POLICY ISSUE
INFORMATION

August 31, 2007 SECY-07-0152

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: SEMIANNUAL UPDATE OF THE STATUS OF NEW REACTOR LICENSING ACTIVITIES AND FUTURE PLANNING FOR NEW REACTORS

PURPOSE:

This paper informs the Commission of the staff's new reactor licensing activities and accomplishments since the issuance of SECY-07-0039, "Semiannual Update of the Status of New Reactor Licensing Activities and Future Planning for New Reactors," dated February 27, 2007. This paper does not address any new commitments or resource implications.

SUMMARY:

The paper provides an update of the licensing and future planning activities of the Office of New Reactors (NRO). This includes the status of the activities associated with design certification, early site permit, and combined license reviews. In addition, the staff provides the status of its regulatory infrastructure development, as well as rulemaking and international activities. The staff also addresses resource allocation with respect to anticipated new reactor work.

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BACKGROUND:

In SECY-01-0188, "Future Licensing and Inspection Readiness Assessment," dated October 12, 2001, the staff of the U.S. Nuclear Regulatory Commission (NRC) assessed its technical, licensing, and inspection capabilities and described enhancements to support new reactor licensing. The staff also committed to giving the Commission semiannual updates of the status of new reactor licensing activities.

DISCUSSION:

Office of New Reactors

The staffing of NRO has taken place in various phases. The various phases occurred in October and December 2006; and February, April, and July 2007. The final phase will occur in September 2007. NRO is currently staffed at approximately 75 percent. Management continues to aggressively recruit staff in preparation for the anticipated new reactor workload.

Economic Simplified Boiling-Water Reactor Design Certification

The staff is continuing with its review of the General Electric Company (GE) economic simplified boiling-water reactor (ESBWR) standard plant design. The NRC staff has met all three milestones to date, which entailed issuing requests for additional information (RAIs). In February 2007, GE proposed to the NRC staff an approach to facilitate RAI resolution to support a more efficient ESBWR design certification (DC) review process. Since then, GE has established and met more achievable milestones for RAI responses and other key deliverables, and significant progress has been made in reducing the number of unresolved RAIs. In June 2007, GE submitted its revised schedule for the ESBWR DC, which indicates that Design Control Document (DCD) Revision 4 will be submitted in September 2007, and DCD Revision 5 will be submitted in March 2008. The staff is developing a detailed schedule for completion of the ESBWR DC review.

Early Site Permit Activity

On March 8, 2007, the Commission issued its decision approving issuance of the Exelon Generation Company, LLC, Clinton Early Site Permit (ESP), and on March 15, 2007, ESP-001 was issued. On March 27, 2007, the Commission issued its decision approving issuance of the System Energy Resources Inc., Grand Gulf ESP, and on April 5, 2007, ESP-002 was issued.

In April 2007, the Atomic Safety and Licensing Board (ASLB) held a hearing regarding the North Anna ESP. On June 29, 2007, the ASLB issued its initial decision authorizing issuance of the North Anna ESP. On August 2, 2007, the Commission issued Order CLI-07-23 inviting the staff and Dominion to address the questions raised in the ASLB's initial decision (LBP-07-09), the issues raised by the dissenting judge, and any other issues that the parties believed warranted comment.

In August 2006, the staff received the Vogtle ESP application, and in September 2006, the staff completed its acceptance review. The staff is preparing both the safety evaluation report with

open items and the draft environmental impact statement, which are scheduled to be issued later this summer.

Combined License Activity

On July 13, 2007, UniStar Nuclear and Constellation Generation Group submitted Part 1 of their application for a combined license (COL) for a U.S. Evolutionary Power Reactor to be designated as Calvert Cliffs Power Plant, Unit 3. Unistar/Constellation supplemented the application on July 16 and August 2, 2007. On August 23, 2007, the staff notified Unistar Nuclear of the status of the acceptance review of Calvert Cliffs Nuclear Power Plant, Unit 3, partial COL application. The staff identified several areas that have not yet been sufficiently addressed in the application. The staff requested Unistar's plan for submitting additional information to address the issues. The staff will resume its acceptance review upon receipt of the additional information.

Advanced Non-Light-Water Reactor Activities

The Office of Nuclear Regulatory Research (RES) continues to engage in activities related to advanced reactor designs (i.e., non-light-water-reactor (non-LWR) designs). These include the U.S. Department of Energy (DOE) Next Generation Nuclear Plant (NGNP) project, the pebble bed modular reactor (PBMR) preapplication review, and high-temperature gas-cooled reactor knowledge management.

Pebble Bed Modular Reactor Company, Ltd. (PBMR (Pty) Ltd.), continues to interact with the staff in preapplication review activities. Currently, this involves the technical review of a set of four high-level documents that enable the staff to develop an understanding of the PBMR safety case on which a DC application will be based. PBMR (Pty) Ltd. has indicated a desire to submit as many as 15 additional such documents during the preapplication period. The staff is preparing a memorandum informing the Commission of the staff plan and course of action related to the additional submittals expected.

Global Nuclear Energy Partnership

The Office of Nuclear Materials Safety and Safeguards has been working with NRO, RES, and other supporting offices to review DOE plans for the Global Nuclear Energy Partnership (GNEP) program, identify potential technologies, and develop a regulatory framework for these activities. The current DOE GNEP planning for a closed nuclear fuel cycle would include spent fuel reprocessing, fuel fabrication, and a sodium-cooled advanced burner reactor (ABR), as well as advanced fuel separation facilities. The fuel reprocessing and fabrication facilities and ABR would be regulated by the NRC. As directed in Staff Requirements Memorandum (SRM) SECY-07-0081, "Regulatory Options for Licensing Facilities Associated with the Global Nuclear Energy Partnership (GNEP)," dated June 28, 2007, NRO and RES will lead the ABR licensing framework development and the ABR gap analysis.

Regulatory Infrastructure Development

The staff continues to perform activities to ensure that it is prepared to review new applications. These activities include finalizing a COL application regulatory guide (Regulatory Guide 1.206,

"Combined License Applications for Nuclear Power Plants (LWR Edition)," issued June 2007); updating NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," issued March 2007, and associated regulatory guides; developing strategies for optimizing the review of the applications to be received; developing a construction inspection program (CIP) framework and subsequent inspection program for new construction activities; and continuing activities in the preapplication and DC review processes.

Construction Inspection Program

NRO has been developing the necessary programs and procedures to address the inspection of anticipated new nuclear power plant construction. The Division of Construction Inspection & Operational Programs, working with Region II, continued the development of the inspections, tests, analyses, and acceptance criteria program, updated field procedures for staff inspectors, continued the development of a database program for construction-based information management, and initiated the development of assessment and enforcement processes. The first annual review of the CIP indicated no adverse impact in 2006 on the oversight of operating facilities. The staff will annually assess the program's impact to existing reactor oversight as the CIP grows proportionately to the industry's expansion.

Rulemaking

On April 11, 2007, the Commission voted to approve the publication and implementation of the final rule amending Title 10, Part 52, of the *Code of Federal Regulations* (10 CFR Part 52), subject to changes and comments noted by the Commission in SRM M070411, "Staff Requirements—Briefing on Draft Final Rule—Part 52 (Early Site Permits/Standard Design Certifications/Combined Licenses)," dated April 11, 2007. The new 10 CFR Part 52 will be named "Licenses, Certifications, and Approvals for Nuclear Power Plants."
On August 28, 2007, the 10 CFR Part 52 final rule was published in the *Federal Register* (72 FR 49352). The rule becomes effective 30 days following its publication.

On April 17, 2007, the Commission voted to approve the publication and implementation of the final rule amending 10 CFR Part 2, "Rules of Practice for Domestic Licensing Procedures and Issuance of Orders," and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to revise requirements for limited work authorizations (LWAs) and site preparation activities (ADAMS Accession No. ML071070361). The LWA final rule was submitted for approval by the Office of Management and Budget on August 30, 2007. The Commission also directed the staff to work with external stakeholders to develop and publish the necessary implementation guidance for the LWA rule. NRO is preparing guidance for the LWA rule.

The NRC staff is preparing a proposed rulemaking on aircraft impact assessments following the SRM for SECY-06-0225, "Assessment of Aircraft Impacts on New Reactor Designs," dated May 1, 2007, directing the staff to incorporate the requirement into 10 CFR Part 52. The proposed rule is expected to be published for public comment in mid-September 2007. The SRM also directed the staff to share sensitive information related to aircraft impact with new plant designers. Orders requiring vendors to establish programs for control of Safeguards Information will be issued by August 30, 2007. It is expected that all vendors will be supplied the aircraft impact characteristics by mid-September 2007.

Multinational Design Evaluation Program

The NRC staff continues to participate in Multinational Design Evaluation Program (MDEP) Stage 1 and 2 activities, with the goal of leveraging the experience of the agency's foreign counterparts in the review of new reactor designs. As part of MDEP Stage 1, the NRC staff continues to meet with the French nuclear safety authority and the Finnish radiation and nuclear safety authority (STUK). In addition, NRC and STUK staff are continuing to cooperate on the review of the Olkiluoto 3 main control room design.

For MDEP Stage 2, the 10 participating countries continue their work on a year-long pilot effort to analyze the feasibility of enhancing regulatory cooperation and, where feasible and desirable, converging on common regulatory requirements and regulatory review practices associated with the design reviews of new reactors.

Contracting Strategy to Support New Reactor Licensing

The Contract Planning and Management Branch continues to implement the contracting strategy outlined in SECY-07-0009, "Procurement Strategy for Contracts and DOE Laboratory Technical Assistance Activities Supporting Combined License Applications," dated January 11, 2007. The staff should have all commercial contracts and DOE laboratory and other interagency agreements in place by the middle of September 2007.

Approach to Resource Allocation

As of July 2007, the staff is aware of at least 20 potential COL applications to be submitted in Fiscal Year (FY) 2007 through FY 2009. Table 2 of the enclosure lists the anticipated activities for FY 2007 through FY 2009 based on the formal correspondence of prospective applicants. Based on the current FY 2008 budget approach, the staff would begin review of up to 15 COL applications received in FY 2008. Based on current FY 2009 budget projections, the staff would start work on the first FY 2009 application when it is received. Work on the remaining submittals could be delayed depending on resource availability. The staff would prioritize any additional COL submittals.

Security and Emergency Planning

In 2006, the Division of Preparedness and Response in the Office of Nuclear Security and Incident Response (NSIR) established New Reactor Licensing Teams. The creation of the teams has increased the focus on key activities. NSIR has been coordinating with the Department of Homeland Security (DHS) to clarify its role in the security and emergency preparedness areas. Effective April 2007, the management of the Radiological Emergency Preparedness Program transferred to the Technological Hazards Division within the National Preparedness Directorate under the Federal Emergency Management Agency (FEMA). The NRC staff continues to work with appropriate contacts at DHS and FEMA to ensure continuity of activities.

Potential Policy Issues

Staff requirements for COMGBJ-06-0001, "Establishing a Policy for the Review of New Power Reactor Combined Licenses," dated April 14, 2006, directed the staff to address policy issues related to new reactor applications in this paper. At this time, the staff has not identified any potential policy issues related to current LWRs under review. For non-LWRs and other advanced reactors, the staff is working to identify policy issues through the development of the NGNP licensing strategy, the preapplication review of the PBMR, and the GNEP regulatory framework reviews. The staff will inform the Commission of non-LWR policy issues as these projects progress.

CONCLUSIONS:

The staff continues to focus on reviewing applications for DCs and ESPs and on preparing for the review of multiple COL applications. The NRC staff continues its interactions with stakeholders to ensure openness in these activities and that any future planning reflects the most recent industry plans and schedules.

COORDINATION:

The Office of the General Counsel (OGC) has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

/RA/

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for Operations

Enclosure:
Background Material to
Support the Semiannual
Update

Background Material to Support the Semiannual Update

INTRODUCTION

This enclosure to the August 2007 update of the status of new reactor licensing activities provides a history and current status of the Advanced Plant 1000 (AP1000), Advanced Boiling-Water Reactor (ABWR), and the Economic Simplified Boiling-Water Reactor (ESBWR) design certification (DC) reviews, the combined license (COL) application interactions, the early site permit (ESP) reviews, pre-application activities for other reactor plant designs, regulatory infrastructure development, technical development activities, and stakeholder interactions.

The staff requirements memorandum for SECY-05-0203, "Revised Proposed Rule to Update 10 CFR Part 52, 'Licenses, Certifications, and Approvals for Nuclear Power Plants,'" dated January 30, 2006, directed the staff to provide resource and organization plans for the next 4 years and proposed strategies for staff review of expected applications and support for COL hearings before the Atomic Safety and Licensing Board (ASLB) (WITS 200600063).

The staff requirements memorandum for COMGBJ-06-001, "Establishing a Policy for the Review of New Power Reactor Combined Licenses," dated April 14, 2006, directed the staff to provide an update on activities related to the design-centered review approach (DCRA) for COL applications in the next semiannual update on new reactor licensing. The Commission also directed the staff to inform it of any impediments to using the DCRA. Additionally, the Commission directed the staff to continue to use the planning, budgeting, and performance management process for new reactor licensing activities and to address policy issues related to new reactor applications.

The staff requirements memorandum for SECY-06-0071, "Chairman Review Thresholds for Contractual Decisions," dated April 18, 2006, directed the staff to provide the Commission with a status report on the plans for contracting work in new reactor licensing and other new work areas. On January 11, 2007, the staff provided to the Commission an "Official Use Only" SECY-07-0009, "Procurement Strategy for Contracts and [Department of Energy] DOE Laboratory Technical Assistance Activities Supporting Combined License Applications."

A June 27, 2006, memorandum from then U.S. Nuclear Regulatory Commission (NRC) Chairman Nils J. Diaz to Luis A. Reyes, Executive Director for Operations (EDO), and Graham Wallis, Chairman of the Advisory Committee on Reactor Safeguards (ACRS), requested that the staff provide the Commission with a status report on its interactions with stakeholders and on completing the master integrated schedule for new reactor licensing (WITS 200600279 and WITS 200600306).

The staff requirements memorandum for SECY-06-0244, "Final Rulemaking—10 CFR Part 26 —Fitness for Duty Programs," dated April 17, 2007, provided Commission approval of the final rule, which amends Title 10, Part 26, "Fitness for Duty Programs," of the *Code of Federal Regulations* (10 CFR Part 26) governing the domestic licensing of production and

utilization facilities to revise, reorganize, and clarify drug alcohol testing and other programs, subject to changes provided. The Commission directed the staff to continue engaging the industry and other stakeholders to complete the associated regulatory guidance for this rule and ensure that it addressed the broad range of questions of interpretation and implementation. The staff requirements memorandum for SECY-07-0030, "Final Rulemaking on Limited Work Authorizations," dated April 17, 2007, provided Commission approval of a final rule that amends 10 CFR Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to revise the requirements for limited work authorizations (LWA) and preparation activities at the prospective site of a nuclear power plant. The Commission directed the staff to publish the necessary implementation guidance for the final rule on LWAs with the external stakeholders per comments in the staff requirements memorandum (SRM). It also directed the staff to keep the Commission informed of progress in implementing the new LWA process and forward to the Commission any substantive policy or implementation questions for resolution (WITS 200700144 and 200700145).

The staff requirements memorandum for SECY-07-0184, "Briefing on New Reactor Issues—Environmental Issues," dated April 27, 2007, directed the staff to recommend generic resolutions for emerging policy issues or proposed rulemaking that the Commission might initiate to add efficiency and effectiveness to the process for conducting environmental reviews for ESP and COL applications (WITS 200700189).

The staff requirements memorandum for COMDEK-07-001/COMJSM-07-001, "Report of the Combined License Review Task Force," dated April 27, 2007, directed the staff to conduct a public meeting with industry representatives and other stakeholders to give the stakeholders an opportunity to present their views on how to enhance the efficiency and effectiveness of the environmental review process (WITS 200700205).

The staff requirements memorandum for SECY-06-0225, "Proposed Rulemaking—Security Assessments Requirements for New Nuclear Power Reactor Designs," dated May 1, 2007, directed the staff to provide information based on the beyond-design-basis aircraft characteristics specified by the Commission to plant designers or other stakeholders who have the need to know, and who meet the NRC's requirements for disclosure of such information per the SRM. In addition, if it is determined that designers need secret information, the staff is directed to brief the Commission Technical Assistants on its plan for designers to store and generate secret information (WITS 200700154 and 200700155).

The staff requirements memorandum for SECY-07-0076, "Proposed Plan for Cooperation with China on the AP1000," dated May 15, 2007, directed the staff to provide technical assistance, training, and NRC safety codes, pending Executive Branch approval in accordance with the NRC and Chinese National Nuclear Safety Administration Memorandum of Cooperation.

The staff requirements memorandum for SECY-07-0047, "Staff Approach to Verifying the Closure of Inspections, Tests, Analyses, and Acceptance Criteria Through a Sample-Based Inspection Program," dated May 16, 2007, directed the staff to continue to engage industry and interest group stakeholders to obtain views on the construction inspection program (CIP) using a public meeting approach similar to what was done during the development of the Reactor Oversight Process.

The staff requirements memorandum for COMDEK-07-0001/COMJSM-07-0001, "Report of the Combined License Review Task Force," dated June 22, 2007, directed the staff to conduct a public meeting with external stakeholders to roll out its COL review approach and to provide an overview of the New Reactor Licensing Program Plan (LPP) before implementation of the recommendations of the COL Review Task Force.

The staff requirements memorandum for SECY-07-0081, "Regulatory Options for Licensing Facilities Associated with the Global Nuclear Energy Partnership (GNEP)," dated June 28, 2007, directed the staff to provide the Commission with supplemental information that discusses how the regulatory framework and gap analysis will be performed and coordinated among the NRC organizations.

The staff requirements memorandum - M070718B, "Briefing on Digital Instrumentation and Control," dated August 3, 2007, the Commission directed the staff to proceed with the timely implementation of the NRC's Digital Instrumentation and Control Project Plan and the issuance of interim guidance, recognizing that the staff will continue to work with the stakeholders to refine the guidance, to address the existing issues within each of the task working groups (TWGs), and to risk-inform the regulatory framework for digital instrumentation and control (I&C).

DESIGN CERTIFICATION

Advanced Plant 1000

The AP1000 is a 3400-megawatt thermal (MWt) (approximately 1117-megawatt electric (MWe)) standardized nuclear power plant design. This design makes extensive use of passive design features to provide postaccident core and containment cooling. On March 28, 2002, Westinghouse Electric Company, LLC (Westinghouse) submitted its application for final design approval (FDA) and standard DC for the AP1000 design. The NRC staff issued the final safety evaluation report (FSER) and the FDA on September 13, 2004. The proposed design certification rule (DCR) was published in the *Federal Register* on April 18, 2005 (70 FR 20062). Subsequently, Westinghouse submitted changes to the AP1000 design information in Revision 15 to the design control document (DCD). The NRC staff evaluated these changes in a supplement to the FSER (Supplement 1 to NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," issued in September 2004). The EDO transmitted the final rule to the Commission on December 14, 2005 (SECY-05-0227, "Final Rule-AP1000 Design Certification"). On December 30, 2005, the Commission voted to approve the final DCR for the AP1000 standard plant design, and the Secretary of the Commission signed the final rule on January 23, 2006, after approval of the information collection requirements by the Office of Management and Budget (OMB).

On January 27, 2006, the NRC issued the AP1000 final DCR in the *Federal Register* (71 FR 4464) as Appendix D, "Design Certification Rule for the AP1000 Design," to 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants." Applicants or licensees intending to construct and operate an AP1000 design may do so by referencing the AP1000 DCR. On March 10, 2006, the NRC issued a revised FDA based on Revision 15 of the Westinghouse DCD.

In a joint letter dated March 8, 2006, NuStart Energy Development, LLC (NuStart), and Westinghouse stated that they would be submitting the AP1000 technical reports to the NRC for review during the pre-application phase for the Bellefonte COL application. These reports will provide the following:

- information needed to close all or part of specific generically applicable COL items in the AP1000 certified standard design
- standard design changes that are a result of the AP1000 detailed design efforts
- specific standard design information in areas or for topics where the AP1000 DCD focused on design process/methodology and design acceptance criteria (DAC)
- deferral of COL information items to as-built requirements (e.g., inspections, tests, analyses, and acceptance criteria (ITAAC))

Most of the technical reports are related to the closing or partial closing of the AP1000 DCD COL information items; however, the largest review effort will center on the expected design changes. The design changes include a redesign of the pressurizer, a revision to the seismic analysis to allow an AP1000 to be constructed on a site with rock and soil conditions other than the hard rock conditions certified in the AP1000 DCR, changes to the I&C systems, a redesign of the fuel racks, and a revision of the reactor fuel design. Another area requiring large resources will be the review of DAC-related items, such as the technical reports on human factors engineering (HFE), the I&C design, and piping. Additionally, Westinghouse submitted one report covering numerous COL information items that can be completed only after the plant is built. Westinghouse proposes to convert these items to either ITAAC, license conditions, or license commitments.

By letter dated May 26, 2007, Westinghouse submitted an application to amend the AP1000 DCR and also submitted Revision 16 to the AP1000 DCD. Revision 16 contains changes proposed in technical reports, some of which have not been reviewed by the NRC staff. The May 26, 2007, application noted that the submittal was being made in advance of the effective date of the 10 CFR Part 52 rule provisions that establish the DC amendment process within the regulations. The letter requested that the NRC establish a schedule for acceptance of the application. The staff is currently evaluating the submittal to determine an appropriate scheduled for review.

As of July 3, 2007, Westinghouse had submitted 104 technical reports for staff review. Although submitted as part of the Bellefonte COL pre-application phase, these technical reports apply generically to the remaining COL applications that intend to reference the AP1000 design. The staff has held several meetings with Westinghouse and has performed audits of documentation related to leak-before-break analyses, I&C, HFE, and seismic analyses.

Advanced Boiling-Water Reactor

The ABWR is a 3926-MWt (approximately 1350-MWe) Generation III reactor design. This design is the first of the next generation of advanced light-water reactor (LWR) plants to be committed to construction. The ABWR design was certified in Appendix A, “Design Certification

Rule for the U.S. Advanced Boiling Water Reactor," to 10 CFR Part 52 in May 1997. In December 2006, General Electric Company (GE) began submitting a series of topical reports in advance of the COL application. These reports address generic changes to the certified design.

Economic Simplified Boiling-Water Reactor

The ESBWR is a 4500-MWt (approximately 1550-MWe) reactor design that uses natural circulation for normal operation and has passive safety features. On August 24, 2005, GE submitted an application for FDA and standard DC of the ESBWR standard plant design. By letter dated December 1, 2005, the NRC staff informed GE that the application, as revised and supplemented, was sufficiently complete to allow the staff to proceed with its detailed technical review.

The NRC staff established the date of October 11, 2006, for issuing its requests for additional information (RAIs). Because of revised schedules for GE deliverables, the NRC staff established, by letter dated August 9, 2006, an additional RAI milestone of December 11, 2006, for areas impacted by delays in submittals. When the schedule for GE deliverables and proposed changes to the design and the DCD changed again, the staff established a third milestone for issuance of RAIs on January 31, 2007, by letter dated October 5, 2006. The staff met these milestones.

In a letter dated February 2, 2007, GE proposed to the NRC staff an approach to facilitate RAI resolution to support an efficient ESBWR DC review process. Since then, timeliness of GE deliverables has improved and significant progress has been made in reducing the number of unresolved RAIs. Nonetheless, much work remains for completion of the ESBWR design review, and several of the remaining GE deliverables will require significant staff effort to complete.

On June 1, 2007, GE submitted its schedule for submitting major deliverables to support the ESBWR DC. The revised schedule indicated that DCD Revision 4 will be submitted by September 28, 2007, and DCD Revision 5 will be submitted by March 31, 2008. GE also provided the schedule for new topical reports, revised topical reports, and the remaining sections of Revision 2 of the probabilistic risk assessment (PRA). The staff is developing a schedule for future review milestones including issuance of the final SER, based on the information that has been submitted by GE to date. The schedule for new topical reports, and any impact on the overall schedule for the design certification, will be established after the topical reports are submitted and the associated acceptance reviews have been completed.

COMBINED LICENSE APPLICATION

On July 13, 2007, UniStar Nuclear and Constellation Generation Group submitted Part 1 of their application for a COL for a U.S. Evolutionary Power Reactor (U.S. EPR) to be designated as Calvert Cliffs Power Plant, Unit 3. UniStar/Constellation supplemented the application on July 16 and August 2, 2007. The staff is conducting its acceptance review of the partial application. On August 23, 2007, the staff issued a letter to Unistar stating that the detailed design information necessary to meet the requirements for the initial submittal is not complete. The staff requested that additional information be submitted so that the staff can complete its acceptance review.

COMBINED LICENSE PRE-APPLICATIONS

The number of expected COL applications for the period of Fiscal Year (FY) 2007 to FY 2009 is currently 20, and several of these applications will be for dual-unit sites.

On March 9, 2007, and April 9, 2007, TXU Power submitted letters notifying the NRC that it had chosen the US-Advanced Pressurized-Water Reactor (US-APWR) design and that it plans to construct the proposed two new units at the Comanche Peak Steam Electric Station site. TXU Power previously indicated that it was exploring additional sites for more units. However, in its April 9, 2007, letter, TXU Power indicated that currently it is not pursuing additional construction at other sites.

On March 15, 2007, Amarillo Power, LLC, submitted a letter notifying the NRC that it had changed its choice of reactor technology (previously listed as ABWR) to the U.S. EPR design for both units at an unannounced site in the vicinity of Amarillo, Texas. In addition, Amarillo Power, LLC, indicated that it plans to forego an ESP and proceed directly to a COL application and submit its application in the last quarter of 2008.

On April 5 and June 1, 2007, AmerenUE submitted letters notifying the NRC that it had entered into an agreement with UniStar Nuclear, LLC, to assist with the development of a COL application for a single unit to be submitted to the NRC in the third quarter of 2008. In addition, AmerenUE notified the staff that it had chosen the AREVA NP (AREVA) EPR design. In its letter dated June 1, 2007, AmerenUE indicated that it had selected the Callaway site as the basis for submitting its COL application.

On June 13, 2007, PPL Generation, LLC, submitted a letter notifying the NRC that it had publically announced its intent to submit a COL application for a new nuclear unit at the current Susquehanna Steam Electric Station site.

On July 23, 2007, Alternate Energy Holdings, Inc. (AEHI), submitted a letter notifying the NRC of its intent to submit a COL application in the fourth quarter of 2008 for a single unit to be located in Bruneau, Idaho. AEHI notified the staff that it had chosen the U.S. EPR design.

On August 8 and 9, 2007, Dominion Energy, Inc., and Entergy/NuStart Energy, respectively, submitted letters notifying the NRC that the ESBWR Design-Centered Working Group (DCWG) has selected North Anna as the reference combined license (R-COL) applicant for the ESBWR design. The Dominion letter also stated that the North Anna R-COL application will be submitted in November 2007, and the Entergy/NuStart Energy letter identified a revised date of February 2008 for when it intends to submit its application for the Grand Gulf site.

NRG Energy is planning to submit a COL application for two ABWR units in fall 2007 at the South Texas Project site.

Since February 2007, the NRC staff has completed three additional pre-COL visits at potential sites (Levy County, River Bend, and Callaway) to observe pre-COL subsurface investigation (e.g., soil suitability, hydrology) activities. Interactions with each applicant's experts provided a forum for discussing a potential site's geological attributes and the applicant's site exploration program and observing different geophysical and geotechnical investigations.

NRC staff conducted readiness assessment visits at the potential sites of six future COL applicants (V.C. Summer, Bellefonte, Shearon Harris, Lee, Calvert Cliffs, and South Texas Project) in order to become familiar with the proposed sites and to begin establishing working relationships with the applicants and local agencies. Topics discussed during the visits included hydrology, meteorology, ecology, radiation protection, socioeconomics, energy alternatives, and alternative sites. The staff conducted followup visits with the applicants for these sites and the North Anna site to assess the state of readiness of the applicants' draft environmental reports (ERs). A combination of headquarters and NRC-contractor technical experts, managers, and project managers conducted these activities. The readiness assessment is a voluntary predecisional interaction between the NRC staff and prospective applicants intended to aid the staff in allocating the resources necessary to conduct its environmental review.

NRC staff conducted public outreach meetings at the South Texas Project and Calvert Cliffs sites. The purpose of these meetings was to inform members of the public of the new reactors planned for the sites, inform them about the COL process under the new 10 CFR Part 52 regulations, and let them know when and how they can participate during the licensing process.

Design-Centered Review Approach

The industry has generally embraced the DCRA described in NRC Regulatory Issue Summary (RIS)-06-006, "New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach," dated May 31, 2006. This support has been demonstrated by the active participation of industry preapplicants in DCWG meetings with the NRC that offer a forum for communication of important issues. The NRC has held DCWG meetings associated with the AP1000 and ESBWR design centers, at approximately 6-week intervals, since July 2006. Meeting topics have included a spectrum of COL-related topics such as RIS-06-06 response; key COL applicant and NRC staff challenges; pre-application interaction site visits; pre-application topical reports; development of emergency action levels for passive new reactor designs; environmental review activities; COL application content and format; Technical Support Center location; responses to RIS-07-08, "Updated Licensing Submittal Information to Support the Design-Centered Licensing Review Approach," dated April 16, 2007; and the NRC's COL application acceptance review process. Representatives from other DCWGs participate in AP1000/ESBWR meetings.

The staff expects to continue these public meetings with the AP1000 and ESBWR DCWGs and to support similar meetings with other design centers when requested. In addition to the DCWG meetings, the staff has conducted several public workshops on topics related to industry's development of COL applications (e.g., content and format of sample chapters of the final safety analysis report, ITAAC, and PRA) to identify insights that could be used by applicants to improve their applications. In their respective responses to RIS-07-08, the potential applicants reinforced their commitment to the DCRA and their participation in DCWGs.

Another indication that the industry is committed to a design-centered strategy is the involvement of the Nuclear Energy Institute (NEI) in the development and submission of topical reports to support pre-application staff review activities. For example, NEI has submitted for staff review the templates for an industry quality assurance (QA) program document, an industry training program, and an industry radiation protection program and has committed to submit a

template for radioactive waste programs. The expectation is that multiple COL applicants will reference these topical reports, if approved by the NRC, thus offering an efficiency in the use of staff review resources.

Table 1 lists the COL applications anticipated based on correspondence received from potential applicants.

Table 1 Potential COL Applications Based on Letters of Intent

Applicant	(Units)	Designs under Consideration	Pre-application	COL Application
Dominion (North Anna Site)	1	ESBWR	FY 2006–2008	FY 2008–2011
South Carolina Electric and Gas* (Summer)	2	AP1000	FY 2006–2008	FY 2008–2011
NuStart App 1* (Bellefonte Site)	2	AP1000	FY 2007–2008	FY 2008–2011
NuStart App 2 (Grand Gulf Site)	1	ESBWR	FY 2007–2008	FY 2008–2011
Progress Energy App 1* (Harris)	2	AP1000	FY 2007–2008	FY 2008–2011
Progress Energy App 2* (Florida)	2	AP1000	FY 2007–2008	FY 2008–2011
Duke Energy* (Lee)	2	AP1000	FY 2007–2008	FY 2008–2011
Entergy* (River Bend Site)	1	ESBWR	FY 2006–2007	FY 2008–2011
Southern Nuclear (Vogtle Site)	2	AP1000	FY 2006–2007	FY 2008–2011
UniStar App 1* (Calvert Cliffs)	1	U.S. EPR	FY 2007	FY 2007 Part 1 FY 2008 Part 2
Amarillo Power* (Site TBD)	2	U.S. EPR	FY 2007–2008	FY 2009–2011
NRG Energy * (South Texas Project)	2	ABWR	FY 2007–2008	FY 2008–2011

Applicant	(Units)	Designs under Consideration	Pre-application	COL Application
UniStar App 2* (Nine Mile Point)	1	U.S. EPR	FY 2007–2008	FY 2008–2011
Florida Power and Light * (Site TBD)	1	TBD	FY 2007–2008	FY 2009–2012
TXU Power* (Comanche Peak)	2	US-APWR	FY 2007–2009	FY 2008–2011
Exelon* (Texas)	1	TBD	FY 2007–2009	FY 2009–2010
DTE* (Fermi)	1	TBD	FY 2007–2009	FY 2009–2011
AmerenUE* (Callaway)	1	U.S. EPR	FY 2007–2008	FY 2008–2011
PPL Generation* (Susquehanna)	1	U.S. EPR	FY 2007–2008	FY 2009–2011
Alternate Energy Holdings, Inc., and UniStar* (Bruneau, Idaho)	1	U.S. EPR	FY 2008–2009	FY 2009–2011

* COL Application not referencing an ESP

APPROACH TO RESOURCE ALLOCATION

Since the last update, additional information has been received concerning the number of expected COL applications for the period FY 2007 through FY 2009 and the total is currently at 20; several of these applications will be for dual-unit sites. Table 2 lists the anticipated activities for FY 2007 through FY 2009 based on current budget assumptions.

The transition plan for staffing the Office of New Reactors (NRO) considers all expected new reactor licensing applications, including COL applications, design certification applications (DCAs), currently ongoing ESP application reviews, expected ESP application reviews, topical/technical report reviews, and regulatory infrastructure work (such as development of NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,” issued March 2007 (hereafter referred to as the SRP)). Initial staffing levels (January 2007) were set to support known case work (ESBWR DC and ongoing ESP reviews) as well as infrastructure activities. The office growth rates, selected to provide a smooth transition to FY 2008 staffing levels, are slightly skewed toward the first half of FY 2007 to ensure that adequate resources will be on board, trained, and available to support new reactor licensing reviews when needed in early FY 2008. The staff is maintaining some flexibility in the plan so that it can make adjustments as it gains experience in performing new reactor licensing reviews.

Table 2 FY 2007–FY 2009 New Reactor Licensing Anticipated Activities

FY 2007	FY 2008	FY 2009
Complete Grand Gulf, Clinton	North Anna ESP	
Continue Southern (Vogtle) ESP	Continue Southern ESP	Complete Southern ESP
DC pre-application activities for U.S. EPR, pebble bed modular reactor (PBMR), and US US-APWR	DC pre-application activities for U.S. EPR, PBMR, and US-APWR	DC pre-application activities for PBMR
Continue ESBWR DC	Continue ESBWR DC	Continue ESBWR DC
	Start U.S. EPR DC	Continue U.S. EPR DC
	Start AP1000 DC amendment	Continue AP1000 DC amendment
	Start US-APWR DC	Continue US-APWR DC
Pre-application activities for potential COL applicants	Pre-application activities for potential COL applicants	
	Start South Carolina Electric and Gas (Summer) COL	Continue South Carolina Electric and Gas COL
	Start Dominion (North Anna) COL	Continue Dominion COL
Start UniStar (Calvert Cliffs) COL	Continue UniStar (Calvert Cliffs) COL	Continue UniStar COL
	Start Duke (Lee) COL	Continue Duke COL
	Start NuStart 1 (Bellefonte) COL	Continue NuStart 1 COL
	Start NuStart 2 (Grand Gulf) COL	Continue NuStart 2 COL
	Start Southern (Vogtle) COL	Continue Southern COL
	Start UniStar (Nine Mile Point) COL	Continue UniStar COL
	Start NRG Energy (South Texas) COL	Continue NRG Energy COL
	Start Progress Energy (Harris) COL	Continue Progress Energy COL
	Start Progress Energy (Florida) COL	Continue Progress Energy COL
	Start Entergy (River Bend) COL	Continue Entergy COL
	Start TXU Power (Comanche Peak) COL	Continue TXU Power COL
	Start AmerenUE (Calvert Cliffs) COL	Continue AmerenUE COL
		Start PPL Gen. (Susquehanna) COL
		Start Amarillo Power COL
		Start Florida Power and Light COL*
		Start Exelon (Texas) COL*
		Start DTE (Fermi) COL*
		Start AEHI (Idaho) COL*
Regulatory infrastructure development and technical development	Regulatory infrastructure development and technical development	Regulatory infrastructure maintenance and technical development
Continue Next Generation Nuclear Plant (NGNP) interactions with the U.S. Department of Energy (DOE)	Submit joint NGNP licensing strategy to Congress	Continue NGNP interactions with DOE

* Resources to support these reviews are being considered through the Agency's FY 2009 budget process.

RESOURCES

As of July 8, 2007, NRO has approximately 325 staff on board, with about 55 additional people in the hiring pipeline or pending transfer from other offices, for a total of approximately 380 staff.

This includes most of the FY 2008 complement of supervisory and management support staff who are necessary to build the office infrastructure and hire and train the technical staff. Based on current budget estimates, NRO expects to utilize 483 full-time equivalents (FTEs) in FY 2008 and have 469 FTEs available in FY 2009. NRO has developed a qualification program and is in the process of qualifying the staff currently on board. NRO and the Office of Human Resources (HR) continue to work to rapidly fill the remaining NRO vacancies. A realignment of HR teams in late July 2007 provided a dedicated team of personnel specialists to NRO and is anticipated to greatly increase the pace of NRO hiring.

There are currently a number of vacancies in the areas of electronics (I&C) engineers, structural engineers, electrical engineers, and project managers for both safety and environmental reviews.

MULTINATIONAL DESIGN EVALUATION PROGRAM

This multinational initiative name was changed from the Multinational Design Approval Program to the Multinational Design Evaluation Program (MDEP) by consensus of the 10 countries (the United Kingdom, France, Finland, China, South Korea, Japan, South Africa, Russia, Canada, and United States) participating in Stage 2 activities. The Chairman signed the Terms of Reference (TOR) on September 22, 2006. Since the issuance of SECY-06-0187, "Semiannual Update of the Status of New Reactor Licensing Activities and Future Planning for New Reactors," dated August 25, 2006, the NRC staff has continued to make progress in implementing Stages 1 and 2 of the MDEP.

Multinational Design Evaluation Program Stage 1 Developments

The NRC staff continues to participate in MDEP Stage 1 activities, with the goal of leveraging the experience of the agency's foreign counterparts in the review of new reactor designs. Since the last semiannual update and as part of MDEP Stage 1, the NRC staff participated in the March 22 and 23, 2007, meetings with the French and Finnish regulatory authorities, ASN and STUK, respectively. In addition, NRC and STUK staff are continuing to cooperate on the review of the Olkiluoto 3 (OL3) main control room design. (STUK sent additional design information to the NRC in this area via email on June 7, 2007. The NRC staff is developing a plan and schedule to provide feedback to STUK on this information.)

At the March meetings in Paris, NRC staff exchanged information with counterparts on the status of the reviews of the EPR designs in each country, including OL3, which is under construction in Finland; Flamanville 3, which received a construction permit in May 2007 in France; and the U.S. EPR, which is in pre-application review for DC in the United States. Other topics discussed at the meetings were digital I&C, construction inspection frameworks in each country, and plans for moving MDEP Stage 1 forward, including the means to facilitate welcoming other national regulators into this initiative (see meeting summary dated April 23, 2007 (ADAMS Accession No. ML071020307)). Of note regarding cooperation on

construction inspection issues, and as agreed in the March meeting, an NRC construction inspector was assigned to STUK for a two-month period to gain familiarity with the EPR construction inspection issues.

The NRC will host the next MDEP Stage 1 meeting with STUK and ASN in the month of November.

Multinational Design Evaluation Program Stage 2 Developments

The 10 participating countries endorsed the MDEP Stage 2 TOR on September 22, 2006, in Paris at the Organization for Economic Cooperation and Development Nuclear Energy Agency headquarters. The TOR directed the establishment of a 1-year pilot program to test the overall feasibility of the MDEP Stage 2 concept (followed by a 3-month assessment period). Andre-Claude Lacoste, Chairman of ASN, was chosen as the Chair of the Policy Group. NRC staff attended the initial pilot project working group meetings in Paris October 23–27, 2006. The first meeting, which took place October 23–25, 2006, was that of the MDEP Steering Technical Committee (STC), and the NRC representative was elected STC Chair. The purpose of the meeting was for the 10 participating MDEP countries to begin discussions and develop work plans for evaluating the similarities and differences with regard to the safety goals, regulatory practices, and the scope of the regulatory review for new reactor designs.

The STC agreed to prepare a survey for the purpose of identifying the similarities and differences of the regulatory requirements and practices in the areas of severe accidents, digital I&C, and emergency core cooling systems. The survey was issued to the participating countries in November 2006, and the results were discussed at a meeting of the STC in March 2007. Following that meeting, the lead country for each of the survey areas hosted a meeting of the technical experts from several countries to obtain additional information on the regulations and policies in each country and to discuss the cost and benefits of cooperation and convergence.

A working group on component manufacturing oversight (WGCMO) was formed to assess the similarities and differences in the regulatory requirements and practices associated with the manufacture of Class 1 mechanical components. The working group issued a survey in November 2006. The participating countries provided initial responses in February 2007 and final responses in April 2007. The WGCMO met three times during the pilot program, including visits to manufacturing sites. The purpose of the meetings was for the 10 participating MDEP countries to evaluate the similarities and differences with regard to the regulatory oversight of component manufacturing. A fourth meeting is scheduled for August 2007 to finalize the report of the working group's efforts.

A report of the Stage 2 pilot program will be completed by the end of 2007. The report will summarize the efforts of the STC and the WGCMO, address areas of commonality and differences, and identify potential areas for increased regulatory cooperation and convergence. The recommendations of the STC will be provided to the Policy Group in early 2008.

NRO staff continue to work with the Office of International Programs on the MDEP and is coordinating communications to the Commission and other stakeholders.

EARLY SITE PERMITS

The staff has completed its review of the Grand Gulf and Clinton ESP applications. The staff is currently reviewing two ESP applications. The staff received ESP applications in September 2003 from Dominion Nuclear North Anna, LLC (Dominion), for the North Anna site, and in

August 2006 from Southern Nuclear Operating Company (SNC) for the Vogtle site.

Early Site Permit Safety Reviews

The staff has completed its FSERs for the Grand Gulf, Clinton, and North Anna ESP applications. The NRC issued the North Anna FSER as NUREG-1835, "Safety Evaluation Report for an Early Site Permit (ESP) at the North Anna Site," on September 30, 2005; the Grand Gulf FSER as NUREG-1840, "Safety Evaluation of Early Site Permit Application in the Matter of System Energy Resources, Inc., a Subsidiary of Entergy Corporation, for the Grand Gulf Early Site Permit Site," on April 14, 2006; and the Clinton FSER as NUREG-1844, "Safety Evaluation Report for an Early Site Permit (ESP) at the Exelon Generation Company, LLC (EGC) ESP Site," on May 1, 2006. The staff issued Supplement 1 to the North Anna FSER (NUREG-1835) on November 20, 2006.

On August 15, 2006, the staff received an application from SNC for an ESP at the Vogtle site. Following receipt of the application, the staff conducted an acceptance review and identified two areas, seismology and emergency planning, where additional information would be necessary for the staff to accept the application. In a teleconference on September 8, 2006, SNC committed to supplement the emergency plans contained in the ESP application by March 1, 2007, to address the staff's concerns. By letter dated September 13, 2006, SNC supplemented its ESP application to address the concerns identified in the area of seismology. Following receipt of the SNC commitments and supplements to the ESP application, the staff found the application acceptable for docketing on September 19, 2006.

On November 1, 2006, the safety review team conducted an audit at the Vogtle site focusing on the applicant's site hazards analysis. The staff toured the Vogtle site and held discussions with the applicant. On December 6, 2006, the safety review team conducted a second site audit focused on meteorology. The staff participated in a second tour of the site and met with SNC meteorological experts to discuss the information contained in the application. The staff conducted a final audit in January 2007, which focused on hydrology, seismology, geology, and geotechnical engineering. The intent of these site audits is for the staff to become familiar with the site, to review supplemental information, and to engage the applicant early in the process to address staff questions.

Following completion of the safety site audits, the staff issued 187 safety RAIs between February 1 and April 19, 2007. The staff received all responses to RAIs from SNC within the allotted 30 calendar days of issuance of the letters and was satisfied with the timeliness of the responses. The staff has reviewed the responses to the RAIs and is currently developing the SER with open items, which is scheduled to be issued on August 30, 2007.

On May 21, 2007, SNC submitted a letter to the NRC notifying its intent to submit a request for an LWA under the new LWA rulemaking. The purpose of the SNC request was to take advantage of the new rule, which allows for laying of engineered backfill and setting of reinforcing bar before pouring first concrete. On June 6, 2007, the staff participated in a conference call with SNC to discuss this issue further. During the call, the staff informed SNC that it could not submit an LWA request under the new LWA rule until the rule was final. The staff also informed SNC of the possibility of requesting an LWA-2 as part of its ESP application under the current rule, which would allow SNC to lay engineered backfill and reinforcing bar.

SNC indicated that it would submit a request for an LWA-2 possibly in August 2007.

In preparation for this request, the staff is aligning the resources necessary to complete an LWA-2 review and developing a review schedule in parallel with the ESP application review schedule.

Early Site Permit Environmental Reviews

The staff completed environmental impact statements (EISs) for the Grand Gulf, Clinton, and North Anna ESP applications. The NRC issued the Grand Gulf EIS as NUREG-1817, "Environmental Impact Statement for an Early Site Permit (ESP) at the Grand Gulf Site," on April 7, 2006; the Clinton EIS as NUREG-1815, "Environmental Impact Statement for an Early Site Permit (ESP) at the Exelon ESP Site," on July 20, 2006; and the North Anna EIS as NUREG-1811, "Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site," on December 15, 2006.

The NRC received the ER for the Vogtle ESP on August 15, 2006. The staff performed the acceptance review and accepted the ER, along with the other portions of the ESP application, for docketing on September 19, 2006. Acceptance of the ER initiated the EIS scoping process. The staff developed 103 environmental RAIs and issued them to SNC on December 29, 2006. SNC provided responses to the RAIs on January 30, 2007. The contractor supporting the review of the Vogtle ER, Pacific Northwest National Laboratory (PNNL), stopped work on January 15, 2007, because of a lack of funding as a result of the Continuing Resolution in Congress. PNNL resumed work on February 16, 2007, after funding was made available. The staff review determined that several responses to the RAIs were inadequate, and 22 environmental RAIs were developed and issued to SNC on April 20, 2007. SNC provided responses to this second round of RAIs on May 10, 2007. As a result of the funding issues associated with the Continuing Resolution and the issuance of a second round of RAIs, the schedule for the Vogtle ESP EIS was revised. The draft EIS is scheduled to be available to the public on September 14, 2007. Issuance of the draft EIS will initiate a public comment period, and a draft EIS public meeting is scheduled to be held in Waynesboro, Georgia, on or about October 4, 2007.

Table 3 shows the major remaining schedule milestones in the NRC staff's review of the other ESPs.

Table 3 Schedule Milestones

ESP Milestone	SNC (Vogtle)
Draft EIS issued to EPA	09/14/07 T
Final EIS issued to EPA/NRC Notice of Availability Issued	07/03/08 T
SER with Open Items*	08/30/07 T
FSER issued	05/20/08 T

T = Target
*Previously titled as draft SER

Early Site Permit Proceedings/Hearings

On January 10, 2007, the ASLB authorized the issuance of the Clinton ESP. On January 22, 2007, the Commission issued an order requesting the staff and applicant to respond to two specific issues raised by the ASLB order. On March 8, 2007, the Commission issued its decision to approve issuance of the Exelon Generation Company, LLC, Clinton ESP, and on March 15, 2007, ESP-001 was issued by the NRO Office Director.

On January 26, 2007, the ASLB authorized the issuance to System Energy Resources, Inc. (SERI) of an ESP for the Grand Gulf site. On March 27, 2007, the Commission issued its decision to approve issuance of the Grand Gulf ESP, and on April 5, 2007, ESP-002 was issued by the NRO Office Director.

Between April 24, 2007, and April 26, 2007, the ASLB conducted the hearing on the North Anna ESP. On June 29, 2007, the ASLB released an initial decision authorizing issuance of the North Anna ESP. On August 2, 2007, the Commission issued Order CLI-07-23 inviting the staff and Dominion to address the questions raised during the hearing, the issues raised by the dissenting judge, the suggestions raised by the initial decision (LBP-07-09) of the ASLB, and any other issues that, the parties believed warranted comment.

On December 11, 2006, a group of petitioners filed seven contentions opposing the Vogtle ESP application, with all seven related to SNC's ER. An ASLB was established and it ordered SNC and the NRC staff to file responses to the joint petitioners' hearing request and that the joint petitioners reply to the applicant and staff responses. The ASLB scheduled an initial prehearing conference in Waynesboro, Georgia, on February 13, 2007, to hear arguments by legal counsel in connection with the admissibility of each of the petitioners' contentions.

On March 12, 2007, the ASLB admitted two contentions—Environmental Contention 1.2, "ER Fails to Identify and Consider Cooling System Impacts on Aquatic Resources," and Environmental Contention 1.3, "ER Dry Cooling System Alternatives Discussion Fails to Address Aquatic Species Impacts." On May 7, 2007, the ASLB issued a general schedule for the Vogtle ESP proceedings. The amended/late-filed contentions are due by August 4, 2008, pre-filed direct testimony is due by November 28, 2008, and the evidentiary hearings will be held January 26–30, 2009. The ASLB partial initial decision on the contested hearing is scheduled for April 30, 2009, and on the mandatory hearing for May 15, 2009.

Future Early Site Permits

By letter dated March 16, 2006, Duke Energy stated that it was designating two additional sites for possible future ESP development. These two sites, in Davie County, North Carolina, and Oconee County, South Carolina, will undergo limited site characterization in the future. Duke Energy did not indicate a schedule for future interactions with the NRC staff.

By letter dated April 5, 2007, an unannounced applicant stated that it was designating a site for possible future ESP development. The applicant indicated that the application would be submitted to the NRC between June 2010 and June 2012.

PRE-APPLICATION ACTIVITIES

U.S. Evolutionary Power Reactor

The U.S. EPR is a large pressurized-water reactor of evolutionary design, with a design output of about 1600 MWe, designed by AREVA. Design features include four divisions of engineered safety features and a "core catcher" for containment and cooling of core materials for severe accidents resulting in a reactor vessel failure. The design also includes a shield building around the containment, two of four engineered safety feature divisions, the control room, and spent fuel pool. The design does not rely on passive safety features.

The first U.S. EPR is currently being constructed in Finland (OL3). An U.S. EPR is also planned for the Flamanville site in France, with operation currently slated for 2012. AREVA expects to apply for NRC certification of the U.S. EPR design in December 2007. UniStar Nuclear has stated its plans to reference the U.S. EPR design in a COL application in the fourth quarter of calendar year (CY) 2007.

AREVA submitted a proposed revised scope of work for the pre-application review, which includes 15 topical reports and 4 informational technical reports. The NRC staff has completed its review of two topical reports on the QA program and the applicability of accident and transient analysis codes and methodologies to the U.S. EPR. The staff is currently reviewing 10 topical reports covering piping analysis and design criteria, severe accident evaluation, critical heat flux correlation, priority module, software program manual, human factors program, digital protection system design, instrument setpoint methodology, realistic large-break loss-of-coolant accidents (LOCAs), I&C diversity, and defense in depth. Other topical reports planned

to be submitted over the next 6 months will cover the fuel assembly mechanical analysis, setpoint safety analysis methods for the U.S. EPR, and reactivity insertion accident. The NRC staff holds pre-submittal public meetings and post-submittal teleconferences with AREVA to discuss the above-mentioned topical reports and technical reports.

Mitsubishi Nuclear Energy Systems US-Advanced Pressurized-Water Reactor

The US-APWR is a 4451-MWt (approximately 1700-MWe) pressurized-water reactor designed by Mitsubishi Heavy Industries, Ltd. The NRC staff has hosted several public meetings with Mitsubishi Nuclear Energy Systems (MNES) and is reviewing eight topical reports submitted to the NRC by MNES on the US-APWR reactor design technology.

Two public meetings were held with MNES in March 2007. The March 1, 2007, public meeting covered radiation dose assessment, severe accident mitigation, and PRA. The March 22, 2007, public meeting covered engineered safety features, small break LOCAs, and containment response analysis methodologies.

On June 13, 2007, staff conducted a public meeting with MNES on the contents of the DCD, technical specifications for unique design features, and the electrical system design. On June 19, 2007, a TXU Power design-centered working meeting was held, and MNES presented its reactor technology, a US-APWR technology overview. Public interactions included a July 18–19, 2007, NRC public workshop on ITAAC; a July 26, 2007, public meeting on severe accidents, methodologies and assumptions used for the analyses, and thermal design methodology. Future public meetings with MNES may include other safety features (such as safe shutdown systems and mitigation systems), plant design concepts (plant layout, separation criteria, and steel and concrete structure), and safety analysis methodologies.

MNES has submitted eight topical reports to the NRC, which are undergoing staff review. The topics include an advance accumulator (January 2007), QA program description (January 2007), safety I&C system description and design process (March 2007), safety system digital platform (MELTAC) (March 2007), defense in depth and diversity (April 2007), human systems interface system description and HFE process (April 2007), fuel design criteria and methodology (May 2007), and thermal design methodology (May 2007). MNES intends to submit additional topical reports in the area of safety analysis methodology, including large break-LOCA, small break-LOCA, and non-LOCA accidents.

MNES plans to submit a DCA for the US-APWR in December 2007. TXU Power expects to submit a COL application in July 2008 for Comanche Peak, Units 3 and 4, using the US-APWR technology.

Pebble Bed Modular Reactor

The pebble bed modular reactor (PBMR) is a 400-MWt (165-MWe) helium-cooled high-temperature reactor. A full-scale demonstration plant is being planned for construction in the Republic of South Africa. The NRC has entered into pre-application discussions with the company responsible for the design, construction, and operation of the reactor, PBMR (Pty) Ltd., based on its stated purpose to pursue a DC under 10 CFR Part 52. The company intends to eventually seek deployment of the PBMR in the United States. At present, PBMR (Pty) Ltd. does not have a domestic utility partner.

PBMR (Pty) Ltd. projects in its most recent schedule that the pre-application phase will extend to the latter half of CY 2009, which is when the company plans to submit a DCA to the NRC. Consistent with planned resource allocations, the staff has committed to engage in a limited pre-application review at this time. The review effort is focused on white papers, where each paper covers a reasonably discrete subject area that has significance for a DCA. The white papers that have been submitted provide high-level information on the PRA approach; the identification of licensing-basis events; the classification of structures, systems and components; and the company's defense-in-depth approach. PBMR (Pty) Ltd. has indicated a desire to submit up to 15 more white papers between now and the submission of the DCA.

The staff has been reviewing the submitted white papers using a relatively small fraction of the budgeted manpower because the skilled staff needed for the review of the subject matter involved is engaged in higher priority LWR reviews. The budgeted manpower for FY 2007 has been modest, with a significantly declining trend in both FY 2008 and 2009. The staff met with PBMR (Pty) Ltd. on July 18, 2007, to discuss the current status of white paper reviews and the company's future plans. Having been provided with the information on the staff's constraints, PBMR (Pty) Ltd. indicated that it recognized the need to pursue the pre-application activity giving due consideration to the NRC's constraints. The staff is preparing a memorandum informing the Commission of the staff plan and course of action related to the additional submittals.

International Reactor Innovative and Secure

The International Reactor Innovative and Secure (IRIS) is a pressurized, light-water cooled, medium-power (1000-MWt) reactor. The IRIS development program was originally sponsored by DOE as part of the Nuclear Energy Research Initiative program and has now been selected as an International Near-Term Deployment reactor, within the Generation IV International Forum activities. The NRC held the last public meeting regarding the IRIS on September 28, 2005, when the staff and Westinghouse discussed WCAP-16392, "IRIS Test Plan"; WCAP-16318, "IRIS Small Break LOCA Phenomena Identification Ranking Table"; and the submittal of scaling analyses in support of the IRIS test program.

Westinghouse submitted a letter on September 7, 2006, providing some details of its plans to submit a DCA. In this letter, the company outlined a proposed schedule for pre-application activities and restated its intent to begin the formal DC process in 2010. Westinghouse also indicated a two-path approach to obtaining a DC. The first approach is to submit a DCA under 10 CFR Part 52 requirements in 2010. The second approach involves a separate DCA pending the evolution of 10 CFR Part 53. The September letter also outlined plans for additional topical report submittals describing the company's Simulatore PWR per Esperienze di Sicurezza, three-loop (SPES-3) test facility and the related IRIS test matrix early in FY 2007, with further periodic reports of test results, related analyses, and evaluation model changes through CY 2010.

Toshiba Super Safe, Small, and Simple Reactor for Galena, Alaska

The Toshiba Super Safe, Small, and Simple (4S) plant is a small, sodium-cooled fast reactor with a compact steam turbine secondary system. In April 2006, the City Manager of Galena, Alaska, requested a meeting with the NRC to discuss the white papers, the preliminary safety information document, and other issues relating to the potential filing of an ESP application for a small liquid-metal reactor design in Galena.

On December 7, 2006, the NRC's Tribal Consultation Team (TCT) met with the Yukon River Inter-Tribal Watershed Council (YRITWC) to discuss tribal interests and consultation processes, NRC organizational changes, and future interactions between NRC and the tribes, as related to the potential siting of a reactor in Galena, Alaska. Some of the concerns expressed by the YRITWC during the meeting were the adequate timing of communications to the tribes in the potential pre-application review and licensing process, the advantage of written consultation protocols, the importance of the Yukon River to the Tribes' subsistence, and site-specific issues related to siting a reactor in Galena, such as the complexity of permafrost and nearby fault lines.

The TCT plans to provide a status report to the Commission in November 2007 on the items included in the scope of work, such as the identification of prospective roles, responsibilities, and expectations of the Native American Tribal governments and the NRC in consultation, whether a written agreement documenting the consultation process is needed, and future plans and resource requirements for the development, implementation, and maintenance of consultation with the appropriate Native American Tribal governments.

High-Temperature Teaching and Test Reactor, University of Texas

On May 11, 2006, the NRC staff held an initial public meeting with the University of Texas and General Atomics (GA) to discuss the potential licensing of a proposed test reactor at the University of Texas of the Permian Basin (UTPB) campus. As described by UTPB and GA, the proposed test reactor, the High-Temperature Teaching and Test Reactor (HT3R), would be a small high-temperature gas-cooled reactor (HTGR) with prismatic graphite fuel blocks, 10-percent enriched uranium-oxide coated particle fuel, a thermal power level of 25 megawatts, and a helium coolant outlet temperature of 850C (1562F). The passive safety characteristics of the HT3R would be similar to those of proposed commercial modular HTGR designs such as the gas turbine-modular helium reactor and PBMR.

The potential uses of HT3R include (1) testing and demonstration of HTGR technology and its application to Brayton-cycle electric power generation, hydrogen production, water desalination, and other uses of high-temperature process heat and (2) isotope production, basic research, teaching, and operator training. UTPB has indicated that its preliminary plans include submitting a license application in early 2009, starting construction in early 2010, and completing construction and licensing by the end of 2012. Pursuant to these plans, UTPB and GA requested NRC staff input on the test reactor licensing process to support planning during the remainder of the HT3R pre-conceptual design phase in 2006 and NRC staff review of the licensing plan developed during the conceptual design phase in 2007.

Preliminary Pre-application Discussions with Hyperion Power Generation

On May 30, 2007, staff from NRO, Office of Congressional Affairs, Office of Public Affairs, and the Office of Nuclear Regulatory Research (RES) met with representatives from Purple Mountain Ventures (PMV) to discuss potential licensing processes that could be applied to the PMV Hyperion reactor design. At this meeting, PMV stated that it is looking into the feasibility of mass producing a small reactor for dedicated or remote applications. The design under consideration consists of an 80-MWt self-regulating reactor that uses powdered uranium hydride as the fuel, has no mechanical moving parts, and could be buried underground. The reactor would be constructed in a factory, shipped to the site, installed, and operated for 5 years, before being returned to the factory for refueling.

By letter dated June 15, 2007 (ADAMS Accession No. ML071800261), Hyperion Power Generation, Inc. (HPG) requested the continuation of pre-application discussions with RES. RES met with HPG on August 22, 2007, to learn more regarding the development status of the Hyperion reactor design. HPG presented the major design concepts of their proposed design. HPG indicated that formal analysis and design documentation suitable for NRC pre-application review would be available in late FY09. (The meeting summary is available in ADAMS; Accession No. ML072360204.)

GLOBAL NUCLEAR ENERGY PARTNERSHIP

The Office of Nuclear Materials Safety and Safeguards (NMSS) has been working with NRO, RES, and other supporting offices to review DOE plans for the GNEP program, identify potential technologies, and develop the regulatory framework for these activities. GNEP is a DOE initiative that was introduced as a part of President Bush's Advanced Energy Initiative. The GNEP initiative aims to expand the use of nuclear power, both domestically and internationally; minimize nuclear waste; develop advanced proliferation-resistant recycling and separation technologies; develop advanced burner reactors (ABRs) for transmutation of long-lived fission products; establish reliable fuel services; demonstrate grid-appropriate, exportable reactors; and enhance nuclear safeguards technology. The current DOE GNEP planning for a closed nuclear fuel cycle would include spent fuel reprocessing, fuel fabrication, and a sodium-cooled ABR as well as advanced fuel separation facilities. The fuel reprocessing and fabrication facilities and ABR would be regulated by the NRC. As directed in SRM-07-0081, "Staff Requirements-Regulatory Options for Licensing Facilities Associated with the Global Nuclear Energy Partnership (GNEP)," dated June 27, 2007, NRO and RES will develop the ABR licensing framework and gap analysis.

NEXT GENERATION NUCLEAR PLANT LICENSING STRATEGY DEVELOPMENT

The Energy Policy Act of 2005 (EPAct), Section 641, provides that the Secretary of Energy shall establish a project known as the "Next Generation Nuclear Plant Project" (NGNP Project). The NGNP Project consists of research, development, design, construction, licensing, and operation of a prototype plant, including a very high temperature gas-cooled reactor (VHTR), which can be used to generate electricity and co-generate hydrogen. Section 644(a) of the EPAct provides that the NRC shall have licensing and regulatory authority for any reactor authorized under Sections 641–645 of the EPAct. Section 644(b) of the EPAct requires the Secretary of DOE and the Chairman of the NRC to develop and jointly submit a licensing strategy for the prototype

nuclear reactor within 3 years of the date of the law's enactment (i.e., August 8, 2008). The licensing strategy, as defined in Section 644(b) of the EPAct, has four elements—licensing approach, analytical tools for confirmatory safety analysis, supporting research and development (R&D) bases, and resources—all of which are required by the NRC to perform licensing and regulatory review of an NGNP plant.

Pursuant to the EPAct mandate, the NRC and DOE put in place on October 12, 2006, a memorandum of understanding (MOU) to establish a framework for interactions between the NRC and DOE to develop and document the licensing strategy. The MOU describes respective organizational responsibilities, the interaction process and schedule, planned work products, and funding. An NRC/DOE licensing strategy working group has been formed to develop the licensing strategy. This group consists of staff from RES, NRO, NMSS, the Office of the General Counsel (OGC), and the DOE Office of Nuclear Energy. The group has been working on the licensing strategy and has been meeting monthly to discuss progress made on all four elements of the licensing strategy.

Key issues discussed by the group include licensing approaches that could be used for the NGNP. The group identified potential options based on adaptation, to various degrees, of the current LWR licensing processes while making greater use of risk insights. This is consistent with the language in the EPAct and with relevant SECY papers and SRMs on risk-informed, performance-based regulatory process. Although evaluating all licensing options, the group is focusing its attention on addressing a limited number of options. The group is currently evaluating the advantages and disadvantages of using the licensing processes under 10 CFR Part 50 and Part 52.

With regard to the identification of NRC needs for analytical tools and supporting R&D bases, the staff, in collaboration with DOE, conducted a phenomena identification and ranking technique (PIRT)—an expert elicitation process—to identify safety-relevant NGNP phenomena and assess the knowledge base. Key technical areas addressed in the PIRT process include accident analysis and thermofluidics, high-temperature materials and graphite, process heat applications, and fission products. A separate PIRT that addressed the NGNP fuels issues had been conducted previously. The staff will use the PIRT findings to assess the knowledge gaps in key technical areas and to determine the scope of analytical tools and the supporting R&D that will form the technical basis for supporting the licensing and regulatory review of an NGNP application.

REGULATORY INFRASTRUCTURE

This section provides the status of the 10 CFR Part 52 rulemaking, CIP development, COL issues, other regulatory guidance for both LWR and non-LWR technologies, and other infrastructure activities.

10 CFR Part 52 Update

On April 11, 2007, the Commission voted to approve the publication and implementation of the final rule amending 10 CFR Part 52, subject to changes and comments noted by the Commission in its SRM (ADAMS Accession No. ML071010223). The final rule enhances the effectiveness and efficiency of the 10 CFR Part 52 licensing processes and clarifies the

applicability of requirements to each of the processes—ESP, standard design approval, standard DC, COL, and manufacturing license. On May 21, 2007, the staff posted the draft final rule on the NRC's rulemaking Web site, reflecting changes that resulted from the Commission's SRM. On August 28, 2007, the 10 CFR Part 52 final rule was published in the *Federal Register* (72 FR 49352). The rule becomes effective 30 days following its publication.

Limited Work Authorization Rule Update

On April 17, 2007, the Commission voted to approve the publication and implementation of the final rule amending 10 CFR Part 2 and 10 CFR Part 50 to revise requirements for LWAs and site preparation activities (ADAMS Accession No. ML071070361). The staff made the changes to the LWA rule directed by the Commission's SRM and submitted a clearance package to OMB on August 30, 2007. OMB must review and approve the information collection aspects of the final rule before it can be published in the *Federal Register*.

The Commission also directed the staff to work with external stakeholders to develop and publish the necessary implementation guidance for the LWA rule. To that end, on May 22, 2007, the staff held a public meeting to discuss the development of regulatory guidance to support implementation of the LWA rule.

Aircraft Impact Characteristics Sharing

In the SRM on SECY-06-0204, "Proposed Rulemaking—Security Assessment Requirements for New Nuclear Power Reactor Designs," dated April 24, 2007, the Commission directed the staff to share aircraft impact characteristics with the new reactor vendors. In order to accomplish this goal, the staff issued Orders to Westinghouse and GE on June 8 and June 15, 2007, respectively, imposing requirements for the protection of Safeguards Information (SGI). The Orders designated the aircraft impact characteristics as SGI. Westinghouse and GE responded to the Order on June 14 and July 2, 2007, respectively. Based on the satisfactory results of the staff's review of the responses, the aircraft impact characteristics were sent to Westinghouse and GE. The staff is in the process of meeting with the vendors to discuss the aircraft characteristics that they received and to discuss high-level results from the analyses done by RES. The staff plans to issue to all four new reactor vendors (Westinghouse, GE, Mitsubishi, and Areva), Orders that will impose the same requirements for the protection of SGI as in the previous Orders, but with special restrictions on the sharing of information. The staff plans to issue these Orders in the near future and they will supersede the Orders previously issued to Westinghouse and GE.

Rulemaking on Aircraft Impact Assessments

The NRC staff is preparing a proposed rulemaking on aircraft impact assessments following SRM-06-0225, "Assessment of Aircraft Impacts on New Reactor Designs," dated May 1, 2007, directing the staff to incorporate the requirement into 10 CFR Part 52. The proposed rule is expected to be published for public comment in mid-September 2007.

Construction Inspection Program

Development of the guidance, enforcement, information management (IM), policies, and programs necessary for the agency to run a successful CIP continues to be accomplished. Highlights are provided below.

Inspections, Tests, Analyses, and Acceptance Criteria Working Group

The staff initiated a working group that focuses on the closure verification of ITAAC, which affects all divisions within NRO. The working group is composed of members from all NRO divisions, NRC Region II, and OGC and is intended to resolve key policy issues and other issues associated with ITAAC. The working group charter includes many items such as developing the scope and process for headquarters technical support of ITAAC closure verification, developing regulatory guidance for licensee closure documentation, developing the NRC process for ITAAC closure verification, developing a policy for inspection sampling of site-specific ITAAC, and estimating resources needed to implement the baseline inspection program.

In addition to establishing this working group, on July 11, 2007, the staff briefed the ACRS on the prioritization method used for selecting ITAAC for direct inspection. ACRS, in a letter dated July 24, 2007, concurred with the staff's approach to ITAAC sampling as presented.

Assessment and Enforcement Program

The staff is developing assessment and enforcement program guidance for plants that would be licensed under 10 CFR Part 52. A full day workshop will be held on August 30, 2007, to discuss initial concepts in this area.

The guidance for the CIP assessment process will be included in Inspection Manual Chapter (IMC) 2505, "Periodic Assessment of Construction Inspection Program Results," which is currently under development. The objectives of IMC 2505 are to determine overall licensee performance, determine the readiness of key operational programs, guide timely and predictable decisions regarding agency actions in response to licensee performance, and provide a process for informing the licensee and the public of the NRC's assessment and subsequent actions. The IMC 2505 assessment process will capture the fundamental enhancements of the Reactor Oversight Process such as transparency and predictability. The refinement of the assessment process and its relation to ITAAC sampling will occur in future fiscal years.

The Enforcement Policy is currently being revised by the Office of Enforcement and will include modifications to address new reactors licensed under 10 CFR Part 52. The enforcement program objectives for new reactors will be very similar to those for reactors licensed under 10 CFR Part 50. These objectives include deterring non-compliance by emphasizing the importance of NRC requirements and encouraging prompt identification and comprehensive corrective actions.

Inspection Procedures Development

The staff is continuing to develop and revise inspection procedures for use with the 10 CFR Part 52 licensing process. Progress continues on the development of inspection procedures for ITAAC-related construction activities under IMC 2503, "Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)." The first set of procedures, which would be required to support the inspection of licensee activities under an LWA, will be issued before the end of FY 2007. The remaining 20 procedures will be issued by summer 2008.

The staff is progressing with its update of the inspection guidance for operational programs as described in IMC 2504, "Non-ITAAC Inspections." In addition to operational programs, IMC 2504 addresses the inspection of other non-ITAAC activities, including the preoperational test and startup test programs and the transition to the Reactor Oversight Process. In total, the agency will develop and revise approximately 150 procedures to support inspections under IMC 2504. The staff has prioritized the procedure review effort such that necessary procedures would be available well in advance of their need. To date, 92 procedure reviews have been performed, 17 procedures have been consolidated into other procedures, 34 procedures are in final review cycle for issuance this fall, and 10 procedures will be completed this FY. The entire project is scheduled to be completed by the end of FY 2008, with the exception of security procedures, which are being coordinated with an anticipated rulemaking.

Construction Inspector Qualification and Development

IMC 1252, "Construction Inspector Training and Qualification Program," which defines the initial training and qualification requirements for staff performing inspections of reactor construction activities, was issued in February 2007. With the support of HR, the staff is developing and piloting the training courses needed for the qualification program. NRO and Region II construction inspection staff have participated in courses for the new reactor technologies, 10 CFR Part 52, and the CIP. Additionally, Region II construction inspection staff have participated in commercial training courses for specific technical areas such as fiber optic cables, soils, concrete, welding, and digital process controls.

Information Management

The construction inspection team continues to work with the Office of Information Services (OIS), the Region II construction organization, and the NRO Information Technology Team to complete the CIP Information Management System, a database that will allow the NRC staff to manage inspection-generated information. The ability to document vendor inspection information has recently been added to the system. The system design is nearly complete, and initial system testing will begin before the end of FY 2007. The system is scheduled for deployment in early CY 2008.

Additionally, NRO is evaluating the use of the Microsoft Enterprise Project Management software suite (EPM Solution) for tracking and documentation of the ITAAC closure process.

Construction and Operational Experience Program

The NRC is currently capturing the operating experiences gained from the current fleet of reactors in the Operating Experience (OpE) Program, which resides in the Office of Nuclear Reactor Regulation (NRR). In order to focus on the issues that are unique to the construction and operation of new reactors, the staff is developing an internal NRO process, called the Construction and Operational Experience (COpE) Program. The COpE Program will collect, evaluate, and communicate the lessons learned from the new reactor construction projects. This program also collects and evaluates the operating experience that could impact the operation of new reactors by monitoring operating reactors' events as well as inspections of vendors and licensee QA programs.

The COpE Program has been integrated with the agency OpE Program. The NRO process focuses on issues that are primarily applicable to the construction of new reactors. The goal of the COpE Program is to support the NRC mission of protecting public health and safety through incorporation of COpE into activities associated with the inspection and licensing of new reactors.

The collection of international experience will be accomplished through bilateral agreements, joint QA and vendor inspections, the Committee on Nuclear Regulatory Activities (CNRA) working group on operating experience, and the CNRA working group on new reactors. Participating countries are expected also to be participating in the MDEP.

The application of the COpE Program includes issuing generic communications, revising NRC inspection procedures, providing insights to vendor QA audits, and providing insights into licensing reviews. Examples of recent construction and operational experiences currently being evaluated by NRO technical reviewers include problems with Kerotest valves at French plants (multiple incidents since 1993), cracks in the auxiliary building at a French plant (October 2001), insufficient guidance of subcontractors' work in Finland, and ABWR turbine damage at Hamaoka-5 in Japan (June 2006).

Vendor Inspections

The staff is finalizing its updates of the inspection guidance for ESP and COL applications (IMC 2501, "Early Site Permit," issued in October 2002 and IMC 2502, "Pre-Combined License (Pre-COL) Phase," issued in June 2005). With the issuance of Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," in June 2007 and SRP Sections 17.4, "Reliability Insurance Program," and 17.5, "Quality Assurance Program Description—Design Certification, Early Site Permit, and New License Applicants," the staff is revising the IMCs and associated inspection procedures for ESP and COL applications to focus the guidance on ensuring the appropriate implementation of QA programs. With support from Region II, the staff has performed QA audits before COL submittal, consistent with the revised IMCs, to support the review of the COL applications that are expected in fall 2007. In addition to ESP and COL reviews, the staff has developed IMC 2508, "Construction Inspection Program: Design Certification," and the associated inspection procedures to support the review of DCAs. Final issuance of the revised and new IMCs and associated inspection procedures is scheduled to be completed within the next 6 months.

The staff is enhancing the vendor inspection program (VIP), established in NRR by IMC 2700, "Vendor Inspection Program," and in NRO with the development of IMC 2507, "Construction Inspection Program: Vendor Inspections Program." IMC 2507 contains additional inspection guidance and procedures to specifically target nuclear component suppliers and suppliers of energy services because of a number of significant factors, such as (1) the entry of new suppliers to the U.S. nuclear industry, most of whom are expected to be based overseas, (2) the use of modular construction techniques during the fabrication of new reactors, (3) the requirement to verify completion of ITAAC associated with systems and components, and (4) the extensive use of contractors to provide engineering and licensing services to most applicants.

During the next several months, the staff will be performing vendor inspections at a number of facilities identified as suppliers of items and services for the construction of new nuclear power plants. These inspections will afford the staff an opportunity to pilot the enhancements to the NRO VIP, including inspection program guidance, and to engage interested stakeholders in the process and results of such efforts.

Operator Licensing Program

The staff met with industry representatives in a public meeting on May 24, 2007, to discuss issues related to the operator licensing program for COL applicants. Topics of discussion included use of limited-scope simulators, licensed operator eligibility requirements, cold licensing of operators, changes to NUREGs and regulatory guides (RGs), and industry-administered initial operator licensing examinations.

The industry proposed using limited-scope simulators for operator training, as plant-referenced simulators are not projected to be available until 18 months before fuel load. The industry intends to conduct operator licensing exams on a plant-referenced simulator.

The industry also proposed developing alternative criteria and suggested that RG 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," may need to be updated to address the new construction conditions.

The industry indicated that a technical paper will be developed for NRC review that presents a uniform industry approach toward "cold" licensing of operators and discusses, among other topics, on-the-job training before fuel load, conducting systems training before construction of the systems, and reactivity manipulations without a plant or plant-referenced simulator.

At the public meeting, the staff and industry agreed that changes to NUREG-1122, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Pressurized Water Reactors," dated June 5, 1998, and NUREG-1123, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Boiling Water Reactors," dated June 5, 1998, may be necessary after industry completes additional licensed operator job analyses.

NEI proposed that (1) the Institute for Nuclear Power Operations be given "management" responsibility of the Generic Fundamentals Examination (GFE) and that (2) utilities be allowed to develop, administer, and grade license examinations without any prior NRC review or approval. NRC expressed concern regarding the reduced Government role, the qualifications

and objectivity of the utility's examination teams, the ability of the licensee to independently author high-quality examinations, the potential for examination development biases, public confidence in the proposed process, and the potential for significant resource allocations necessary to effect such a change.

Since the meeting in May, NEI has informed the staff that industry has decided not to pursue the proposed change to the initial examination process while continuing to pursue evaluation of the possibility of assuming responsibility for administration of the GFE.

To meet the industry-projected date for licensing operators, additional NRC operator licensing examiners will be needed before 2012. The staff met with representatives of the NRC Technical Training Center to address the issues in order to achieve this need. NRO anticipates that a mixture of existing qualified examiners and new hires will be used to meet industry demands in the next decade.

Regulatory Guides

In March 2007, the NRC staff issued the highest priority RGs related to the support of new reactor licensing activities. The staff prioritized the remaining RGs based on information from several sources. The staff plans to develop and publish the second group (Phase 2) by December 2008 and the third group (Phase 3) by December 2009.

The staff issued RG 1.206 in June 2007 after resolving public comments and the issuance of the SRM for the 10 CFR Part 52 rulemaking. The vast majority of the RG was issued for preliminary use between March 2007 and the final issuance of the RG to support preparation of applications. The staff is continuing to conduct meetings and other discussions with stakeholders to resolve issues related to the format and content of applications.

Standard Review Plan

In March 2007, the NRC staff issued a wholesale update of the SRP (NUREG-0800). Before formal issuance, preliminary SRP section revisions were made publicly available to support applicants in their preparation of COL applications. The last several sections of the SRP, including those related to PRA, were issued in June 2007 following the issuance of the SRM for the 10 CFR Part 52 rulemaking.

On August 9, 2007, the staff conducted a public workshop on recently updated high-priority sections of NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," most recently issued in its entirety in October 1999.

Watts Bar Nuclear Plant Unit 2 Feasibility Assessment

In a November 14, 2006 letter the Tennessee Valley Authority (TVA) informed the NRC of its intention to perform a feasibility study on completing Watts Bar Nuclear Plant (WBN) Unit 2.

On June 7, 2007, the staff submitted a paper seeking Commission approval of the staff's

approach for possible reactivation of the WBN Unit 2 project (SECY-07-0096). The Commission provided direction to the staff for the licensing and inspection program for WBN Unit 2 in an SRM dated July 25, 2007.

In a letter dated August 3, 2007, the TVA officially notified the NRC of its intent to reactivate and complete construction activities at WBN Unit 2. In the letter, TVA indicated that it intends to resume construction activities on December 3, 2007, and that it expects to complete construction and request an operating license prior to April 1, 2012. NRR staff is developing a project plan and project organization to perform the reviews necessary for licensing the facility in accordance with the SRM and to coordinate construction inspection activities with Region II.

Office Instructions and Other Infrastructure Activities

The staff is developing procedures (office instructions) to support the various functions and responsibilities of NRO. This effort includes administrative controls for the new office as well as specific procedures for processing applications submitted under 10 CFR Part 52 for COLs, DCs, and ESPs. These procedures and related tools, such as information systems and document templates, will enhance the NRO staff and managers' ability to operate as an office, including guidance to orchestrate the receipt, acceptance, review, and environmental evaluation of applications related to new reactor facilities. The staff is developing the licensing-related procedures in coordination with the revisions to 10 CFR Part 52, the standard format and content guide (RG 1.206), and the SRP. NRO will determine priorities and schedules for the completion of specific office instructions and related tools based on the expected application schedules and the needs of the staff and management in the office. As of July 2007, 12 office instructions have been issued with another 12 in the final stages of approval.

Technical review tools have been deployed and the NRC staff and contractors are evaluating and developing the appropriate content to facilitate the technical reviews. The NRC staff, with the assistance of the national laboratories, is developing design-specific templates for the SERs needed for the issuance of COLs. The staff expects to have the tools available for use by the receipt of the first application in fall 2007.

Advance Notice of Proposed Rulemaking

The SRM for SECY-05-0130, "Policy Issues Related to New Plant Licensing and Status of the Technology-Neutral Framework for New Plant Licensing," dated September 15, 2005, directed the staff to consider ACRS comments in developing a subsequent notation vote paper addressing the policy issues of level of safety and integrated risk. In addition, the Commission directed the staff to expeditiously develop an Advance Notice of Proposed Rulemaking (ANPR) to consider the spectrum of issues relating to risk-informing the reactor requirements and to incorporate into this ANPR the formal program to risk-inform 10 CFR Part 50, as well as other related risk-informed efforts. The Commission also directed that safety, security, and preparedness be integrated throughout this effort. The staff prepared an ANPR incorporating the issues identified by the Commission in the SRM for SECY-05-0130. In accordance with the SRM for SECY-06-0007, "Staff Plan to Make a Risk-Informed and Performance-Based Revision to 10 CFR Part 50," dated March 22, 2006, the staff published the ANPR in the *Federal Register* (71 FR 26267). Additionally, the staff placed the latest working draft of the technology-neutral framework on the RuleForum Web site to facilitate stakeholder comment on the framework as

part of the ANPR. The staff conducted a public workshop on this subject September 14–15, 2006. The ANPR comment period ended in December 2006.

In SECY-07-0101, "Staff Recommendations Regarding a Risk-Informed and Performance-Based Revision to 10 CFR Part 50," dated June 14, 2007, the staff provided its recommendation on whether and how to proceed with a rulemaking and also a summary of stakeholder comments on issues in the ANPR. The staff recommended that the NRC not proceed on rulemaking at this time and to allow the need for and scope of a rulemaking to be informed by the development of a licensing strategy for the NGNP and the pre-application review of the PBMR.

Security Requirements for New Reactors

Power Reactor Security (10 CFR 73.55, 10 CFR 73.56, 10 CFR 73.58, 10 CFR 73.71, and Appendices B, C, and G)

The proposed rule was published in the *Federal Register* on October 26, 2006, and had an extended public comment period ending February 23, 2007. The staff received about 600 pages of comments and is currently in the process of developing responses. The staff is currently scheduled to provide the final rule package to the EDO about January 2008. The first draft regulatory guidance in support of the proposed rule was published in the *Federal Register* on July 6, 2007, for public comment. The first public meeting to discuss the guidance was held on July 27, 2007. The publication of draft guidance will continue into the end of 2007.

Security Assessment Rulemaking and Guidance Development

On July 6, 2005, the staff provided the Commission with SECY-05-0120, "Security Design Expectations for New Reactor Licensing Activities." On September 9, 2005, the Commission issued an SRM approving the actions proposed in SECY-05-0120. One of the proposed actions, to conduct rulemaking to require applicants to submit a security assessment and target set analysis, is due on September 29, 2007. The NRC conducted two public meetings (March 6 and July 17, 2006) on this rulemaking and posted draft rule language on the Web for stakeholder information. The staff delivered the proposed rule to the Commission in SECY-06-0204 on September 28, 2006. On April 24, 2007, the Commission issued SRM-SECY-06-0204, which disapproved the proposed rulemaking and directed the staff to discontinue some aspects of the proposed rule and to consolidate other aspects in changes to a 10 CFR Part 52 rulemaking.

Currently, the Office of Nuclear Security and Incident Response (NSIR) staff is continuing with regulatory guidance for target set analyses, upon which site protection strategies would, in part, be based, and for security assessments, upon which mitigative strategies would be based consistent with the proposed Appendix C to 10 CFR Part 73, "Physical Protection of Plants and Materials."

Security Measures During Construction of a New Plant

The staff continues to meet with the New Plants Security Task Force (industry/vendors) on a periodic basis to discuss security for new reactors. Topics normally include access authorization for greenfield construction sites as addressed in Appendix F to NEI 03-12, "Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan;" ITAAC; and generic implementation schedule for operational programs.

Security Memorandum of Understanding with the Department of Homeland Security

Section 657 of the EPAct provides that before issuing a license for a utilization facility, the NRC shall consult with the U.S. Department of Homeland Security (DHS) concerning the potential vulnerabilities of the location of the proposed facility to terrorist attack. The MOU with DHS was published in the *Federal Register* on March 6, 2007 (72 FR 9959–9960). The staff meets with DHS on a monthly basis to develop an implementation plan (procedure) on the MOU for interaction between the two organizations.

Contracting Strategy to Support New Reactor Licensing

The Contract Planning and Management Branch (NCPM) staff continues to implement the contracting strategy in anticipation of the new reactor licensing activities projected for FY 2007 and FY 2008. The NRO contracting strategy includes the use of a broad mix of contractors, early identification of needs, and placement of contracts consistent with the DCRA. NRO has engaged with the DOE laboratories, commercial contractors, and other Federal agencies and is finalizing basic ordering agreements and commercial contracts to provide technical assistance for all phases of the new reactors licensing process.

NCPM has finalized basic ordering agreements with PNNL, Sandia National Laboratory, and Brookhaven National Laboratory. NRO expects to finalize new agreements with the Oak Ridge National Laboratory, Argonne National Laboratory, the U.S. Army Corps of Engineers (USACE), and the U.S. Geological Survey (USGS) by the middle of September 2007. The Division of Contracts is scheduled to award four new commercial contracts by the end of FY 2007. Therefore, NRO will have multiple vehicles in place to obtain technical assistance from USACE, USGS, five DOE laboratories, and four commercial contractors.

At the present time, NCPM is working with the technical divisions to develop task order statements of work for the anticipated outsourcing of technical reviews and other licensing activities to USACE, USGS, DOE laboratories, and commercial contractors. In addition, NCPM continues to explore the possibility of expanding the use of other organizations while addressing organizational conflict of interest (OCOI) issues to ensure the independence of COL reviews.

The staff is committed to ensure that each laboratory agreement and commercial contract is assessed for OCOI and that the laboratories and commercial contractors are required to comply with the NRC's OCOI rules.

Licensing Program Plan

The LPP defines the process that NRO will use to perform licensing reviews of DCs, COL, and ESP applications. The LPP defines the anticipated work, the schedule and resources required to perform the reviews, processes to perform this work, methods of statusing the work, practices for change controls, communication plans, and the information technology (IT) requirements for implementing the review process. Accompanying the LPP document is the EPM Solution, which integrates the licensing review schedules (Gantt chart) for all the DC, COL, and ESP applications that industry has indicated it will be submitting. The schedules will be developed, monitored, and maintained using the EPM Solution. The EPM Solution will permit task statusing through the NRC Intranet.

Version 1 of the LPP and its integrated schedule (approximately 80,000 task line items) was issued on February 7, 2007. Training of management and staff on the use of the EPM Solution started in the third quarter of FY 2007 and will continue to evolve as lessons learned are incorporated into the system. The planning and scheduling staff has developed R-COL, subsequent COL (S-COL), and DC templates that will be customized based on RIS-07-08 responses, discussions with applicants about the contents of their applications, and interactions with the technical staff for each of the various potential applications. NRO will maintain the LPP and its associated schedules throughout the licensing reviews.

New Reactor Business Process Plan

To assist in creating the new reactor program, the staff developed a Business Process Plan, formerly known as the master integrated schedule, to facilitate interactions among key stakeholders for significant issues directly related to the success of the program. The Business Process Plan included activities related to organizational development, resource acquisition, work processes, and technical guidance. The plan was instrumental in tracking the development and progress of those activities that were essential for starting up the new office.

The majority of the actions included in the plan have been completed, and the remainder will be completed by the end of FY 2007. The programs that were described in the plan, such as a contracting strategy, staff qualification program, and the LPP, are well established. The activities described in the Business Process Plan are now included in the NRO Operating Plan, and the remaining milestones are being tracked as part of the Operating Plan. Therefore, the staff decided that it was no longer beneficial to maintain the Business Process Plan as a separate communications and tracking tool and has closed this activity.

Combined License Review Task Force

In the SRM for COMDEK-07-0001/COMJSM-07-0001, dated June 22, 2007, the Commission approved, in part, the recommendations of the Combined License Review Task Force. The Commission directed the staff to expeditiously provide the Commission with plans for implementing the recommendations. A brief description of the approved recommendations/Commission directions and status is provided below.

Regarding Recommendation 1, the Commission approved the proposal that the Commission itself will conduct the mandatory hearing (in the absence of legislation eliminating the requirement for a hearing even if a request for hearing is not made). OGC is preparing a plan for the conduct of these hearings by the Commission, modeled after the Browns Ferry restart meeting and the Calvert Cliffs and Oconee license renewal meetings.

Regarding Recommendation 2, the Commission approved expansion of the scope and duration of the COL application acceptance review to include completeness and technical sufficiency review. The staff has developed a working group on the acceptance review process for new reactor COL applications, as addressed below, which will ensure that the criteria used for the expanded scope of review are clear and transparent.

Regarding Recommendation 4, the Commission approved of the staff seeking additional opportunities to use EISs completed by other government agencies for NRC COL reviews, to the extent that they are appropriate and applicable. The staff intends to utilize the techniques under the National Environmental Policy Act (NEPA) of "tiering," "incorporation by reference," and "adoption" outlined in Appendix A.1(b) to 10 CFR Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,” to take advantage of information and positions developed by the NRC or other Federal agencies, including EISs that are relevant to proposed new reactor licensing actions, to the maximum extent practicable. Where other Federal agencies, such as the Federal Energy Regulatory Commission, the U.S. Environmental Protection Agency (EPA), USACE, and others have Federal actions that overlap with the NRC's action, the NRC staff plans to coordinate with other agencies to exploit synergies. The value of the coordination will depend on the timing of actions, i.e., one preceding the other or one concomitant with the other. The NRC has MOUs to work cooperatively so that each agency can meet its responsibilities under the NEPA in the most effective manner for the Federal Government.

Regarding Recommendation 5, the Commission directed the staff to conduct a public meeting with industry representatives and other stakeholders to give the public and stakeholders an opportunity to present their views on how to enhance the efficiency and effectiveness of the environmental review process. The staff is currently working with industry on scheduling this meeting.

Regarding Recommendation 6, the Commission approved maximizing the use of electronic document management to eliminate the processing time for bound reports from the critical path on the schedule. The staff is taking various actions to maximize the use of electronic document management. Examples include working with industry on electronic submittals and developing electronic distribution of documents generated by the staff.

In Additional Recommendation 1, the Commission approved obtaining legislative authority from Congress to eliminate from Section 189a of the Atomic Energy Act the statutory requirement to conduct a hearing even if no one has asked for a hearing.

In Additional Recommendation 2, the Commission approved rulemaking to resolve issues that are generic to COL applications. The staff is in the process of evaluating those rulemakings that will provide the greatest efficiencies—on such subjects as nonproliferation risks of nuclear

power, the need for power, the long-term storage of spent fuel, reprocessing and waste confidence—and assessing the impact of pursuing such rulemaking initiatives on the staff's ability to complete the COL reviews in a timely manner.

Working Group on Acceptance Review Process for New Reactor Combined License Applications

In May 2007, a working group was formed in NRO in response to recommendations in COMDEK-07-0001/COMJSM-07-0001, "Report of the Combined License Review Task Force," dated April 18, 2007, relating to the acceptance review of COL applications. In the SRM for COMDEK-07-0001/COMJSM-07-0001, as discussed above, the Commission directed the staff to expand the scope and duration of the COL application acceptance review from 30 to 60 days and to include completeness and technical sufficiency reviews. Furthermore, the Commission reaffirmed that the safety and environmental technical reviews should commence on the date the application is docketed (i.e., after the acceptance review, when the application is determined to be complete and technically sufficient and not when the application is initially submitted by the applicant). The working group set out to implement the Commission's direction by developing an NRO office instruction that discusses the 60-day completeness and technical sufficiency acceptance review.

The working group comprises staff and managers from five NRO divisions. The working group has nearly completed the development of an efficient and effective acceptance review process for new reactor COL applications. In addition, it has nearly completed a final draft of an NRO office instruction that would provide guidance to the staff during the acceptance review to ensure that the applications meet the NRC's regulations and are technically sufficient, streamline the acceptance review considering both safety and risk insights, and provide schedule input for the development of an application-specific review plan and updated schedule. Upon completion of the NSIR and NRO review of the office instruction, the expanded acceptance review will be rolled out to the staff at an all-hands meeting.

Training to the Chinese on the AP1000 Design

From August 3–19, 2007, NRC staff traveled to Beijing and Beidaihe, China, to provide technical training to the Chinese on the AP1000 design and the NRC's DC review. This was the first cooperative activity as discussed in the May 2007 memorandum of cooperation (MOC) between the NRC and the National Nuclear Safety Administration (NNSA), the regulator in the People's Republic of China. The MOC agrees to cooperation on the nuclear safety review and inspection for the siting, design, manufacturing, construction, commissioning and operation phases of the AP1000. The cooperation between the NRC and NNSA on the AP1000 will be done under the NRC-NNSA Steering Committee on Nuclear Safety Cooperation, which will discuss specific cooperative programs for this project.

Information Technology/Information Management

As the agency continues preparations for new reactor licensing, the Office of Information Services (OIS) is coordinating closely with agency offices to implement business process and technology improvements in advance of the anticipated ESP and COL applications. Several

recent process and technology implementations are providing enhanced support for the DCRA and the mandatory adjudicatory hearings.

OIS is hiring additional staff based on the number and complexity of these new reactor projects and a review of current workloads. The staff is planning, implementing, and supporting application enhancements, technology improvements, security requirements, and other initiatives to address agency growth and expanding NRC Headquarters locations. The staff has completed preparations to fulfill increased IM requirements that support the New Reactor Licensing Program.

Information Technology/Information Management Contracting Strategy

OIS is using a diverse mix of contractors under various contracting vehicles to effectively meet agency IT/IM support requirements. Whenever possible, OIS uses existing support and service contracts to quickly and efficiently meet agency needs. OIS has modified existing contracts for desktop computers, network support, computer center operations, systems administration, applications development and support, telecommunications services, and IM to accommodate enhancements and changes in scope. For example, the recent Seat Management Services Contract modification has resulted in the deployment of Microsoft Office to enhance the NRC's ability to effectively communicate with licensees and other external stakeholders. For requirements beyond these established contracts, OIS identifies additional commercial contracting requirements and pursues competitive sources. The office is also exploring General Services Administration and other interagency agreements as potential sources. OIS documents all procurement activities in the Advance Procurement Plan provided to the Division of Contracts.

The four primary factors described below drive OIS contracting activities.

(1) Agency Growth

The growth in agency staff and the expansion to additional offsite buildings have increased costs in a number of areas. For example, direct expenses include direct costs for computer workstations, telecommunications services, software licenses, and help desk support personnel. Agency growth and the expansion in NRC Headquarters locations also drive the need for additional capacity for Internet service, remote access, and audio/video conferencing. The Seat Management Services Contract to provide infrastructure services and support has been modified to accommodate projected agency staff growth.

(2) Technology Requirements

The initial efforts to address technology requirements involve working directly with program offices to ensure that technology investments effectively meet business needs, minimize duplication of systems, maximize data sharing, and integrate well with the agency IT/IM infrastructure. OIS has completed initial solution deployments to address new reactor licensing requirements, such as electronic receipt and review of COLs, agencywide deployment of Microsoft Office, electronic receipt and processing of adjudicatory documents for COL hearings, and automated capture of email in the Agencywide Documents Access and Management

System (ADAMS). A combination of contract modifications, competitive procurement, and interagency agreements supplies the expertise to deliver the required solutions.
The agency is using the IT/IM improvements implemented to support the adjudicatory process in the context of a pilot project during the Vogtle ESP proceeding. In addition to automated capture of email for the hearing file, these improvements provide for electronic filing, review, and distribution of adjudicatory documents. NRC staff has evaluated the pilot project and implemented required adjustments to the business process and IT/IM components. In addition, the NRC has issued guidance for electronic submissions to the NRC to assist all users on how to properly submit electronic information to the NRC.

In partnership with NRO and the industry, OIS has successfully streamlined the process for electronic receipt and online review of COL applications. All of the stakeholders are now aligned concerning how a COL will be formatted, packaged, and submitted to the NRC. The enhanced IT components and business process improvements are implemented in the production environment and have been used during the latest revision of the AP1000 DCD to (1) guide the applicant in creating consistently formatted electronic COL application documents, (2) automate the COL application document intake process, (3) manage submission revisions, (4) ensure submission referential integrity, and (5) simplify the navigation of the complex COL application.

(3) End User and Systems Support

Contract resources are integral to delivering an enhanced level of end user and system support as the efforts to review ESPs and COLs peak. To better support telecommuting and overtime work, modifications to the Seat Management Services Contract have been completed to extend the hours of the Desktop Support Center to 6 a.m. to 9 p.m. weekdays (the Desktop Support Center previously closed at 6 p.m.) and to add weekend support hours from 9 a.m. to 9 p.m. Network and data center onsite support has likewise been extended to provide an immediate response capability to the NRC's core infrastructure components (i.e., local and wide area networks, email, ADAMS). A new help desk is currently in the procurement process to provide specialized support to ensure that licensees, staff, and members of the public can effectively use the processes and systems designed for the electronic submission and review of ESP and COL documents. The Public Document Room is providing help desk services until the new help desk is operational. OIS is acquiring these enhanced support services through a combination of contract modifications, competitive procurement, and interagency agreements.

(4) Information Management

Both the FY 2008 and FY 2009 budget requests include resources to process an increased volume of documents generated during the new reactor licensing review process. In addition to the information collections deployed to support the staff's reference material needs, the Technical Library staff will perform a needs assessment for additional online technical research databases. The Technical Library has deployed a collection of online IT books for NRC staff.

The collection contains e-books on the suite of Microsoft Office software being deployed by OIS to NRC staff. OIS is acquiring these materials and services through a combination of contract modifications, purchase card transactions, and competitive procurement.

TECHNICAL DEVELOPMENT ACTIVITIES

Support for Light-Water Reactors

The staff is using the TRACE thermal-hydraulics code to perform independent confirmatory analyses of ESBWR accidents and transients. Activities include model development, TRACE code assessment against test data, and confirmatory calculations. Moreover, the MELCOR code (the NRC's severe accident code) is used in performing the ESBWR containment performance analysis to identify the limiting containment pressure response.

To support the review of the ESBWR design, the staff developed a version of the TRACE code, along with (1) ESBWR input decks, (2) a report documenting the results of calculations to demonstrate the ability of the code to model operating and accident scenarios, (3) descriptions of models included in the TRACE code, and (4) supporting documentation for code users. Additional support for the ESBWR design review is provided in the area of computational fluid dynamics (CFD). The staff is developing a detailed CFD model of the core bypass region to support the review of anticipated transient without scram scenarios by providing insights into the mixing of the boric acid solution injected into the core bypass region from the standby liquid control system. For ESBWR severe accident analysis, the staff performed MELCOR calculations of risk-dominant sequences addressing severe accident issues identified in SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs." In addition, the staff performed MELCOR calculations of containment loading for design-basis events along with selected code sensitivities to confirm the adequacy of the ESBWR containment design.

The staff has developed an U.S. EPR research plan and is in the process of developing a US-APWR research plan. The main objectives of the plans are to (1) identify key safety research area needs and (2) describe subsequent research to develop the necessary tools, knowledge, and data to conduct an independent safety review of the reactor design. Key research areas in the U.S. EPR research plan include severe accident and thermal-hydraulics analyses and digital I&C. Key research areas in the US-APWR plan include thermal-hydraulics and containment analyses.

Support for Gas-Cooled Reactors

The NRC staff's HTGR knowledge management efforts have involved remaining cognizant of domestic and international developments in safety-related aspects of HTGR technology, ensuring that the HTGR analysis tools developed are documented and retrievable for future staff use, and preserving and transferring the knowledge gained from the staff's earlier efforts on HTGR technology. Under this activity, the staff has been capturing critical internal and external HTGR information and establishing the ability to make the appropriate information available to cognizant NRC staff as needed. As part of this process, three knowledge capture seminars have been completed, each bringing an individual with significant experience and expertise in a facet of HTGR technology to the NRC for a full day. Video files of the seminars as well as various other HTGR documents are accessible through a Web-based HTGR community of practice, where information can be shared to facilitate current work assignments and knowledge transfer between expert and journeyman staff.

The staff has completed a draft update of the NRC Advanced Reactor Research Program Plan previously documented in SECY-03-0059, "NRC's Advanced Reactor Research Program," dated April 18, 2003. The draft update involved a comprehensive reassessment of the technical infrastructure development needs for HTGR and VHTR designs, and a limited-scope technical infrastructure development needs survey for fast liquid metal reactor (LMR) designs. It is anticipated that the final version of the updated Advanced Reactor Research Program Plan will be issued before the end of CY 2007. The update is being used to support the development of the joint NRC-DOE licensing strategy for the NGNP project as required by the EPAct.

Support for Other Reactor Technologies

As documented above, the staff has conducted an initial infrastructure needs survey of the technical and safety R&D issues associated with fast LMRs. The infrastructure assessment survey addresses potential future applications involving fast LMRs, such as small, secure reactors or the ABR, associated with the GNEP initiative.

Codes and Standards Development

The NRC staff continued its participation in the quarterly meetings of the American Nuclear Society (ANS) 28 Subcommittee, which is preparing an ANS safety standard for modular HTGRs, titled "Nuclear Safety Criteria for the Design of Modular Helium-Cooled Reactor Plants." The objective of the standard is to establish the nuclear safety criteria, functional performance, and design requirements of structures, systems, and components of modular gas reactor plants consistent with established risk objectives.

The staff is working with the American Society of Mechanical Engineers (ASME) and ANS on a suite of PRA standards to support regulatory guidance being developed by the NRC. The staff is also working with other ANS committees to appropriately endorse existing safety criteria standards that have been used in advanced reactors such as the AP1000, ESBWR, and EPR. These standards are based on deterministic principles that have provided the safety criteria for LWRs.

The NRC staff is supporting ASME code development by serving on the steering committee and as a technical advisor to the DOE/ASME collaboration to update and expand appropriate materials, construction, and design codes for application in future Generation IV (Gen IV) nuclear reactor systems that operate at elevated temperatures. The NRC staff also participated at meetings of the American Society of Testing Materials, which is developing nuclear graphite materials specifications and testing standards for important properties determination.

Additionally, NRC staff has participated in a discussion on industry activities and improvements to the ASME Code to help in the licensing and operation of new reactors. The staff discussed the provisions of 10 CFR Part 52 and possible areas where ASME could help promote the safety and performance of new nuclear power plants and the efficiency of the licensing process.

Human Factors Research

One of the TWGs that was established as part of the Digital I&C Steering Committee initiative relates to human factors and highly integrated control rooms. The primary purpose of this activity is to facilitate consistent and efficient licensing of new digital human-system interface technology at new reactors by modifying existing or developing new HFE review guidance, regulatory positions, and acceptance criteria, as needed. The areas of particular interest are the minimum inventory of alarms, displays, and controls needed to implement the emergency operating procedures (EOPs) when the primary control system has failed; computerized procedures; the safety parameter display system; a graded approach to human factors design and review; the feasibility and reliability of manual operator actions that provide diversity and defense in depth; and the human factors aspects associated with operating safety and non-safety functions through a non-safety multichannel video display unit. In addition, RES performed a PIRT process to prioritize research needed to develop the technical bases to support the advanced reactor guidance development. The report from this activity will be available during the next reporting period.

Digital Instrumentation & Controls

Digital I&C Steering Committee Activities

On November 8, 2006, the NRC staff and industry briefed the Commission on digital I&C issues. As a result of the meeting, the Commission issued an SRM instructing the staff to engage industry in order to establish a project plan with specific milestones and deliverables to address issues involving deployment of digital I&C for new reactors and digital upgrades to existing plants. In response, the staff formed the Digital I&C Steering Committee with members representing key NRC program offices, including NRO, NRR, RES, NSIR, and NMSS. Under the steering committee, six TWGs have been formed for each of the following six key issue areas:

(1) cyber security
(2) diversity and defense in depth
(3) risk-informed digital I&C
(4) highly integrated control room—communications
(5) highly integrated control room—human factors
(6) licensing process

The steering committee and TWGs have been working directly with the corresponding industry counterparts—the Industry Digital I&C/Human Factors Working Group and various task forces and focus groups. The Digital I&C Steering Committee has held several public meetings with industry, and the TWGs have publicly met with their industry contacts at more than 30 public meetings this year. As a result, the staff completed and issued the digital I&C project plan on July 12, 2007, and implementation of the plan is currently underway.

On July 18, 2007, the NRC staff and industry briefed the Commission on the progress toward establishing an integrated digital I&C and human-machine interface test facility, and the status of the regulatory infrastructure for digital I&C. The Commission directed the staff to proceed with the issuance of interim guidance.

The staff developed an interim staff guidance (ISG) process, similar to previous ISG processes successfully used, so that the staff guidance to be developed by the TWGs through the project plan could be made publicly available for industry use in a timely manner. The development of the ISG for the key issues is in various stages for each of the TWGs. The staff has already issued a draft ISG on diversity and defense in depth, discussed it with the stakeholders in June 2007, and recently received industry comments. The staff plans to issue the ISG before September 30, 2007, after addressing comments. The remaining near-term ISGs are scheduled to be issued by the end of this year. The ISGs are intended to provide the industry with acceptable approaches that are expected to have a high likelihood of staff review and approval of submittals in a timely manner. The ISGs issued may need to be updated on a case-by-case basis as appropriate for continuous improvement based on industry feedback, lessons learned, and the availability of relevant information. Eventually, the ISGs will be used to update the SRP and other RGs in the next year or two.

Current Review Activities

The NRC staff is currently reviewing the ESBWR digital I&C design as part of the DCA review. GE has also submitted topical reports on several key technical areas in support of the DC and plans to submit additional reports in the future. The staff reviewed Revisions 1, 2, and 3 to the DCD and identified numerous RAIs. Based on the submittals and RAI responses, the staff recently developed a preliminary SER with open items for the digital I&C area. The open items are associated with the remaining RAIs to which GE is yet to respond and the additional topical reports to be submitted. In addition, a large volume of pre-application activities is ongoing for future DC and COL applications for other designs. Specifically, the industry has submitted a number of digital I&C topical/technical reports associated with U.S. EPR, US-APWR, ABWR, and AP1000. The staff is in the process of reviewing these reports. The vendors indicated that they would submit additional technical and topical reports in the future.

At this time, the staff has not identified any policy or technology impediments for the ABWR, ESBWR, or AP1000 designs. The final design details remain to be developed and reviewed by the staff for each of the three designs. The staff has identified several technical issues regarding the U.S. EPR and US-APWR designs that require increased attention and interaction with the vendors. For example, the staff is closely evaluating the interaction between safety and nonsafety systems, integration of the reactor trip system and engineered safety features actuation system into single controllers, and diversity and defense in depth. The staff is fully engaged with the vendors on these issues through public meetings and correspondence to gain a better understanding of these new designs and technologies and to seek effective and efficient resolution of potential safety concerns. Staff review of the ESBWR DC and technical/topical reports is progressing using the existing guidance.

International Activities

The NRC staff continues to have extensive interaction with international entities and partners concerning the deployment of digital I&C in nuclear facilities. For example, the staff has held several bilateral meetings with various foreign countries concerning digital I&C in new reactors. These bilateral meetings have been mutually beneficial as lessons learned, current developments, and insights on regulatory, operational, and technical issues are shared.

The staff engaged in a full-day meeting on June 18, 2007, with representatives from seven international regulatory agencies to discuss technical and regulatory issues related to diversity and defense in depth. The staff also hosted an international symposium June 19–21, 2007, sponsored by the International Atomic Energy Agency (IAEA) on digital common-cause failures. The staff is also participating in other IAEA TWG activities.

From June 20–21, 2007, the staff participated in a meeting in France led by the MDEP to identify areas of potential convergence and cooperation associated with the digital I&C technical reviews conducted in support of licensing and regulatory reviews. This effort was in support of the MDEP Stage 2 activities.

Research Activities

The staff is conducting several research projects to augment and supplement review criteria for licensing digital I&C systems, solicit insights from international nuclear regulators, and build on the agency's licensing experiences with digital I&C systems. These include, but are not limited to, risk assessment of digital systems, the highly integrated control room, diversity and defense in depth, and security aspects of digital systems.

Challenges

The staff is actively recruiting qualified employees with the appropriate skill sets to be able to handle the future digital I&C workload associated with new reactors. Progress has been made in hiring employees for digital I&C, but the timely hiring of staff with the right skill sets has been challenging for several key reasons, including high demand with limited pool in this country and deployment of the first-of-its-kind technologies in new reactor designs such as the U.S. EPR and US-APWR. Because of the uniqueness, complexity, and continuing evolution of digital I&C technologies, there will also be a steep learning curve for the staff already on board in its review of new reactor activities.

Structural and Seismic Accomplishments

One of the high-priority regulatory guidance documents issued in March 2007 was RG 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion." This new RG provides an acceptable alternative to existing RG 1.165, "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," issued March 1997. This RG has been developed to provide general guidance on methods acceptable to the NRC staff for (1) conducting geological, geophysical, seismological, and geotechnical investigations, (2) identifying and characterizing seismic sources, (3) conducting a probabilistic seismic hazard assessment, (4) determining seismic wave transmission (soil amplification) characteristics of soil and rock sites, and (5) determining site-specific, performance-based ground motion response spectra, satisfying the requirements of paragraphs (c), (d)(1), and (d)(2) of 10 CFR 100.23, "Geologic and Seismic Siting Criteria," and leading to the establishment of a safe-shutdown earthquake to satisfy the design requirements of Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants," to 10 CFR Part 50.

The RG continued the acceptance of probabilistic seismic hazard assessment as part of the primary basis for the establishment of the earthquake ground motion characteristics for use in siting and designing nuclear power plants.