSI-191 technical report on May 19, 2010, that did not consider in-vessel downstream effects. At a July 7, 2010, public meeting, AREVA committed to provide future revisions that will include results from additional testing regarding sump performance and downstream effects. Several tests conducted by AREVA and witnessed by the staff in August and September 2010, did not achieve the expected results. AREVA will provide an explanation for the test results and path forward strategy by December 2010 and all technical information by the end of March 2011.

AREVA has changed the analytical methodology being used to complete the seismic and structural design. The staff conducted an audit of Sections 3.7 and 3.8 (seismic and structural design) of the U.S. EPR DC FSAR, during April 26-30, 2010. The audit identified a significant number of problems with the modeling and reanalysis that the applicant performed. A path forward was identified for approximately 40 items for which analyses and calculations will need to be redone to resolve NRC technical concerns with the design. As a followup to this audit, the NRC conducted a public meeting on June 9, 2010, to discuss AREVA's new schedule for completion of this reanalysis work and to finalize the associated RAI responses. The majority of the technical information needed to establish the licensing basis in order to complete the staff's Phase 2 review will be provided in January and February 2011. The current review schedule was based on obtaining this information by June 30, 2010. As a result of this delay, the staff reevaluated the review schedule for this application and expects to issue a revised schedule in November 2010.

US-APWR DC

MHI submitted the US-APWR DC application on December 31, 2007. MHI has been implementing a plan since August 2009 to address DI&C issues in the areas of software program manuals, communications independence, and quality assurance. MHI submitted technical reports in these areas, which the staff has reviewed. The outcome of the NRC's review is that significant concerns still exist that may require design changes. The NRC conducted a public meeting with MHI in late July and August 2010 to discuss these key technical issues related to the review of the DI&C design. MHI submitted a closure plan on August 27, 2010, for the US-APWR instrumentation and control open issues to address the NRC's concerns. MHI also submitted additional documents, which addressed the NRC comments, on September 30, 2010.

MHI made structural changes to its design which required performing a new seismic analysis. MHI also changed the soil-structure interaction seismic analysis methodology for all safety-related structures from a soil-spring approach to a finite element approach. This new analysis is complete and is based on revised input parameters, such as ground motion time histories, finite element models and damping values that differ from the current DCD. The results of this seismic reanalysis impact the design of all structures, piping, equipment, and components. MHI has submitted the new seismic reanalysis technical reports and they are under review. MHI has also submitted a revision to the methodology report, which requires additional staff review effort. The staff identified three additional reports needed to resolve the issue of seismic "Category II over Category I." MHI has committed to submit these seismic

analysis summary reports for the turbine building, auxiliary building, and the access control building by late December 2010.

The NRC has not approved the computer codes used by MHI for performing the LOCA analysis. MHI will submit additional technical reports and analysis by the end of October 2010 to address the staff's concerns.

MHI completed the sump head loss testing in June 2010 and is currently conducting the in-vessel downstream effects testing (also known as core inlet blockage testing). Based on the test results, MHI is determining the best sump design and net positive suction head (NPSH) requirements, and will present its design approach to the NRC. The staff discussed the sump design and NPSH approach with MHI in September 2010. The staff will review the head loss test results report and the downstream effects test results to be submitted by MHI in November 2010.

MHI conducted departure from nucleate boiling thermal-hydraulic testing of the reactor fuel during August-September 2010, and again in October-December 2010. MHI will submit the results in a report to the NRC by March 2011.

ABWR DC Rule Amendment for Aircraft Impact

On June 30, 2009, STPNOC submitted an application to amend the ABWR DC rule to address the requirements of the aircraft impact rule. On May 17-21, 2010, the staff conducted an inspection of the STP Nuclear Operating Company (STPNOC) aircraft impact assessment (AIA) pertaining to activities conducted in support of STPNOC's application requesting an amendment to the ABWR DCR. Based on the results of this inspection, the staff issued a notice of violation (NOV) stating that STPNOC did not use realistic analyses for certain aspects of its AIA and did not fully identify and incorporate into the design those design features and functional capabilities credited. The staff has completed its SE and made presentations to the ACRS. The ACRS draft review letter accepted the staff's SE pending closure of the NOV and STPNOC documentation of temperature analyses for the alternate feedwater injection system instrument room.

The applicant has responded to the NOV and is providing a revised AIA application. The staff has reviewed the NOV response and has developed a response to the ACRS letter. These actions were coordinated with ongoing rulemaking activities to ensure that all necessary changes to the SER were made before the rulemaking package is provided to the Commission.

Combined License Application Activities

As of September 30, 2010, the NRC has received 18 COLAs for review. Five of the reviews have been suspended due to changes in the applicants' business strategy, as described below. The NRC is actively reviewing 13 applications. By letter dated September 29, 2010, TVA requested that the NRC defer most of the Bellefonte Units 3 and 4 COLA review. The NRC staff's response to TVA's request is currently being evaluated. After submitting an ESP, one of the applicants withdrew a suspended COLA (Victoria). Based on letters from potential applicants, the NRC expects two new COLAs by the end of FY 2012.

The NRC is reviewing the following applications:

Calvert Cliffs COLA

On July 13, 2007, Calvert Cliffs 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 staff issued RAIs on April 21, 2010, to obtain additional information related to the organization and financial information. The applicant submitted its response to these RAIs on July 9, 2010, and the staff has recently completed review of the additional information. Based on its review of the submitted information, the staff issued an additional RAI on September 21, 2010. The staff is currently waiting for the applicant to provide the additional information requested in the latest RAI.

South Texas COLA

On September 20, 2007, STPNOC submitted a COLA for two ABWR units to be located at its South Texas Project (STP) site near Bay City in Matagorda County, Texas. On February 24, 2010, STPNOC submitted a letter identifying schedule challenges pertaining to issuing some chapters of the safety evaluation report with open items to meet the Phase 2 milestone. On March 26, 2010, the NRC responded identifying three chapters that have issues which must be resolved prior to exiting the current Phase 2 milestone. These issues involve ground water hydrology models, soil structural interaction analyses requiring additional detail, flow induced vibration of components, and spent fuel pool criticality. Once the required information is provided to resolve the issues, the staff will reassess the overall schedule impacts. The staff intends to continue its review with the schedule for Phase 2 through 6 to be determined. The safety evaluations for other chapters are continuing forward.

NRC staff has issued 16 of 19 chapters of the safety evaluation with open items on schedule for review by the ACRS. Additional requests for information (RAIs) have been issued for the groundwater model, a site audit has been conducted, and the RAI responses have been received from the applicant and are under review by the staff. Additional RAIs have also been issued for the soil structure analysis. Initial responses to the structural analysis RAIs were received in September 2010 with additional responses due later in the year and an audit scheduled later in the year. Design information is scheduled to be received for the flow induced vibration later in the year from the applicant; however, the staff performed an audit in July of 2010 to review the test set-up. The applicant submitted a criticality analysis for the spent fuel pool in June of 2010 and the staff determined that additional work is necessary; an audit is planned later in 2010.

On November 16, 2009, STPNOC submitted a letter that requested approval for a limited work authorization (LWA) to construct permanent crane foundation retaining walls if NRC approval was required. In a letter dated January 8, 2010, the staff informed STPNOC that the walls met the definition of construction and would require NRC regulatory approval. On February 2, 2010, STPNOC withdrew the LWA request and requested an exemption to allow the start of construction activities for a crane foundation retaining wall prior to COL issuance. On March 23, 2010, STPNOC submitted a revised exemption request for the installation of crane foundation retaining walls. NRC staff has begun the review of the request for exemption to authorize the installation of crane foundation retaining walls in Units 3 and 4. The staff plans to complete the safety evaluation and the environmental assessment in October of 2010.

The staff held a public teleconference with STPNOC on August 25, 2010, to clarify issues raised in comments submitted by other agencies on the DEIS. STPNOC submitted complete and satisfactory responses.

Bellefonte COLA

On October 30, 2007, TVA submitted a COLA for two AP1000 units to be located at its Bellefonte site near Scottsboro in Jackson County, Alabama. The hydrology review is delayed because of data pending from the applicant. On August 20, 2010, the TVA Board authorized funding to proceed with engineering studies to support the completion of Bellefonte Unit 1, an existing Babcock & Wilcox design. Despite the shift towards completion of the partially constructed units, the COLA for Units 3 and 4 remains a viable option for TVA. The completion and operation of Unit 1 will require significant revisions to the environmental report and the site safety analysis report (SAR). TVA expects to complete the additional requisite site studies and changes to the COLA by the second quarter of CY 2013.

In a letter dated September 29, 2010, TVA requested that the NRC defer most of its review of the AP1000 COLA for Bellefonte Units 3 and 4, as detailed in its enclosure to the letter. TVA also requested that the NRC provide TVA with a plan and schedule for completing the requested work. TVA has made no decision on Bellefonte Unit 1, but TVA's board is expected to consider final approval in Spring 2011. TVA informed the NRC that it will notify the NRC if it pursues completion of Unit 1. In the meantime, TVA plans to submit the annual update to the Bellefonte COLA in December 2010 to incorporate standard content changes submitted on the Vogtle docket and site-specific related changes. The staff is evaluating the TVA requests. The staff's response to TVA's request is currently being developed.

North Anna COLA

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

The applicant publicly announced its 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 is developing a new review schedule to accommodate the new technology for the North Anna 3 application and has already begun to evaluate the revised application. The NRC will supplement the final supplemental EIS that was completed in February 2010, which was based on the ESBWR design. The staff is currently establishing a revised schedule for the latest revision of the application.

William States Lee III COLA

On December 13, 2007, Duke submitted a COLA for two AP1000 units to be located at its Lee site near Charlotte in Cherokee County, South Carolina. The supplemental environmental scoping period for make-up pond C ended on July 2, 2010, and a scoping summary report is expected to be issued by December 2010. The staff conducted an environmental audit for make-up pond C on August 9-13, 2010. The staff issued follow-up RAIs regarding make-up pond C in mid-September 2010.

Shearon Harris COLA

On February 19, 2008, Progress Energy Carolinas, Inc. (PEC), submitted a COLA for two AP1000 units to be located at its Harris site, near New Hill in Wake County, North Carolina. The applicant filed an updated integrated resource plan on September 13, 2010, with the North Carolina Utilities Commission. This action delays the operational need of the two new reactors at the Shearon Harris Plant site until 2020, or later. The staff is preparing Requests for Additional Information (RAIs) regarding the need for power from two proposed AP1000 units at the Shearon Harris site.

The staff, working with USACE as a cooperating agency, has identified several issues that remain unresolved for the environmental review. The staff anticipates that clarifying resolution strategies for these issues will enable the establishment of a revised environmental review schedule. On August 27, 2010, the NRC informed the applicant of outstanding issues related to the environmental review and stated that the schedule for the environmental impact statement (EIS) will depend on the resolution of these issues.

The USACE is a cooperating agency for development of the EIS and requires information that affects its LEDPA decision under the Clean Water Act. USACE provided comments to the NRC on April 15, 2010, regarding supplemental information provided by the applicant on September 14, 2009. USACE identified deficiencies in the applicant's alternative sites analysis regarding alternative reservoir levels for the Shearon Harris site and aquatic impacts to the proposed and alternative sites. The applicant provided a revised analysis to USACE on September 27, 2010.

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

Grand Gulf COLA

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

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

Vogtle COLA

On March 31, 2008, Southern Nuclear Operating Company (SNOC) submitted a COLA for two AP1000 units to be located at its Vogtle site near Augusta in Burke County, Georgia.
On June 28, 2010, the staff issued Amendment Number 2 to the VEGP ESP. Amendment 2 revises the VEGP ESP site safety analysis report to allow the use of Category 1 and 2 backfill

material from additional onsite areas that were not specifically identified as backfill sources for the activities approved under the ESP and LWA that was issued in August 2009. Amendment 1, issued on May 21, 2010, approved only a subset of onsite borrow sources specified in VEGP's request dated May 13, 2010, for a limited scope approval.

September 3, 2010, the NRC issued the draft supplemental environmental impact statement. The public comment period will end November 24, 2010, and a public meeting was held on October 7, 2010. The staff continues to work on the safety review and plans to complete its review by the end of December 2010.

Virgil C. Summer COLA

On March 27, 2008, South Carolina Electric & Gas (SCE&G) submitted a COLA for two AP1000 units to be located at its Virgil C. Summer Nuclear Station site in Fairfield County, South Carolina. On June 15, 2010, the last of the four affected counties agreed to the proposed Emergency Planning Zone (EPZ) for Summer Units 2 and 3. The applicant provided its response to the Federal Emergency Management Agency's (FEMA's) RAI in a letter dated June 24, 2010. Based on the applicant's response, both FEMA and the staff consider this issue resolved.

In a submitted revision to the final safety assessment report (FSAR), the applicant requested an exemption to the AP1000 DCD, Revision 17, value for the maximum safety wet-bulb temperature, which is a parameter used to measure the evaporative cooling capability of the air. The applicant's site value was recalculated based on interactions with the staff. To support an exemption request, the staff completed additional analysis and held a public meeting on June 23, 2010, to discuss RAI responses. Based on the public meeting, the applicant provided revised RAI responses to the staff in a June 30, 2010, letter. Based on the applicant's revised RAI responses, the staff considers this issue resolved.

The staff held two public meetings for the DEIS on May 27, 2010. The DEIS comment period closed on July 9, 2010. By letter dated July 9, 2010, the EPA provided comments on the DEIS. The DEIS received a rating of EC-2 which met the staff's operating plan target of EC-2 or higher for EPA's rating of COL DEISs. The EPA comments focused on alternatives, transmission lines, radioactive wastes, greenhouse gases, drinking water standards, freshwater and aquatic ecology, endangered species, historic/cultural resources, environmental justice, and the LWA regulation.

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service submitted DEIS comments indicating their need for more information to complete consultations.

Callaway COLA

On July 28, 2008, Ameren UE submitted a COLA for a U.S. EPR to be located at its Callaway site in Callaway County, Missouri. The NRC suspended Callaway's review at the request of the applicant in June 2009, and it remains suspended.

Levy County COLA

On July 30, 2008, Progress Energy Florida, Inc. (PEF) submitted a COLA for two AP1000 units to be located at its site in Levy County, Florida. The initial seismology review identified that the applicant did not use the NRC-endorsed methodology for probabilistic seismic hazards analyses

(PSHA). The staff received responses to RAIs from the applicant in August 2010. The staff has evaluated the RAI responses and determined that the applicant adequately addressed this issue.

Challenges have arisen in maintaining the hydrology review schedule because the applicant's responses to RAIs have been late, and because many responses did not adequately address the issues raised in the RAIs. To facilitate progress, the staff has conducted multiple teleconferences in recent months. As a result of these interactions the applicant has modified its activities to expedite responses to key RAIs on probable maximum flood, storm surge, and tsunamis. Additional supplemental RAIs have been issued to address remaining issues. Resolution of remaining open issues is expected by December 2010.

The U.S. Army Group of Engineers (USACE) is a cooperating agency for development of the environmental impact statement (EIS) and requires information that affects its LEDPA decision under the Clean Water Act. The USACE has identified several deficiencies in the applicant's LEDPA analysis. The applicant provided a revised analysis to USACE on June 30, 2010.

On August 6, 2010, the NRC issued the DEIS. The public comment period ends on October 27, 2010. The NRC held a public meeting to solicit comments on the DEIS on September 23, 2010.

Victoria County Station (VCS) COLA

On September 3, 2008, Exelon submitted a COLA for two ESBWR units to be located at its VCS site near Victoria City in Victoria County, Texas.

Exelon requested that the COLA for VCS Units 1 and 2, (NRC docket numbers 52-031 and 52-032), which it submitted to the NRC on September 2, 2008, be withdrawn upon docketing of the VCS ESP application. On July 20, 2010, the NRC accepted Exelon's request to withdraw the VCS COLA and issued an FR notice announcing the withdrawal.

On August 31, 2010, the NRC issued a schedule letter to Exelon for the VCS ESP. The staff began the safety and environmental reviews in October 2010. The environmental review schedule supports issuance of the DEIS in August 2012 and the FEIS in August 2013.

Fermi COLA

On September 19, 2008, Detroit Edison Company submitted a COLA for an ESBWR to be located at its Fermi site near Newport City in Monroe County, Michigan. On June 28, 2010, the staff issued a letter to the Detroit Edison Company informing the applicant that the safety and environmental review schedules (for issuance of the SER and FEIS) for the Fermi 3 COLA were now indeterminate and all remaining public milestones were TBD. The TBD status results from continuing delays in receipt of complete responses to RAIs related to the environmental review and the delayed submittal of an acceptable cyber security plan.

The staff will continue the review of unaffected portions of the application. A revised cyber security plan for Fermi was recently received and the staff is reviewing it. The Detroit Edison Company will update its COLA design information to reflect Revisions 7 and 8 of the DCD, and will submit a letter providing dates to facilitate transition to the Reference COL (RCOL), as well as an updated letter to adopt North Anna's standard RAI responses.

Comanche Peak COLA

On September 19, 2008, Luminant Generation Company LLC (Luminant) submitted a COLA for two US-APWR units to be located at its Comanche Peak site near Glen Rose in Somervell County, Texas.

By letter dated April 28, 2010, the NRC staff informed MHI of the schedule change to the DCD. Subsequently, on May 28, 2010, the NRC staff issued a letter to Luminant informing it of a change to the public milestone schedule for Phases 2 and 3 of the safety review to June 24, 2011, and November 2, 2011, respectively. The schedule change was a result of delays arising in the US-APWR DC review and the subsequent schedule change to the US-APWR DC public milestones. In the same letter, the NRC stated that the schedule impact for Phases 4, 5, and 6 will be examined when the complexity of DCD open items is better understood.

During the review of Luminant's responses to the NRC staff's RAIs for FSAR Section 2.5 "Geology, Seismology, and Geotechnical Engineering," Section 2.5.2, the NRC staff identified errors and omissions in the applicant's Probabilistic Seismic Hazards Analyses (PSHA) calculations. The applicant has updated the PSHA calculations. The NRC staff reviewed the updates and identified inadequate RAI responses. In addition, the applicant was requested to conduct sensitivity analyses for its site response calculations to demonstrate the simplified site model is realistic. NRC staff conducted a second site audit of Section 2.5.2 on April 7 and 8, 2010. The NRC staff issued RAIs on June 9, 2010. Luminant provided its response to these RAIs in August 2010 and the staff is evaluating them.

The NRC staff has determined that Luminant did not provide sufficient information in Part 1, "Administrative and Financial Information." The NRC staff issued RAIs on March 9, 2010, and discussed these RAIs during a May 18, 2010, proprietary meeting. Luminant provided its response to these RAIs on June 11, 2010.

On August 6, 2010, the NRC issued the DEIS. The public comment period ended on October 27, 2010. The NRC held a public meeting in the vicinity of the site to solicit comments on the DEIS on September 21, 2010.

River Bend COLA

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

Nine Mile Point COLA

On September 30, 2008, Nine Mile Point Nuclear Project, LLC, and UniStar Nuclear Energy (UNE) submitted a COLA for a U.S. EPR (Unit 3) to be located at its Nine Mile Point site in Oswego, New York. On December 1, 2009, UNE submitted a letter requesting that the NRC temporarily suspend the NMP3 COLA review, including any supporting reviews by external agencies, until further notice. The review remains suspended.

According to its letter to the NRC, dated August 31, 2010, UNE will submit, on December 15, 2010, Revision 2 of the NMP3 COLA, which will be a general update incorporating changes to generic text to maintain consistency with the RCOLA but will not contain updated site-specific information. UNE's submittal date for Revision 2 of the NMP3 COLA is consistent with the submittal frequency requirements in 10 CFR 52.3(b)(6) and 10 CFR 50.71(e).

Bell Bend COLA

On October 10, 2008, PPL Bell Bend, LLC, 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. Based on lessons learned from Calvert Cliffs, the applicant has conducted a new alternative site selection process. Two new alternate sites have been identified that required additional audit and evaluation. NRC staff conducted an audit of additional sites in June 2010.

The applicant proposed site layout changes to reduce impacts to "exceptional value" wetlands to satisfy USACE's need for a Section 404 permit under the Clean Water Act. These wetland avoidance issues for Bell Bend require the applicant to move the power block to avoid the currently impacted wetlands. Several technical areas will be receiving revised information to address the power block move. The agency received an updated submittal schedule from the applicant on July 16, 2010. The staff will need to revisit large portions of the geology, seismic design, and the hydrology reviews based on the revised submittals. The agency is currently receiving revised portions of the application. The applicant intends to submit the full scope of the changes by February 2, 2011.

The Susquehanna River Basin Commission (SRBC) issues permits for water withdrawal from the Susquehanna River. SRBC has communicated its position to the applicant that it does not intend to approve water withdrawal during low flow periods unless there is low flow augmentation (water storage). The impact of this decision could be significant depending upon applicant's decision on water storage. The EIS should evaluate the impacts of proposed water storage and alternatives (e.g., flood abandoned mines, build reservoir). The applicant is developing its options and communicating with SRBC. The applicant indicated that it would make a final decision on low-flow augmentation in August 2011. The staff is waiting for the applicant to submit the results of the in-stream flow incremental methodology study to SRBC in February 2011.

Turkey Point COLA

On June 30, 2009, FPL submitted a COLA for AP1000 units to be located at the existing Turkey Point site, located in Miami-Dade County, Florida. Areas of the environmental report such as aquatic ecology, radiological health, cultural resources, and alternative site selection will require additional effort to resolve. The review team developed initial drafts of the EIS sections and the information needs and completed the environmental site audit in June 2010. The NRC held public scoping meetings on July 15, 2010.

The NRC has developed an initiative to contract out the safety aspects of the COL review. The NRC selected Turkey Point as the pilot project for this initiative and awarded a contract to Information Systems Laboratory to review major parts of the application; the review is ongoing.

On May 28, 2010, the NRC issued a schedule for the COLA for Turkey Point Units 6 and 7, which incorporates by reference the AP1000 DC amendment. The schedule for the safety review shows completion dates for the advanced SER with no open items in May 2012 and completion of the final SER in December 2012. The environmental review supports the issuance of the draft EIS in October 2011, with the FEIS issued in October 2012.

Expected Application Submittals to the NRC

The NRC has received letters of intent regarding the following potential applications:

Southern Nuclear Operating Company informed the NRC that it intends to submit a COLA for a greenfield unnamed site sometime after FY 2012.

Transition Power Development LCC informed the NRC that it intends to submit a COLA or an ESP application by September 2011 for nuclear units. The units will be part of the Blue Castle Generation Project, to be located in east central Utah.

The NRC received a proprietary letter indicating intentions to file a COLA for units in FY 2012.

Duke, representing Southern Ohio Clean Energy Park Alliance, plans to submit an ESP application some time in FY 2013.

Alternate Energy Holdings, Inc. anticipates submitting a COLA to the NRC in FY 2012.

Regarding DC renewals, the NRC received letters from GEH and Toshiba Corporation notifying the NRC of their intent to submit renewal applications in 2010 for the ABWR DC. On May 12, 1997, the NRC issued the ABWR DC rule in 10 CFR Part 52, Appendix A, "Design Certification Rule for the U.S. Advanced Boiling-Water Reactor," which is effective for 15 years.

The NRC has had several meetings with Korea Electric Power Corporation (KEPCO), and understands that KEPCO anticipates submitting an application for a DC by the end of FY 2012.

Regulatory Infrastructure

The NRC continues to enhance the effectiveness and the 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.

Inspections, Tests, Analyses, and Acceptance Criteria Maintenance Rulemaking

The NRC has developed a proposed rulemaking to amend the regulations related to the verification of NPP construction activities through inspections, tests, analyses, and acceptance criteria (ITAAC) under a COL. The staff provided the proposed rulemaking package to the Commission for review in SECY-10-0117, "Proposed Rule: Requirements for Maintenance of Inspections, Tests, Analyses, and Acceptance Criteria," dated August 30, 2010. Specifically, the NRC is proposing new provisions that apply after a licensee has completed an ITAAC and submitted an ITAAC closure letter. The new provisions would require a licensee to report new

information materially altering the basis for determining that it performed a prescribed inspection, test, or analysis as required or had met a prescribed acceptance criterion. The NRC has worked with external stakeholders to establish thresholds for determining what types of unplanned events or licensee actions would materially alter the original ITAAC determination basis, and regulatory guidance for implementing the proposed rule will contain this information.

The proposed rule would also require licensee documentation of the basis for all ITAAC notifications. The NRC does not expect either the original ITAAC closure letters or the supplemental ITAAC closure letters that are being proposed in this rule to contain all of the detailed ITAAC closure information (e.g., analyses reports, test result packages). Licensees will maintain the detailed ITAAC closure information onsite and will reference that information in the ITAAC closure letters. This detailed onsite information is referred to as the ITAAC determination basis. The NRC is proposing to codify the requirement to maintain these ITAAC records.

Finally, the NRC is proposing to require licensee notification of the completion of all ITAAC activities. This proposed notification would be a one-time letter stating that the licensee has successfully met all ITAAC and is maintaining all acceptance criteria. This notification would support the finding that the Commission makes under 10 CFR 52.103(g), that all ITAAC in the COL are met, before it allows fuel load and operation. If the Commission approves the NRC staff's recommendation, then the proposed rule would be issued for public comment following incorporation of any Commission-directed changes.

Access Authorization and Physical Protection Requirements for NPP Construction Rulemaking

The NRC staff is preparing a proposed rulemaking to establish personnel access authorization and physical protection requirements for NPPs during the construction phase. Over the past several years, the NRC has held numerous meetings with the industry's New Plant Security Task Force to discuss the need for (and the scope of) security measures at nuclear power reactor construction sites. Based in part on this collaborative effort with the industry, the NRC developed a technical basis to pursue an access authorization and physical protection rulemaking during NPP construction. The NRC solicited input from stakeholders through a public workshop during the rulemaking process. The NRC has scheduled publication of the proposed rule in the FR in late 2010 and plans to publish the final rule in the FR in late 2011.

Aircraft Impact Assessment Rulemaking

The NRC published the final rulemaking on aircraft impact assessments in the FR on June 12, 2009 (74 FR 28111), and it became effective on July 13, 2009. The rule at 10 CFR 50.150, "Aircraft Impact Assessment," requires applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large commercial aircraft. The rule requires applicants to use realistic analyses to identify and incorporate design features and functional capabilities to show, with reduced use of operator actions, that either the reactor core remains cooled or the containment remains intact, and either spent fuel cooling or spent fuel pool integrity is maintained. The staff endorsed industry guidance on the methodology for performing aircraft impact assessments for new plant designs in Draft Regulatory Guide (RG) 1.217, "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts," which was issued in July 2009. Information to comply with the rule has been submitted for all design centers currently under NRC review, and the NRC staff is reviewing the submittals. Review of the amended ABWR design is complete and review of the ESBWR design is nearly complete.

10 CFR Part 73, Loss of Large Areas

The NRC published its final rulemaking on power reactor security requirements in the FR on March 27, 2009, and it became effective on May 26, 2009. The rulemaking was the primary vehicle to codify the requirements imposed on operating reactors by orders issued after September 11, 2001. The two areas receiving NRC attention are 10 CFR 50.54(hh) and 10 CFR 52.80(d). The NRC held discussions with NEI and the design-centered working groups on the development of guidance for strategies to mitigate the loss of large areas caused by explosions or fires (Item B.5.b in Interim Compensatory Measure Orders for operating plants and 10 CFR 50.54(hh) in the final security rulemaking). The NRC developed DC/COL-ISG-016, "Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d)," to endorse NEI 06-12, Revision 3. On August 10, 2010, the ACRS accepted ISG-016, including comment resolutions and responses. During 2011, the NRC will integrate ISG-016 into the SRP. Because the NEI document contains security-related information, it is not publicly available. A redacted version of ISG-016 is publicly available.

Design Certification Rulemaking Streamlining

A potential scheduling issue that has been introduced by the concurrent reviews of DC applications and related COLAs is the need to complete the DC rulemaking before the issuance of a COL that relies on that DC. Given the current schedules for completing some of the DCs and related COLAs, the rulemaking process could be a significant critical path item for the issuance of the first COL in several design centers. The staff evaluated the DC rulemaking process as part of the NRC's Lean Six Sigma Program to identify possible ways to shorten it and coordinate activities (design reviews, rulemaking, licensing) to minimize the impact of the rulemaking on the COL schedules.

The NRC issued SECY-09-0018, "Streamlining Design Certification Rulemakings," on January 30, 2009, to describe the NRC's streamlining effort. By making various improvements, the NRC believes that DC rulemakings can be completed in about 1 year and can be timed to minimize possible delays in the COL licensing process. The NRC has implemented the identified improvements.

Interoffice Rulemaking Contract

The NRC has begun an effort to coordinate and consolidate certain rulemaking activities by issuing a single rulemaking support contract, thus preventing duplicate efforts to issue individual contracts. Each lead office would be able to write task orders against the contract. The NRC established an interoffice working group and has drafted a request for procurement action. The NRC Chairman approved the request in July 2010. Contracting activities are underway with a target to award this contract in the second quarter of FY 2011.

Design Certification with Multiple Vendors

The NRC staff has developed plans to address industry activities related to the ABWR DC. Two parties have stated their intention to submit renewals for the ABWR DC in FY 2011. In addition, in June 2009, STPNOC submitted a request to amend the ABWR DC to comply with the aircraft impact assessment rule. The NRC staff has completed its technical review of this application and has considered several options for resolving issues associated with multiple suppliers for a single design. The staff will provide its recommended approach to the Commission.

Regulatory Guides

During the second half of FY 2010, the NRC's Office of New Reactors (NRO) reviewed approximately 30 draft and final RGs in preparation for their issuance for public comment, for final issuance, or for withdrawal. In the second half of FY 2010, NRO prepared RG 1.215, "Guidance for Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Closure Under 10 CFR Part 52," issued October 2009; and RG 1.68.2, "Initial Startup Test Program to Demonstrate Shutdown Capability for Water-Cooled Nuclear Power Plants," issued April 2010. In April 2010, RG 1.165, "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," was withdrawn.

Interim Staff Guidance (ISGs)

ISGs serve as interim measures to provide guidance to the NRC during licensing reviews. They are also an important reference to assist applicants and licensees in understanding NRC expectations. The information contained in ISGs is incorporated into other permanent NRC documents, such as RGs and SRPs, when they are periodically updated.

During the second half of FY 2010, the NRC issued two ISGs:

- COL-ISG-022, "Interim Staff Guidance on Impact of Construction on New Nuclear Power Plants on Operating Units at Multi-Unit Sites" (issued for public comment in September 2010)

- DC/COL-ISG-16, "Interim Staff Guidance DC/COL-ISG-016, 'Compliance with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d)'" (issued final June 9, 2010 - contains security information; available to the public in a redacted version)

The NRC issued the following two final ISGs in the second half of FY 2010:

- DC/COL-ISG-17, "Ensuring Hazard-Consistent Seismic Input for Site Response and Soil Structure Interaction Analyses" (issued final on March 31, 2010)

- DC/COL-ISG-20, "Implementation of a Probabilistic Risk Assessment-Based Seismic Margin Analysis for New Reactors" (issued final on March 22, 2010)

Standard Review Plan

The SRP is the primary document used by the NRC to review and evaluate proposed licensing actions for NPPs. It contains guidelines to ensure that NRC evaluations lead to clear and defensible findings that demonstrate that public health and safety will be maintained.

The SRP contains approximately 250 sections covering the entire scope of an NPP. Updating the SRP and other associated guidance documents is critical to ensuring that NRC evaluations reflect the latest information and knowledge related to the safe operation of NPPs. The comprehensive SRP review and update program occurs approximately every 4 years, and it calls for a review of all sections of the SRP to determine which sections require an update and to budget and schedule the resources necessary to perform the updates. In the first half of FY 2010, the NRC prepared plans to perform the next periodic update, beginning in

September 2010.

In support of this review effort, the staff organized a number of kickoff meetings for program managers in NRR, NRO, the Office of Nuclear Security and Incident Response, RES, and the NRR Leadership Team. The staff issued a memorandum soliciting input from various users of the SRP guidance by September 15, 2010. The staff is tallying the results of the comprehensive survey received so far from all offices across the agency and will compile them early in FY 2011. The preliminary results indicate that 65 percent or more of the SRP 250 sections, as well as addition of new chapters and a need for expanding existing guidance beyond March 2007 issuance. The update will also include guidance for reviewing new applications for the four advanced reactor technologies under consideration.

In supporting emergent requests, the NRC issued a number of SRP section revisions for public comment in the second half of FY 2010. These included changes in guidance warranted because of major rule changes, such as the 10 CFR Part 73 rule on physical security, in June 2010, and the cyber security program.

The NRC made administrative changes to numerous chapters of the "Review Interfaces" sections of the SRP, in response to the audit recommendations identified in the Office of the Inspector General's audit report OIG-10-A-02, "Audit of NRC's Quality Assurance Planning for New Reactors," dated November 16, 2009. Specifically, the report recommended these changes to increase process efficiencies in the NRC review of COLA and DC applications by clearly defining the quality assurance (QA) review coordination requirements in the SRP. The recommendations were written into the SRP guidance and include development of a process for reviewers to coordinate QA interfaces and a method to determine that the QA coordination has occurred with respect to the applications.

International Activities

The NRC continues to use international experience and lessons learned to assist other regulatory authorities to ensure safe designs, both domestically and internationally. All of the new reactor designs under review in the United States are also under review, being constructed, or in operation in other countries. During this period, the NRC participated in multilateral and bilateral activities as part of a multinational design evaluation program, attending conferences and workshops, hosting assignees from other regulatory bodies, and supporting IAEA requests for expert participation.

Multinational Design Evaluation Program

The U.S. EPR working groups met May 17–21, 2010. During this meeting, the member countries were able to gain a better understanding of the U.S. EPR licensing process employed by other member countries and to get insight into technical issues of concern, such as DI&C, accident analysis, and probabilistic risk assessment and severe accidents.

The Steering Technical Committee (STC) met June 6–7, 2010. At this meeting, the participating countries discussed the results obtained to date by the working groups, discussed policy and procedural issues, and planned the next steps for the program.

The DI&C working group met June 21–23, 2010. At this meeting, the members updated the Communication, Program, and Problem Solving Model plans to reflect the STC guidance. Two common positions, software common cause and software tools, incorporated minor changes,

and the members approved the final position. Additional common positions are under development and will be completed and sent to the STC in the near future.

Conferences and Workshops

On May 17–21, 2010, the NRC participated in the 18th International Conference on Nuclear Engineering. The China Nuclear Society, ASME, and the Japan Society of Mechanical Engineers sponsored the conference, held at the Xi'an International Conference Center, Xi'an, China. The School of Nuclear Science and Technology, Xi'an Jiatong University, organized the conference.

On September 13–16, 2010, NEA's Committee on Nuclear Regulatory Activities, Working Group on Regulating New Reactors (WGRNR), held a workshop on the exchange of construction and operating experience with WGRNR member countries. The purpose of this meeting was to learn how other countries are handling issues related to the siting of plants, and to share the NRC perspective on the exchange of construction and operating experience with WGRNR member countries.

From September 6–8, 2010, NRO and NRR participated in a DI&C workshop in Taiwan with the Taiwanese regulator, where they exchanged information on regulatory issues regarding DI&C. The information regarding regulatory approaches to the resolution of safety issues benefited both regulators, who agreed on topics for continued and future cooperation.

Bilateral Support

From April 6–26, 2010, two inspectors visited China to discuss construction inspection with the National Nuclear Safety Administration of China (NNSA). They held detailed discussions with representatives from NNSA's Shanghai Regional Office concerning the NRC and NNSA planned construction inspection programs for the Westinghouse AP1000 reactor. The inspectors also visited the Sanmen NPP (AP1000) construction site, observing and participating in construction inspection activities. One of the inspectors from NRC's Region II spent an additional 5 weeks at the Sanmen site. During this period, the NRC also hosted four staff of the Chinese regulatory agency. Each assignee spent approximately 6 months working with the NRC in the areas of inspection program development, inspection activities, and structural and DI&C design.

IAEA Request

From May 1–8, 2010, NRO, with along with representatives from other countries, supported a delegation to understand the implications of the February 27, 2010, magnitude 8.8 earthquake offshore of Maule, Chile. The participants also shared with the Chilean Nuclear Energy Commission their experience and the lessons learned from IAEA involvement after the 2007 earthquake in Japan, including its impact on the Kashiwazaki-Kariwa Nuclear Power Plant.

Construction Inspection Program Developments

The NRC has begun inspection activities on the construction underway at the Vogtle Unit 3 and 4 site. Infrastructure is in place to support near-term inspection activities to verify quality construction. During FY 2010, site construction officially began at Vogtle Unit 3 with the start of engineered backfill operations authorized under the LWA. NRC Region II construction inspectors were present to view the initial activities and to begin the first onsite ITAAC

inspection. Region II placed the construction senior resident inspector and resident inspector at Vogtle on August 16, 2010.

The staff continues to make significant progress in the development of programs and procedures to support construction inspection and achieved several milestones, including the following.

The NRC staff submitted SECY-10-0100, "Staff Progress in Resolving Issues Associated with Inspections, Tests, Analyses, and Acceptance Criteria," to the Commission on August 5, 2010. The paper reports the staff's progress in resolving issues associated with ITAAC, including developing a process to ensure that the validity of conclusions regarding acceptability of completed ITAAC is maintained. Topics covered include ITAAC maintenance regulatory guidance and rulemaking progress; license amendments necessitated by changes to ITAAC; the ITAAC closure verification process; a simulated ITAAC closure and verification demonstration exercise; the update to RIS 2008-05, "Lessons Learned to Improve Inspections, Test, Analyses, and Acceptance Criteria"; and staff training for the "best practices" in ITAAC development.

In June 2010, the NRC received Revision 4 to NEI 08-01, "Industry Guidelines for the ITAAC Closure Process under 10 CFR Part 52," dated July 2010, for 10 CFR Part 52 applicants and licensees on requirements for the ITAAC closure process. The revised industry guideline was edited to add critical sections on ITAAC maintenance, which have been vetted through public ITAAC workshops. The ITAAC maintenance period covers the time from when the licensee submits an ITAAC closure letter to the time the Commission authorizes the facility to operate. Using Revision 4 as the current reference point, the NRC is revising RG 1.215, which endorses the industry guide. The NRC plans to issue the draft revision to RG 1.215 for public comment by the end of 2010.

On July 29, 2010, the NRC held the kickoff meeting for the simulated ITAAC closure and verification demonstration exercise, as described in SECY-10-0100, "Staff Progress in Resolving Issues Associated with Inspections, Tests, Analyses, and Acceptance Criteria," dated August 5, 2010. The exercise, sponsored by the U.S. Department of Energy (DOE), will simulate licensee closure and submittal of a sample of ITAAC. The NRC will then verify closure through the process proposed in SECY-10-0100. The exercise will also include an action to evaluate the surge in ITAAC closure submittals expected during the last year of construction for a new NPP. The exercise is expected to conclude in February 2011 and will include a lessons-learned report.

To complement the guidance provided in both RIS 2008-05 and its revision, the NRC held training sessions for NRO technical reviewers and inspection program staff on April 20, July 13, and September 21, 2010. These training sessions summarized the lessons learned and discussed specific examples on the best practices associated with the quality, clarity, and inspectability of ITAAC submitted as part of the applications for ESPs, standard DCs, or COLs. The NRC developed the training in parallel with the update to RIS 2008-05. The revision of RIS 2008-05 and the internal staff training sessions are helping to inform all stakeholders and to minimize recurrence of these types of issues.

In March 2010, site construction activities authorized under the LWA issued by the NRC for Vogtle Unit 3 officially began with the placement of engineered backfill. NRC inspections of QA, fitness for duty, and ITAAC-related construction activities began in accordance with the NRC inspection program.

In June 2010, Region II, with support from NRC headquarters staff, conducted an ITAAC inspection of the design acceptance criteria for the STP DI&C software lifecycle planning phase in June 2010.

In June 2010, the NRC hosted the second NRC Workshop on Vendor Oversight for New Reactor Construction in New Orleans, Louisiana. The workshop was widely attended and included discussions on such issues as vendor oversight for new reactors; the ASME nuclear survey process; the NRC enforcement policy as it applies to vendors; counterfeit, fraudulent, or suspect items; and vendor insights on third-party oversight. Approximately 550 people attended the workshop, representing companies and organizations from 11 countries. They included 233 vendors, 3 industry groups, 10 government regulatory agencies, and 45 foreign and domestic utilities, including NRC license applicants (for DC, COL, and fuel cycle facility licenses).

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 2012. The staff has evaluated past advanced reactor experience and interacted with stakeholders to identify issues that need to 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.

Next Generation Nuclear Plant

The NRC is currently working with the U.S. Department of Energy (DOE) to coordinate various research and pre-application activities related to Phase 1 of the Next Generation Nuclear Plant (NGNP) program. An example of the DOE/NRC cooperation was a multi-day training course on high temperature gas-cooled reactor (HTGR) technology and history that was provided to NRC staff from NRO, RES, and other offices. The NRC staff communicates often with DOE and the lead laboratory, Idaho National Laboratory (INL) regarding research and development activities as well as the efforts to support the future licensing of the NGNP prototype and subsequent commercial units.

The staff is currently reviewing white papers submitted by INL to describe the expected risk-informed, performance-based licensing approach, as described in the August 2008 licensing strategy report to Congress. This approach will develop a technical approach that adapts existing NRC light water reactor technical licensing requirements to HTGR licensing. The approach will use deterministic engineering judgment and analysis, complemented by probabilistic risk assessment (PRA) information and insights, to establish the NGNP licensing basis and requirements. Submittals in this area include defense-in-depth, licensing basis event selection, and safety classification and treatment of systems, structures, and components.

Other engineering topics addressed by white papers include materials to be used in the challenging high temperature environment, the mechanistic source term used for radiological effects calculations, and qualification of fuel. INL has also submitted a description of its proposed quality assurance program, and its proposals for addressing emergency planning and licensing of modular facilities.

NRC assessments of these issues will provide feedback addressing outcome objectives identified by INL, along with other issues that the NRC staff believes may be relevant to licensing the NGNP. The assessments will not provide a final regulatory conclusion on any aspect of the NGNP design, but are intended to support future licensing by facilitating discussions and reaching general consensus on policy and licensing issues.

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

Decisions regarding Phase 2 of the NGNP program, which involves specific design and licensing activities for a prototype reactor, are expected in mid-2011 following proposal reviews by the Nuclear Science Advisory Committee and DOE.

Integral Pressurized Water Reactors

NuScale Power, Inc.

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

The NRC staff has been engaged in pre-application activities with NuScale since early 2008 and NuScale has informed the staff that it intends to file its formal application for Design Certification in early 2012. In advance of its design certification application, NuScale informed the NRC of its intent to submit fifteen technical reports. The NRC has received reports on human factors engineering, loss-of-coolant accident (LOCA) thermal-hydraulic and neutronics phenomena, and cyber security and is establishing review schedules and feedback format for these reports. The staff also held a meeting in June 2010 with NuScale to discuss their proposed simulator, codes and methods, probabilistic risk analysis, licensing strategy, and licensing topical reports.

Babcock and Wilcox mPower™

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

The NRC staff has been engaged in pre-application activities with B&W since mid-2009. In July 2010, B&W provided a letter to the NRC that detailed its plans to submit twelve technical reports between now and submittal of its design certification application, expected in late FY 2012. The NRC staff has received technical reports on the following topics: quality assurance (QA) program description, plant design description, critical heat flux testing plan, core design criteria and analysis methodology, and integrated system testing plan. The staff is establishing review schedules and the feedback format for these reports. The staff held detailed technical meetings

with B&W in the 4th quarter of FY2010 on the core design criteria and analysis methodology and integrated system testing plan reports.

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 staff activities related to these designs are limited to low level efforts (e.g., knowledge management) and non-resource intensive interactions with vendors (e.g., occasional meetings).

Generic Policy Issues

The NRC staff continues to focus on identifying and resolving policy and key technical issues, developing guidance, and participating in preapplication interactions related to various advanced reactor technologies and designs. On March 28, 2010, the staff issued SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," outlining a number of generic issues facing the future licensing of SMRs. The staff has developed specific resolution plans for the issues identified in SECY-10-0034 and are also working on a number of key technical issues associated with integral pressurized water reactors and the next generation nuclear plant program. Within the last year, the industry has also formed groups to discuss and coordinate issues associated with SMRs. The Nuclear Energy Institute (NEI) and the American Nuclear Society (ANS) 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, and timely resolution of the issues, the NRC and the 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. These meetings began on July 22, 2010, and will continue to occur approximately every six weeks for the remainder of 2010 and throughout 2011.

Infrastructure Development

Focusing the attention of the NRC staff on the NGNP program and on iPWRs continues to enhance the effectiveness and efficiency of other advanced reactor activities by: (1) providing the information necessary to develop resource estimates for reviewing the designs for advanced reactors; (2) allowing the technical review NRC staff sufficient time to become familiar with advanced reactor design concepts; (3) providing feedback on key design, technology, safety research, and licensing issues; (4) identifying interrelated or cross-cutting regulatory safety issues and identifying reasonable resolution paths for these issues; and (5) identifying technical skills necessary to review these designs and, as appropriate, hiring staff and contractors who possess the requisite knowledge, skills and abilities.

The NRC staff has developed and is executing a procurement strategy that relies on the expertise in advanced reactor designs provided by the DOE laboratories. The staff has placed four basic task order agreements with four of the DOE laboratories (Oak Ridge National Laboratory, Brookhaven National Laboratory, Sandia National Laboratory, and Pacific Northwest National Laboratory) and has issued several task orders against these agreements. The staff is using on the DOE laboratories for support in the resolution of generic policy and technical issues, development of guidance documents for both the NRC staff and industry, and

pre-application reviews of topical reports and white papers submitted by potential suppliers. The NRC staff is developing its longer term contracting strategy that will likely involve commercial contractors for the review of actual design and licensing applications.

Consistent with the staff's approved procurement strategy, the staff is also working with the DOE national laboratories to develop training for both HTGRs and iPWRs. During the last six months of fiscal year (FY) 2010, the staff was successful in coordinating preliminary training sessions on HTGRs and iPWRs. The staff is assessing feedback from these preliminary training sessions and, with support from the DOE national laboratories, will develop and implement a rigorous training program to address skill gaps and infrastructure gaps within NRO.