
*Protecting People and the Environment*

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

**April 2009 - September 2009**

Note: The period of performance covered by this report includes activities occurring between the first day of April 2009 and last day of September 2009. The transmittal letter to Congress accompanying this report may provide more recent information in order to keep Congress fully and currently informed of NRC's licensing and regulatory activities.

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## I Implementing Risk-Informed and Performance-Based Regulations

The U.S. Nuclear Regulatory Commission (NRC) added 10 CFR 50.48(c) to the regulations to allow existing nuclear power plant licensees to adopt voluntarily a risk-informed and performance-based fire protection licensing basis, also known as the National Fire Protection Association (NFPA) Standard 805. As of September 2009, there are 50 reactor units committed to transitioning to the new licensing basis. Two nuclear power stations, Shearon Harris and Oconee, volunteered to pilot their transition. The licensees for Shearon Harris and Oconee submitted their license amendment requests to transition to NFPA 805 on May 29, 2008 and May 30, 2008, respectively. The staff is currently reviewing the pilot plant license amendment requests. The staff is also working with stakeholders to update the regulatory guidance during this pilot transition period.

## II Reactor Oversight Process

The NRC continues to implement the Reactor Oversight Process (ROP) at all nuclear power plants. The NRC also continues to meet with interested stakeholders on a periodic basis to collect feedback on the effectiveness of the process and to consider feedback for future ROP refinements.

ROP Program Activities

The agency's most recent performance assessments show that all plants continue to operate safely. On September 3, 2009, the NRC Office of Public Affairs issued a press release summarizing the 2009 mid-cycle performance assessments and associated annual mid-cycle assessment letters for all nuclear plants. This information is publicly available on the NRC web site.

From April 2009 through September 2009, the NRC staff completed a biennial review of the ROP baseline inspection program to ensure that the ROP continues to focus and realign resources on the most appropriate areas of reactor safety while maintaining the current level of overall inspection effort. Changes will become effective January 1, 2010.

On April 15, May 20, June 17, August 12, and September 16, 2009, the NRC hosted public meetings, attended by the ROP Working Group and other interested stakeholders, to provide a forum for external feedback on staff initiatives. The ROP Working Group is composed of representatives from industry, the Nuclear Energy Institute (NEI), and NRC staff, who work toward continuously improving the ROP and reactor safety. Topics discussed at these meetings included the following:

- ROP realignment of baseline inspections.
- Changes to performance indicator guidance, including the Mitigating Systems Performance Index (MSPI).
- Draft NEI 99-02, Revision 6, "Regulatory Assessment Performance Indicator Guideline."
- Proposed changes to NRC Inspection Manual Chapter (IMC) 0612 Appendix B, "Issue Screening."

- Issues related to 10 CFR Part 26 Subpart I, "Managing Fatigue" issues; implemented October 1, 2009.
- The NRC's initiative to integrate traditional enforcement with ROP performance indicators.
- Performance assessment and reactor inspection topics.
- Frequently asked questions regarding ROP performance indicators.

On September 29, 2009, NRC staff participated in a public meeting with NEI, industry, and other stakeholders regarding risk-informed applications, reactor oversight, and the transition to the ROP for new reactors.

Other significant areas of activity related to the ROP are described below.

Safety Culture

In 2006, the ROP was enhanced to provide for oversight of a licensee's safety culture (i.e., that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance). Currently, NEI and industry are developing safety culture guidance. On April 16 and September 10, 2009, the NRC conducted public meetings with NRC staff, NEI, and other interested stakeholders on industry's proposed safety culture process (NEI 09-07, "Fostering a Strong Nuclear Safety Culture, Revision 0") and the NRC's independent regulatory role within that process. A pilot to implement NEI 09-07 is planned at four plants (one within each of NRC's regions) to begin in November 2009.

Radiation Control Activities

The NRC inspects radiation safety under the ROP for both occupational radiation safety and public radiation safety. Performance indicators on radiation safety at each plant are posted on the NRC web site.

In June 2009, the NRC issued two regulatory guides related to health physics and radiological environmental monitoring around nuclear power plants: Regulatory Guide 1.21, "Measuring, Evaluating and Reporting Radioactive Materials in Radioactive Effluents and Solid Waste" and Regulatory Guide 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants." NRC staff presented updates about these regulatory guides at the 2009 Radioactive Effluent Technical Specifications (RETS)/Radiological Environmental Monitoring Programs (REMP) Workshop in South Bend, Indiana, held June 22 to 24, 2009, and the Electric Power Research Institute (EPRI) Groundwater Protection Workshop (in collaboration with NEI), held in Charleston, South Carolina, on September 15-16, 2009.

On July 8, 2009, NRC staff participated in a public meeting on current health physics topics, the proposed realignment of radiation safety procedures within the ROP and changes to the Radiation Safety Cornerstone, and recently revised recommendations from the International Commission on Radiation Protection (ICRP Publication 103).

From August 16-19, 2009, the NRC staff participated in the annual NEI Health Physics Forum, held in Laguna Beach, California. Staff presented an update on the recently issued Regulatory Issue Summary (RIS) 2009-09, "Use of Multiple Dosimetry and Compartment Factors in Determining Effective Dose Equivalent from External Radiation Exposures," the draft regulatory

guide on multi-badging for effective dose equivalent, the ROP baseline inspection procedure realignment, and *As Low as Reasonably Achievable* (ALARA).

10 CFR Part 26 Subpart I Final Rule

10 CFR Part 26, Subpart I, "Managing Fatigue," establishes an integrated approach to fatigue management for nuclear power plant workers. The requirements were developed on the premise that fatigue management requires collaboration between individual workers and the licensees, with fatigue prevention, detection, and mitigation as the primary components. Subpart I of the rule requires worker training on practices that contribute to and mitigate fatigue. It also requires that each individual have the ability to self-declare fatigue. Subpart I imposes work hour controls including minimum day off requirements to help combat the effects of acute and cumulative fatigue. The NRC required licensees to implement Subpart I by October 1, 2009.

NRC sponsored a series of three public meetings (May 22, July 15, and September 16, 2009) with representatives of NEI, industry, the International Brotherhood of Electrical Workers (IBEW), and others to provide the status of NRC activities related to Subpart I, and to understand from stakeholders the progress of industry implementation, including any challenges.

In addition, NRC staff participated in IBEW's NRC Region III Fatigue Rule Summit in Willowbrook, Illinois, on April 20 to 21, and the panel discussion at the Utility Workers Union of America conference in Las Vegas, Nevada, on April 22-24, 2009. On August 4, 2009, NRC staff conducted a public meeting with NEI and industry representatives to discuss approaches for meeting work hour controls under 10 CFR Part 26, Subpart I. From August 12-13, 2009, NRC staff participated as subject matter experts in an NEI-sponsored workshop regarding 10 CFR Part 26.

Maintenance Rule

The objective of 10 CFR 50.65 (commonly referred to as the maintenance rule) is to require the monitoring of the overall continuing effectiveness of licensee maintenance programs to ensure that safety-related and certain non-safety related structures, systems, and components are capable of performing their intended functions.

From August 4-5, 2009, NRC staff participated in the summer meeting of the Electric Power Research Institute Maintenance Rule Users Group. Staff made a presentation and participated in discussions regarding system unavailability, system scoping rules, and performing risk assessments for planned and emergent work.

Buried Piping

There have been concerns raised recently among several NRC stakeholders regarding leaking buried piping at nuclear reactor facilities. The NRC Chairman has directed the agency staff to develop an information paper explaining the generic activities currently underway or planned on the issue of leaks from buried piping. The information paper is to address plans for evaluating the adequacy of current NRC and American Society of Mechanical Engineers ASME code requirements associated with the design, inspection, and maintenance of safety-related buried piping. These requirements, as well as voluntary initiatives, will be evaluated with respect to how they ensure public health and protection of the environment. If found necessary, the staff

will develop recommendations for enhancements to existing regulations, requirements, practices, or oversight.

Training and Accreditation at Nuclear Power Plants

Public health and safety depend on proper operation, testing, and maintenance of power plant systems and components. Successful performance by nuclear power plant personnel is ensured by having workers achieve and maintain job-task qualification through a systems approach to training (SAT)-based process. The implementation of SAT-based training is monitored by the Institute of Nuclear Power Operations (INPO) during the training program accreditation reviews conducted for the National Nuclear Accrediting Board (NNAB). The NRC assesses the effectiveness of the accreditation process and industry's implementation of the systems approach to training by observing selected INPO-led accreditation team visits and NNAB meetings.

On May 11, 2009, a periodic public NRC/INPO coordination meeting on training-related issues was held at INPO headquarters in Atlanta, Georgia. The purpose of the meeting was to discuss items of mutual interest concerning INPO's training program accreditation process.

International Affairs

On April 20, 2009, NRC staff participated in the 37th Committee on Nuclear Regulatory Activities (CNRA) Working Group on Inspection Practices (WGIP) meeting in Paris, France. NRC staff currently has the lead to develop a report on the inspection of licensee corrective action programs and a discussion at the WGIP workshop in 2010 regarding the inspection of safety culture at nuclear power plants.

From June 24-25, 2009, NRC staff met with a 16-person delegation of regulatory and industry executives from Japan. The staff discussed standard technical specifications, the operating experience program, and the ROP. In addition, the group toured the NRC Emergency Response Center.

The CNRA Working Group on Operating Experience (WGOE) provides an annual forum for discussion among the member countries of operating experience topics of interest. The NRC hosted the fifth meeting of the CRNA WGOE from May 27 to 29, 2009. NRC staff made several presentations giving an overview of the NRC Operating Experience program to provide other countries a better understanding of the process and how it can be adapted to their own needs. Further discussions focused on topics of generic interest, which had been posted to the international Incident Reporting System, updates on the operating experience programs in the member countries, and brief presentations by United States and international industry representatives.

The International Atomic Energy Agency (IAEA) International Nuclear and Radiological Event Scale (INES) provides a rating scale to allow events of nuclear and radiological significance to be placed in context in a clear manner that can be communicated to the media, public, and the international community. Each event reported by licensees to the NRC is rated against the criteria of the scale, and those events that reach a prescribed threshold are submitted to the IAEA Nuclear Events Web-based System. From September 21-25, 2009, NRC staff participated in an IAEA INES "train the trainer" session at the IAEA offices in Vienna, Austria. The workshop included presentations on the types of events that would be rated on the scale, and small group sessions encouraged interactions among representatives of the more than 30

countries to come to an understanding of how to apply the scale consistently around the world.

## III Status of Issues Tracked in the Reactor Generic Issues (GI) Program

There are currently five open generic issues being tracked in the Generic Issues Management Control System. Actions related to GI-163, "Multiple Steam Generator Tube Leakage," were completed on July 16, 2009. Progress on each generic issue (including the completion of GI-163) is described below.

GI-163, "Multiple Steam Generator Tube Leakage"

Actions relating to GI-163 were completed on July 16, 2009, with the issuance of a memorandum, including the supporting technical basis, to the Executive Director for Operations. The technical work conducted to address this issue supports its closure with no changes to existing regulations or guidance beyond new technical specification requirements that all U.S. pressurized-water reactor (PWR) licensees voluntarily adopted. As of September 30, 2007, new performance-based technical specification requirements were in place at all U.S. PWRs in response to NRC Generic Letter 2006-01, "Steam Generator Tube Integrity and Associated Technical Specifications." These requirements are the culmination of work between NRC staff and the industry to develop a generic template for new technical specification requirements incorporating a programmatic, performance-based approach for ensuring steam generator tube integrity. Each PWR licensee adopted the new technical specification requirements voluntarily, consistent with the generic template, and not as the result of an NRC backfit. The NRC staff completed its review of the GI and determined that no additional regulatory actions are necessary. The lead office for this GI was the Office of Nuclear Reactor Regulation (NRR).

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

In April 2008, NEI submitted preliminary guidelines to address reactor vessel head drop consequence analyses and to establish a highly reliable handling system for reactor vessel head lifts. In July 2008, NEI submitted final industry-developed guidelines for these and other related applications. On September 5, 2008, NRC staff issued a safety evaluation endorsing these guidelines, with one exception regarding acceptance criteria for the consequence analysis. The staff also issued supplementary inspection guidance for refueling and other outage activities that addresses implementation of the industry initiative on control of heavy loads. This inspection guidance was posted for inspector use and public review on September 18, 2008. The NRC issued RIS 2008-28, "Endorsement of Nuclear Energy Institute Guidance for Reactor Vessel Head Heavy Load Lifts," to notify stakeholders of NRC endorsement of the guidelines in NEI 08-05. Through December 2009, the NRC staff is conducting sampling inspections to validate initial implementation of the guidelines. The staff will submit a closeout memorandum for review through the Advisory Committee on Reactor Safeguards (ACRS) by January 2010. The closeout schedule has been adjusted in order to address inspection issues arising during the initial implementation of the industry initiative on heavy loads. The lead office for this GI is NRR.

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

NRC staff has reviewed industry proposals from licensees affected by GI-189 and has concluded that those proposed modifications will resolve GI-189 and provide benefit for some

separate security scenarios that were identified during the course of the investigation. On June 15, 2007, NRC staff issued letters to affected licensees accepting their commitments. Since that time, licensee implementation and NRC verification inspections performed pursuant to NRC Temporary Instruction (TI) 2515/174, "Hydrogen Igniter Backup Power Verification," have been completed at eight of nine affected sites. Implementation and verification activities at the final affected site are expected to be complete, and this issue is expected to be closed, by early 2010. The lead office for this GI is NRR.

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

This GI concerns the possibility that, following a loss of coolant accident (LOCA) in a PWR, debris accumulating on the emergency core cooling system sump screen may result in clogging and restrict water flow to the pumps. As a result of this GI and/or the related generic letter, all PWR licensees increased the size of their containment sump strainers, significantly reducing the risk of strainer clogging. An associated issue, which needs to be resolved to close GI-191, is the potential for debris to bypass the sump strainers and enter the reactor core. In 2008, the NRC staff determined that additional industry-sponsored testing was necessary to support resolution of this issue. The testing resulted in submittal of a topical report to the NRC in April 2009. The NRC staff determined that further testing was still needed, and the PWR Owners Group expects to complete the testing by the end of 2009. The NRC expects to issue a safety evaluation on the topical report in mid-2010. The report will provide guidance to licensees regarding use of the industry-developed test results and topical report. During 2009, the NRC will review licensee responses to NRC requests for additional information (RAIs) to resolve plant-specific testing and evaluation issues. Review and resolution of the remaining technical issues should support industry-wide resolution of this issue in 2010. The lead office for this GI is NRR.

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

The task action plan to resolve this GI involves an evaluation of suppression pool designs, the dynamics of air entrainment in the suppression pool, and the impact of air entrainment on ECCS pump performance. The BWR Owners Group has agreed to provide input that will give insights into the characteristics of LOCA phenomena at the earliest stages of the postulated accidents, plus general information about wetwell geometries in relation to ECCS suction strainers. This input is expected late in 2009. Staff efforts are underway to estimate the maximum potential void fraction through scale experiments being planned at Purdue University. These experiments are expected to characterize the behavior of the BWR Mark I design with regard to the potential transport of air bubbles resulting from a LOCA blowdown. Actual model testing is expected to begin by January 2010. The lead office for this GI is the Office of Nuclear Regulatory Research (RES).

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

While reviewing new reactor applications and updating seismic hazard information from the U.S. Geological Survey, the staff recognized that the estimated seismic hazard levels at some current central and eastern U.S. (CEUS) nuclear sites may be higher than seismic hazard values used in design and previous evaluations. GI-199 was opened to assess the implications of updated seismic data and methods on operating nuclear plants. A comparison of the new

seismic hazard data and methods with the earlier evaluations conducted by NRC staff as part of the Individual Plant Examination of External Events Program showed that seismic designs of operating plants in the CEUS still provide adequate safety margins. At the same time, the staff recognized that the new seismic data and models could reduce available safety margins. EPRI is also evaluating the effects of new seismic hazard data and methods on U.S. nuclear plants. The RES is collaborating with EPRI to ensure that the complex seismic hazard assessments make use of available expertise for a sound technical approach. The assessment is expected to be completed by the end of 2009. The lead office for this GI is RES.

## IV Licensing Actions and Other Licensing Tasks

Operating power reactor licensing actions are defined as orders, license amendments, exemptions from regulations, relief from inspection or surveillance requirements, topical reports submitted on a plant-specific basis, notices of enforcement discretion, or other actions requiring NRC review and approval before they can be implemented by licensees. The FY 2009 NRC Performance Budget plan incorporates two output measures related to licensing actions – number of licensing actions completed per year and age of the licensing action inventory. The output measure associated with licensing action age was changed in FY 2008 to reflect monthly versus yearly age measurements to make the timeliness measurement more challenging.

Other licensing tasks for operating power reactors are defined as licensee responses to NRC requests for information through generic letters or bulletins, NRC responses to 10 CFR 2.206 petitions, NRC review of generic topical reports, responses by NRR to regional office requests for assistance, NRC review of licensee 10 CFR 50.59 analyses and final safety analysis report updates, or other licensee requests not requiring NRC review and approval before they can be implemented by licensees. The FY 2009 NRC Performance Budget plan incorporates two output measures related to other licensing tasks – the number of other licensing tasks completed per year and the age of the other licensing task inventory.

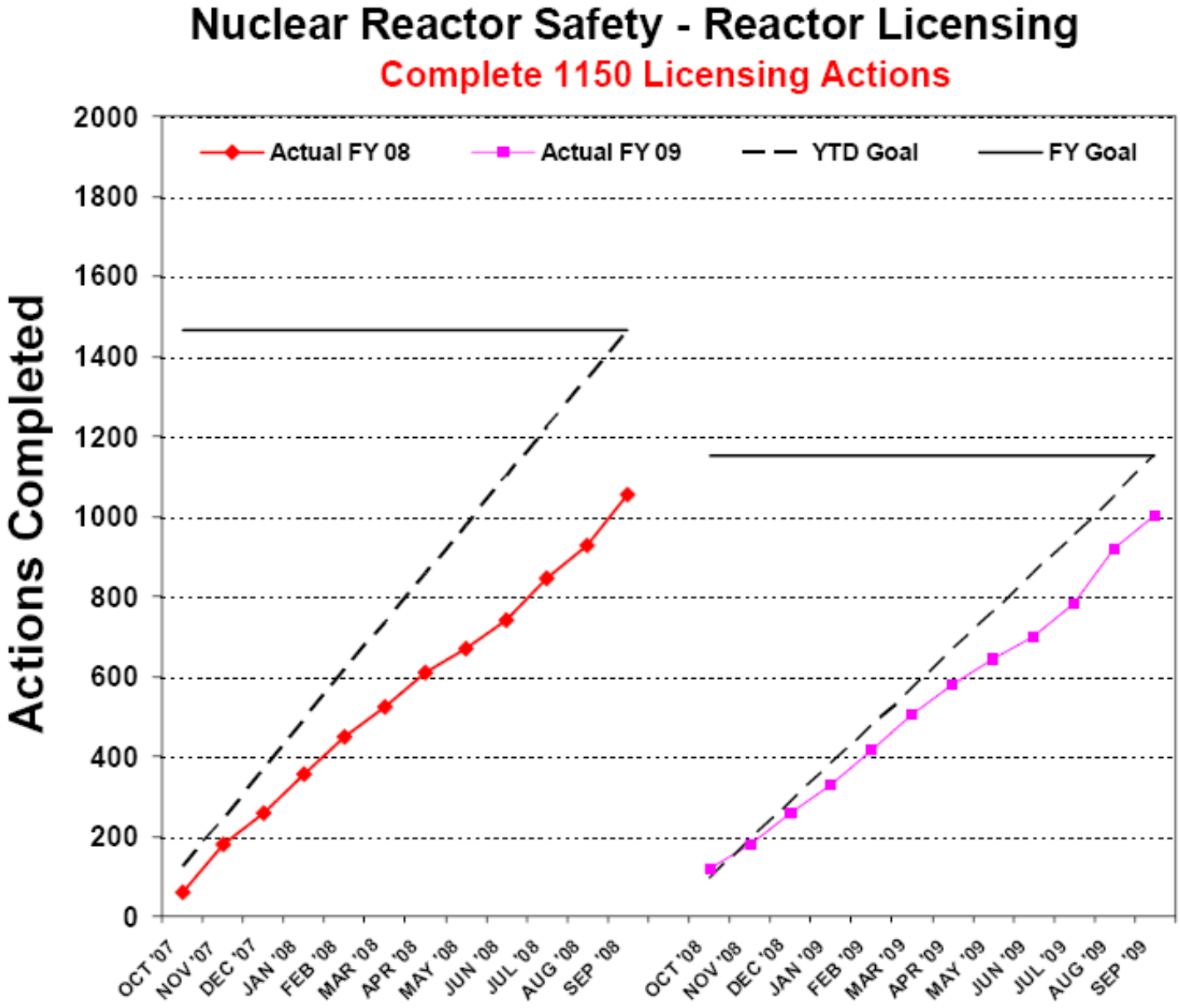
The actual FY 2007 and FY 2008 results, the FY 2009 goals, and the end-of-year FY 2009 results for the two NRC Performance Plan output measures for operating power reactor licensing actions and other licensing tasks are shown in the following table.

| PERFORMANCE PLAN | | | | |
|---|---|---|---|---|
| **Output Measure** | **FY 2007 Actual** | **FY 2008 Actual** | **FY 2009 Goals** | **FY 2009 Actual** |
| Licensing actions completed/year | 1542 | 1054 | ≥ 1150 | 1002 |
| Age of licensing action inventory | 97.6% ≤ 1 year and 100% ≤ 2 years | 94.6%*≤ 1 year and 100% ≤ 2 years | 93%** ≤ 1 year and 100% ≤ 2 years | 93.3%<br>100% |
| Other licensing tasks completed/year | 1045 | 678 | 600 | 541 |
| Age of other licensing tasks inventory | Not measured | 96.6%*≤ 1 year and 100% ≤ 2 years | 90%*** ≤ 1 year and 100% ≤ 2 years | 90.0%<br>100% |

* 9 of 12 months above target measure.

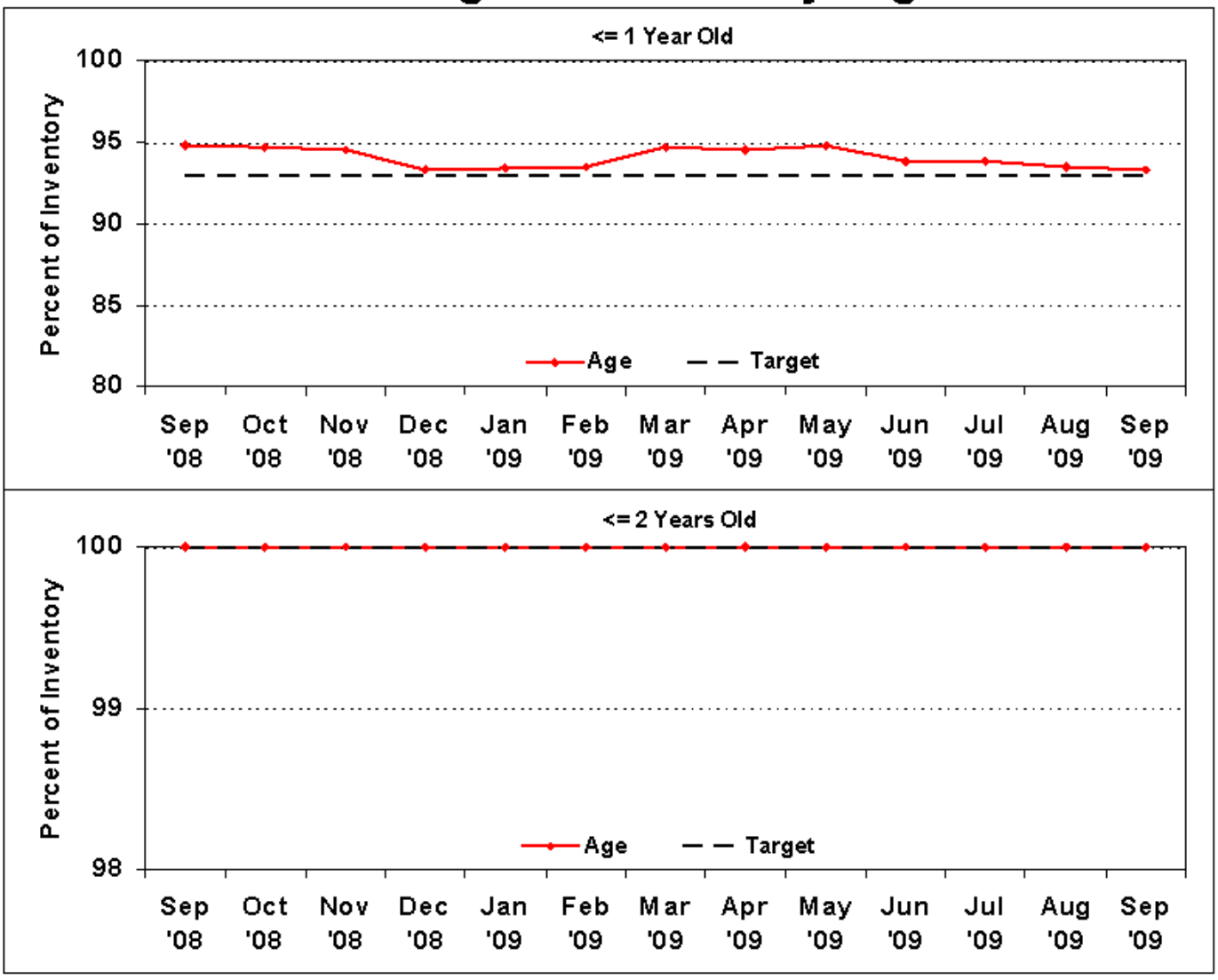
** NRC changed the metric to 9 out of 12 months for the overall year metric. The metric was achieved in 12 out of 12 months.

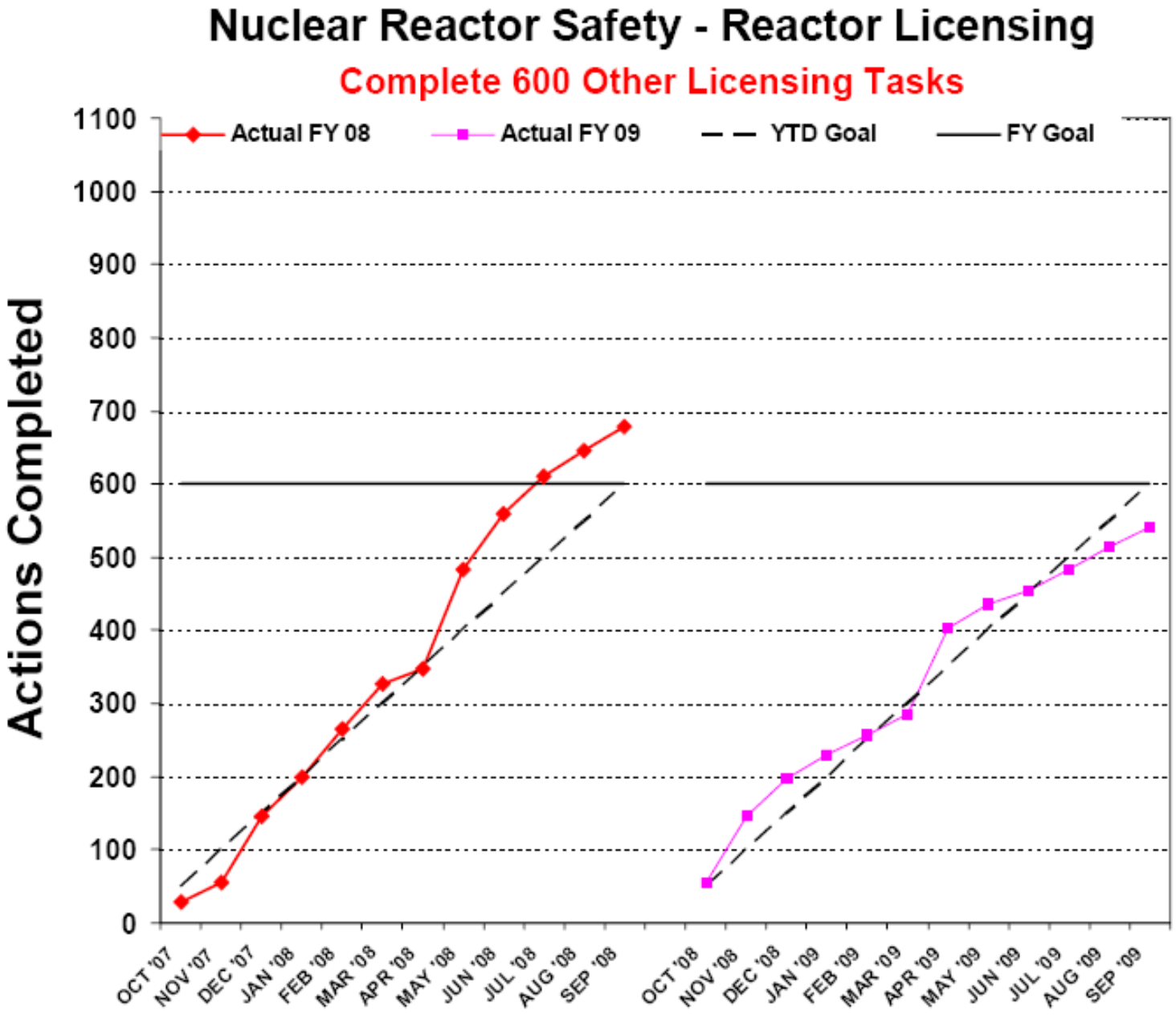
*** NRC changed the metric to 9 out of 12 months for the overall year metric. The metric was achieved in 12 out of 12 months.




The charts on the following pages display FY 2009 trends for the two operating power reactor licensing actions and other licensing task output measure goals.

# Licensing Action Inventory - Age Goals




Nuclear Reactor Safety - Reactor Licensing
Complete 600 Other Licensing Tasks
Actions Completed
Actual FY 08
Actual FY 09
YTD Goal
FY Goal
1100
1000
900
800
700
600
500
400
300
200
100
0
OCT '07
NOV '07
DEC '07
JAN '08
FEB '08
MAR '08
APR '08
MAY '08
JUN '08
JUL '08
AUG '08
SEP '08
OCT '08
NOV '08
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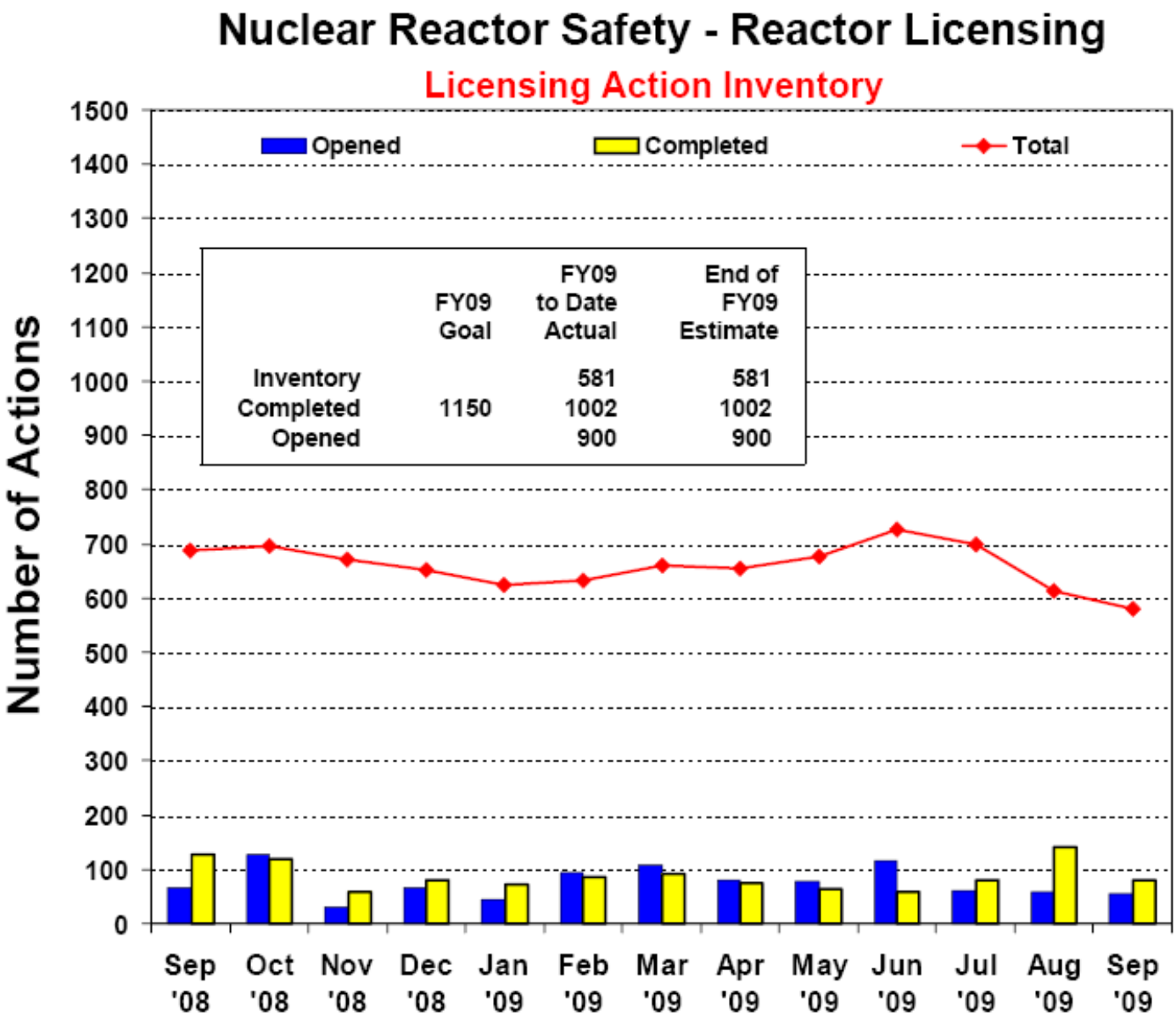
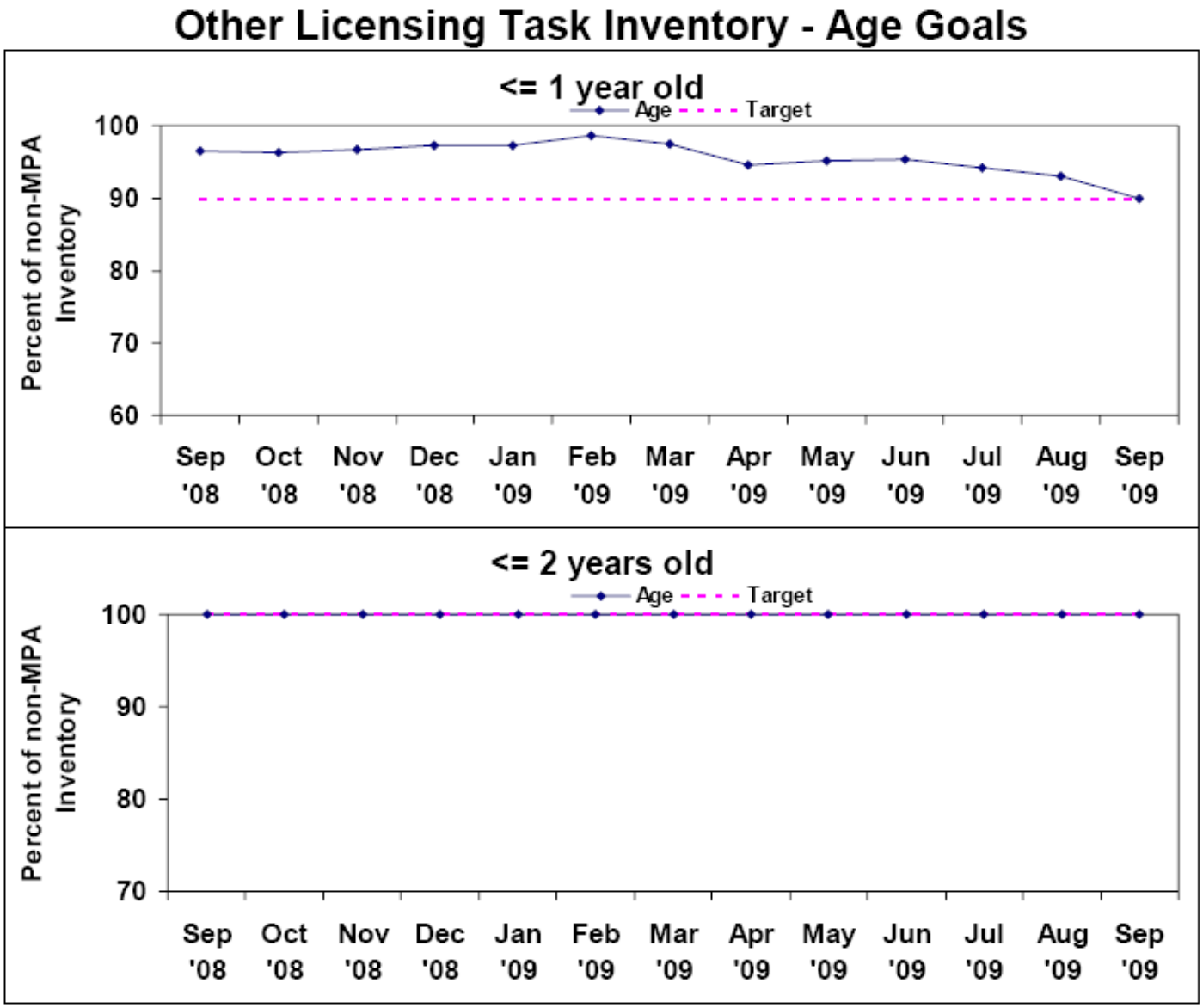
AUG '09
SEP '09


Nuclear Reactor Safety - Reactor Licensing
Licensing Action Inventory
Opened
Completed
Total
Number of Actions
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
FY09 Goal
FY09 to Date Actual
End of FY09 Estimate
Inventory 581 581
Completed 1150 1002 1002
Opened 900 900
Sep '08
Oct '08
Nov '08
Dec '08
Jan '09
Feb '09
Mar '09
Apr '09
May '09
Jun '09
Jul '09
Aug '09
Sep '09




## V Status of License Renewal Activities

The NRC has completed the review of license renewal applications for 54 of the 104 units licensed to operate. During this period, the NRC issued the renewed licenses for the Oyster Creek Nuclear Generating Station and the Vogtle Electric Generating Plant, Units 1 and 2. The NRC currently has license renewal applications for 21 units at 13 sites under review. The following is the status of applications currently under review.

Oyster Creek Nuclear Generating Station

On July 22, 2005, the NRC received an application from Exelon Generation Company, LLC (Exelon) for renewal of the operating license for the Oyster Creek Nuclear Generating Station (Oyster Creek). The final supplemental environmental impact statement (SEIS) was issued on

January 19, 2007, and the final safety evaluation report (SER) was issued on March 30, 2007. On September 19, 2008, the staff issued Supplement 1 to the final safety evaluation.

On April 1, 2009, the Commission issued a memorandum and order affirming the Atomic Safety and Licensing Board's (ASLB's) decision, which found in favor of Exelon. The order directed the NRC staff to enhance its review and verification of Exelon's three-dimensional finite element analysis summary report, but stated that the review is not a precondition for issuing the renewed license.

The staff issued the renewed license on April 8, 2009. Oyster Creek's original 40-year license period ended on April 9, 2009.

The staff completed its assessment of the Exelon three-dimensional finite element analysis summary report as part of the Region I license renewal inspection report issued on May 12, 2009. In September of 2009, the ACRS performed an independent review of the three-dimensional finite element analysis. On September 23, 2009, the NRC staff and Exelon staff discussed the results of the three-dimensional finite element analysis with the ACRS Materials, Metallurgy, and Reactor Fuels Subcommittee. The ACRS concluded that the analysis confirms that Oyster Creek's drywell shell complies with its current licensing basis for design basis accidents with margin and that the analysis was performed using good engineering practices and judgment and used conservatively biased realistic assumptions.

Pilgrim Nuclear Power Station

On January 25, 2006, Entergy Nuclear Operations (Entergy) submitted a license renewal application for the Pilgrim Nuclear Power Station (Pilgrim), to extend Pilgrim's operating license for an additional 20 years beyond the current license period. The final SER was issued on June 28, 2007, and the final SEIS was issued on July 27, 2007. The ACRS full committee meeting on the SER was held on September 6, 2007, and the ACRS letter was issued on September 26, 2007.

The ASLB admitted two contentions from Pilgrim Watch relating to leak detection of radioactively contaminated water from underground piping and tanks, and to Pilgrim's severe accident mitigation alternatives (SAMA) analysis for offsite radiological and economic consequences. The SAMA contention was resolved, leaving only the buried piping and tanks contention for hearing before the ASLB. That hearing was held on April 10, 2008 in Plymouth, Massachusetts, with a limited appearance session for members of the public the night before. On October 30, 2008, the ASLB found in favor of Entergy.

On November 12, 2008, both Pilgrim Watch and the Commonwealth of Massachusetts filed petitions related to previous decisions handed down by the ASLB. On March 23, 2009, the Commission issued an order extending the date by which it may rule on these petitions until further notice. The Commission denied the Massachusetts Attorney General's petition on June 4, 2009. The Pilgrim Watch petition is pending before the Commission.

Also pending before the U.S. Court of Appeals is the Massachusetts Attorney General's appeal of the Commission's denial of a petition for rulemaking concerning environmental impact consideration of the high density of fuel stored in the spent fuel pools.

Vermont Yankee Nuclear Power Station

In January 2006, the NRC received an application from Entergy Nuclear Operations for renewal of the operating license for the Vermont Yankee Nuclear Power Station (Vermont Yankee). The draft SEIS was issued in December 2006. The final SEIS was issued in August 2007. The SER with Confirmatory Items was issued in March 2007. The agency issued the final SER in February 2008.

The SER contains a proposed license condition that requires the licensee to perform and submit to NRC for review and approval an ASME code fatigue analyses for the reactor recirculation outlet nozzle and the core spray nozzle at least two years before the period of extended operation. These analyses should be documented in the final safety analysis report as the analysis-of-record for these two nozzles. On November 24, 2008, the ASLB issued a partial initial decision on three admitted contentions from the New England Coalition, Inc. (NEC). The contentions were related to metal fatigue, flow-accelerated corrosion, and steam dryer degradation. The ASLB required that the licensee submit the analyses related to metal fatigue before it would make a final ruling on this contention.

The applicant submitted the metal fatigue analyses to the NRC on January 15, 2009. The staff completed its review of the metal fatigue analyses and issued a supplement to the SER in September 2009.

The ASLB issued its final ruling on July 8, 2009, denying NEC's motion to file a new contention, thus terminating the ASLB portion of the adjudicatory proceeding. Subsequently, NEC filed a petition for review of the ASLB's full initial decision. On September 3, 2009, the Commission issued an order extending the time within which the Commission may rule on NEC's petition for review until further order of the Commission.

Susquehanna Steam Electric Station, Units 1 and 2

On September 13, 2006, the NRC received an application from PPL Susquehanna, LLC (PPL) for renewal of the operating licenses for Susquehanna Steam Electric Station, Units 1 and 2 for an additional 20 years beyond the current 40-year term.

The licensee submitted the license renewal application concurrent with a request for extended power uprate (EPU). Because of the potential impact of the EPU amendment on the plant's licensing basis, the licensee agreed that the license renewal schedule would be established after a decision on the EPU. The EPU was approved in January 2008, and PPL submitted a letter to the NRC in February 2008 outlining the impact of the EPU on the license renewal application.

The final SEIS was issued on March 11, 2009. On August 27, 2009, the final SER was issued. The staff met with the ACRS full committee on October 8, 2008, to present the results of the safety review.

Indian Point Nuclear Generating Station, Units 2 and 3

On April 30, 2007, the NRC received an application from Entergy Nuclear Operations for renewal of the operating licenses for Indian Point Nuclear Generating Station, Units 2 and 3 for an additional 20 years beyond the current 40-year term.

On December 22, 2008, the NRC staff issued preliminary findings of the environmental review in a draft SEIS and held public meetings on February 12, 2009, in Cortland Manor, New York, to receive comments on the draft SEIS. Individuals, groups, and agencies also submitted written comments through the end of the draft SEIS comment period on March 18, 2009. The staff plans to issue the final SEIS in February 2010.

On August 11, 2009, the final SER was issued. The staff presented the final results of the safety review to the ACRS full committee on September 10, 2009. To date, 19 contentions (consolidated to 13) have been admitted by the ASLB.

Vogtle Electric Generating Plant, Units 1 and 2

On June 27, 2007, the staff received an application from the Southern Nuclear Operating Company for renewal of the operating license for the Vogtle Electric Generating Plant, Units 1 and 2 for an additional 20 years beyond the current 40-year term.

The final SEIS was issued in December 2008. On March 13, 2009, the final SER was issued. The staff presented the final results of the safety review to the ACRS full committee on April 2, 2009. On June 3, 2009, the staff issued the renewed license.

Beaver Valley Power Station, Units 1 and 2

On August 28, 2007, the staff received an application from First Energy Nuclear Operating Company for renewal of the operating licenses for the Beaver Valley Power Station, Units 1 and 2.

The final SEIS was issued on May 14, 2009. On June 8, 2009, the final SER was issued. The staff presented the final results of the safety review to the ACRS full committee on July 8, 2009.

During the ACRS full committee meeting, the applicant discussed additional information regarding the containment liner, and subsequently submitted it to the NRC. As a result, the NRC staff is issuing a supplement to the SER. A subsequent ACRS full committee meeting to discuss the containment was held on September 11, 2009.

Three Mile Island Nuclear Generating Station, Unit 1

On January 8, 2008, the staff received an application from AmerGen Energy Company, LLC, for renewal of the operating license for the Three Mile Island Nuclear Generating Station, Unit 1 for an additional 20 years beyond the current 40-year term.

The final SEIS was issued on June 25, 2009. On June 30, 2009, the final SER was issued. The staff presented the results of the safety review to the ACRS full committee on September 10, 2009. The staff issued the renewed license on October 22, 2009.

Prairie Island Nuclear Generating Plant, Units 1 and 2

On April 15, 2008, the NRC received an application from the Nuclear Management Company, now known as Northern States Power Company, a Minnesota corporation, for renewal of the operating licenses for Prairie Island Nuclear Generating Plant, Units 1 and 2 for an additional 20 years beyond the current 40-year term.

The agency signed a memorandum of understanding (MOU) with the Prairie Island Indian Community to participate as a cooperating agency in the staff's review of the environmental impacts of license renewal. The Prairie Island Indian Community has filed requests for a hearing, and an ASLB was established to review the contentions. The ASLB admitted seven contentions. Six of those contentions have since been dismissed. The staff is conducting the environmental review of the application. On June 8, 2009, the SER with open items was issued. The staff presented the results of the safety review to the ACRS subcommittee on July 7, 2009.

Kewaunee Power Station

On August 14, 2008, Dominion Energy Kewaunee submitted an application for renewal of the operating license for the Kewaunee Power Station for an additional 20 years beyond the current 40-year term. The staff performed an acceptance review and determined the application was acceptable for docketing and review. The staff is conducting the environmental and safety reviews of the application in accordance with NRC regulations. During the review, the staff identified issues with the use of the work control process as an aging management program. The applicant has supplemented the application to address the staff's concerns. The staff conducted an environmental site audit in May 2009 and a site audit of aging management programs in June 2009. The staff is working to update the license renewal schedule.

Duane Arnold Energy Center

On October 1, 2008, FPL Energy Duane Arnold submitted an application for renewal of the operating license for Duane Arnold Energy Center for an additional 20 years beyond the current 40-year term. By letter dated December 11, 2008, the NRC staff requested that FPL Energy Duane Arnold supplement the Duane Arnold license renewal application. The staff received the supplement by letter dated January 23, 2009. The NRC completed its acceptance review and found the application and supplement acceptable for docketing and review. The staff is conducting the environmental and safety reviews of the application in accordance with NRC regulations. The staff conducted an environmental site audit in June 2009 and a site audit of aging management programs in August 2009.

Cooper Nuclear Station

On September 30, 2008, the Nebraska Public Power District submitted an application for renewal of the operating license for the Cooper Nuclear Station for an additional 20 years beyond the current 40-year term. The staff performed an acceptance review and determined the application was acceptable for docketing and review. The staff is conducting the environmental and safety reviews of the application in accordance with NRC regulations. The staff conducted an environmental site audit in March 2009 and a site audit of aging management programs in April 2009.

Palo Verde Nuclear Generating Station (PVNGS)

On December 11, 2008, Arizona Public Service Company (APS) submitted an application for renewal of the operating license for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 for an additional 20 years beyond the current 40-year terms. By letter dated February 13, 2009, the NRC staff requested that the applicant supplement the PVNGS license renewal application. The staff received the supplement by letter dated April 14, 2009. The NRC completed its acceptance review and found the application and supplement acceptable for

docketing and review. The staff is conducting the environmental and safety reviews of the application in accordance with NRC regulations.

Crystal River Unit 3 Nuclear Generating Plant, Unit 3

On December 16, 2008, the Florida Power Corporation submitted an application for renewal of the operating license for Crystal River Nuclear Generating Plant, Unit 3, for an additional 20 years beyond the current 40-year term. The staff performed an acceptance review and determined that the application was acceptable for docketing and review. The staff is conducting the environmental and safety reviews of the application in accordance with NRC regulations. The staff conducted an environmental site audit and a site audit of aging management programs in July 2009.

Salem Nuclear Generating Station, Units 1 and 2

On August 18, 2009, PSEG Nuclear LLC submitted an application for renewal of the operating license for Salem Nuclear Generating Station, Units 1 and 2, for an additional 20 years beyond the current 40-year term. The staff is performing an acceptance review to determine if the application is acceptable for docketing and review.

Hope Creek Generating Station

On August 18, 2009, PSEG Nuclear LLC submitted an application for renewal of the operating license for Hope Creek Generating Station for an additional 20 years beyond the current 40-year term. The staff is performing an acceptance review to determine if the application is acceptable for docketing and review.

## VI Summary of Reactor Enforcement Actions

Reactor Enforcement by Region

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

These tables are followed by brief descriptions of the escalated reactor enforcement actions associated with both 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 09 | 3 | 3 | 0 | 2 | 8 |
| | 2nd Half FY 09 | 1 | 0 | 0 | 4 | 5 |
| | FY 09 YTD Total | 4 | 3 | 0 | 6 | 13 |
| | FY 08 Total | 0 | 0 | 1 | 3 | 4 |
| | FY 07 Total | 3 | 0 | 0 | 5 | 8 |
| Non-Cited Severity Level IV or GREEN | 1st Half FY 09 | 83 | 45 | 96 | 111 | 335 |
| | 2nd Half FY 09 | 90 | 65 | 109 | 110 | 374 |
| | FY 09 YTD Total | 173 | 110 | 205 | 221 | 709 |
| | FY 08 Total | 235 | 218 | 294 | 316 | 1063 |
| | FY 07 Total | 181 | 147 | 302 | 302 | 932 |
| **TOTAL Cited and Non-Cited Severity Level IV or GREEN** | 1st Half FY 09 | 86 | 48 | 96 | 113 | 343 |
| | 2nd Half FY 09 | 91 | 65 | 109 | 114 | 379 |
| | FY 09 YTD Total | 177 | 113 | 205 | 227 | 722 |
| | FY 08 Total | 235 | 218 | 295 | 319 | 1067 |
| | FY 07 Total | 184 | 147 | 302 | 307 | 940 |

**NOTE:** The nonescalated enforcement data above reflect the cited and non-cited violations either categorized at Severity Level IV or associated with GREEN findings during the referenced time periods. The numbers of cited violations are based on enforcement action tracking system data that may be subject to minor changes following verification. The monthly totals generally lag by 30 days due to inspection report and enforcement development. GREEN findings that do not have associated violations are not included in these data.

| ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH TRADITIONAL ENFORCEMENT | | | | | | |
|---|---|---|---|---|---|---|
| | | Region I | Region II | Region III | Region IV | TOTAL |
| Severity Level I | 1st Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | 2nd Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | FY 09 YTD Total | 0 | 0 | 0 | 0 | 0 |
| | FY 08 Total | 0 | 0 | 0 | 0 | 0 |
| | FY 07 Total | 0 | 0 | 0 | 0 | 0 |
| Severity Level II | 1st Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | 2nd Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | FY 09 YTD Total | 0 | 0 | 0 | 0 | 0 |
| | FY 08 Total | 0 | 1 | 0 | 0 | 1 |
| | FY 07 Total | 0 | 1 | 0 | 0 | 1 |
| Severity Level III | 1st Half FY 09 | 1 | 0 | 0 | 0 | 1 |
| | 2nd Half FY 09 | 0 | 0 | 2 | 0 | 2 |
| | FY 09 YTD Total | 1 | 0 | 2 | 0 | 3 |
| | FY 08 Total | 2 | 1 | 1 | 0 | 4 |
| | FY 07 Total | 2 | 2 | 2 | 0 | 6 |
| **TOTAL Violations Cited at Severity Level I, II, or III** | 1st Half FY 09 | 1 | 0 | 0 | 0 | 1 |
| | 2nd Half FY 09 | 0 | 0 | 2 | 0 | 2 |
| | FY 09 YTD Total | 1 | 0 | 2 | 0 | 3 |
| | FY 08 Total | 2 | 2 | 1 | 0 | 5 |
| | FY 07 Total | 2 | 3 | 2 | 0 | 7 |

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

| ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS | | | | | | |
|---|---|---|---|---|---|---|
| | | Region I | Region II | Region III | Region IV | TOTAL |
| Violations Related to RED Findings | 1st Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | 2nd Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | FY 09 YTD Total | 0 | 0 | 0 | 0 | 0 |
| | FY 08 Total | 0 | 0 | 0 | 0 | 0 |
| | FY 07 Total | 0 | 0 | 0 | 0 | 0 |
| Violations Related to YELLOW Findings | 1st Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | 2nd Half FY 09 | 0 | 0 | 0 | 0 | 0 |
| | FY 09 YTD Total | 0 | 0 | 0 | 0 | 0 |
| | FY 08 Total | 0 | 1 | 0 | 0 | 1 |
| | FY 07 Total | 0 | 0 | 1 | 0 | 1 |
| Violations Related to WHITE | 1st Half FY 09 | 0 | 2 | 3 | 1 | 6 |
| | 2nd Half FY 09 | 2 | 2 | 3 | 0 | 7 |
| | FY 09 YTD Total | 2 | 4 | 6 | 1 | 13 |

| ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS | | | | | | |
|---|---|---|---|---|---|---|
| Findings | FY 08 Total | 0 | 1 | 1 | 4 | 6 |
| | FY 07 Total | 4 | 5 | 2 | 4 | 15 |
| **TOTAL Related to RED, YELLOW, or WHITE Findings** | 1st Half FY 09 | 0 | 2 | 3 | 1 | 6 |
| | 2nd Half FY 09 | 2 | 2 | 3 | 0 | 7 |
| | FY 09 YTD Total | 2 | 4 | 6 | 1 | 13 |
| | FY 08 Total | 0 | 2 | 1 | 4 | 7 |
| | FY 07 Total | 4 | 5 | 3 | 4 | 16 |

**NOTE:** The escalated enforcement data above reflect the violations or problems cited during the referenced time periods that were associated with either RED, YELLOW, or WHITE findings. RED, YELLOW, or WHITE findings that do not have associated violations are not included in these data.

Reactor Escalated Enforcement Actions (EA) as Well as Any Other Significant Actions Taken

This list also includes security-related actions and confirmatory actions that are not included in the preceding tables.

Constellation Energy (**Calvert Cliffs Nuclear Power Plant**), EA-08-351 - On April 3, 2009, a Notice of Violation was issued to Constellation Energy for a violation associated with a White SDP finding at the Calvert Cliffs Nuclear Power Plant. Specifically, the licensee failed to maintain in effect emergency plans that met the requirements of 10 CFR 50.47(b)(4) and 10 CFR Part 50, Appendix E. An emergency action level table used by operators to assess the functionality of the containment barrier during an accident contained an inaccurate threshold for identifying a potential loss of the containment barrier. This error could have adversely impacted the licensee's ability to accurately classify an emergency condition.

Northern States Power Company (**Prairie Island Nuclear Generating Plant**), EA-08-349 - On May 6, 2009, a notice of violation was issued to Northern States Power Company for a violation associated with a White SDP finding at the Prairie Island Nuclear Generating Plant. Specifically, the licensee failed to meet the requirements of 49 CFR 173.441(a), which requires shipments of radioactive material to be packaged such that, under conditions normally incident to transportation, dose rates on all external surfaces of the package are less than 200 mrem per hour, and 49 CFR 172.704, which requires training for personnel involved in packaging and shipping radioactive materials. Specifically, on October 31, 2008, a shipment of radioactive material sent from Prairie Island to a Westinghouse facility in Pennsylvania was found to have a dose rate on an external surface in excess of 200 mrem per hour. Subsequent investigation identified that a number of the personnel involved in preparing this shipment had not been properly trained, as required.

Northern States Power Company (**Monticello Nuclear Generating Plant**), EA-09-010 - On May 27, 2009, a notice of violation was issued for a Severity Level III problem involving incomplete and inaccurate information in the renewal application for a senior reactor operator's (SRO) license. Specifically, on September 11, 2008, Monticello Nuclear Generating Plant submitted NRC Form 396 for renewal of an SRO license certifying that the individual met the medical requirements. The NRC renewed the SRO license based on NRC Form 396, which only requested a corrective lenses license restriction. Later in November 2008, the NRC received a license restriction change request for the same SRO to add a "Must Take Medication as Prescribed to Maintain Medical Qualifications" license restriction. During the review of the

licensing action, the NRC discovered that the SRO started taking medication and notified the plant medical staff in July 2004. The licensee failed to notify the NRC of this change in medical condition. This is a violation of 10 CFR 50.74(c), which requires the licensee to notify the appropriate Regional Administrator within 30 days of a permanent disability or illness of a licensed operator. Based on the inaccurate information contained in the renewal request, the NRC renewed the SRO license. This is a violation of both 10 CFR 50.9 and 10 CFR 55.23. Title 10 CFR 50.9, states, in part, "Information provided to the Commission…shall be complete and accurate in all material respects" and 10 CFR 55.23, states, in part, that to certify the medical fitness of the applicant, an authorized representative of the facility licensee shall complete and sign NRC Form 396, "Certification of Medical Examination by Facility Licensee."

Florida Power and Light Company (**Duane Arnold Energy Center**), EA-09-083 - On June 6, 2009, a notice of violation was issued to Florida Power and Light Duane Arnold Energy, LLC for a violation associated with a White SDP finding involving a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions." Specifically, the licensee initially identified and corrected a condition adverse to quality regarding overspeed trip alarms on the Train B emergency diesel generator (B EDG), a safety-related component covered under 10 CFR Part 50, Appendix B, in February and March 2008. However, when spurious overspeed trip alarms began recurring in June 2008, the licensee did not perform any additional evaluation to identify the cause for the new condition adverse to quality and did not correct the recurring spurious overspeed trip alarms. This allowed the overspeed switch degradation to continue, resulting in the failure of the B EDG during the monthly surveillance test conducted in November 2008.

Constellation Energy (**R.E. Ginna Nuclear Power Plant**), EA-09-045 - On June 8, 2009, the NRC issued a notice of violation to Constellation Energy for a violation of Technical Specification 5.4.1.a, "Procedures" at the R.E. Ginna Nuclear Power Plant. The violation, which is associated with a White SDP finding, involved the failure to implement a technical specification-required procedure. Specifically, in March 2008, the licensee did not implement steps for cleaning and lubricating the turbine-driven auxiliary feedwater pump's governor linkage assembly, as required. Failure to conduct this preventive maintenance led to the turbine-driven auxiliary feedwater pump being declared inoperable when the governor linkage became stuck, preventing the pump from obtaining the required discharge pressure and flow during surveillance testing in December 2008.

Southern Nuclear Operating Company, Inc. (**Edwin I. Hatch Nuclear Plant**), EA-09-054 - On June 9, 2009, a notice of violation was issued to Southern Nuclear Operating Company, Inc. for a violation associated with a White SDP finding involving a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions." Specifically, since 1988 the licensee had observed cracks in the glands of the emergency diesel generator (EDG) couplings, but did not recognize the cracking was an indication of coupling deterioration. This fact was not documented during routine maintenance inspections; therefore, no condition report was written to identify and correct the condition. Subsequently, the 1B EDG coupling developed higher than normal vibration on July 12, 2008, during a routine surveillance test, which prompted the licensee to declare the 1B EDG inoperable.

Nuclear Management Company, LLC (**Point Beach Nuclear Generating Plant**), EA-09-012 - On June 26, 2009, the NRC issued a notice of violation to NextEra Energy Point Beach, LLC for a Severity Level III problem involving the failure to implement: (1) 10 CFR 50.74(c), which requires that each licensee notify the appropriate NRC Regional Administrator within 30 days of a permanent disability or illness (as described in 10 CFR 55.25) of a licensed operator or a senior licensed operator; (2) 10 CFR 50.9, which requires, in part, that information provided to

the Commission by an applicant for a license or by a licensee, or information required by statute or by the Commission's regulations, orders, or license conditions be maintained by the applicant or the licensee shall be complete and accurate in all material respects; and (3) 10 CFR 55.23, which requires, in part, that to certify the medical fitness of the applicant, an authorized representative of the facility licensee shall complete and sign NRC Form 396, "Certification of Medical Examination by Facility Licensee."

Specifically, the licensee was informed in February 1993 that the non-licensed operator was taking prescribed medication for hypertension, a permanent disability or illness. The non-licensed operator applied for an NRC operating license in May 1999. The NRC issued the operator a reactor operator license on August 27, 1999, and an SRO license on February 22, 2002, with no restrictions. The licensee did not inform the NRC of the operator's medical condition until October 20, 2008.

In addition, the licensee submitted an NRC Form 396 for renewal of an SRO's license that certified that the applicant met the medical requirements of American National Standards Institute/American Nuclear Society 3.4-1996 with no restrictions. However, in February 1993, the operator was prescribed medication to adequately compensate for a disqualifying medical condition. The certification by the senior licensee facility representative was material to the NRC because the NRC relied upon this certification to renew the SRO's license pursuant to 10 CFR Part 55 when the license should have been modified with a restriction that the SRO was required to take medication as prescribed to maintain his qualification.

Southern Nuclear Operating Company, Inc. (**Joseph M. Farley Nuclear Plant**), EA-09-103 - On July 10, 2009, the NRC issued a notice of violation to Southern Nuclear Operating Company, Inc. (SNC) for a violation of 10 CFR 50.54(q), which states, in part, that the licensee shall follow and maintain emergency response plans that must meet planning standards in 10 CFR 50.47(b). This regulation requires, in part, that the licensee establish a means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone (EPZ). SNC's emergency plan identifies both tone alert radios (TARs) and sirens as the means by which it provides alert and notification to the populace within the plume exposure pathway. This violation is associated with a White SDP finding.

Specifically, in January 2008, the licensee identified that approximately 109 TARs had not been provided to residences that were outside the limits of the sirens, but within the 10 mile EPZ of Joseph M. Farley Nuclear Plant. The licensee's subsequent review identified additional residences within the 10 mile EPZ that were required to have TARs in accordance with the plant emergency plan, but that were not provided TARs.

PPL, Susquehanna, LLC (**Susquehanna Steam Electric Station**) EA-09-108[1] - On August 11, 2009, a notice of violation was issued for a violation associated with a greater-than-Green Issue. The details of the issue involve official use only security-related information.

Northern States Power Company (**Prairie Island Nuclear Generating Plant**), EA-09-167 - On September 3, 2009, a notice of violation was issued to Northern States Power Company in Minnesota for a violation associated with a White SDP finding involving a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which requires, in part, that measures be

[1] Actions are security-related. Details of the violation are not publicly available. Therefore, these metrics are not included in the tables of Part VI of this report.

established to ensure that the design bases for safety related functions of structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to this requirement, Prairie Island Nuclear Generating Plant failed to implement design control measures to ensure that the design basis for the component cooling water system was correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to ensure that the safety-related function of the component cooling water system was maintained following a high energy line break, or seismic, or tornado events in the turbine building.

## VII Power Reactor Security and Emergency Response Regulations

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

The "Power Reactor Security Requirements," final rule was approved by the Commission on December 17, 2008, and subsequently published in the *Federal Registe*r on March 27, 2009, (74 FR 13926-13993). The rule, which became effective on May 26, 2009, amends existing security regulations and adds new security requirements pertaining to nuclear power reactors, including cyber security requirements. Licensees must be in compliance with the new rule no later than March 31, 2010. Subsequent to the publication of the final rule, the NRC published several regulatory guides to provide guidance for licensees in rule implementation. Specific topics addressed included response strategies for potential aircraft threats, safeguards contingency planning, access authorization for nuclear power plants, managing the safety/security interface, training and qualification of security personnel at nuclear power plants, physical security, and insider mitigation program. The NRC is reviewing and revising further security guidance on associated topics that will be made available for public comment. In addition to regular security licensing activities, the NRC has approved one exemption request and anticipates additional requests regarding extensions to the compliance dates for several of the new security requirements.

On March 31, 2009, nuclear power plant licensees were required to implement the updated and enhanced drug and alcohol requirements of 10 CFR Part 26 (73 FR 17176; March 31, 2008). The fatigue management (e.g., work hour controls) requirements must be implemented by October 1, 2009, and are applicable to operating reactors and new reactor licensees as detailed in the regulations. The NRC is actively engaged with the public and the industry through public meetings to answer questions, receive feedback on industry lessons learned, and develop regulatory guides implementing rule requirements. The NRC continues to inspect industry implementation of the 10 CFR Part 26 requirements and to coordinate with external stakeholders on future rulemaking to further enhance 10 CFR Part 26 requirements.

The NRC is continuing force-on-force inspections at each nuclear power reactor and Category I fuel cycle facility on a normal 3- year cycle using the adversary characteristics that were developed as a result of the current threat environment. The purpose of the force-on-force inspections is to assess and improve, as necessary, performance of defensive strategies at licensed facilities. During the third and fourth quarters of FY 2009, the NRC completed force-on-force inspections at 14 sites. The current force-on-force cycle ends in December 2010. The NRC remains committed to working with the industry to improve the realism and

effectiveness of the force-on-force inspection program and continues to pursue methods to improve simulations.

The NRC has developed a revised proposed rule amending 10 CFR Part 73 that contains the implementing provisions for section 161A of the Atomic Energy Act (AEA). It will permit NRC licensees to obtain enhanced weapons, and it requires new background checks for armed security personnel of designated licensees. The NRC worked with the U.S. Department of Justice, including the Federal Bureau of Investigation (FBI) and the Bureau of Alcohol, Tobacco, and Firearms (ATF), to develop the firearms guidelines required by the AEA. The Attorney General approved the firearms guidelines on July 7, 2009 and the Commission approved them on August 31, 2009. The NRC published the guidelines in the *Federal Register* on September 11, 2009. This rulemaking is currently scheduled to be published in the *Federal Register* by the end of 2009.

The NRC continues to make progress on implementing a comprehensive revision to emergency preparedness (EP) regulations and associated guidance. During the April – September 2009 period, the NRC held a total of 12 public meetings in coordination with the Federal Emergency Management Agency (FEMA) to inform and answer questions on the proposed EP rulemaking effort, which was published in the *Federal Register* in May 2009. Additionally, at the end of calendar year 2009, the NRC will conclude a 3-year initiative with the nuclear industry and FEMA to voluntarily conduct hostile-action-based (HAB) EP drills at each commercial nuclear power plant site in order to determine how best to address such events and incorporate lessons learned into the proposed EP rulemaking and associated guidance documents.

Work is ongoing to establish personnel access authorization and physical security requirements for nuclear power plant construction. Over the last 2 years, the NRC has held numerous meetings with the industry's New Plants Security Task Force to discuss the need for (and the scope of) security measures at new power reactor construction sites. In light of this collaborative effort with the industry, the NRC developed a regulatory basis to pursue an access authorization and physical security rulemaking for power reactor construction sites. The NRC intends to solicit input from stakeholders through public meetings and *Federal Register* notices during the rulemaking process. The proposed final rule is scheduled to be published by August 2010, and the final rule is planned for publication in the *Federal Register* in late 2011.

To date, all emergency preparedness and physical security program reviews are on schedule for new reactor applications. The security policy division has increased resources for the development of policies and procedures, including qualification requirements for new reactor application reviewers. In addition, the NRC continues to work with the Department of Homeland Security (DHS) and FEMA to ensure that their deliverables are provided in accordance with the predetermined schedules, including the completion of 16 DHS consultation visits for docketed applications.

## VIII Power Uprates

There are three types of power uprates. A measurement uncertainty recapture (MUR) power uprate is a power uprate of less than 2 percent and is based on the use of more accurate feedwater flow measurement techniques. Stretch power uprates (SPUs) are power uprates that are typically on the order of less than 7 percent and are within the design capacity of the plant. SPUs require only minor plant modification. Extended power uprates (EPUs) are power uprates beyond the design capacity of the plant and, thus, require major plant modification.

Licensees have applied for and implemented power uprates since the 1970s as a way to increase the power output of their plants. The NRC staff has completed 127 power uprate such reviews to date. Approximately 17,085 megawatts-thermal (MWt) or 5,695 megawatts-electric (MWe) in electric generating capacity (an equivalent of about 5.7 nuclear power plant units) have been gained through implementation of power uprates at existing plants. The NRC currently has nine plant-specific power uprate applications under review. The nine applications include two MUR power uprates and seven EPUs.

In May 2009, the NRC staff conducted a survey of all nuclear power plant licensees to obtain information on whether they planned to submit power uprate applications over the next 5 years. Based on updates to this survey, licensees plan to request power uprates for 40 nuclear power plants over the next 5 years. If approved, these power uprates will result in an increase of about 6,227 MWt or approximately 2,075 MWe in generating capacity.

## IX New Reactor Licensing

The NRC expects to license the next generation of nuclear power plants using 10 CFR Part 52, which governs the issuance of standard design certifications (DCs), early site permits (ESPs), and combined licenses (COLs) for nuclear power plants. The NRC staff is engaged in numerous ongoing interactions with vendors and utilities regarding prospective new reactor applications and licensing activities. As of September 30, 2009, the NRC has received 18 COLAs for a total of 26 new nuclear units.

Over the past few years, the NRC has taken steps to improve the licensing process that serve to increase the effectiveness, efficiency, and predictability of licensing a new reactor while maintaining the NRC's focus on safety and security. The revision of 10 CFR Part 52 ("Licenses, Certifications, and Approvals for Nuclear Power Plants") is one of the key accomplishments that contribute to this improvement. At this time, the NRC staff is making good progress on the applications it currently has under review. However, the reviews have been complicated because some applicants are revising both the proposed designs and the submittal dates for responses to RAIs, thereby causing the schedule delays and resource impacts. The NRC is working with applicants to overcome these challenges.

It appears to the agency that about one-third of the COL applicants intend to begin construction as soon as their COLAs are approved. The others still desire the COL, but for longer term use. The NRC is responding with a set of goals that reflect the evolving plans of new reactor applicants and that align its resources to focus on the licensing reviews expected to result in new plant operation beginning during calendar years (CYs) 2016–2017. The agency is sequencing its work to focus on those COLAs with strong near-term construction intentions and the necessary supporting activities.

Early Site Permit (ESP) Reviews

To date, the NRC has issued four ESPs: System Energy Resources, Inc., for the Grand Gulf site in Mississippi; Exelon Generation Company, LLC, for the Clinton site in Illinois; Dominion Nuclear North Anna, LLC, for the North Anna site in Virginia; and Southern Nuclear Operating Company for the Vogtle Electric Generating Plant (VEGP) ESP and limited work authorization (LWA) in Georgia. The NRC staff issued the VEGP ESP and LWA on August 26, 2009.

Design Certifications (DCs)

The NRC staff has issued DCs for four reactor designs that can be referenced in an application for a nuclear power plant: General Electric (GE) Nuclear Energy's Advanced Boiling Water Reactor (ABWR) design, Westinghouse Electric Company, LLC's (Westinghouse's) System 80+ design, Westinghouse's Advanced Passive (AP) 600 design, and Westinghouse's AP1000 design.

The NRC staff is currently performing the following DC reviews: GE Hitachi Nuclear Energy's (GEH) Economic Simplified Boiling Water Reactor (ESBWR), Westinghouse's AP1000 DC amendment, AREVA Nuclear Power's (AREVA's) US Evolutionary Power Reactor (US EPR), Mitsubishi Heavy Industries, Ltd.'s (MHI's) US-Advanced Pressurized Water Reactor (US-APWR), and South Texas Project Nuclear Operating Company's (STPNOC's) Advanced Boiling Water Reactor DC rule amendment.

The ESBWR DC application was submitted on August 24, 2005. GEH submitted Revision 5 to the ESBWR design control document (DCD) on June 1, 2008. The NRC staff's updated review schedule for the ESBWR DC was provided to GEH on February 18, 2009. The ESBWR DCD review has high project schedule risks related to GEH's spent fuel rack design, steam dryer analysis methodology, aircraft impact analysis, and setpoint methodology. GEH's ability to address open items in a timely manner and with high-quality information continues to impact the review schedule. Although GEH submitted Revision 6 of the DCD on August 31, 2009 and has recently submitted the majority of the information required to support preparation of the final safety evaluation report (FSER), several deliverables were submitted late and several issues remain open. As a result, in October 2009, the NRC staff expects to revise the schedule for issuance of the FSER to reflect a 3-month delay from August 16, 2010, to November 2010.

By letter dated May 26, 2007, Westinghouse submitted an application to amend the AP1000 DC rule and also submitted Revision 16 to the AP1000 DCD. The NRC staff published its review schedule for the AP1000 amended DC on February 15, 2008. Revision 17 to the AP1000 DCD was submitted the week of September 22, 2008. The NRC staff's updated review schedule for the AP1000 DC was provided to Westinghouse on April 3, 2009. The schedule was revised because of delayed responses to RAIs and new submittals.

The AP1000 DC amendment has high project schedule risks related to Westinghouse's shield building design and containment sump. Regarding the shield building design, the NRC staff has been meeting with Westinghouse and discussing the shield building design for quite some time. Specifically, NRC staff met with Westinghouse on March 18-19, April 13-17, and May 4-8, 2009, to discuss an important Westinghouse design methodology document that was due May 22, 2009. On that date, Westinghouse submitted a shield building design methodology report on the analytical techniques and testing methods used to demonstrate the safety of the design. The NRC reviewed the design methodology report and found that it did not contain the full AP1000 design methodology expected by NRC staff. Following that submittal, NRC staff had additional, detailed discussions on the continuing lack of information on the design methodology in meetings and regulatory audits on June 15-16, July 14, and August 10-14, 2009. In a letter dated August 31, 2009, Westinghouse submitted a comprehensive design methodology report to the NRC intended to resolve the continuing issues the NRC staff had with the Westinghouse shield building design. On October 15, 2009, the NRC informed Westinghouse that the company has not demonstrated that certain structural components of the revised AP1000 shield building can withstand design basis loads. The impact on the overall AP1000 certification review will be established after the staff and Westinghouse discuss the company's plans to

address the NRC's conclusions regarding the shield building design. The impact on related review schedules for Combined License applications referencing the AP1000 will be addressed once the design certification review schedule is better understood.

The NRC issued a supplemental RAI in August 2009 on containment sump issues. On August 27, 2009, NRC staff issued a letter advising that the schedule will be impacted for the chapter related to containment sump review. A public meeting on containment sump issues was held on September 2, 2009, and on September 16, 2009, a teleconference with Westinghouse and the NRC staff took place on issues discussed at the public meeting. Westinghouse submitted its responses to containment sump issues on September 22, 2009, and the NRC staff is now evaluating the responses. The test plan and certain aspects of the sump design are also being evaluated. Submittal of supporting documentation has been postponed until the testing is complete and the design has been finalized.

The US EPR DC was submitted on December 11, 2007. NRC staff completed its acceptance review of AREVA's US EPR DC on February 25, 2008, and is currently conducting its safety review of the US-EPR DC application. The staff issued a RAI early in the review asking the applicant to provide justification for the proposed US EPR containment design. Phase 1 of the review for the US EPR DC was completed on January 28, 2009. The schedule was revised on February 19, 2009, adding one month to the FSER schedule because certain questions were answered by the vendor more than 30 days after their issuance. The FSER schedule was revised again on June 25, 2009, moving the FSER completion date from June 2011 to September 2011.

The US-APWR DC was submitted on December 31, 2007. NRC staff completed its acceptance review of MHI's US-APWR DC on February 29, 2008, and published its review schedule for the DC application. Twelve MHI US-APWR Topical Reports referenced in the DC are also under NRC staff review. The FSER is scheduled for completion in September 2011. MHI informed the staff that it will submit Revision 2 of the DCD in late October 2009. The revision will include design changes that will require additional NRC staff review. The staff will review the DCD revision to determine if the review can be completed within the current schedule. The need to translate source documents has caused some delays in providing information to support reviews. In addition, follow-up questions have been necessary to resolve issues in some areas where initial responses were incomplete. These two factors have contributed to schedule risk.

On June 30, 2009, STPNOC submitted an application to amend the ABWR DC rule to address the requirements of the aircraft impact rule. NRC staff completed the acceptance review and docketed the amended application. The staff accepted the DC rule amendment application but requested, in a letter dated September 9, 2009, that STPNOC submit a supplemental environmental report to support this application.

COLA Activities

As of September 30, 2009, the NRC has received 18 COLAs for review. These applications are listed below with a brief status of the NRC staff's review activities:

- Calvert Cliffs COLA: On July 13, 2007, Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC. (UniStar) submitted a partial COLA for a US EPR to be located at UniStar's Calvert Cliffs site near Lusby in Calvert County, Maryland.

    - On August 14, 2007, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
    - The NRC completed its acceptance review of the partial COLA on January 25, 2008.
    - The second and final part of the COLA was submitted on March 17, 2008.
    - NRC staff issued the schedule for the review of the full COLA on August 18, 2008.
    - The schedule was revised on December 19, 2008, to change all environmental review due dates to "to be determined," pending complete and sufficient responses from UniStar, the applicant.
    - The safety review schedule was revised on February 19, 2009, because of changes to the US EPR DC schedule.
    - The FSER is scheduled for completion in November 2011.
    - Because of the change in the intake structure, numerous open items from RAIs, and ongoing negotiations between UniStar and the State of Maryland on environmental impact mitigation issues, the schedule for the draft environmental impact statement (DEIS) was reexamined.
    - The NRC held a public meeting on May 8, 2009, to discuss its concerns regarding the alternative site selection process and to inform UniStar that the information currently submitted on the docket regarding this process was insufficient to prepare the DEIS.
    - The DEIS schedule was also impacted by issues with the applicant's alternative site selection process. Revised alternatives information was submitted on July 17, 2009. An alternative site audit was held on August 18-19, 2009. Revision 1 of the alternative submittal was received by the staff on August 29, 2009. The NRC reviewed the information and determined that RAIs were still needed. NRC staff developed RAIs that were issued on September 17, 2009.
    - The current schedule reflects completion of the Safety Evaluation Report (SER) by July 2012, DEIS by March 2010 and final environmental impact statement (FEIS) by February 2011.
    - As of September 30, 2009, there is a lack of documentation regarding seismic analyses and geotechnical and financial information. UniStar has committed to provide seismic information by December 29, 2009, geotechnical information by October 9, 2009 (recently received), and financial information by November 13, 2009.

- South Texas COLA: On September 20, 2007, STPNOC submitted a COLA for two ABWR units to be located at STPNOC's South Texas Project (STP) site near Bay City in Matagorda County, Texas.

    - On June 27, 2007, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.

- The NRC completed its acceptance review on November 29, 2007, but noted that a schedule would not be provided until additional information was submitted by STPNOC.
- By letter dated January 10, 2008, STPNOC informed the NRC that it was arranging vendor support for the application and requested that the NRC suspend its review of several sections of its application. As a result, the NRC continued to conduct only a partial review of the STP application.
- Revision 2 of the STPNOC's application was received on September 24, 2008.
- NRC staff published a review schedule for the STP COLA review on February 11, 2009.
- The FEIS is scheduled for completion in March 2011.
- The FSER is scheduled for completion in September 2011.
- STPNOC provided a revised analysis of alternative sites in June 2009. A site visit to the new alternative site was conducted by NRC staff in late August 2009.
- NRC staff recently issued a fourth round of RAIs related to hydrology in part because of questions raised by previous RAIs. If the responses to these RAIs are timely and sufficient, the staff believes it will be able to meet the published environmental review schedule.
- On September 18, 2009, STPNOC submitted Revision 3 of the COLA.

- Bellefonte COLA: On October 30, 2007, Tennessee Valley Authority (TVA) submitted a COLA for two AP1000 units to be located at TVA's Bellefonte site near Scottsboro in Jackson County, Alabama.

  - On September 11, 2007, the NRC staff conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC staff completed its acceptance review on January 18, 2008.
  - The NRC staff issued a review schedule on February 15, 2008.
  - The safety and environmental reviews are currently underway.
  - The hydrology review is delayed because of data pending from the applicant.
  - TVA's tentative schedule for providing hydrology information is January 2010.
  - The NRC staff issued a SER with open items for Chapters 1, 4, 5, 10, 11, 12, 14, 16, 17, and 19 on or before June 24, 2009, to support Advisory Committee on Reactor Safeguards (ACRS) meetings on July 23 and 24, 2009.
  - On July 21, 2009, the NRC staff informed TVA that it intends to hold publication of the Bellefonte Unit 3 and 4 DEIS until after TVA's Board of Directors makes a decision and informs the NRC regarding whether it will complete Units 1 and 2. TVA has indicated that it intends to make a decision sometime in 2011.
  - NRC staff is currently scheduled to complete the second phase of its safety evaluation, SER with open items, by January 2010, without the hydrology and security information. However, the safety review will be rebaselined to reflect the DC review schedule and change in status from Reference COL (RCOL) to Subsequent COL (SCOL).
  - The FSER is scheduled for completion in March 2011.

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

- On October 24, 2007, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
- The NRC completed its acceptance review on January 28, 2008.
- NRC staff issued a review schedule on February 27, 2008.
- The safety and environmental reviews are currently underway.
- The Final Supplemental EIS (SEIS) is scheduled for completion in April 2010.
- The FSER is scheduled for completion on February 2011.
- On December 19, 2008, the NRC published the draft SEIS for the COL for North Anna Unit 3.
- On February 3, 2009, the NRC held a public meeting in Mineral, Virginia, at which the NRC staff discussed the results of the North Anna Unit 3 draft SEIS.
- On April 2, 2009, the NRC staff received notification from the U.S. Environmental Protection Agency that the NRC's draft SEIS for the North Anna COLA has been rated EC-1.
- In August 2009, the NRC staff completed on schedule Phase 2 of its Safety Review by issuing the SER with open items (incorporating COLA Revision 1).
- The applicant is expected to submit information sufficient for the NRC staff's evaluation in the areas of (1) fiberglass piping for the plant service water system, (2) cyber security, (3) large area fires, and (4) physical security consistent with the established safety review schedule. The staff is actively pursuing resolution of open items with the applicant.
- The applicant has been evaluating technology options in an effort to decide whether to remain with the ESBWR or chose another option. The applicant's schedule would call for a technology decision by December 2009.

- William States Lee III COLA: On December 13, 2007, Duke Energy submitted a COLA for two AP1000 units to be located at Duke's Lee site near Charlotte in Cherokee County, South Carolina.

  - On August 30, 2007, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on February 25, 2008.
  - NRC staff issued a review schedule on April 2, 2008.
  - The safety and environmental reviews are currently underway.
  - On September 14, 2009, Duke Energy sent a letter to the NRC describing its three-year delay for commercial operations for the William States Lee III Nuclear Station Units 1 and 2.
  - By letter dated September 24, 2009, a supplement to the environmental report was submitted to the NRC, which describes the applicant's plan for Make-Up Pond C. The sufficiency review is underway.
  - The environmental impact statement (EIS) scoping summary report was issued on September 11, 2008. The FEIS completion date has not yet been determined. The environmental review schedule will be revised because of the applicant's plans to construct an additional offsite source of make-up water and the applicant's change to its commercial operational schedule.
  - The FSER is currently scheduled for completion in February 2011. However, the FSER review schedule is expected to change to reflect the revised review

schedule for the AP1000 DC application and the need for sequencing the reviews, the applicant's plans to construct an additional offsite source of make-up water, and the applicant's change to its commercial operational schedule.

- Shearon Harris COLA: On February 19, 2008, Progress Energy Carolinas, Inc. (PEC) submitted a COLA for two AP1000 units to be located at PEC's Harris site near New Hill in Wake County, North Carolina.

  - On September 18-20, 2007, the NRC conducted public outreach meetings to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on April 17, 2008.
  - The NRC staff issued a review schedule on May 16, 2008.
  - The safety and environmental reviews are currently underway.
  - The FEIS was scheduled for completion on May 2010. However, the FEIS schedule was revised on June 19, 2009, to change all remaining environmental review due dates to "to be determined," pending complete and sufficient RAI responses from PEC.
  - The FSER is scheduled to be completed by April 2011. However, the schedule will be revised to reflect the revised review schedule for the AP1000 DC application review and the need for sequencing the reviews.

- Grand Gulf COLA: On February 27, 2008, Entergy Operations, Inc. (EOI) submitted a COLA for an ESBWR to be located at EOI's Grand Gulf site near Port Gibson in Claiborne County, Mississippi.

  - By letter dated January 9, 2009, EOI requested the NRC to suspend, until further notice, the NRC staff's review of the docketed COLAs for the River Bend Station, Unit 3, and the Grand Gulf Nuclear Station, Unit 3. Entergy plans to reconsider the GEH ESBWR reactor technology, which was the basis for the COL. The NRC has responded to the request and will work with EOI and other Federal agencies supporting the NRC staff to suspend the COLA review in a timely and orderly manner in an effort to preserve appropriately work that has been accomplished.
  - This review remains suspended.

- Vogtle COLA: On March 31, 2008, Southern Nuclear Operating Company (SNC) submitted a COLA for two AP1000 units to be located at SNC's Vogtle site near Augusta in Burke County, Georgia.

  - On July 17, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on May 30, 2008.
  - The NRC issued a review schedule on June 27, 2008.
  - The NRC staff is currently conducting the safety and environmental reviews.
  - On August 26, 2009, the NRC issued the Vogtle ESP and LWA. The recently issued Vogtle ESP facilitates the COLA review.
  - The NRC staff issued a revised safety review schedule on June 30, 2009. The FSER is scheduled for completion in April 2011.

- Virgil C. (V.C.) Summer COLA: On March 27, 2008, South Carolina Electric & Gas (SCE&G's) submitted a COLA for two AP1000 units to be located at SCE&G's V.C. Summer Nuclear Station site in Fairfield County, South Carolina.

    - On August 27, 2007, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
    - The NRC completed its acceptance review on July 31, 2008.
    - NRC staff issued a review schedule on September 26, 2008.
    - The safety and environmental reviews are underway.
    - Public scoping meetings to support the EIS were held on January 27 and 28, 2009, and an environmental site audit was completed on March 9, 2009.
    - The FEIS and FSER are scheduled for completion in February 2011. However, the review schedule is expected to change to reflect the revised review schedule for the AP1000 DC application.

- Callaway COLA: On July 28, 2008, AmerenUE submitted a COLA for a US EPR to be located at AmerenUE's Callaway site in Callaway County, Missouri.

    - Callaway's review was suspended at the request of the applicant in June 2009 and remains suspended.

- Levy County COLA: On July 30, 2008, Progress Energy Florida, Inc. (PEF) submitted a COLA for two AP1000 units to be located at PEF's site in Levy County, Florida.

    - On June 5, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
    - The NRC completed its acceptance review on October 6, 2008.
    - Public scoping meetings to support the EIS were held on December 4, 2008, and an environmental site audit was completed on December 1, 2008.
    - The NRC staff issued a review schedule on February 18, 2009.
    - The safety and environmental reviews are underway.
    - In a letter dated May 1, 2009, PEF formally withdrew an LWA request associated with the site in Levy County, Florida.
    - By letter dated September 16, 2009, NRC staff informed PEF of a 2.5 month safety review schedule change for the Levy County COLA. The material properties and characteristics of the Levy County site result in a more complicated review and an anticipated higher number of RAIs in the geotechnical and structural engineering areas. This complexity and the applicant's RAI responsiveness have affected the schedule. The FSER completion date was changed from May 2011 to July 2011.

- Victoria County COLA: On September 3, 2008, Exelon Nuclear Texas Holdings, LLC (Exelon) submitted a COLA for two ESBWR units to be located at Exelon's Victoria County Station site near Victoria City in Victoria County, Texas.

- By letter dated November 24, 2008, Exelon advised the NRC staff that it expected to designate an alternate reactor technology.
- The NRC staff suspended most of the COLA review.
- FEMA review of offsite emergency preparedness continues because it is independent of any future reactor technology selection.
- The existing application remains docketed.
- By letter dated July 1, 2009, Exelon notified the NRC staff that Exelon has decided to pursue an ESP rather than a COL for Victoria Station. Exelon stated that it plans to submit the application either late in the fourth quarter of calendar year 2009 or in the first quarter of calendar year 2010.

- Fermi COLA: On September 19, 2008, Detroit Edison Company submitted a COLA for an ESBWR to be located at the Detroit Edison Company's Fermi site near Newport City in Monroe County, Michigan.

  - On August 20, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on November 25, 2008.
  - The NRC staff is developing the safety and environmental reviews.
  - Public scoping meetings to support the EIS were held January 14, 2009, and an environmental site audit was completed on February 6, 2009.
  - By letter dated June 30, 2009, the NRC staff issued a review schedule for the COLA.
  - The FEIS is scheduled for completion in August 2011.
  - The FSER is scheduled for completion in March 2012.
  - The applicant has submitted changes to the application for relocation of the cooling tower, and the NRC staff's assessment indicates that there are no significant schedule impacts. However, the changes also affect the meteorological monitoring tower, and that submittal is due in November 2009. Schedule impacts will be assessed at that time.
  - The NRC staff conducted an inspection of the applicant's quality assurance program during the week of August 17 – 21, 2009.

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

  - On June 12, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactors planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on December 2, 2008.
  - Public scoping meetings to support the EIS were held on January 6, 2009, and an environmental site audit was completed on February 23, 2009.
  - The FEIS is scheduled for completion in January 2011.
  - The FSER is scheduled for completion in December 2011.
  - Phase 1 of the safety review, issuance of initial RAIs, is on schedule to be completed by November 2009.

- Revision 1 to the COLA is scheduled to be submitted to the NRC in November 2009. It should incorporate Luminant's RAI responses.

- River Bend COLA: On September 25, 2008, Entergy Operations, Inc. (EOI) submitted a COLA for an ESBWR to be located at EOI's River Bend Station site near St. Francisville, Louisiana.

  - On November 18, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on December 4, 2008.
  - By letter dated January 9, 2009, EOI requested the NRC to suspend, until further notice, the NRC staff's review of the docketed COLAs for the River Bend Station Unit 3 and the Grand Gulf Nuclear Station Unit 3.
  - This review remains suspended except for FEMA's emergency preparedness reviews, which are independent of any future selected reactor technology.

- Nine Mile Point COLA: On September 30, 2008, Nine Mile Point Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (UniStar) submitted a COLA for a US EPR (Unit 3) to be located at UniStar Nuclear Energy's Nine Mile Point site in Oswego, New York.

  - On August 21, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
  - The NRC completed its acceptance review on December 12, 2008.
  - On February 9, 2009, UniStar submitted a letter requesting that the NRC stagger the review of the Nine Mile Point Unit 3 (NMP3) COLA, relative to the current schedule of the Calvert Cliffs Unit 3 Reference COLA. UniStar requested that some review activities, such as those associated with the DHS audit, emergency preparedness (FEMA), the environmental scoping summary report, and the physical security plan, continue during the first half of 2009.
  - An environmental scoping meeting was conducted on June 10, 2009.
  - In a letter dated August 17, 2009, UniStar requested that the remaining portions of the review be sequenced so that the NRC staff technical reviews commence in September 2010.
  - The NRC's response to the applicant's letter dated August 17, 2009, was issued on September 28, 2009. The response letter communicates to the applicant the NRC's decision to suspend most review activities on the application until at least September 2010 and to continue with the limited-scope activities associated with (1) hydrologic engineering, specifically the Lake Ontario tsunami effect study by the U.S. Geological Survey and the Lake Ontario ice effect study by the U.S. Army Corps of Engineers (USACE) resulting in a technical report with adequate guidance for FSAR review; (2) environmental scoping, specifically delineation and binning of the comments received during the public scoping period, limited coordination with the New York State (NYS) Department of Environmental Conservation and USACE on joint permitting and NYS draft EIS activities, and limited maintenance of environmental files and records; and (3) emergency

planning, specifically FEMA review of State and local emergency planning information through completion of advanced SER input.

- Bell Bend COLA: On October 10, 2008, PPL Bell Bend, LLC submitted a COLA for a US EPR to be located at a new site adjacent to PPL's Susquehanna Steam Electric Station, Luzerne County, Pennsylvania.

    - On August 19, 2008, the NRC conducted a public outreach meeting to inform members of the public about the new reactor planned for the applicant's site, the COL process under the new 10 CFR Part 52 regulations, and when and how they can participate in the licensing process.
    - The NRC completed its acceptance review on December 19, 2008.
    - Public scoping meetings to support the EIS were held on January 29, 2009.
    - An environmental site audit was conducted on April 27, 2009.
    - The EIS scoping report was completed in August 2009.
    - The FEIS is scheduled to be completed by March 2011. However, site-related issues necessitate redesign to address stormwater management and availability of water resources as well as other potential design changes that can impact the schedule.
    - The FSER is scheduled to be completed by March 2012.
    - This SCOL is dependent on the Calvert Cliffs (RCOL) project's ability to meet its schedule.

- Turkey Point COLA: On June 30, 2009, Florida Power & Light Company (FPL) submitted a COLA for AP 1000 units to be located at the existing Turkey Point site, located in Miami-Dade County, Florida.

    - On March 26, 2009, NRC staff conducted a public outreach meeting to discuss FPL's planned COLA for the Turkey Point site, scheduled for submittal in June 2009. Participants discussed the details of a proposal to inject routine radioactive liquid releases into a geologic formation about 3,000 feet below the plant surface (deep well disposal).
    - The staff completed its acceptance review on September 4, 2009. The application was accepted for docketing, but NRC staff cannot develop the review schedules until the applicant provides additional information.
    - The staff has identified the following technical and environmental review areas that will affect the length of the review schedule: regional geology description, soil dynamic properties, use of generic curves for dynamic testing of soil, hydrology, and DCD changes requiring additional information.

<u>Applications Expected to be Submitted to the NRC:</u>

Based on letters from potential applicants that the NRC has received in the past, the following COLAs are expected to be submitted in the future:

- Southern Nuclear Operating Company (SNC) informed the NRC that it intends to submit a COLA for a green-field unnamed site in the late 2011 timeframe.

- Transition Power, LLC informed the NRC that it intends to submit a COLA or an ESP by 2010 for a COLA for two nuclear units. The two units will be part of the Blue Castle

Generation Project, to be located in east central Utah.

- The NRC received a proprietary letter indicating intentions to file a COLA with two new units in late FY 2010.

- The NRC received a proprietary letter indicating intentions to file a COLA with unspecified units in the 2010 to 2011 timeframe.

The NRC has not received any letters from potential applicants updating the NRC on application intentions during the period of this report.

The NRC received a letter dated October 2, 2009, from Southern Nuclear Operating Company with a new LWA request for Vogtle Electric Generating Plants, Units 3 and 4 COLA.

The following ESPs are expected to be submitted in the future:

- PSEG Power LLC informed the NRC that it intends to submit an ESP application during the second quarter of 2010.

- Transition Power Development LLC (Transition Power) informed the NRC that it intends to submit either an ESP application or COLA to the NRC by April 2010.

- By letter dated July 1, 2009, Exelon notified NRC staff that it will pursue an ESP rather than a COL for Victoria Station. Exelon stated that it plans to submit the application either late in the fourth quarter of calendar year 2009 or in the first quarter of calendar year 2010.

Regulatory Infrastructure

The NRC staff continues to perform activities to enhance the efficiency and effectiveness of the review processes for new reactor applications. These activities include updating key guidance documents for NRC activities and application preparation, developing strategies and work products for optimizing the review of applications received, developing a construction inspection program for new construction activities, and continuing activities in the preapplication and DC review processes.

Examples of recent infrastructure activities include the following:

- On June 12, 2009, a final rule regarding aircraft impact assessment (AIA) was published in the *Federal Register* (74 FR 28111), and it became effective on July 13, 2009. The rule requires applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The NRC staff has completed its review of an NEI guidance document related to the performance of the aircraft impact assessment (NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs") and issued DG-1176, "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impacts," for public comment on July 10, 2009. The comment period closed on September 8, 2009. The NRC staff is also developing application content guidance and NRC staff review guidance.

- The NRC staff continues to hold discussions with NEI and Design Center Working Groups on the development of guidance for mitigating strategies for the loss of large areas due to explosions or fires. The NRC staff has developed interim staff guidance (ISG) for NEI 06-12, which provides guidance to assist applicants and licensees in developing regulatory submittals that describe their approach to complying with 10 CFR 50.54(hh)(2) and 10 CFR 52.80(d). The ISG will be issued for comment in October 2009.

- The recent security rulemaking includes a new provision for cyber security. A draft of the associated guidance document was issued for public comment. A meeting on the associated draft regulatory guide was held on July 18, 2008. Between February 26 and March 5, 2009, NRC staff briefed the ACRS Digital Instrumentation and Controls (I&C) Subcommittee and full committee on draft Regulatory Guide (RG) RG-5.71, "Cyber Security Programs for Nuclear Facilities." The regulatory guide was developed in response to the new cyber security rule, 10 CFR 73.54. A meeting was held with stakeholders on March 5, 2009, to discuss the draft NEI 08-09, “Cyber Security Plan Template.” NRC staff provided comments on this draft to NEI in June 2009. Revision 3 of NEI 08-09 is under NRC review. The staff briefed the ACRS on the draft final RG-5.71 on October 23, 2009.

- NRC staff is working on the rulemaking for access authorization and physical protection requirements for nuclear power plant construction. This rulemaking would require the implementation of access authorization and physical protection measures during the reactor construction phase.

- The staff issued the DC rulemaking paper on January 30, 2009, which details the NRC staff’s streamlining effort for DC rulemakings. If the various identified improvements are implemented, the NRC staff believes that the DC rulemakings could be completed in about one year and could be timed to minimize possible delays in the COL licensing process. The NRC staff is currently implementing the identified improvements.

Cooperation between the NRC and the U.S. Army Corps of Engineers (USACE)

The NRC and USACE are actively engaged in the review of new reactor applications under an updated Memorandum of Understanding (MOU) on environmental reviews related to the issuance of authorizations to construct and operate nuclear power plants that was signed on September 12, 2008.

In most cases, new reactor applicants will need permits from the USACE under the Federal Water Pollution Control Act (Clean Water Act) and the Rivers and Harbors Act. The NRC and the USACE believe that cooperation provides the most effective and efficient use of Federal resources for environmental review of new reactor plant applications when an NRC license and a USACE permit will both be needed. Therefore, the goal is for the EIS to provide the environmental basis for the NRC’s license decision and USACE’s permit decision.

The USACE is a cooperating agency in developing the EIS for most of the new reactor applications, and representatives of both agencies are interacting collaboratively to implement the provisions of the MOU.

From June 2-3, 2009, NRC staff held a workshop with the USACE in Bethesda, Maryland, to further facilitate interactions between the agencies related to the MOU.

Construction Inspection Program Developments

The NRC continues to make significant progress in the development of programs and procedures to support construction inspection. Several milestones were achieved regarding the development of the construction inspection program, including the following:

- NRC staff prepared and issued for public comment a draft regulatory guidance document (DG-1204) to endorse the industry guidance document, NEI 08-01, for 10 CFR Part 52 applicants and licensees on requirements for the inspections, tests, analyses, and acceptance criteria (ITAAC) closure process. The draft regulatory guide was provided to the Commission in July 2009 for review. The NRC staff plans to issue this regulatory guide by the end of October. In addition, the NRC staff began drafting two information notices on welding and non-destructive examinations and pipe supports.

- The NRC staff submitted a Commission paper, "Update on the Development of Construction Assessment Process Policy Options and the Construction Inspection Program Information Management System" (SECY 09-0113), dated August 14, 2009, that provided an update on an interim construction assessment program and the NRC staff's commitment to provide policy options to the Commission by November 2010. Additionally, the NRC staff published a revised Enforcement Policy for public comment that included appropriate changes to support enforcement actions for new reactors licensed under 10 CFR Part 52.

- Other stakeholder interactions in FY 2009 included 12 public meetings in the Washington, D.C. area to work through implementation details associated with ITAAC closure, licensee assessment, enforcement, and other construction inspection program topics.

Advanced Reactors

The NRC established an Advanced Reactor Program (ARP) to plan for future applications involving small and medium-sized reactors (SMRs). The NRC is currently working with DOE to coordinate various research and pre-application activities related to the Next Generation Nuclear Plant (NGNP) program. In addition, the ARP is increasing its efforts in preparing for the review of small and medium-sized light-water reactors (LWRs). The NGNP program remains one of the primary focus areas of the ARP as the NRC develops the necessary infrastructure to license gas-cooled reactors consistent with the joint NRC/DOE NGNP licensing strategy. On September 18, 2009, DOE issued a financial offer of assistance related to developing conceptual designs for the NGNP.

Leveraging its efforts on the NGNP program, the NRC staff has begun to identify the generic policy and technical issues associated with the licensing of small and medium-sized LWRs. As resources allow, the staff is also interacting with various designers of SMR technologies.

The NRC staff continued to focus its pre-application review efforts on advanced reactor designs in a more integrated manner. Focusing the attention of the NRC staff on the NGNP program continues to enhance the effectiveness and efficiency of other advanced reactor activities by doing the following:

- Providing the information necessary to develop resource estimates for reviewing the designs for advanced reactors.
- Allowing the NRC technical review staff sufficient time to become familiar with advanced reactor design concepts.
- Providing feedback on key design, technology, safety research, and licensing issues.
- Identifying interrelated or cross-cutting regulatory safety issues and beginning to identify reasonable resolution paths for these issues.
- Identifying the technical skills necessary to review these designs and, as appropriate, hiring staff and identifying potential contractors who possess the requisite knowledge, skills, and abilities.

The NRC staff participated in several meetings with potential applicants for advanced reactor designs.

The NRC staff also met with various international organizations regarding technical and licensing issues associated with small and medium-sized reactors. In addition, from October 8-9, 2009, the NRC staff conducted a workshop on advanced reactor licensing. The workshop provided an overview of current SMR activities and focused on generic, licensing, and design-basis issues for these reactors.