Protecting People and the Environment

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

April–September 2015

Note: The period of performance covered by this report includes activities that occurred from the first day of April to the last day of September 2015. The transmittal letter to Congress accompanying this report provides additional information to keep Congress fully and currently informed of the licensing and regulatory activities of the U.S. Nuclear Regulatory Commission.

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I. Reactor Oversight Process

The U.S. Nuclear Regulatory Commission (NRC) continues to use the Reactor Oversight Process (ROP) at all nuclear power plants to assess performance of reactor licensees and to guide assignment of inspection resources. NRC staff meets with interested stakeholders periodically to collect feedback on the effectiveness of the process, which is then considered in making future refinements to the ROP. Additionally, the NRC is making progress on the ROP Enhancement Project, which is focused on enhancing the effectiveness of the ROP using inputs from both self-assessments and independent evaluations.

The agency's most recent performance assessments show that all plants continue to operate safely. The NRC issued a press release on September 3, 2015, summarizing the 2015 mid-cycle performance assessments for all nuclear plants and associated mid-cycle assessment letters, which are publicly available on the NRC Web site. The Web site also has been updated to reflect the latest performance assessments as of the end of the third quarter of calendar year 2015.

II. Implementing Risk-Informed and Performance-Based Regulations

Currently, 46 operating nuclear power reactors have made the transition, or are committed to making a transition, to the risk-informed, performance-based fire protection licensing basis permitted under Title 10, "Energy," of the *Code of Federal Regulations* (10 CFR) section 50.48(c). This licensing basis is also known as National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants." Of the 46 reactor units, 20 have already transitioned to an NFPA 805 licensing basis; 23 are under active review by the NRC; and three have expressed their intention to submit license amendment applications to the NRC. The NRC anticipates that it will complete its review of the 23 reactors currently under review by the end of fiscal year (FY) 2016. The agency expects to receive license amendment applications for the remaining three reactors in FY 2016 (for one reactor) and FY 2017 (for the final two reactors).

On November 5, 2012, the Commission directed the staff to develop an approach for allowing licensees to propose to the NRC a prioritization of the implementation of regulatory actions as an integrated set and in a way that reflects their risk significance on a plant-specific basis for Commission review and approval. NRC staff refers to this initiative as the risk-prioritization initiative (RPI) and worked with external stakeholders to develop a proposed process for Commission review. In May 2015, NRC staff and an external panel consisting of members of the public briefed the Commission on issues related to RPI. The briefing included the staff's lessons learned from RPI pilot projects, possible approaches for implementing the RPI, as well as licensees' experiences with RPI pilot projects. In its direction to staff (SRM-SECY-15-0050, "Cumulative Effects of Regulation Process Enhancements and Risk Prioritization Initiative"), the Commission did not approve the staff proposal that would create new processes. However, the Commission stated that risk insights should be considered in regulatory decisionmaking through existing agency processes. The staff is exploring the development of other guidance to enhance licensees' ability to use risk information in existing agency processes, such as 10 CFR 50.12, "Specific Exemptions."

Southern Nuclear Operating Co. ("Southern") submitted its proposal to implement 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," for Vogtle Electric Generating Plant (VEGP), Units 1 and 2, on August 31, 2012. The staff completed the technical review and issued a safety

evaluation in December 2014. Southern submitted a second proposal to implement risk-informed allowed outage times for VEGP's technical specifications on September 13, 2012. This submittal is under staff review, and NRC staff is completing the safety evaluation.

III. Status of Issues Tracked in the Reactor Generic Issues Program

The Generic Issues Program is evaluating four open generic issues (GIs) and tracking their resolution. Three GIs are in regulatory office implementation stage, which is the final stage of the NRC staff's process to develop and perform an appropriate regulatory action to implement resolution of a generic issue: GI-191, GI-199, and GI-204. One GI - GI-93 - is in the GI program assessment stage, which is the second stage of the NRC staff's process to perform an assessment of the proposed generic issue to determine if it merits further regulatory action. The status of each open generic issue is described below:

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

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

Because of this GI and the related Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004, all PWR licensees increased the size of their containment sump strainers, significantly reducing the risk of strainer clogging. A related issue, which needs to be resolved to close GI-191, is the potential for debris to bypass the sump strainers and enter the reactor core. In 2008, NRC staff determined that more testing was necessary to resolve this issue. In 2012, the industry performed and completed the extra testing and submitted a topical report to the NRC. In 2013, NRC staff issued a safety evaluation of the topical report, finding it an acceptable model for assessing the effect of sump-strainer-bypassed fibrous, particulate, and chemical debris on core cooling in PWRs.

In December 2010, the Commission determined that it was prudent to allow the nuclear industry to complete testing on in-vessel effects and zone of influence and to develop a path forward by mid-2012. The Commission directed NRC staff to evaluate alternative approaches, including risk-informed approaches, for resolving GI-191 and to present them to the Commission by mid-2012. Based on the interactions with stakeholders and the results of the industry testing, NRC staff in 2012 developed three options for licensees to resolve GI-191. These options were documented and proposed to the Commission in SECY-12-0093, "Closure Options for Generic Safety Issue 191, 'Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance'," dated July 9, 2012. All options require licensees to demonstrate compliance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." The options allow industry alternative approaches for resolving GI-191. The Commission issued a Staff Requirements Memorandum on December 14, 2012, approving the options for closure of GI-191.

Licensees have since notified the NRC of the option that they have selected and are developing proposed technical resolutions based on the option selected. NRC staff is reviewing the proposed technical resolutions as they are submitted by licensees. To date, seven sites have successfully resolved GI-191.

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

GI-193 involves an evaluation of the consequences of LOCA causing a blowdown of containment gas into the suppression pool. The noncondensable gas could enter into the suction piping of the ECCS pumps, causing gas binding, vapor locking, or cavitation, leading to a possible failure or degraded performance. The Office of Regulatory Research (RES) has completed a technical report providing a basic understanding of the overall phenomena. The results of the study provide the “exclusion zone” and a quantification of the time-dependent gas void fraction present at different locations in the suppression pool after a large-break LOCA.

RES has now completed computational fluid dynamics (CFD) models and analyses for several tests at two smaller scale test facilities that model the post-LOCA noncondensable gas behavior in a suppression pool. Using the computational methods employed for the two test programs, the agency completed CFD analyses to simulate full-scale Mark I suppression pool behavior after a large-break LOCA. The results from the full-scale CFD analyses can be used to determine the location of a time dependent “exclusion zone” in the suppression pool. The “exclusion zone” is the volume below and around the downcomer exhaust that is expected to contain a large concentration of noncondensable gas from the drywell for a few seconds after a LOCA. If an ECCS pump suction strainer is in the “exclusion zone,” the ECCS pump could be vulnerable to gas entrainment if it is operated in the time period during which the large noncondensable gas volume is present.

The completed RES technical report supplies a means to assess the post-LOCA vulnerability of an ECCS pump based upon pump strainer location and an ECCS pump start time. Now that the technical report is complete, the GI assessment can determine whether the issue should proceed to regulatory office implementation. A new generic issue review panel has been formed and is working on completing the GI program assessment.

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

This GI addresses the estimated seismic hazard levels at current nuclear sites in the central and eastern United States that might be higher than the values used in designs and previous evaluations.

The NRC evaluated the effects of new seismic hazard data and methods on U.S. nuclear plants and collaborated with the Electric Power Research Institute to ensure a sound technical approach was developed. The Safety/Risk Assessment Panel issued its report on September 2, 2010. The panel recommended taking further actions to address GI-199 outside the GI program. The NRC issued Information Notice 2010-18, “Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,” on September 2, 2010, to inform stakeholders that the GI-199 Safety/Risk Assessment Report had been issued. The information notice also stated that the NRC will follow the appropriate regulatory process to request that operating plants and independent spent fuel storage installations offer specific information about their facilities to enable NRC staff to complete the regulatory assessment and identify and evaluate candidate backfits. After the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the NRC incorporated GI-199 into the work responding to the accident. Activities since that time are discussed in Section X of this report, “Response to Lessons Learned from the Fukushima Accident in Japan.”

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

This GI relates to potential flooding effects from upstream dam failure(s) on nuclear power plant sites, spent fuel pools, and sites undergoing decommissioning with spent fuel stored in spent fuel pools. The Office of Nuclear Reactor Regulation (NRR) proposed this GI in July 2010, and it has been subsumed as part of the implementation of the recommendations from the agency’s Japan Near-Term Task Force. See Section X of this report for additional information.

IV. Licensing Actions and Other Licensing Tasks

Operating power reactor licensing actions are orders, license amendments, exemptions from regulations, relief from inspection or component testing, topical reports submitted on a plant-specific basis, or other actions requiring NRC review and approval before they can be carried out by licensees. The FY 2015 NRC Performance Budget plan incorporates two output measures related to licensing actions: the number of licensing actions completed per year and the age of the licensing action inventory.

Other licensing tasks for operating power reactors include:

- licensee responses to NRC requests for information through generic letters or bulletins
- NRC responses to petitions filed for enforcement action under 10 CFR 2.206
- NRC review of generic topical reports
- responses by NRR to NRC regional office requests for assistance
- NRC inspection of licensee analyses under 10 CFR 50.59, “Changes, Tests and Experiments”
- final safety analysis report updates
- other licensee actions not requiring NRC review and approval before licensees can carry them out

The FY 2015 NRC Performance Budget plan incorporates two output measures related to other licensing tasks: the number of other licensing tasks completed each year and the age of the other licensing task inventory.

The table below shows the actual FY 2012, FY 2013, and FY 2014 results and the FY 2015 goals for the NRC Congressional Budget plan performance indicators for operating power reactor licensing actions and other licensing tasks. The NRC continues to work on the Fukushima Tier 1 activities under aggressive schedules that require close monitoring to ensure that implementation of the activities is successful. The agency prioritizes all licensing action reviews in accordance with their safety significance; however, because of Fukushima-related work competing for the same critical skill sets, the backlog inventory of operating reactor licensing actions has increased. In late FY 2014, the staff redistributed resources to support stabilizing and reducing the licensing action backlog, and as a result the NRC has seen the backlog inventory stabilize in FY 2015 and has seen improvement towards reducing the backlog this FY. To improve the agency’s projections, manage workload, and identify needed skills, the

NRC issued a regulatory information summary to request that licensees supply information on their plans to submit licensing actions over the next 3 years. The agency plans to request updates to this information later this year. The NRC's senior management remains heavily engaged in monitoring the licensing action workload towards an objective of achieving target performance goals.

CONGRESSIONAL BUDGET PERFORMANCE INDICATORS					
Output Measure	**FY 2012 Actual**	**FY 2013 Actual**	**FY 2014 Actual**	**FY 2015 Goals**	**FY 2015 Actual**
Licensing actions completed per year	770	668	607	737[1]	792
Age of inventory of licensing actions	95.8% ≤ 1 year and 100% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 99% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years	88% ≤ 1 year and 99% ≤ 2 years
Other licensing tasks completed per year	674	529	402	500	461
Age of inventory of other licensing tasks	94.6% ≤ 1 year and 100% ≤ 2 years	97.6% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 100% ≤ 2 years	90% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 97% ≤ 2 years

V. Status of License Renewal Activities

The NRC has issued renewed licenses to 78 power reactor units licensed to operate. The NRC has nine license renewal applications (LRAs) for 16 reactor units under review.

Applications Currently under Review

The following is the status of each application under review during the reporting period.

Indian Point Nuclear Generating Units 2 and 3

On April 30, 2007, Entergy Nuclear Operations, Inc. ("Entergy"), submitted an LRA for Indian Point Nuclear Generating Units 2 and 3 to extend the operating licenses for 20 years beyond the current license periods. In July 2014, the staff announced its intent to prepare a second supplement to the December 2010 final Supplemental Environmental Impact Statement (SEIS) to address new information and other developments since Final Environmental Impact Statement (FEIS) Supplement 1 was issued in June 2013. The staff expects to publish the draft

[1] Congressional Budget Performance indicator is limited by the number of licensing action requests submitted or accepted the previous FY.

supplement in January 2016 and the final supplement in September 2016. On November 6, 2014, staff issued Supplement 2 to the safety evaluation report (SER). The staff briefed the Advisory Committee on Reactor Safeguards (ACRS) on SER Supplement 2 on April 23, 2015. Additionally, activities related to the Atomic Safety and Licensing Board (ASLB) hearing process continued. Hearings on the three remaining safety contentions are scheduled to be held in Tarrytown, NY, November 16-20, 2015.

The operating license for Indian Point Nuclear Generating Unit 2 was set to expire on September 28, 2013. Given the timely submittal of the LRA, Unit 2's continued operation is permitted under NRC regulations and the Administrative Procedure Act until the NRC determines whether to issue a renewed license. The operating license for Indian Point Nuclear Generating Unit 3 is set to expire on December 12, 2015; inasmuch as the Unit 3 LRA was timely submitted, the staff anticipates that Unit 3 also will continue to operate under its existing license until the NRC makes a final determination on whether to issue a renewed license. A final determination will be made once the staff's review is complete and the ASLB hearing is concluded. Entergy has implemented aging management programs for both Units 2 and 3, as described in the LRA, and the NRC continues normal reactor oversight to ensure safe operations.

Diablo Canyon Nuclear Power Plant, Units 1 and 2

On November 24, 2009, Pacific Gas and Electric Co. (PG&E) submitted an LRA for the Diablo Canyon Power Plant, Units 1 and 2, to extend the operating licenses for 20 years beyond the current license periods. In April 2011, PG&E requested that the NRC delay its final licensing decision to allow PG&E to satisfy State of California requests for studies made under the Coastal Zone Management Act. In December 2014 and February 2015, in response to staff requests, PG&E submitted updates to its LRA, which provided most of the information the staff identified as necessary to complete its review. During the reporting period, staff conducted public environmental scoping meetings and onsite audits related to the environmental review of the application. In addition, activities related to the ASLB hearing process are completed although an appeal on several proposed contentions is pending before the Commission.

Seabrook Station, Unit 1

On June 1, 2010, NextEra Energy Seabrook, LLC, submitted an LRA for the Seabrook Station, Unit 1, to extend the operating license for 20 years beyond the current license period. In April 2013, the staff issued a second draft SEIS, which included a revised severe accident mitigation alternatives analysis and updates to comply with the NRC's revised environmental protection regulations. During the reporting period, the staff also worked toward resolution of the open items identified in the staff's June 2012 SER with Open Items. In July 2015, the staff issued the final SEIS. Additionally, activities related to the ASLB hearing process are completed.

Davis-Besse Nuclear Power Station, Unit 1

On August 30, 2010, FirstEnergy Nuclear Operating Co. submitted an LRA for the Davis-Besse Nuclear Power Station, Unit 1, to extend the operating license for 20 years beyond the current license period. The staff issued the draft SEIS in February 2014 and published the final supplement in April 2015. Activities related to the ASLB hearing process are completed. During the current reporting period, the staff issued a supplemental SER in August 2015 and in September 2015, the staff presented the supplemental SER before the ACRS.

South Texas Project, Units 1 and 2

On October 28, 2010, South Texas Project (STP) Nuclear Operating Co. submitted an LRA for STP Units 1 and 2, to extend the operating licenses for 20 years beyond the current license periods. The staff issued the final SEIS in November 2013. During the reporting period, the staff continued its work toward resolution of the open items identified in the staff's February 2013 SER with open items.

Grand Gulf Nuclear Station, Unit 1

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

Sequoyah Nuclear Plant, Units 1 and 2

On January 7, 2013, Tennessee Valley Authority (TVA) submitted an LRA for Sequoyah Nuclear Plant, Units 1 and 2, to extend the operating licenses for 20 years beyond the current license periods. The staff issued the draft SEIS in July 2014 and the SER with Open Items in September 2014. The staff issued the final SER in January 2015 and the final SEIS in March 2015. On September 28, 2015, NRR issued a renewed operating license to Tennessee Valley Authority for Sequoyah Nuclear Plant, Units 1 and 2.

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

On May 29, 2013, Exelon submitted LRAs for Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, to extend the operating licenses for 20 years beyond the current license periods. The staff issued the Byron draft SEIS in December 2014 and the Braidwood draft SEIS in March 2015. The staff issued its SER with Open Items on October 30, 2014. During the reporting period, the staff continued work on the environmental and safety reviews of the application, completing the final SER in July 2015 and the final SEIS for Byron in July 2015. Staff plans to issue the final SEIS for Braidwood in November 2015.

Fermi, Unit 2

On April 30, 2014, DTE Electric Co. ("DTE Electric") submitted an LRA for Fermi, Unit 2, to extend the operating license for 20 years beyond the current license period. During the reporting period, the staff continued work on the environmental and safety reviews of the application. The staff plans to publish the draft SEIS for comment in October 2015. Activities related to the ASLB hearing process are completed.

LaSalle County Station, Units 1 and 2

On December 9, 2014, Exelon Generation Co., LLC submitted an LRA for LaSalle County Station, Units 1 and 2 to extend the operating licenses for an additional 20 years beyond the current license periods. During the reporting period, the staff continued work on the environmental and safety reviews of the application. The staff plans to publish the draft SEIS for comment in February 2016.

VI. Summary of Reactor Enforcement Action

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

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

NON-ESCALATED REACTOR ENFORCEMENT ACTIONS						
		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1st Half FY 15	4	1	1	9	15
	2nd Half FY 15	0	6	0	1	7
	FY 15 YTD Total	4	7	1	10	22
	FY 14 Total	8	5	3	2	18
	FY 13 Total	6	8	1	4	19
Non-Cited Severity Level IV or Green	1st Half FY 15	57	53	96	93	299
	2nd Half FY 15	80	50	86	131	347
	FY 15 YTD Total	137	103	182	224	646
	FY 14 Total	124	147	223	257	751
	FY 13 Total	155	117	201	203	676
TOTAL Cited and Non-Cited Severity Level IV or Green	1st Half FY 15	61	54	97	102	314
	2nd Half FY 15	80	56	86	132	354
	FY 15 YTD Total	141	110	183	234	668
	FY 14 Total	132	152	226	259	769
	FY 13 Total	161	125	202	207	695

NOTE: The non-escalated enforcement data above reflect the cited and non-cited violations either categorized at Severity Level IV, the lowest level, or associated with green findings during the indicated time periods. The numbers of cited violations are based on Enforcement Action Tracking System data that may be subject to minor changes following verification. The monthly totals generally lag by 30 days because of the time needed for inspection report and enforcement development. These data do not include green findings that do not have associated violations.

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH TRADITIONAL ENFORCEMENT						
		Region I	Region II	Region III	Region IV	TOTAL
Severity Level I	1st Half FY 15	0	0	0	0	0
	2nd Half FY 15	0	0	0	0	0
	FY 15 YTD Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
Severity Level II	1st Half FY 15	0	0	0	0	0
	2nd Half FY 15	0	0	0	0	0
	FY 15 YTD Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
Severity Level III	1st Half FY 15	2	1	0	1	4
	2nd Half FY 15	1	1	0	0	2
	FY 15 YTD Total	3	2	0	1	6
	FY 14 Total	1	0	0	0	1
	FY 13 Total	1	6	1	2	10
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 15	2	1	0	1	4
	2nd Half FY 15	1	1	0	0	2
	FY 15 YTD Total	3	2	0	1	6
	FY 14 Total	1	0	0	0	1
	FY 13 Total	1	6	1	2	10

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS						
		Region I	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1st Half FY 15	0	0	0	0	0
	2nd Half FY 15	0	0	0	0	0
	FY 15 YTD Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
	FY 13 Total	0	0	0	0	0
Violations Related to Yellow Findings	1st Half FY 15	0	0	0	2	2
	2nd Half FY 15	1	0	0	0	1
	FY 15 YTD Total	1	0	0	0	3
	FY 14 Total	0	0	0	2	2
	FY 13 Total	0	1	1	0	2
Violations Related to White Findings	1st Half FY 15	2	1	2	0	5
	2nd Half FY 15	2	0	3	0	5
	FY 15 YTD Total	4	1	5	0	10
	FY 14 Total	1	2	3	4	10
	FY 13 Total	2	7	7	2	18
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 15	2	1	2	2	7
	2nd Half FY 15	3	0	3	0	6
	FY 15 YTD Total	5	1	5	2	13
	FY 14 Total	1	2	3	6	12
	FY 13 Total	2	8	8	2	20

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

Reactor Escalated Enforcement Actions and Other Significant Actions Taken

The list below includes Severity Level I, II and III Notices of Violation (NOV) associated with an inspection finding that the Significance Determination Process evaluates as having low to moderate (white) or greater safety significance; civil penalties; NOVs to individuals; and enforcement-related orders. The list also includes security-related actions and confirmatory actions not included in the tables above. The NRC does not make details of security-related violations publicly available.

Energy Northwest (Columbia Generating Station) EA-14-240

On September 28, 2015, the NRC issued a confirmatory order to Energy Northwest, to formalize commitments made because of an alternative dispute mediation session on August 6, 2015. The commitments were made as part of a settlement agreement between Energy Northwest and the NRC regarding a violation that involved Nuclear Security Officers at Columbia Generating Station being willfully inattentive while on duty, which resulted in them not meeting the requirement to be available at all times inside the protected areas for their assigned response duties, contrary to 10 CFR 73.55(k)(5)(iii). In light of the significant corrective actions Energy Northwest had taken and subject to the satisfactory completion of the additional actions committed to take, as described in the Confirmatory Order, the NRC will not issue a notice of violation for the apparent violation. Those corrective actions include, but are not limited to: (1) conducting a common cause evaluation, (2) revising its annual compliance and ethics computer-based training to address deliberate misconduct, (3) presenting at an industry forum to discuss the events that led to the confirmatory order, (4) conducting a targeted nuclear safety culture assessment, and (5) paying a civil penalty of $35,000.

Exelon Generation Co., LLC (Dresden Nuclear Power Station Unit 2) EA-15-115

On September 16, 2015, the NRC issued a notice of violation associated with a white significance determination process finding to Exelon Generation Co., LLC, for a violation of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion III, "Design Control." This violation involved the failure to review the suitability of application of the automatic depressurization system (ADS) electromatic relief valve (ERV) actuators, which are essential to the safety-related reactor vessel depressurization and overpressure protection functions. This resulted in a failure of ERV, and an indeterminate period of inoperability and unavailability greater than allowed by technical specifications (TS) during the operating cycle. The ERV inoperability during the operating cycle was identified after the failure of the valve during its first operational test in a mid-cycle outage. Additionally, because the licensee was not aware of the valve's inoperability between 2013 and 2015, the required TS actions were not followed.

Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station) EA-15-081

On September 1, 2015, the NRC issued a notice of violation associated with a white significance determination process finding to Entergy Nuclear Operations, Inc. for a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." This violation involved the failure to establish measures to promptly identify and correct a significant condition adverse to quality, or take corrective actions to prevent repetition, relating to a component that is essential to the ADS safety-related functions. Specifically, the licensee failed to identify that the ADS safety/relief valve (SRV) did not open upon manual actuation on February 9, 2013. The licensee therefore did not take action to prevent repetition, which resulted in the failure of another ADS SRV to operate upon manual actuation on January 27, 2015. Additionally, because the licensee was not aware of the SRV's inoperability from February 9, 2013, until January 27, 2015, a period greater than the allowed TS outage time, the required actions of the TS were not followed.

Dominion Nuclear Connecticut, Inc. (Millstone Power Station, Unit 2) EA-13-188

On August 26, 2015, the NRC issued a confirmatory order to Dominion Nuclear Connecticut, Inc. (DNC), to formalize commitments made because of an alternative dispute resolution mediation session on July 15, 2015, and two follow up conference calls. The commitments were made as part of a settlement agreement between DNC and the NRC regarding apparent violations of 10 CFR 50.59, "Changes, Tests, and Experiments." The apparent violations involved implementing changes to documents related to Millstone Unit 2 spent fuel decay time limits and the Millstone Unit 2 chemical and volume control system charging pumps without the NRC's approval and providing incomplete and inaccurate information to the NRC. The NRC considered one of the apparent violations to have been willful. In response to these apparent violations, DNC agreed to complete a number of actions memorialized in the confirmatory order. In consideration for those actions, the NRC agreed not to pursue further enforcement action.

Exelon Generation Co., LLC (Clinton PowerStation) EA-15-064

On August 11, 2015, the NRC issued a notice of violation associated with a white significance determination process finding to Exelon Generation Co., LLC for a violation of 10 CFR Part 50, Appendix B, Criterion III. This violation involved the failure to review the suitability of application of the Division 3 Shutdown Service Water pump modifications, which were essential to the safety-related functions of the High Pressure Core Spray system. Specifically, on or about October 3, 1995, the licensee failed to ensure the modified pump internals would not degrade under expected operating conditions in a way that affected the safety function. The licensee determined the pump failed at the conclusion of its surveillance run on May 30, 2014, but this condition did not reveal itself until the pump failed to start on September 16, 2014. This resulted in the pump being inoperable for more than 100 days, a period greater than the allowed limiting condition for operation outage times provided in the plant technical specifications. Additionally, because the licensee was not aware of the pump's inoperability during the unit's operation cycle, the required actions of the TS were not followed.

Susquehanna Nuclear, LLC (Susquehanna Steam Electric Station) EA-15-022

On June 22, 2015, the NRC issued a notice of violation associated with a white significance determination process finding to Susquehanna Nuclear, LLC. The finding was associated with the failure to implement the 15-minute assessment, classification, and declaration period for a potential loss of Reactor Coolant System (RCS) barrier emergency action level (EAL) at the Susquehanna Steam Electric Station (Susquehanna), Units 1 and 2. Specifically, Susquehanna interpreted the 15-minute assessment, classification, and declaration clock to start when operator actions were, or were expected to be, unsuccessful in isolating an RCS leak rather than upon the time when the EAL thresholds were exceeded. Susquehanna's incorrect interpretation of the 15-minute assessment and declaration period degraded its ability to make a timely site area emergency declaration. The notice of violation involved the failure to comply with the requirements of 10 CFR 50.47(b)(4), "Emergency Plans," 10 CFR 50.54(q)(2), "Conditions of License," and 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," Section IV.C.2.

Luminant Generation Co., LLC (Comanche Peak Nuclear Power Plant) EA-14-234

On April 28, 2015, a notice of violation was issued to Luminant Generation Co., LLC for a violation associated with a greater-than-green significance determination process finding at

the Comanche Peak Nuclear Power Plant. The details of the finding are not publicly available, as they contain information marked as "Official Use Only—Security-Related Information."

Exelon Generation Co., LLC (Oyster Creek Nuclear Generating Station) EA-14-178

On April 27, 2015, the NRC issued a notice of violation associated with a yellow significance determination process finding to the Exelon Generation Co., LLC for a violation identified at its Oyster Creek Nuclear Generating Station. The violation involved the failure to comply with 10 CFR 50, Appendix B, Criterion III, which required the licensee to establish measures for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components. Specifically, from original installation of ERVs in 1969, until the valves were redesigned and reinstalled during the 2014 refueling outage, the ERV actuators were inadequate because when they were placed in an environment where the actuator was subject to vibration associated with plant operation, the mechanical tolerance between posts and guides created a condition where the springs could wedge between the guides and the posts, jamming the actuator plunger assembly. In addition, given the original design of the valve, the maintenance refurbishing processes were not adequate to maintain the required internal tolerances to prevent excessive fretting and wear of the internal components. As a consequence, two of the five total ERVs were inoperable for greater than 24 hours in violation of TS 3.4.B.

NextEra Energy Duane Arnold, LLC (Duane Arnold Energy Center) EA-14-237

On April 16, 2015, the NRC issued a notice of violation associated with a white significance determination process finding to NextEra Energy Duane Arnold, LLC for a violation identified at its Duane Arnold Energy Center involving the failure to comply with 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," which required the licensee to maintain measures to ensure that special processes are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Specifically, between November 5 and November 10, 2012, the licensee did not adequately control the application of the torus coating, because the requirements associated with wet film thickness measurements and conditions for recoat application were not contained in design specifications and vendor documentation, nor were they included in qualified procedures. The licensee's failure to establish adequate quality controls during the application of a torus coating resulted in an unqualified torus coating in excess of the emergency core cooling system suction strainer design debris loading margin. This finding did not present an immediate safety concern because the unqualified torus coating in excess of the design margin was removed during an outage before the reactor resumed operation.

Exelon Generation Co., LLC (Nine Mile Point Nuclear Station) EA-14-192

On April 10, 2015, the NRC issued a notice of violation to Exelon Generation Co., LLC for a Severity Level III Problem involving two related violations identified because of an inspection at its Nine Mile Point Nuclear Station (NMP). The first violation involved the failure on multiple occasions to notify the NRC within 30 days of medical conditions of licensed reactor operators and senior reactor operators that involved permanent disabilities/illnesses as required by 10 CFR 50.74(c). Specifically, between June 2001 and September 2014, NMP staff was informed that operators were taking prescribed medication for such conditions as hypertension, post-traumatic stress disorder, attention deficit disorder, and asthma. The NMP staff did not report these permanent medical conditions to the NRC when they submitted NRC Form 396 as

part of the operators' license application process. Additionally, NMP did not restrict these same licensed reactor operators and senior reactor operators from licensed duties when the individuals had disqualifying medical conditions, in accordance with 10 CFR 55.25, "Incapacitation because of Disability or Illness." The second violation involved the submittal by NMP of information to the NRC that was not complete and accurate in all material respects as required by 10 CFR 50.9, "Completeness and Accuracy of Information." Specifically, on multiple occasions between September 2002 and February 2012, NMP submitted applications for operators that certified the medical fitness of the applicants and that did not identify any needed license operator restrictions regarding disqualifying medical conditions or related prescription medication. Each of the applicants had medical conditions that did not meet the minimum standards of 10 CFR 55.33(a)(1). Based in part on this inaccurate information, the NRC issued reactor operator licenses without the required restricting license conditions.

Tennessee Valley Authority (Watts Bar, Unit 2) EA-14-179

On April 7, 2015, the NRC issued a notice of violation to TVA, for a Severity Level III violation, identified because of an inspection and investigation at its Watts Bar Nuclear Plant, Unit 2, involving the licensee employees' willful failure to follow a procedure for activities affecting quality in accordance with 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings." Specifically, on or about December 19, 2011, contract employees assigned to install anchor bolts for overhead base plates, which support safety-related ventilation in the containment building, willfully failed to remove and replace, or obtain site engineering approval for, newly installed wedge bolt anchors that exceeded 5 degrees of perpendicular, as required by the licensee's procedure. Out of tolerance anchor bolts on two hangers were bent (straightened) to within 5 degrees of perpendicular utilizing a non-approved modified tool. All four overhead base plates of the two hangers had at least one bent (and therefore weakened) bolt.

Dominion Nuclear Connecticut, Inc. (Millstone Power Station) EA-14-159

On April 2, 2015, a notice of violation was issued to Dominion Resources, for a violation associated with a greater-than-green significance determination process finding at the Millstone Power Station. The details of the finding are not publicly available, as they contain information marked as "Official Use Only—Security-Related Information."

VII. Power Reactor Security and Emergency and Incident Response Activities

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

The NRC continues to conduct force-on-force (FOF) inspections at each nuclear power reactor and Category I fuel cycle facility on a regular 3-year cycle. Each FOF inspection includes both tabletop drills and exercises that simulate combat between a mock adversary force and the licensee's security force. FOF inspections assess the ability of power reactor facilities to defend against the design-basis threat (DBT) of radiological sabotage. They also provide valuable insights that enable the NRC to evaluate the effectiveness of licensee security programs. At Category I fuel cycle facilities, a similar process is used to assess the effectiveness of the licensees' protective strategy against two DBTs—one for radiological sabotage and another to prevent the theft or diversion of special nuclear material.

The NRC is developing a final rule that amends security requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," to implement the new statutory authority related to firearms, provided to the Commission under Section 161A of the Atomic Energy Act of 1954, as amended. These new regulations will allow certain classes of Commission-designated facilities and activities to apply for NRC authorization to use various weapons and large-capacity ammunition-feeding devices, notwithstanding State, local, and other Federal firearms laws. The NRC has taken these actions in consultation and coordination with the U.S. Department of Justice's Office of the Attorney General, the Federal Bureau of Investigation (FBI), and the Bureau of Alcohol, Tobacco, Firearms, and Explosives. In advance of the final rulemaking, the NRC has designated, through orders, seven power reactor licensees, one Category I strategic special nuclear material licensee, and one "at-reactor" independent spent fuel storage installation licensee as being eligible to apply for Section 161A preemption authority to address the site-specific needs of these facilities. In conjunction with this final rule implementing Section 161A, the NRC is also revising the requirements for physical security event notifications.

The NRC plans to publish a proposed rule in 2015 that amends the drug-testing requirements of 10 CFR Part 26, "Fitness-for-Duty Programs," to better align NRC drug-testing requirements with those of the U.S. Department of Health and Human Services' 2008 version of "Mandatory Guidelines for Federal Workplace Drug Testing Programs." Specifically, the proposed changes will broaden the panel of drugs to be tested during required drug testing, enhance medical review officer guidance, and improve the clarity of the organization and language of the rule.

The NRC continues to be an active participant in the Integrated Response Program, which is a partnership between the Federal Government (the NRC and FBI) and the nuclear industry to improve Federal, State, and local law enforcement tactical responses to beyond-DBT events at nuclear power plant sites.

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

The NRC has developed an oversight program for cybersecurity that includes an inspection program, inspector training, and a process for evaluating the significance of inspection findings. This was accomplished collaboratively with stakeholders, including members of industry and representatives from the U.S. Department of Homeland Security, the Federal Energy Regulatory Commission, and the National Institute of Standards and Technology. The NRC has begun inspecting activities related to the interim milestones and will complete these inspections in calendar year 2015.

The NRC is implementing a cybersecurity roadmap (SECY-12-0088, "The Nuclear Regulatory Commission Cyber Security Roadmap") to evaluate the need for cybersecurity requirements for non-power reactors, independent spent fuel storage installations, and byproduct materials licensees. Implementation of the roadmap will help ensure that appropriate levels of cybersecurity actions are carried out promptly and efficiently at all NRC-licensed facilities. Additionally, implementation of the roadmap will identify whether, or to what extent, the program

needs to be improved. In March 2015, the Commission directed the staff to initiate a cyber security rulemaking for fuel cycle facilities. The NRC published the regulatory basis for this rulemaking in September 2015 and will start developing the proposed rule and draft guidance in late 2015.

The agency plans to further amend 10 CFR Part 73 by adding timely notification requirements for certain cybersecurity events. This final rule will make generically applicable certain voluntary reporting activities associated with cybersecurity events contained in security advisories. The final rule also will establish new cybersecurity event notifications that will contribute to the NRC's analysis of the reliability and effectiveness of licensees' cybersecurity programs, playing an important role in the continuing effort to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the DBT. This rulemaking will increase the NRC's ability to respond to emergencies, monitor ongoing events, assess trends and patterns, and identify precursors of more significant events. This rulemaking will also enhance NRC's ability to inform other licensees, the U.S. Department of Homeland Security, and Federal intelligence and law enforcement agencies of cybersecurity-related events and will enhance the agency's safety and security efforts.

Prior status reports provided updates on the NRC's path forward on EP communications and staffing issues identified in the NRC's assessment of the accident at the Fukushima Dai-ichi nuclear power plant in Japan. In addition, during this reporting period all sixty-two power reactor sites implemented multiunit/multisource dose assessment capabilities. The NRC staff incorporated these enhancements related to emergency preparedness into the proposed rulemaking on mitigation of beyond design bases events discussed further in Section X of this report.

The NRC revised EP regulations in 10 CFR Part 50 effective December 23, 2011. This was the first significant revision to the EP rules in over 30 years; implementation continued throughout FY 2014. Specifically, during this reporting period, the staff focused on hostile-action-based (HAB) exercises at all nuclear power reactor sites. Power reactor licensees are required to demonstrate response to a HAB event as part of a biennial exercise by December 31, 2015. As of September 30, 2015, 55 HAB exercises have been completed. Licensees have demonstrated their ability to respond to a HAB event; implement their emergency plans in response to the event; and coordinate onsite security, operations, and emergency response personnel with offsite response organizations.

In April 2012, the NRC and the Federal Emergency Management Agency (FEMA) began a multiyear initiative to revise NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," one of the key guidance documents for developing and evaluating onsite and offsite emergency plans for nuclear power plants and for the State and local governments whose personnel would respond to the plant sites. In FY 2014, the joint NRC/FEMA working group completed initial drafts of the introductory information and the emergency plan evaluation criteria. NRC and FEMA staff met publicly in FY 2014 to solicit feedback from stakeholders and members of the public on these initial drafts. A final draft of this document was completed in FY 2015 and issued for a 90-day public comment period on May 29, 2015. This comment period was extended to October 13, 2015, in response to requests from external stakeholders.

The NRC continues to work with States to replenish potassium iodide supplies for use as a supplement to public protective actions within the 10-mile emergency planning zones around nuclear power plants.

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

VIII. Power Uprates

There are three types of power uprates. A measurement uncertainty recapture power uprate is a power uprate of less than 2 percent and is based on using more accurate feedwater flow measurement techniques. Stretch power uprates are power uprates that are typically up to 7 percent and are within the design capacity of the plant. Stretch power uprates require only minor plant modifications. Extended power uprates are power uprates beyond the original design capacity of the plant and 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. NRC staff has reviewed and approved 156 power uprates to date. Approximately 21,979 megawatts thermal (MWt) or 7,326 megawatts electric (MWe) in electric generating capacity (the equivalent of about seven large nuclear power plant units) have been gained through power uprates at existing plants. The NRC currently has two power uprate applications under review, which would add an additional 1,674 MWt or 558 MWe to the nation's electrical grid, if approved.

In December 2014, NRC staff conducted its most recent survey of nuclear power plant licensees' plans to submit power uprate applications over the next 5 years. This latest information indicates that licensees plan to request power uprates for seven nuclear power plants during the next 5 years.

IX. New Reactor Licensing

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

Large Light-Water Reactor Application Reviews

Although most new reactor applications have been or will be submitted and reviewed under the provisions of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," the NRC is reviewing one large light-water reactor application for an operating license using 10 CFR Part 50, which is discussed below.

10 CFR Part 50 Operating License Reviews

Watts Bar Nuclear Plant Unit 2

Watts Bar Nuclear Plant, Unit 2 was the only nuclear plant being reviewed for an operating license using the 10 CFR Part 50 process, which includes a construction permit followed by an operating license. TVA received a construction permit for Watts Bar, Units 1 and 2, in 1973 and submitted operating license applications for both units in 1976. Because of the identification of a large number of deficiencies, Unit 2 construction was suspended in the mid-1980s, with major structures in place and equipment such as reactor coolant system piping installed. TVA resumed construction on Unit 2 in late 2007 and submitted an updated operating license application in 2009.

NRC staff has issued eight supplemental safety evaluation reports (SSERs) documenting its safety review and published a supplement to the FEIS. During the reporting period, the staff completed the majority of the planned construction inspections including recent inspections of hot functional testing, pre-operational testing activities, and an operational readiness assessment inspection. Activities related to the ASLB hearing process are completed. After the reporting period ended, the NRC staff completed its safety review and the Director of NRR issued the operating license for Watts Bar Unit 2 on October 22, 2015.

Early Site Permit Reviews

PSEG Power, LLC, and PSEG Nuclear, LLC

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

In September 2015, NRC staff issued the final safety evaluation report (FSER) for the PSEG ESP application, completing the final milestone for the staff's safety review.

NRC staff issued the draft environmental impact statement (DEIS) for the PSEG ESP application in August 2014. NRC staff is actively engaged with the National Marine Fisheries Service to complete consultation under the Endangered Species Act (Section 7) as well as with the New Jersey State Historic Preservation Officer to complete consultation under the National Historic Preservation Act (section 106). NRC staff completed a supplemental biological assessment and submitted it to the National Marine Fisheries Service for review. NRC staff also published a *Federal Register* notice on the draft memorandum of agreement pertaining to Section 106 consultation. These actions are important steps toward completing requisite consultation for the PSEG ESP review. NRC staff anticipates publishing its FEIS by the end of 2015.

TVA Clinch River Early Site Permit Application

TVA has stated that it plans to apply for an ESP for the Clinch River site near Oak Ridge, TN, in early calendar year 2016. This application will be based on a plant parameter envelope characterizing several light-water small modular reactor designs. NRC staff conducted pre-

application readiness assessments for both environmental and safety in August and September 2015.

Design Certification Reviews

U.S. Evolutionary Power Reactor

AREVA, Inc., submitted the U.S. EPR design certification (DC) application on December 11, 2007.

On February 25, 2015, AREVA requested that the NRC suspend the application review. AREVA further requested that the NRC post no new charges to the docket after March 27, 2015, unless specifically authorized by AREVA. AREVA did not define an end date for the suspension period and said that it will contact the NRC before restarting the DC review. NRC staff's review of the U.S. EPR DC application remains in suspension.

U.S. Advanced Pressurized Water Reactor

Mitsubishi Heavy Industries, Ltd., (MHI) submitted its US-APWR DC application on December 31, 2007. On November 5, 2013, MHI issued a letter informing the NRC of its plans to implement a coordinated slowdown of licensing activities related to the application review. MHI stated that the slowdown is necessary to focus its resources on supporting Japanese utilities in restarting Mitsubishi-designed PWRs in Japan. NRC staff has been performing a limited scope review of the US-APWR DC application since March 24, 2014, and will continue with this limited review until further notice from the applicant.

Advanced Power Reactor 1400

On December 23, 2014, Korea Electric Power Corp. (KEPCO) and Korea Hydro & Nuclear Power Co., Ltd., (KHNP) submitted to the NRC their application for the certification of the Advanced Power Reactor 1400 (APR1400) standard plant design. On March 4, 2015, NRC staff accepted the APR1400 design certification application for docketing and the docketing decision was published in the *Federal Register* on March 12, 2015. NRC staff developed a six-phase milestone schedule for completing the application review within a 42-month timeframe and is making good progress on Phase 1 (Preliminary Safety Evaluation Report) of its detailed technical review. NRC staff expects to complete Phase 1 of its technical review in February 2016.

DC Renewals

ABWR Renewal (Toshiba)

On November 2, 2010, Toshiba tendered an ABWR DC renewal application and submitted Revision 1 of its application on June 22, 2012. In a letter to the NRC dated December 13, 2013, Toshiba stated that it plans to submit Revision 2 of the renewal application no sooner than mid-2016 and requested that the NRC postpone its review of the application until Toshiba submits Revision 2. By letter dated May 25, 2015, Toshiba requested that NRC staff postpone further review of its application until July 2016.

ABWR Renewal (GEH)

On December 7, 2010, GEH tendered an ABWR DC renewal application. NRC staff issued a letter to GEH on July 20, 2012, describing certain design changes (28 items) that the staff stated should be considered for inclusion in the application. On May 7, 2015, NRC staff met with the applicant to discuss how GEH intends to address the 28 items as well as several requests for additional information (RAIs) issued on other topics. The applicant has submitted information to address 27 of the 32 open items and NRC staff has communicated to GEH that 13 items are considered closed. The staff plans to issue supplemental RAIs or hold public meetings, if needed, to close the remaining open items.

Combined License (COL) Application Activities

As of September 30, 2015, NRC staff has received 18 COL applications for review. Four of the COL application reviews are suspended at the request of the applicants because of changes in the applicants' business strategies (River Bend, Bellefonte, Harris, and Comanche Peak). Five COL applications have been withdrawn (Victoria, Nine Mile Point 3, Callaway, Calvert Cliffs, and Grand Gulf Nuclear Station, Unit 3). COLs were issued for the Vogtle and Virgil C. Summer sites in 2012, and for the Fermi Unit 3 site in May 2015.

NRC staff is actively reviewing six COL applications for a total of 10 units, as discussed below.

Levy County COL Application

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

NRC staff issued its FEIS for the Levy County COL application on April 27, 2012.

On December 8, 2014, NRC staff issued a letter to Duke Energy Florida. In the letter, NRC staff informed the applicant that because it has not provided the necessary information to resolve the outstanding technical issues on the Levy Units 1 and 2, COL application, the current safety review schedule cannot be achieved. The letter listed the specific unresolved technical issues that the applicant needs to address to establish a revised review schedule. These unresolved technical issues relate to design modifications to the containment condensate return system as well as emerging AP1000 design issues that Westinghouse is addressing for the Vogtle and V.C. Summer COL licensees. The staff believes that three of these issues could be applicable to the Levy COL application safety review. The three issues involve main control room dose, main control room temperature during design-basis accidents, and the location of a hydrogen vent in containment. NRC staff is finalizing all other aspects of the Levy COL safety evaluations.

Lee III COL Application

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

The NRC issued the FEIS on December 27, 2013.

The Lee COL application review may be affected by the same AP1000 design issues described above for the Levy COL application review. By letter dated January 21, 2015, Duke Energy

designated the Levy COL application as the lead for these AP1000 generic issues and acknowledged the potential schedule effects for the Lee COL application review. The NRC staff is finalizing all other aspects of the Lee COL safety evaluations.

Turkey Point COL Application

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

On June 16, 2015, NRC staff completed the Phase A public milestone for the Turkey Point Units 6 and 7 COL review by issuing all RAIs and supplemental RAIs. The NRC staff expects to complete Phase B (Advanced final safety evaluation report without open items) in January 2016.

On February 27, 2015, NRC staff submitted the DEIS for the Turkey Point, Units 6 and 7, COL application to the U.S. Environmental Protection Agency (EPA). The DEIS was developed in cooperation with the U.S. Army Corps of Engineers, Jacksonville District, and the National Park Service (NPS). The NRC and EPA notices of availability of the DEIS were published in the *Federal Register* on March 5 and March 6, 2015, respectively. Public meetings solicited comments on the DEIS on April 22, 2015, in Miami, FL, and on April 23, 2015, in Homestead, FL. The DEIS comment period closed on May 22, 2015. However, NRC staff reopened the public comment period in response to requests from the Seminole Tribe of Florida, the NPS, and EPA. The new comment period closed on July 17, 2015. NRC staff is working to address the comments, which include comments from the NPS and the U.S. Fish and Wildlife Service.

South Texas Project COL Application

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

NRC staff issued its FSER for the STP COL application on September 29, 2015, and is preparing for the mandatory hearing that will occur in November 2015 and is required before issuance of a license.

Bell Bend COL Application

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

On January 9, 2014, PPL requested that the NRC withhold further review of the safety portion of the Bell Bend COL application until further notice. PPL also requested that the NRC continue to support the necessary work leading to the issuance of the FEIS. NRC staff has suspended its review of the safety portion of the COL application as requested by the applicant. By letter dated March 4, 2015, PPL reiterated its request to withhold further review of the safety portion of the Bell Bend COL application, in light of the suspension of the U.S. EPR design certification application.

On April 17, 2015, NRC staff submitted the DEIS for the Bell Bend Nuclear Power Plant COL application to the EPA. The DEIS was developed in cooperation with the U.S. Army Corps of Engineers, Baltimore District. The NRC notice of availability of the DEIS was published in the Federal Register on Tuesday, April 21, 2015, and the EPA notice of availability was published in the Federal Register on Friday, April 24, 2015, which opened the 75-day public comment period. The comment period closed on July 7, 2015, and NRC staff is addressing comments received on the DEIS in order to issue its FEIS by April 2016.

North Anna Unit 3 COL Application

On November 27, 2007, Dominion Virginia Power submitted a COL application for an ESBWR at its North Anna Power Station site near Richmond, in Louisa County, VA. The FEIS was issued in February 2010.

On June 28, 2010, Dominion submitted a revised application to cite the US-APWR design. However, on April 25, 2013, Dominion notified the NRC of its intent to revert back to the ESBWR design. Dominion submitted its partially revised COL application in July 2013 to reflect its revised nuclear technology decision and submitted all remaining application sections to the NRC in December 2013.

On October 22, 2014, Dominion submitted a seismic closure plan that described a modified approach to certain aspects of its seismic analysis to address exceedances to the ESBWR seismic design limitations. The schedule that Dominion outlined in its closure plan includes issuing technical reports and responses to staff questions through calendar year 2015. On September 15, 2015, NRC staff issued a revised review schedule for the North Anna 3 COL application in response to Dominion's October 2014 seismic closure plan. NRC staff expects to complete its safety review and issue its FSER for the North Anna 3 COL application in April 2017.

Light-Water Small Modular Reactor Activities

NuScale Small Modular Reactor Design Certification Application

By letter dated June 17, 2015, NuScale announced a DC application submittal date by December 2016. On May 28, 2014, NuScale and DOE completed a cooperative agreement in which DOE will award up to $217 million to support NuScale's DC application.

On June 30, 2015, NRC staff issued in the *Federal Register* the draft design-specific review standard for the NuScale design. NRC staff is reviewing 680 public comments and expects to issue the final design-specific review standard in the summer of 2016.

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

Regulatory Infrastructure

The NRC continues to enhance its regulatory infrastructure to support planning, licensing, and oversight of new and advanced reactor applications by carrying out timely and effective policy decisions and by enhancing and updating regulatory guidance for light-water reactors. In

addition to updating regulatory guidance, the NRC is also reviewing its internal processes to enhance the efficiency and effectiveness in its application review process. The NRC conducts these regulatory infrastructure enhancements openly and transparently with several opportunities for external stakeholder input. In addition, the NRC rigorously assesses licensing and oversight performance and uses the results to inform these regulatory infrastructure activities.

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

Revision to the June 2007 Version of Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR [light-water reactor] Edition)"

NRC staff is preparing an important revision to Regulatory Guide 1.206, "Combined License Application for Nuclear Power Plants." The revision will clarify the guidance to encompass applicants for all licensing processes under 10 CFR Part 52, including design certifications and early site permits. The revision also will capture important lessons learned from recent licensing actions. The revision is being informed by interactions with stakeholders and the public, including public meetings held in March and June 2015 to obtain feedback on revised sections as well as the overall approach to the update.

Standard Review Plan Updates

NRC staff continues its systematic update of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," to support reviews of COL, DC, ESP, limited work authorization applications, and license amendment requests. The staff published several notices in the *Federal Register* requesting public comment on proposed revisions, or finalizing previously issued proposed guidance, during the reporting period. These include sections on seismic and structural analysis, and severe accident and probabilistic risk assessment evaluation. The staff is working toward finalizing several other proposed revisions issued in 2014. Additionally, the staff is revising guidance on site characteristics and parameters, balance of plant systems, digital instrumentation and controls, and inspections, tests, analyses, and acceptance criteria (ITAAC). The staff issued over 45 proposed revisions and 5 final revisions in the *Federal Register* during 2015.

Construction Oversight

Construction under 10 CFR Part 50

Watts Bar Unit 2 is the only nuclear power plant being constructed under 10 CFR Part 50. TVA estimates that the unit will be complete and ready for operation in late 2015 or early 2016.

Many of the required NRC construction inspections for Watts Bar, Unit 2 were completed or partially completed before suspension of construction in the mid-1980s. When construction resumed, NRC staff reassessed the inspection program for Unit 2 and identified more than 500 items that required inspection and closure. Over the past year, construction inspections have continued and about 500 of the 550 inspection items have been closed. Several of these inspections cannot be completed until after issuance of an operating license. Construction resident inspectors and inspectors from the NRC regional office in Atlanta, GA, conducted the inspections. TVA has substantially completed construction and the NRC issued an operating license on October 22, 2015. Most of the preoperational testing inspections are completed.

The remaining preoperational testing inspections, along with startup testing inspections, are anticipated to take place in late 2015.

Construction under 10 CFR Part 52

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

Safety-related construction activities at Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3 have focused on the construction of the nuclear island walls, fabrication of steel containments, and the fabrication and placement of structural modules for the Summer 2 and Vogtle 3 auxiliary building and containment. In addition, both licensees have a wide variety of nonsafety-related construction activity ongoing. Recent NRC inspections have focused on activities such as concrete placement, welding, module fabrication, and civil or structural engineering activities. NRC inspection activities will continue to increase as licensees broaden the scope of construction activities.

NRC staff and industry have refined the processes and guidance developed for closure verification of ITAAC based on lessons learned from the review of submitted ITAAC closure notifications (ICNs). The staff has facilitated several public workshops to solicit input, exchange views, and reach consensus on several construction inspection issues, including the development of additional ICN examples for inclusion in the Nuclear Energy Institute (NEI) guidance document on the ITAAC closure process. NRC staff reviewed the NEI guidance document for ITAAC closure and, on July 31, 2014, issued a letter stating that licensees could accept the document during the formal NRC endorsement process. The staff has been revising the associated regulatory guide.

A total of 54 ICNs have been submitted for Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3. The staff reviews all ICNs to determine whether they contain sufficient information to demonstrate that the ITAAC have been successfully completed by the licensee. The staff has completed its review of 53 of the submitted ICNs and has published notices in the *Federal Register* to document NRC staff's verification that the associated ITAAC have been completed. NRC staff is reviewing the remaining submitted ICNs.

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

Vendor Inspections

NRC staff is implementing a vendor inspection program for vendors supporting operating plants and plants under construction. Inspection activities for new reactors include continued testing of the design and qualification of key AP1000 valves, the development and verification of the AP1000 digital instrumentation and control system, monitoring resolution of reactor coolant pump testing and design, and continued inspection of modular construction at vendor facilities. Through these efforts, the staff has identified issues and raised those to industry promptly to ensure that the new plants will meet all requirements. Inspections related to operating reactors identified issues such as inadequate dedication of safety-related crane components, improperly calculated radiation doses used to age equipment for environmental qualification, and improper control of the manufacturing process for safety-related wire and cables. NRC staff leverage the work of international regulators through the Multinational Design Evaluation Program Vendor Inspection Cooperation Working Group and have participated in 6 inspections involving international regulators in FY 2015.

Non-Light-Water Reactors

The NRC's expectations for advanced reactors were set forth in October 2008 in the Policy Statement on the Regulation of Advanced Reactors. NRC staff is undertaking activities to prepare for applications for non-light-water reactors in the future.

The NRC and DOE are engaged in a joint initiative to formulate guidance for developing principal design criteria for advanced non-light-water reactor designs. DOE completed a report titled, "Guidance for Developing Principal Design Criteria for Advanced (Non-Light Water) Reactors," and submitted it to the NRC in December 2014. The NRC is reviewing the information in the report and using it to develop NRC's version of design criteria for advanced non-light-water reactors. The intended outcome of this initiative is NRC-issued regulatory guidance for NRC staff and future non-light-water reactor applicants.

The NRC and DOE hosted a 2-day Advanced Non-Light Water Reactors Workshop in September 2015. The focus of the workshop was to open a dialogue between key stakeholders to discuss challenges in the commercialization of non-light-water reactor technologies and to begin to formulate possible solutions.

Internationally, the NRC chairs the Nuclear Energy Agency's ad hoc group for international regulators of non-light-water reactors known as the Group on the Safety of Advanced Reactors (GSAR). The purpose of the GSAR is to bring interested regulators together to discuss common interests, practices, and problems and address both the regulatory interests and needs for research to support the regulators. The NRC also participates in technical meetings hosted by the Generation IV International Forum.

The NRC meets with potential applicants upon request. Over the last 2 years, the NRC has met with approximately 13 different non-light-water reactor companies. The NRC participates in American Nuclear Society standards development working groups for non-light-water reactor designs. NRC staff maintains awareness of DOE's research programs, funding opportunity announcements and planning studies for non-light-water reactor technologies.

X. Response to Lessons Learned from the Fukushima Accident in Japan

The NRC's response to the lessons learned from the Fukushima accident in Japan during the period has focused on the highest-priority (Tier 1) activities, and work on the other activities (Tiers 2 and 3) also progressed consistent with the agency's established schedules. Additionally, some intermediate activities (Tier 2) have been integrated into activities related to the highest priority actions. The agency continued to assign resources to address these activities while ensuring a balance between putting lessons learned from Fukushima into place and the need to ensure that those efforts do not displace ongoing work of greater safety benefit, work that is necessary to maintain safety, or other higher-priority work.

The NRC continues to review nuclear power plant licensees' plans to achieve compliance with the mitigation strategies and spent fuel pool instrumentation orders, which were issued in March 2012. The NRC has issued interim staff evaluations and is auditing licensees' implementation of these important safety improvements. On October 4, 2014, the first licensee informed NRC staff that a nuclear plant was fully compliant with both orders, and as of September 2015, approximately 20 units are in compliance with the mitigating strategies order and about 45 units are in compliance with the spent fuel pool instrumentation order. By the end of calendar year 2015, approximately 50 units are expected to be in compliance with the mitigation strategies order, and about 80 are expected to be in compliance with the spent fuel pool instrumentation order.

In June 2014, NRC staff received the licensees' integrated plans for compliance with Phase 1 of the revised severe accident capable hardened vents order, which was issued in June 2013. The staff has issued interim staff evaluations of those plans. Licensees are required to submit their plans for Phase 2 of the revised severe accident capable hardened vents order by December 31, 2015, and to complete full implementation by June 2019.

The NRC requested that nuclear power plant licensees reevaluate seismic and flooding hazards that could affect their sites. If these newly reevaluated hazards are not bound by the current design basis, licensees are required to determine whether interim protective measures are needed while a longer-term evaluation of the impact of the hazard on the plant is completed.

NRC staff is reviewing flood hazard reevaluation reports submitted by licensees and is issuing its assessment of those reports. Several licensees whose hazard reevaluation report was originally scheduled to be submitted by March 2014 have been granted extensions to allow for the U.S. Army Corps of Engineers to supply input needed to complete the analyses. These licensees are expected to submit their reports before February 2016. Following Commission direction, NRC staff is now implementing the closure plan for the flooding hazard reevaluations. Under this plan, licensees will assess their mitigating strategies to ensure that they can be implemented under reevaluated hazard conditions. Licensees are expected to complete the mitigation strategies assessment by December 2016. Other evaluations may be required, beyond those associated with mitigating strategies, depending on site-specific considerations.

In October 2015, the NRC issued a letter establishing the final list of operating reactor sites that will be required to perform a full seismic probabilistic risk assessment (SPRA). Twenty sites (36 units) screened in to perform an SPRA. The first SPRAs will be due to the NRC in March 2017. Of the remaining sites, 32 will perform limited-scope evaluations (i.e., a high-frequency evaluation, low-frequency evaluation, or spent fuel pool evaluation). Nine sites have screened out and will not need any further seismic evaluations.

Sites that are required to conduct a seismic risk evaluation submitted interim actions or evaluations in December 2014 as part of the expedited seismic evaluation process. These evaluations looked at the systems and components used to safely shut down a plant under certain accident conditions to either confirm that a plant has sufficient margin to continue with a longer-term evaluation without any plant modifications or identify the need to enhance the seismic capacity of the plant. NRC staff has completed its review of expedited seismic evaluation process submittals for most sites and is in the process of issuing the remaining assessments.

The Commission previously approved consolidating the station blackout mitigation strategies rulemaking with the onsite emergency response capabilities rulemaking, as well as including portions of the emergency planning recommendations. The consolidation enables the NRC to use resources more efficiently to produce an integrated and coherent set of requirements for addressing beyond-design-basis accidents. In August 2015, the Commission approved the draft proposed rule, subject to some changes and to the removal of certain requirements. The staff is revising the rulemaking package and will make it available for public comment by the end of 2015. The Commission also directed the staff not to proceed with a separate rulemaking associated with containment protection and release reduction. The potential safety benefit from that rulemaking is already being achieved through the revised severe accident capable hardened vents order.

The NRC is also moving forward with resolving the lower-priority Tier 2 and 3 recommendations that have not already been addressed. The staff plans to deliver a paper to the Commission in the Fall of 2015 that will describe the resolution paths for these recommendations.

The NRC continues to place a high level of importance on public interaction for all of the activities stemming from the Fukushima lessons learned. In FY 2015, the NRC held more than 25 public meetings discussing Fukushima lessons learned, and these opportunities for collaboration with the public, industry, and other stakeholders have improved the effectiveness and efficiency of the NRC's actions.

The Fukushima activities described above demonstrate consistent progress in completing safety enhancements at U.S. facilities in response to lessons learned from the accident. The NRC expects that most licensees will complete implementation of the majority of the most safety-significant enhancements by December 31, 2016.