Protecting People and the Environment

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

October 2015–March 2016

Note: The period of performance covered by this report includes activities that occurred from the first day of October 2015 to the last day of March 2016. 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 has completed implementing nearly all of the recommendations developed from the ROP Enhancement Project, which 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 March 4, 2016, summarizing the 2015 performance assessments for all nuclear plants and associated annual 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 first quarter of calendar year 2016.

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, 23 have already transitioned to an NFPA 805 licensing basis; 21 are under active review by the NRC; and 2 have expressed their intention to submit license amendment applications to the NRC. The NRC anticipates that it will complete its review of the 21 reactors currently under review by the end of the first quarter of fiscal year (FY) 2018. The agency expects to receive one license amendment application for the remaining two reactors in FY 2017.

Southern Nuclear Operating Co. ("Southern") submitted a proposal to implement 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," for Vogtle Electric Generating Plant (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. Four additional licensees submitted similar proposals in 2015. These submittals are under staff review, and the NRC staff and industry are clarifying guidance needed to complete the safety evaluations for these reviews.

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

The Generic Issues Program is currently evaluating four open generic issues (GIs) and tracking their resolution. Three GIs are in regulatory office implementation stage (GI-191, GI-199, and GI-204), and one GI is in the program assessment stage (GI-193). The status of each open GI 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, which significantly reduced the risk of strainer clogging.

A related issue that needs to be resolved to close GI-191 is the potential for debris to bypass the sump strainers and enter the reactor core. In 2008, the NRC staff determined that additional industry-sponsored testing was necessary to resolve this issue. In 2012, the industry completed the additional testing and submitted Topical Report (TR) TR-WCAP-17788, “Comprehensive Analysis and Test Program for GSI-191 Closure.” In 2013, NRC staff issued its safety evaluation of the TR, finding it an acceptable model for assessing the effect of sump-strainer-bypassed fibrous, particulate, and chemical debris on core cooling in PWRs. Recently, the Pressurized-Water Reactor Operating Group submitted an update intended to justify higher fiber limits than previously approved by the NRC. The topic was discussed at the Advisory Committee on Reactor Safeguards (ACRS) meeting on October 20, 2015. ACRS is planning additional meetings before the NRC staff completes their review in fall 2016.

Based on the interactions with stakeholders and the results of the industry testing, the NRC staff in 2012 developed three options for licensees to resolve GI-191. All options required licensees to demonstrate compliance with 10 CFR 50.46, “Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors.” 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. In addition, the NRC staff has developed a risk-informed draft final rulemaking, 10 CFR 50.46c, “Performance-Based Emergency Core Cooling System Acceptance Criteria,” which includes provisions to allow licensees to use a risk-informed alternative to address the effects of debris on long-term core cooling. Guidance associated with these rule provisions will be contained in Regulatory Guide 1.229, which is expected to be issued along with the 50.46c final rule package if approved by the Commission. The NRC staff is reviewing the proposed technical resolutions as they are submitted. To date, seven sites have successfully resolved GI-191.

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

Generic Issue 193 involves an evaluation of the consequences of LOCA causing a blowdown of containment gas into the suppression pool. The non-condensable gas could enter into the suction piping of the ECCS pumps causing gas binding, vapor locking, or cavitation and leading to a possible failure or degraded performance. The Office of Nuclear 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 following a large-break LOCA. The completed technical report provides a means to assess the post-

LOCA vulnerability of an ECCS pump based upon pump strainer location and an ECCS pump start time. The NRC will make these results publicly available mid-2016 when NUREG-2196 is published.

After the technical report was completed, the NRC formed a new Generic Issue Review Panel to perform an assessment of whether the issue presented a significant safety hazard to warrant any new or revised regulatory requirements or guidance. The panel has completed its assessment and determined that no significant hazard was evident to the ECCS low-pressure injection pumps. In its final report, which is anticipated to be completed in the near future, the panel anticipates recommending that the issue be closed without regulatory action. Afterwards, GI-193 will exit the generic issue process.

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

This GI addresses how current estimates of the seismic hazard level at some nuclear sites in the Central and Eastern United States (CEUS) might be higher than the values used in their original designs and previous evaluations. Following collaboration with the Electric Power Research Institute, the agency issued a safety/risk assessment report recommending actions be taken to address GI-199 to licensees and other stakeholders through Information Notice 2010-18, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants."

After the March 2011 nuclear event in Japan, the NRC incorporated GI-199 into the work being performed in response to the accident.

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

This GI relates to potential flooding effects from upstream dam failures 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 the GI Program accepted it for screening in August 2010. This GI is being addressed as part of the NRC's efforts associated with responding to the lessons learned from the Fukushima nuclear accident in Japan.

In March 2012, the NRC sent letters to licensees requesting the re-evaluation of all flood hazards, including dam failures, using present-day guidance and methodologies. As of March 2016, all but four sites have completed their flooding hazard re-evaluation reports and submitted them to the NRC for review. The NRC has issued staff assessments for 14 of the flooding hazard re-evaluation reports, and the NRC staff expects to complete the technical assessment of these reports by 2017. Licensees whose flood hazards exceed their current design basis will be required to perform either a focused evaluation (due in mid-2017) or an integrated assessment (due by the end of 2018).

The remaining four sites have been granted extensions and are awaiting data from the U.S. Army Corps of Engineers (USACE) to complete their flooding hazard re-evaluation reports. The due dates for these four sites will be established when the licensee or the NRC receives the data from USACE.

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 2016 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; and
- Other licensee actions not requiring NRC review and approval before licensees can carry them out.

The FY 2016 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 2013, FY 2014, and FY 2015 results and the FY 2016 goals and year-to-date results 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 fiscal year. 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 2013 Actual**	**FY 2014 Actual**	**FY 2015 Actual**	**FY 2016 Goals**	**FY2016 YTD**
Licensing actions completed per year	668	607	792	730[1]	411
Age of inventory of licensing actions	95% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 99% ≤ 2 years	88% ≤ 1 year and 99% ≤ 2 years	95% ≤ 1 year and 100% ≤ 2 years	94% ≤ 1 year and 100% ≤ 2 years
Other licensing tasks completed per year	529	402	461	500	466
Age of inventory of other licensing tasks	97.6% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 100% ≤ 2 years	87% ≤ 1 year and 97% ≤ 2 years	90% ≤ 1 year and 100% ≤ 2 years	90% ≤ 1 year and 99% ≤ 2 years
2% Improvement in timeliness indicators				≥ 90% for 1-year licensing action indicator ≥ 89% for 1-year other licensing task indicator	94% 90%

V. Status of License Renewal Activities

The NRC has issued renewed licenses to 83 power reactor units licensed to operate. Two units with a renewed license have since permanently shut down. The NRC has 7 license renewal applications (LRAs) for 11 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 Supplement 1 to the final SEIS in June 2013. Staff issued the draft second supplement to the SEIS for comment in December 2015. The comment period closed in March 2016. On November 6, 2014, staff issued Supplement 2 to the safety evaluation report (SER). The staff briefed ACRS on SER Supplement 2 on April 23, 2015. Additionally, activities related to the Atomic Safety and

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

Licensing Board (ASLB) hearing process continued. Several adjudicatory issues remain outstanding. The NRC staff continues to review relevant new information and will supplement its existing evaluations, as necessary. The current schedule for a final licensing decision will be determined pending the resolution of adjudicatory matters.

The operating license for Indian Point Nuclear Generating, Unit 2, expired on September 28, 2013, and the operating license for Unit 3, expired on December 12, 2015. Given the timely submittal of the LRAs for both units, continued operation is permitted under NRC regulations and the Administrative Procedure Act until the NRC determines whether to issue renewed licenses. A final determination will be made once the staff's review is complete and the hearing process 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. 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, the applicant requested the NRC to delay final processing of the application, pending completion of certain seismic studies. In May 2011, the NRC staff delayed all remaining milestones to allow for completion of those studies. In June 2011, the staff issued the SER and a supplement will be issued later in 2016. In April 2015, the NRC staff issued a schedule for the remainder of the staff's review. The staff expects to complete its review in 2017. The current schedule for a final licensing decision is to be determined pending the resolution of adjudicatory matters.

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. The safety review remains in progress to resolve a technical issue regarding alkali-silica reaction (ASR) affecting some concrete structures. The NRC staff continues to work with the applicant to ensure technical issues for closure of the SER ASR open item are properly addressed. The current schedule for remaining milestones is to be determined.

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 completed its reviews as documented in the SER, and Supplement 1, dated September 3, 2013, and August 10, 2015, respectively. The SEIS, NUREG-1437, Supplement 52, was published on April 30, 2015. Activities related to the ASLB hearing process are completed. On December 8, 2015, the staff issued the renewed operating license for Davis-Besse Nuclear Power Station, Unit 1, authorizing operation for an additional 20 years beyond the original license expiration date. The new expiration date is April 22, 2037.

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. The SER for license renewal was issued in January 2013 with open items. One open item involves the selective leaching of aluminum bronze piping and components. The NRC staff continues to work with the applicant to resolve the issue. All other open items have been resolved, and the staff is working to document their closure. The current schedule for remaining milestones is to be determined.

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. The staff issued the draft SEIS in November 2013 and the final SEIS in November 2014. The review schedule was revised to accommodate a concurrent extended power uprate amendment and technical issues with analyses of severe accident mitigation alternatives and neutron fluence. The staff issued its final SER in April 2016. A final decision is expected in December 2016.

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.

For the Byron Station, the staff completed its reviews as documented in the SER dated July 2015 (letter updated and published as NUREG-2190), and the SEIS, NUREG-1437, Supplement 54, published in 2015. On November 19, 2015, the staff issued the renewed operating licenses for Byron Station, Units 1 and 2, authorizing operation for an additional 20 years beyond the original license expiration dates. The new expiration dates are October 31, 2044, for Unit 1, and November 6, 2046, for Unit 2

For the Braidwood Station, the staff completed its review as documented in the SER, NUREG-2190, published in December 2015, and the SEIS, NUREG-1437, Supplement 55, published in November 2015. On January 27, 2016, the staff issued the renewed operating licenses for Braidwood Station, Units 1 and 2, authorizing operation for an additional 20 years beyond the original license expiration date. The new expiration dates are October 17, 2046, for Unit 1 and December 18, 2047, for Unit 2.

Fermi, Unit 2

On April 30, 2014, DTE Electric Co. 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 published the draft SEIS for comment in October 2015. Activities related to the ASLB hearing process are completed. The comment period on the draft SEIS closed in December 2015 and the SER with open items was issued in January 2016. A final license renewal decision is expected in November 2016.

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 published the draft SEIS for comment in February 2016 and is scheduled to issue the final SER in June 2016. A final license renewal decision is expected in November 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, FY to date, and two previous FYs for comparison purposes. Separate tables provide the non-escalated and escalated reactor enforcement data, as well as the escalated enforcement data associated with traditional enforcement and the ROP. The severity level assigned to the violation (i.e., traditional enforcement) generally reflects the significance of a violation. However, for most violations, the significance of a violation is assessed using the significance determination process under the ROP, which uses risk insights, where appropriate, to assist the NRC in determining the safety or security significance of inspection findings identified within the ROP.

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

NON-ESCALATED REACTOR ENFORCEMENT ACTIONS						
		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1st Half FY 16	2	5	2	2	11
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	2	5	2	2	11
	FY 15 Total	4	7	1	10	22
	FY 14 Total	8	5	3	2	18
Non-Cited Severity Level IV or Green	1st Half FY 16	81	74	87	97	339
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	81	74	87	97	339
	FY 15 Total	137	103	182	224	646
	FY 14 Total	124	147	223	257	751
TOTAL Cited and Non-Cited Severity Level IV or Green	1st Half FY 16	83	79	89	99	350
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	83	79	89	99	350
	FY 15 Total	141	110	183	234	668
	FY 14 Total	132	152	226	259	769

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 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
Severity Level II	1st Half FY 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
Severity Level III	1st Half FY 16	0	0	1	1	2
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	1	1	2
	FY 15 Total	3	2	0	1	6
	FY 14 Total	1	0	0	0	1
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 16	0	0	1	1	2
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	1	1	2
	FY 15 Total	3	2	0	1	6
	FY 14 Total	1	0	0	0	1

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

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS						
		Region I	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1st Half FY 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	0	0	0	0	0
	FY 14 Total	0	0	0	0	0
Violations Related to Yellow Findings	1st Half FY 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	1	0	0	2	3
	FY 14 Total	0	0	0	2	2
Violations Related to White Findings	1st Half FY 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	4	1	5	0	10
	FY 14 Total	1	2	3	4	10
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 16	0	0	0	0	0
	2nd Half FY 16	0	0	0	0	0
	FY 16 YTD Total	0	0	0	0	0
	FY 15 Total	5	1	5	2	13
	FY 14 Total	1	2	3	6	12

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

Southern Nuclear Operating Co. Inc. (Vogtle Nuclear Plant) EA-16-017

On March 16, 2016, the NRC issued a notice of violation to Southern Nuclear Operating Co. Inc., for a violation associated with a greater-than-green significance determination process finding at the Vogtle Nuclear Plant. The details of the finding are “official use only—security-related” information.

Wolf Creek Nuclear Operating Corporation (Wolf Creek Generating Station) EA-15-170

On January 27, 2016, the NRC issued a notice of violation to Wolf Creek Nuclear Operating Corporation for violations of 10 CFR 50.9, "Completeness and Accuracy of Information," and 10 CFR 55.25, "Incapacitation because of Disability or Illness." Specifically, from June 30, 2006, to July 9, 2015, the licensee failed to report a permanent disability of an NRC-licensed operator. Additionally, on January 10, 2010, the licensee submitted an NRC-licensed operator application that certified the medical fitness of the applicant without a necessary restricting license condition. Based, in part, on the inaccurate information, the NRC issued the applicant a renewed operator license without the required restricting license condition on February 25, 2010. These two violations represent a Severity Level III problem.

FirstEnergy Nuclear Operating Co. (Davis-Besse Nuclear Power Station) EA-15-222

On January 25, 2016, the NRC issued a notice of violation to FirstEnergy Nuclear Operating Co., for a violation associated with a greater-than-green significance determination process finding at the Davis-Besse Nuclear Power Station. The details of the finding are "official use only—security-related" information.

Northern States Power Co. (Monticello Nuclear Generating Plant, Unit 1) EA-14-193

On December 21, 2015, the NRC issued a Confirmatory Order to Northern States Power Co., Minnesota (licensee) to formalize commitments made because of an Alternative Dispute Resolution mediation session. The licensee made these commitments as part of a settlement agreement between the licensee and the NRC regarding apparent violations of NRC requirements. The agreement resolves the apparent failure to ensure nondestructive examinations (NDE) on spent fuel dry shielded canisters (DSC) were performed in accordance with procedural requirements, and the falsification of records when recording the NDE results, contrary to the requirements of 10 CFR 72.158, "Control of Special Processes"; 10 CFR 72.11, "Completeness and Accuracy of Information"; and 10 CFR 72.154(c). The licensee agreed to a number of corrective actions, including: (1) restore compliance for all affected DSCs, (2) revise applicable procedures, (3) present at an industry forum, (4) submit an article to an industry publication, and (5) assess the effectiveness of improvements. In consideration of these commitments, the NRC agreed to refrain from issuing a Notice of Violation and a proposed imposition of a civil penalty.

Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant) EA-15-171

On November 24, 2015, the NRC issued a notice of violation, characterized as Severity Level III, to Entergy Nuclear Operations, Inc. for a violation of 10 CFR Part 50.9, "Completeness and Accuracy of Information." This violation involved the failure to provide information to the Commission that was complete and accurate in all material respects. Specifically, the licensee submitted Letter No. PNP 2014-015 to the NRC, which inaccurately stated the effective full power years for which the American Society of Mechanical Engineers (ASME) Code acceptance criteria would be met at Palisades Nuclear Plant. The NRC staff used this information to grant the licensee's proposed alternative to regulatory requirements. On May 22, 2015, the licensee submitted Letter PNP 2015-037 with a corrected analysis. The error in letter PNP 2014-015, and resultant change to the analysis results in letter PNP 2015-037, represented a significant reduction in the time to reach the ASME Code acceptance criteria limits. Therefore, the

information is considered material to the NRC for review of the proposed alternative to regulatory requirements in letter PNP 2014-15.

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 adequate 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.

Security

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 would amend security requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," to implement the 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, 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 addition, the final rule will revise the regulations from 10 CFR Part 73 to include enhancements that were identified through a comprehensive review of the emergency event notification regulations.

The NRC plans to publish a proposed rule in 2016 that would amend 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, lower certain drug testing cutoff levels, 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 Federal Government agencies and the nuclear industry to improve Federal, State, and local law enforcement tactical responses to beyond-DBT events at nuclear power plant sites.

Cyber Security

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 cyber security 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 cyber security plans, interim milestones were established to focus efforts on the highest-priority activities. Licensees completed the highest-priority activities in December 2012.

The NRC has developed an oversight program for cyber security that includes 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 (DHS), the Federal Energy Regulatory Commission, and the National Institute of Standards and Technology. The NRC completed inspection activities related to the interim milestones in calendar year 2015. In 2016, the NRC, along with industry, is preparing for full implementation inspection activities that will begin in calendar year 2017.

The agency amended 10 CFR Part 73 by adding timely notification requirements for certain operating reactor cyber security events. The new regulation (10 CFR 73.77, “Cyber Security Event Notification”) requires cyber security event notifications that will contribute to the NRC’s analysis of the reliability and effectiveness of licensees’ cyber security 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 requirement also increases the NRC’s ability to respond to emergencies, monitor ongoing events, assess trends and patterns, and identify precursors of more significant events. This rulemaking also enhances the NRC’s ability to inform other licensees, DHS, and Federal intelligence and law enforcement agencies of cyber security-related events.

The NRC staff proposed several options to the Commission in SECY-14-0147 for implementing cyber security for fuel cycle facilities. In response, the Commission issued an SRM to SECY-14-0147 that directed the staff to initiate a high priority, expedited rulemaking. The NRC staff completed the regulatory basis for the proposed rulemaking in March 2016. The proposed rule phase is scheduled to be submitted to the Commission in March 2017 and the draft final rule package to the Commission in October 2018.

The NRC is implementing a cyber security roadmap (SECY-12-0088, “The Nuclear Regulatory Commission Cyber Security Roadmap”) to evaluate the need for cyber security requirements for other NRC license holders, including non-power reactors, independent spent fuel storage installations, and byproduct materials licensees. Implementation of the roadmap will help ensure that appropriate levels of cyber security actions are carried out promptly and efficiently at all NRC-licensed facilities.

Emergency Preparedness and Incident Response

Previous 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 62 power reactor sites

implemented multiunit/multisource dose assessment capabilities. NRC staff incorporated these enhancements related to emergency preparedness into the proposed rulemaking package on mitigation of beyond design-basis events (MBDBE). The NRC is in the process of addressing the public comments received on the MBDBE rule in support of preparing a final rulemaking package.

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 the conduct of hostile-action-based (HAB) exercises at nuclear power reactor sites. Power reactor licensees were required to demonstrate response to a HAB event as part of a biennial exercise by December 31, 2015. All HAB exercises have been completed satisfactorily. 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 government response organizations 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 jointly conducted a series of public meetings in FY 2014 to solicit feedback from stakeholders and members of the public on the 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. The comment period was extended to October 13, 2015, in response to requests from stakeholders. As of March 31, 2016, the NRC and FEMA are continuing to jointly adjudicate the comments.

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 1,540 MWt or 513 MWe to the nation's electrical grid, if approved.

In December 2015, 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 (LWR) applicants and licensees and pursuing activities to enhance the regulatory framework and infrastructure for advanced, non-LWR. The NRC's new reactor program also is actively engaged in several international cooperative activities to address 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 and Small Modular Reactor Application Reviews

The NRC is currently reviewing new large, LWR applications that have been submitted under the provisions of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." The NRC is preparing for the submittal of one new early site permit application and its first small modular reactor design certification application in calendar year 2016.

Early Site Permit Reviews

<u>Public Service Electric Gas (PSEG) Power, LLC, and PSEG Nuclear, LLC</u>

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 Advanced Passive 1000 (AP1000®).

On September 25, 2015, NRC staff issued the final SER (FSER) for the PSEG ESP application, completing the final milestone for the staff's safety review. The NRC staff issued the final environmental impact statement (FEIS) for the application on November 13, 2015. The NRC is actively working with the National Marine Fisheries Service to complete Section 7 consultations under the Endangered Species Act.

On March 24, 2016, the ASLB conducted the mandatory hearing for the PSEG Site ESP application. NRC staff and the applicant provided oral testimony in response to the ASLB questions. The Board issued its decision, recommending that the ESP be issued, on April 26, 2016.

Tennessee Valley Authority (TVA) Clinch River Early Site Permit Application

TVA plans to submit an ESP application in May 2016 for the Clinch River site near Oak Ridge, TN. This application will be based on a plant parameter envelope characterizing several small modular LWR designs. The NRC staff issued its readiness assessments of the environmental report and the site safety analysis report on October 29, 2015, and November 19, 2015, respectively. The ESP application will request that the NRC review two separate proposals for a reduced emergency planning zone.

Design Certification Reviews

U.S. Evolutionary Power Reactor (U.S. EPR)

AREVA, Inc., submitted the U.S. EPR design certification (DC) application on December 11, 2007. On February 25, 2015, AREVA, Inc., requested that the NRC suspend the application review until further notice. The NRC staff's review of the U.S. EPR DC application remains in suspension.

US-APWR

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. The 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 (APR 1400)

On December 23, 2014, Korea Electric Power Corp. and Korea Hydro & Nuclear Power Co., Ltd., submitted to the NRC their application for the certification of the APR 1400 standard plant design, for use in the U.S. domestic energy market. The NRC staff developed a six-phase milestone schedule for completing the application review within a 42-month timeframe and has completed Phase 1 of its technical review (issuing requests for additional information (RAIs) and developing a preliminary SER) on schedule. The NRC staff has been implementing an aggressive review strategy by addressing many of the RAIs early in the review process. The NRC staff is implementing this approach to ensure that the review milestones can be achieved within the schedule. The Phase 2 review (issuing a SER with open items) is underway for all chapters in the DC application.

NuScale Small Modular Reactor Design Certification Application

By letter dated June 17, 2015, NuScale announced that they would submit a DC application by December 2016. On May 28, 2014, NuScale and the Department of Energy (DOE) completed a cooperative agreement in which DOE will award up to $217 million to support NuScale's DC application.

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

NuScale began submitting topical reports on various aspects of the reactor design for staff review. The staff has accepted and started the technical review on several reports including instrumentation and control, and electrical systems. NuScale plans to submit additional reports later in 2016.

NRC staff and NuScale continue to meet to discuss 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.

DC Renewals

ABWR Renewal (Toshiba)

On November 2, 2010, Toshiba submitted 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. In a letter dated December 1, 2015, the NRC staff accepted Toshiba's request for postponing the application review. The letter also states that the NRC would have to discuss any additional requests by Toshiba to further postpone commencement of this application review.

ABWR Renewal (General Electric-Hitachi)

On December 7, 2010, General Electric-Hitachi (GEH) submitted an ABWR DC renewal application. The 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, the NRC staff met with the applicant to discuss how GEH intends to address the 28 items as well as several RAIs issued on other topics. By letter dated January 8, 2016, GEH submitted proposed changes to the ABWR design control document (DCD) to redesign the containment overpressure protection system (COPS) piping in order to meet the COPS flow rate requirement established in the DCD Tier 1 information. The NRC staff has communicated to GEH that 24 of 33 open items are considered closed and plans to issue supplemental RAIs or conduct public meetings to address remaining open items. GEH submitted its revised application on February 19, 2016, to incorporate changes to the DCD. The NRC staff will continue its discussions with the applicant to resolve the remaining open items. The staff plans to issue an application review schedule letter in the next couple of months.

Combined License (COL) Application Activities

The NRC staff has received a total of 18 COL applications to date. The NRC has issued combined licenses for four sites including Vogtle, Units 3 and 4; V.C. Summer, Units 2 and 3; Fermi, Unit 3; and South Texas Project (STP), Units 3 and 4. Three COL application reviews are currently suspended at the request of the applicants because of changes in the applicants' business plans (River Bend, Harris, and Comanche Peak). Five COL applications have been withdrawn (Victoria County, Nine Mile Point, Callaway, Calvert Cliffs, and Grand Gulf). On February 11, 2016, TVA informed the NRC of its intention to withdraw its COL application for

Bellefonte, Units 3 and 4; the NRC staff is preparing a *Federal Register* notice on withdrawal of the application.

The NRC staff is actively reviewing five COL applications for a total of eight 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. The NRC staff issued its FEIS for the Levy County COL application on April 27, 2012.

The NRC staff has been working to resolve emerging AP1000 design issues to complete its safety review. The staff recently reviewed additional information necessary to complete its technical review and determined that these emerging issues are resolved. On March 1, 2016, the NRC staff issued a revised schedule letter to Duke Energy Florida informing the applicant that it plans to issue its final SER in June 2016. This schedule is contingent upon meetings with ACRS and providing that ACRS interactions do not result in the need for additional NRC staff review.

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 NRC staff's review of the Lee COL application was affected by the same AP1000 design issues mentioned above for the Levy COL application review. On March 7, 2016, the NRC staff issued a revised schedule letter to Duke Energy informing the applicant that it plans to issue its FSER in August 2016. This schedule is contingent upon meetings with ACRS and providing that ACRS interactions do not result in the need for additional NRC staff review.

Turkey Point COL Application

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

The NRC staff is actively engaging with FP&L to resolve the AP1000 design issues (mentioned above) for the Turkey Point COL application. The NRC will issue a revised schedule for completing its safety review of the application when it receives information from the applicant to resolve these issues. The NRC staff is continuing the safety review of all other aspects of the Turkey Point, Units 6 and 7, COL application. The NRC staff plans to present remaining site-specific information on the Turkey Point COL application to ACRS in the next few months.

On February 27, 2015, the NRC staff submitted the draft environmental impact statement (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 USACE, Jacksonville District, and the National Park Service. The NRC received approximately 11,000 comments on the DEIS; a majority of those comments are identical form letters. The NRC received comments from other Federal agencies, including EPA, National Park Service, U.S. Department of the Interior, and the U.S. Fish and Wildlife Service. To respond to and resolve

some of the issues raised in the comments, the NRC staff performed further technical analysis and conducted multiple inter-Federal agency meetings. The NRC plans to meet with other Federal agencies in late April to discuss resolution of the comments and currently expects to issue the final EIS by October 2016.

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, and issued its FSER for the STP COL application on September 29, 2015.

On November 19, 2015, the Commission held the mandatory hearing for the South Texas Project, Units 3 and 4, COL application. On February 9, 2016, the NRC concluded its mandatory hearing on the South Texas Project, Units 3 and 4, COL application. The Commission found the NRC staff's review adequate to make the necessary regulatory safety and environmental findings. The NRC issued the two COLs to NINA on February 12, 2016. These are the first COLs issued for an application referencing the ABWR design.

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 issued the FEIS in April 2016.

North Anna, Unit 3, COL Application

On November 27, 2007, Dominion Virginia Power submitted a COL application for an Economic and Simplified Boiling Water Reactor (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 included

issuing technical reports and responses to staff questions through calendar year 2015. On December 16, 2015, Dominion submitted its third and final submittal to the NRC which included RAI responses and COL application mark-ups. The NRC staff is currently finalizing its review of the North Anna 3 seismic evaluation. If the staff finds no further significant issues, it expects to complete its advanced FSER by the end of August 2016 followed by meetings with ACRS.

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 LWRs. 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 Edition)"

The NRC staff continues its work on revising Regulatory Guide (RG) 1.206. The title has been revised to "Applications 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 will also capture important lessons learned from recent licensing actions on large LWRs but has general applicability to all applications under 10 CFR Part 52. The revision is being informed by ongoing interactions with stakeholders and the public, including a public meeting held in October 2015. During this public meeting, the NRC staff presented the planned restructure of the RG 1.206 revision to relocate the technical information related to safety analysis reports from RG 1.206 to NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." This revised approach would address challenges with reconciliation of applicant guidance in RG 1.206 with review guidance in NUREG-0800. The participants were supportive of the change but wanted to ensure that the technical information in RG 1.206, not included in NUREG-0800, be incorporated or otherwise preserved. The staff plans to hold additional public meetings during calendar year 2016.

Standard Review Plan Updates

NRC staff continues its systematic update of NUREG-0800 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 coolant source terms; solid and gaseous waste management systems; and severe accident and probabilistic risk assessment evaluation. The staff is working toward finalizing several other proposed revisions issued in 2014 and 2015. Additionally, the staff is revising guidance on site characteristics and parameters, balance of plant systems, digital instrumentation and controls, and facility security programs. The staff issued over 45 proposed revisions and five final revisions in the *Federal Register* during 2015.

Environmental Guidance Updates

The NRC staff continues to work on updating RG 4.2, "Preparation of Environmental Reports for Nuclear Power Stations" and NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Plants" to support reviews of ESP, design certification, and COL; limited work authorization requests; and license amendment requests. The staff is incorporating lessons learned from the first set of environmental reviews for new reactors. In addition, the guidance is being updated to address small modular reactor reviews, greenhouse gas emissions, and climate change.

Construction Oversight 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 auxiliary buildings and containment. In addition, both licensees have a wide variety of non safety-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.

The NRC staff and industry have refined the processes and guidance developed for closure verification of Inspections, Tests, Analyses, and Acceptance Criteria (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. The NRC staff reviewed the revised NEI guidance document for ITAAC closure and, in July 2015, endorsed this document in a regulatory guide.

A total of 81 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 all of the submitted ICNs and will publish notices in the *Federal Register* to document NRC staff's verification that the associated ITAAC have been completed.

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

The NRC staff is implementing a vendor inspection program for vendors supporting operating plants and plants under construction. Focus areas for new reactors include integrated system validation for the control room simulators, digital instrumentation and control systems, modular fabrication, and reactor coolant pumps. In all of these areas, the staff has identified and raised issues to industry to ensure that the new plants will meet all requirements. Inspections of safety related components for use in operating reactors identified issues such as inadequate commercial grade dedication, failure to establish adequate design control on control rod drive components, and failure to identify and implement corrective actions related to the quality of batteries.

Non-LWRs

The NRC amended its expectations for advanced reactors in October 2008 in the Policy Statement on the Regulation of Advanced Reactors. The NRC staff is undertaking activities to prepare for applications for non-LWRs in the future.

The NRC is developing a strategy to prepare for advanced reactors, which will describe activities in three areas: technical infrastructure, licensing, and outreach. First, within licensing infrastructure activities, the NRC will seek to optimize the regulatory framework and licensing process for advanced reactor reviews. For example, the NRC plans to conduct a gap analysis of regulations and guidance to determine areas where revisions are needed, and to begin developing revised regulations and guidance for advanced reactors. The NRC will also complete development of advanced reactor design criteria, evaluate new approaches to review conceptual designs on an incremental (or staged) basis, and evaluate unique policy issues.

Technical preparation activities will seek to evaluate, clarify, and resolve critical technical and policy issues that need to be addressed for effective and efficient advanced reactor reviews. Among other things, the NRC recently expanded an existing interagency agreement with DOE for exploring regulatory issues and research needs for novel fuel designs, and held a seminar on advanced reactor and accident-tolerant fuels. The NRC recently completed training for staff on different reactor types, and will plan for additional training in this area. Additionally, the NRC will work with its stakeholders to develop proposed revisions to industry codes and standards to address certain advanced reactor designs and develop related requirements. The NRC will also conduct a hazard analysis to better understand the potential hazards and safety requirements to prevent or mitigate these hazards.

On the subject of outreach activities, the NRC will continue to conduct public meetings with its stakeholders (e.g., industry representatives, designers, members of the public). The NRC will maintain its participation in standards development for advanced reactors and will continue to share information with various national and international groups, including DOE, the Organisation for Economic Co-operation and Development's Nuclear Energy Agency, the International Atomic Energy Agency, and the NRC's international regulatory counterparts.

The NRC and DOE are engaged in a joint initiative to formulate guidance for developing principal design criteria for advanced non-LWR designs. DOE completed a report entitled,

"Guidance for Developing Principal Design Criteria for Advanced (Non-Light Water) Reactors," and submitted it to the NRC in December 2014. The NRC reviewed the information in the report and plans to ultimately issue a regulatory guide on design criteria for advanced non-LWRs. To support that goal, the NRC published draft design criteria for advanced reactors on the NRC's public web site on April 7, 2016, and opened a 60-day public comment opportunity on that draft.

The NRC and DOE will host the second 2-day Advanced Non-Light Water Reactors Workshop in June 2016. The focus of this series of workshops is to open a dialogue between key stakeholders to discuss challenges in the commercialization of non-LWR technologies and to formulate possible solutions. This second workshop will have a focus session non-LWR fuel fabrication and qualification.

Internationally, the NRC chairs the Nuclear Energy Agency's ad hoc group for international regulators of non-LWRs 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 2.5 years, the NRC has met with approximately 15 different non-LWR companies. The NRC is developing a step-wise approach for licensing in response to vendor's expressed needs for incremental NRC reviews. The NRC participates in American Nuclear Society and American Society of Mechanical Engineers standards development working groups for non-LWR designs and related topics. NRC staff maintains awareness of DOE's research programs, funding opportunity announcements and planning studies for non-LWR technologies. Additionally, the NRC will support the DOE's Gateway for Accelerated Innovation in Nuclear initiative, as appropriate.

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. The NRC has also moved forward with resolving the lower-priority (Tier 2 and 3) activities that have not already been addressed, with a paper delivered to the Commission in October 2015 describing the resolution paths for these recommendations. 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. The NRC will complete all of the audits by June 2016. On October 4, 2014, the first licensee informed NRC staff that a nuclear plant had fully implemented both orders, and as of March 2016, approximately 50 percent of all units have fully implemented the mitigating strategies order and about 83 percent of units have implemented the spent fuel pool instrumentation order. By the end of calendar year 2016, all operating units are expected to have substantially implemented the mitigation strategies and the spent fuel pool instrumentation orders.

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. In December 2015, NRC staff received the licensees' integrated plans for Phase 2 of the revised severe accident capable hardened vents order. The NRC staff anticipates completing the interim staff evaluations of those plans by December 2016. Licensees are required to complete full implementation by June 2019.

The NRC requested that nuclear power plant licensees re-evaluate seismic and flooding hazards that could affect their sites. If these newly re-evaluated 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.

The NRC staff is reviewing flood hazard re-evaluation reports submitted by licensees and is issuing its assessment of those reports. As of April 1, 2016, the staff had issued more than 80 percent of the assessment letters. The remaining re-evaluation reports and letters involve complex reviews or are waiting on information from the USACE. These licensees are expected to submit their reports and the NRC expects to issue most of the remaining assessment letters by December 2016.

Following Commission direction, NRC staff is now implementing the closure plan for the flooding hazard re-evaluations. Under this plan, licensees will assess their mitigating strategies to ensure that they can be implemented under the re-evaluated hazard conditions. Most licensees are expected to complete their mitigation strategies assessment by December 2016. Other evaluations may be required, beyond those associated with mitigating strategies, depending on site-specific considerations. The need for any other evaluations will be determined using a graded approach to ensure plants are appropriately protected against the re-evaluated flooding hazards. The NRC staff expects to issue guidance on the graded evaluation approach by mid-2016.

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). There were 20 sites (36 units) that will be required to perform an SPRA. For the remaining reactors, the NRC concluded that the sufficient margin exists such that a detailed SPRA is not needed. The first SPRAs are due to the NRC in March 2017, and all SPRAs will be received by December 2019. Of the remaining sites, 32 will perform limited-scope evaluations (i.e., a high-frequency evaluation, low-frequency evaluation, or spent fuel pool evaluation). Eleven sites have screened out and will not need any further seismic evaluations. The NRC staff has completed its assessment and closed out all required actions concerning seismic hazard re-evaluations for 16 sites.

Sites that are required to conduct a seismic risk evaluation submitted interim actions or evaluations in December 2014 or January 2016 as part of the expedited seismic evaluation process. These evaluations looked at the systems and components used to shut down a plant safely 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 the expedited seismic evaluation process submittals for the CEUS sites and expects to complete the review for one remaining WUS site by July 2016.

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 events. In August 2015, the Commission approved the draft proposed rule, subject to some changes and to the removal of certain proposed requirements. The staff revised the rulemaking package and made it available for public comment in November 2015. The public comment period closed in February 2016. Twenty public comment letters have been received. The NRC staff is reviewing the public comments and will revise the rulemaking package accordingly. The staff will deliver the final rule package to the Commission by the end of 2016.

The NRC has moved forward with resolving the lower-priority Tier 2 and 3 recommendations that have not already been addressed. The staff delivered a paper to the Commission in October 2015 that described the resolution paths for these recommendations. The final Tier 2 and 3 recommendations are on a path to be closed by the end of 2016.

The NRC continues to place a high level of importance on public interaction for all of the activities stemming from the Fukushima lessons learned. So far in FY 2016, the NRC held more than 12 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. In addition, the NRC continues to be actively engaged with the international community on the evaluation and response to lessons learned from the accident.

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. The work remaining past 2016 is primarily associated with completing the severe accident capable hardened vents order, activities associated with re-evaluated flooding and seismic hazards, post-order compliance inspections, and implementation of long-term NRC oversight.

XI. Planned Rulemaking Activities

As of March 31, 2016, the NRC is working on a total of 88 rulemaking activities. Fifty-seven of this total are planned rulemaking activities, 12 are rulemakings the NRC has identified for possible discontinuation and 19 are petitions for rulemaking that the NRC is reviewing. The 57 planned rulemaking activities include: 8 rulemakings in response to industry requests; 8 rulemakings that could reduce regulatory burden; 23 rulemakings that would comply with congressional statute or conform NRC regulations to other agency requirements or to international treaties or agreements; and 18 rulemakings that could impose new regulatory burden. Attachment lists all rulemaking activities planned, including their priority and schedule.