

**WITS 200100018 - Quarterly CA Note on Status of New Reactor Licensing Activities  
July 1 – September 30, 2008**

New Reactor Licensing Reviews

*Design Certifications:*

To date, three Design Certifications (DCs) and one DC amendment are under review. The staff is currently conducting reviews of the Economic Simplified Boiling Water Reactor (ESBWR) DC (ESBWR Design Control Document (DCD) Rev. 5 was submitted June 1, 2008); the US Evolutionary Power Reactor (EPR) and the US-Advanced Pressurized Water Reactor (APWR) DCs as well as the Advance Passive (AP)1000 DC Amendment. All acceptance reviews have been completed and review schedules issued except for the ESBWR DCD.

The staff is currently establishing the schedule for review milestones for the ESBWR based on design changes incorporated in DCD Revision 5, the schedule for review of associated topical reports, and the schedule for General Electric Hitachi Nuclear Energy's (GEH) responses to outstanding requests for additional information (RAIs). In addition, the staff is aware of additional design changes under consideration by GEH which will need to be evaluated for schedule impacts when they are submitted for staff review.

Revision 17 to the AP1000 DCD was submitted the week of September 22, 2008. In Rev. 17, Westinghouse proposed changes that were expected (Control Room Dose) and changes that were not expected (Chapter 8 Electrical – DC Power System Voltage & Design). The staff is re-evaluating the schedule for its review of the amendment to the AP1000 DC due to delayed RAI responses, new submittals, and over-allocation issues.

The status of the DCs that are currently under review is provided in the table below.

<b>Applicant</b>	<b>Design Type</b>	<b>Application Date</b>	<b>Acceptance Date</b>	<b>Status</b>
GEH	ESBWR	Various	Various	Safety review underway.
Westinghouse	AP1000 DC Amendment	5/26/07	01/18/08	Review schedule published. Safety review underway.
AREVA	EPR	12/11/07	02/26/08	Review schedule published. Safety review underway.
Mitsubishi	US APWR	12/31/07	2/29/08	Review schedule published. Safety review underway.

*Early Site Permits:*

The NRC is currently reviewing an application submitted by the Southern Nuclear Operating Company for the Vogtle site in Georgia. The staff issued its Vogtle Early Site Permit (ESP) Final EIS (FEIS) in August 2008. The expected issuance date for the Vogtle ESP Final Safety Evaluation Report (FSER) is February 5, 2009.

The staff is continuing its review of the Vogtle ESP/Limited Work Authorization (LWA) application. In order to complete this review, the staff must also understand the overall seismic demand, and the loading due to the AP1000 design. This portion of the review is on the critical path.

*Combined License Applications:*

As of October 1, 2008, the staff has received sixteen Combined License (COL) applications (COLAs) for review. The current status of the COLAs that are currently under review is provided in the table below.

<b>Applicant</b>	<b>Design Type</b>	<b>Application Date</b>	<b>Acceptance Date</b>	<b>Status</b>
UniStar Nuclear (Calvert Cliffs)	EPR (Reference Plant)	7/13/07 3/17/08	2/11/08 (Part 1) 6/3/08 (Part 2)	Part 2 of COL application submitted on March 17, 2008. Review schedule published.
NRG Energy (South Texas Project (STP))	ABWR (Reference Plant)	9/20/07	11/29/07	Schedule TBD. Applicant has requested that the staff stop its review on portions of application pending resolution of vendor support issues. As a result, the NRC is conducting a partial review of the STP application.  Revision two of the STP application was received on September 24, 2008. The NRC is reviewing revision two to ensure it contains the information necessary to resume a full review and publish a schedule.
TVA (Bellefonte)	AP1000 (Reference Plant)	10/30/07	1/18/08	Review schedule published. Safety and environmental reviews underway.
Dominion (North Anna)	ESBWR (Reference Plant)	11/27/07	02/11/08	Review schedule published. Safety and environmental reviews underway.
Duke (Lee)	AP1000	12/13/07	2/25/08	Review schedule published. Safety and environmental reviews underway.
Progress Energy (Shearon Harris)	AP1000	2/19/08	4/17/08	Review schedule published. Safety and environmental reviews underway.

Entergy (Grand Gulf)	ESBWR	2/27/08	4/17/08	Review schedule published. Safety and environmental reviews underway.
Southern Nuclear Operating Co. (Vogtle)	AP1000	3/31/08	5/30/08	Review schedule to be published.
South Carolina Electric & Gas (VC Summer)	AP1000	3/31/08	7/31/08	Review schedule to be published.
AmerenUE (Callaway)	US EPR	7/28/2008	-	Decision to docket deferred due to inadequate application quality and geosciences and geotechnical information deficiencies. The staff plans further interactions with the applicant and plans to issue a letter describing the issues by the end of October.
Progress Energy (Levy County)	AP1000	7/30/08	10/01/08	Review schedule deferred until after receipt and evaluation of the additional geotechnical information. All other portions of the review are scheduled to begin on or about October 6.
Exelon (Victoria County)	ESBWR	9/03/08		Acceptance review underway.
Detroit Edison Energy (Fermi)	ESBWR	9/18/08		Acceptance review underway.
Luminant Power (Comanche Peak)	US-APWR	9/19/08		Acceptance review underway.
Entergy (River Bend)	ESBWR	9/25/08		Acceptance review underway.
Unistar Nuclear (Nine Mile Point)	EPR	9/30/08		Acceptance review underway.
PPL Generation (Bell Bend)	EPR	Expected 10/15/08		

Details regarding review status as well as project risks and schedule changes associated with each of the new reactor licensing reviews discussed above are available at <http://nrr10.nrc.gov/NRO/new-rx-status/status-reports/2008/index.cfm>. In addition, review schedules and other pertinent information regarding these reviews are available on the public webpage at <http://www.nrc.gov/reactors/new-reactor-licensing.html>.

#### *Other Licensing Activities:*

The staff conducted Public Outreach Meetings in support of COLAs for the following sites: Callaway, Vogtle, Victoria County, Bell Bend, Fermi, and Nine Mile Point. In addition, the staff conducted Readiness Assessment Activities at Fermi, Victoria County, Bell Bend, Turkey Point, and Nine Mile Point.

The staff conducted Department of Homeland Security site visits at Grand Gulf, Watts Bar, Vogtle, and Calvert Cliffs.

The staff posted Detailed Review Schedules for COLAs and DCs onto the public website.

#### Regulatory Infrastructure Activities

##### *Aircraft Impact Assessment (AIA) Rulemaking:*

The staff has developed regulations and is continuing to assess and pursue rulemakings to support the licensing of new reactors and address major policy issues such as the need to address possible aircraft impacts during the design of new reactors. The staff issued a proposed rule for comment which was published in the Federal Register on October 3, 2007. In this rule, the NRC is proposing that applicants for new nuclear power reactor designs to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, the applicant would be required to describe and evaluate design features, functional capabilities, and strategies to avoid or mitigate the effects of the aircraft impact. The staff has evaluated public comments and discussed the rulemaking with the Advisory Committee on Reactor Safeguards (ACRS) at a meeting on July 9, 2008. A favorable letter was received from the ACRS on July 18, 2008. The rulemaking package was presented to the steering committee on August 13, 2008, and the staff is working to incorporate steering committee comments.

The staff is continuing to interact with industry regarding its development of guidance for performing assessments of aircraft impacts with hopes of being able to reference the industry guidance in a future regulatory guide. Interactions with industry regarding specific reactor designs and their assessments will follow activities related to the guidance and rulemaking. The staff is currently reviewing an August 14, 2008 version of a Nuclear Energy Institute (NEI) guidance document related to the performance of the AIA. It is expected that applicants will submit revisions to their applications in early 2009 to address the AIA rulemaking, and other requirements within the security rulemaking.

##### *Standard Review Plan:*

Since the March 2007 revision of the standard review plan (SRP), the staff has issued updates to sections on the maintenance rule and Probabilistic Risk Assessment (PRA). Plans are being

developed to better integrate the maintenance of the SRP into the roles and responsibilities of technical branches, tools such as Wizard, and knowledge management activities. Office instructions for Maintaining and Updating the Standard Review Plan (NRO-REG-300) and Development and Issuance of Interim Staff Guidance for the Office of New Reactors (NRO-REG-301) were issued in September 2008. Also, staff initiated changes to designs or programs (backfit) and these changes are in concurrence process.

#### *Issue Management:*

Several of the issues currently under evaluation are:

- ▶ resolution of “no entry” for Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) in previous/ongoing DCs
- ▶ definition of construction
- ▶ staff initiated DC amendments (backfit)
- ▶ standardized approach to license conditions
- ▶ topical reports and review coordination with NRR

#### *Part 73 Security Rulemaking:*

The Part 73 security rulemaking is primarily the vehicle to codify the requirements imposed on operating reactors by Orders issued after September 11, 2001. The draft final rulemaking was provided to the EDO on June 30, 2008, and has been forwarded to the Commission. The final rulemaking needs to be effective before the FSER for the first COL application is completed.

The NRO staff began discussions with NEI and Design Center Working Groups (meeting held on July 2 and July 22) on the development of guidance for mitigating strategies for loss of large areas due to explosions or fires (Item B.5.b in ICM Orders for operating plants; and section 50.54(hh) in proposed security rulemaking).

The security rulemaking includes a new provision for cyber security. A draft of the associated guidance document was issued for public comment. A meeting on the associated draft regulatory guide was held on July 18, 2008.

#### *DC Rulemaking:*

A potential scheduling issue that has been introduced by the concurrent reviews of DC applications and related combined COLAs relates to the need to complete the DC rulemaking prior to the completion of hearings and issuance of a COL that relies on that DC. The typical rulemaking process includes publication of a proposed rulemaking for public comment, resolution of public comments, and then the issuance of the final rule. Including the development of the rulemaking packages, public comment periods, reviews by the Commission, the Office of the *Federal Register*, and the Office of Management and Budget (OMB), the rulemaking process typically takes approximately two years from the start of the effort to the time the final rule is published. Given the current schedules for completing some of the DCs and related COLAs, the rulemaking process could be a significant critical path item for the issuance of the first COL in several design centers. The staff evaluated the DC rulemaking process as part of the NRC's lean six sigma program in order to identify possible ways to shorten the rulemaking process and coordinate activities (design reviews, rulemaking, licensing) to minimize the contribution of the rulemaking to the COL schedules. In addition to several internal process

improvements, the staff will propose policy changes in a Commission paper currently under development. If the various identified improvements are implemented, the staff believes that the DC rulemakings could be completed in about one year and could be timed to minimize possible delays in the COL licensing process. In a related activity, the staff is preparing a request to the Commission to establish NRO as a lead rulemaking office similar to NRR and FSME.

#### *Advanced Reactors:*

The staff prepared and issued a memorandum to the Commission regarding criteria for funding the review of future small, grid-appropriate reactors. In addition, the staff supported pre-application meetings with vendors regarding the International Reactor Innovative & Secure, the Super-safe, Small and Simple (4S), and NuScale designs.

A meeting with NuScale regarding its small light water reactor design was held on July 24, 2008. NuScale has stated that they intend to submit technical reports for staff review as part of its pre-application activities.

A meeting with Toshiba regarding the 4S reactor design was held on August 8, 2008. Toshiba has provided a design description report and a technical report on metallic fuel. Toshiba is expected later this year to submit additional technical reports for staff review.

The staff prepared and provided to the OEDO on July 3, 2008, a Commission Paper in accordance with a recent SRM to discuss the future budgeting of activities related to grid appropriate reactors. A redacted version of the memorandum has been made publicly available and was sent to the various companies proposing advanced reactor designs.

The NRC and the US Department of Energy (DOE) jointly issued the "Next Generation Nuclear Plant Licensing Strategy" to Congress in August 2008, in accordance with Section 644 of the Energy Policy Act of 2005 (PL 109-58, August 8, 2005).

A more complete status of guidance development and rulemaking, as well as activities associated with Advanced Reactors is available under the section entitled, "Regulatory Infrastructure," at [Hot Topics](#).

#### *Contracting Activities:*

For fourth quarter of FY08, NRO committed a total of approximately \$17.8 M and obligated a total of \$35.2 M. In FY08, the staff committed a total of approximately \$75.9 M and obligated \$73.2 M.

#### Construction Inspection Activities

The staff developed two Inspection Manual Chapters and 20 Inspection Procedures to support inspections of construction activities were completed. The staff is progressing on the remaining Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) procedures and is on track to complete the reviews and updates well in advanced of the anticipated need.

Stakeholder interactions, including public meetings to develop implementation guidance and outreach meetings in the vicinity of potential new reactor sites, are continuing. The staff has

conducted 6 public meetings in the Washington, DC area to work through the implementation details associated with ITAAC closure, licensee assessment, enforcement, safety culture for new reactors, and the implementation of the DOE standby support rule.

Eight additional inspections under the enhanced vendor inspection program were completed.

The database that will be used for documentation of inspection results and ITAAC is in final testing and is nearly complete.

### International Activities

During the week of August 25, 2008, the staff visited the Pebble Bed Modular Reactor test facilities in South Africa.

On September 15-19, 2008, staff traveled to Japan to observe chemical effects tests performed by MHI for the US APWR. The tests will examine the characteristics and quantify the chemical precipitants expected during post-loss-of-coolant accident conditions of the US-APWR and quantify their impact on containment sump strainer head loss and long term cooling.

On September 15-19, 2008, the Director of NRO, along with staff visited Japan Steel Works and Hokkaido Electric Power Company's Tomari Nuclear Power Plant to observe licensed operator training, simulator training and simulator performance testing. During the trip, they met with the Japan Nuclear Energy Safety Organization and made a presentation on new reactor activities in the United States.

From October 8-10, 2008, the staff will participate in a workshop co-sponsored by the International Atomic Energy Agency addressing the use of Field Programmable Gate Array (FPGA) technology in nuclear power plant safety systems. This technology is expected to be deployed for new reactor designs. The staff will chair a session of the FPGA workshop regarding licensing requirements and will also attend the second issue-specific Digital Instrumentation and Controls Working Group meeting under the Multi-national Design Evaluation Program (MDEP) on October 13-15, 2008 in Paris, France.

From October 20-31, 2008, staff and 5 contractors will be holding a workshop in Beijing, China with the Chinese regulator, NNSA, on topical issues related to the NRC safety review of the AP1000. NRC will provide this training as part of its participation with NNSA as part of the Protocol between governments. The NRC expects this to be followed by additional technical exchanges under the MDEP.

In addition, the staff established three issue-specific working groups under the MDEP, which include: Vendor Inspections, Digital Instrumentation and Controls (I&C), and Pressure Boundary Codes & Standards. Under the auspices of the Committee on Nuclear Regulatory Activities, a Working Group on Regulating New Reactors was organized with membership by the regulators of approximately 15 countries initially to be led by NRO management. The staff will be attending this Working Group meeting on November 19-21, 2008, in Helsinki, Finland. The current major areas of cooperation to be discussed at this meeting are containment, I&C and PRA. As this Working Group relates to the construction inspection program, the NRC also has the lead to coordinate international efforts on exchange of construction/operational experience information.