

Renaissance Watch

An update on developments that may lead to new power reactor orders and construction

General developments

On June 30, Florida Power & Light Company applied for combined construction and operating licenses (COL) for two Westinghouse AP1000 pressurized water reactors for the Turkey Point site in Florida, and at this writing, the Nuclear Regulatory Commission was conducting its acceptance review of the application. Babcock & Wilcox announced plans on June 9 to develop a 125-MWe modular PWR called mPower, with a certification application planned for 2011 and the Tennessee Valley Authority cooperating to assess the Clinch River site in Tennessee for suitability (*NN*, July 2009, p. 17). After announcing in April that it was suspending its own work on Callaway-2 but requesting that the NRC continue reviews of the COL application, AmerenUE in June asked the NRC to suspend the agency's work as well.

License applications

In the summation that follows, **bold** indicates a submitted application; *italics* means that an application is forthcoming. Other terms: ACRS, Advisory Committee on Reactor Safeguards; ASLB, Atomic Safety and Licensing Board; COLA, COL application; EPC, engineering, procurement, and construction; FEIS (DEIS), final (draft) environmental impact statement; FSER (DSER), final (draft) safety evaluation report; RAI, request for additional information. In some cases, detailed schedules of the NRC staff's technical reviews have been made public, and the following abbreviations are used for them: SP1, phase 1 of the safety review (RAIs issued by the NRC); SP2, phase 2 (safety evaluation report with open items); EP1, phase 1 of the environmental review (scoping); EP2, phase 2 (DEIS); EP3, phase 3 (public comments on DEIS). To date, no application has progressed beyond those phases; in some cases, the NRC is using a four-phase safety review, with letters instead of numbers. For design certification there is only a safety review; P1 and P2 are the same as the SP1 and SP2 in COLA reviews.

Both to save space and to keep focus on the most active projects, the following list excludes AmerenUE's Callaway-2, Entergy's Grand Gulf-3 and River Bend-3, Exelon's Victoria, and UniStar's Nine Mile Point-3, for which the NRC reviews have been suspended at the applicants' request.

Calvert Cliffs-3, U.S. EPR, UniStar Nuclear; Lusby, Md. The review schedule could lead to the FSER in November 2011; the environmental review currently has no target dates. The Maryland Public Service Commission approved the project in June, but will study whether a larger buy-in by France-based Electricité de France would be in the public interest. The ASLB has admitted three intervenor contentions into the hearing process.

South Texas-3, -4, Toshiba ABWRs, NRG Energy; Palacios, Texas. The NRC is treating the Toshiba design as a modification of the certified design for this COL, and not in need of a separate certification process. The review schedule could lead to the FSER in September 2011 and the FEIS in March 2011. EP1 was finished last September. An ASLB was named in May to review petitions to intervene. NRG signed an EPC contract with Toshiba on February 25.

Bellefonte-3, -4, AP1000s, NuStart/TVA; Scottsboro, Ala. This was the reference COL (R-COL) for the AP1000, but has been replaced by Vogtle-3 and -4 because of prolonged delays

in developing hydrology and geology data on the site. Because of the delays, there are currently no formal target dates for the completion of technical reviews. Ten of the 19 chapters of the SER with open items have been completed. Two contentions by intervenors will be included in the public hearing.

North Anna-3, ESBWR, Dominion; Mineral, Va. The review schedule could lead to the FSER in February 2011 (recently delayed because of ongoing ESBWR certification reviews) and the FEIS in December 2009. SP1 was finished last August, and SP2 was scheduled for completion in July. EP1 was finished last September, and EP2 last December 16; EP3 was to have been finished in July. An early site permit (ESP) was issued by the NRC in November 2007. The ASLB has admitted one contention for the hearing. Dominion announced on January 9 that it will consider contractors other than GE Hitachi Nuclear Energy.

Lee-1, -2, AP1000s, Duke Energy; Gaffney, S.C. The review schedule could lead to the FSER in February 2011; the FEIS schedule now has no target dates, because Duke had not submitted RAI responses and a revision of the environmental report when expected. EP1, however, was finished last September. The ASLB denied all of the submitted contentions last September.

Harris-2, -3, AP1000s, Progress Energy; New Hill, N.C. The review schedule could lead to the FSER in April 2011; the FEIS has no target date, for reasons similar to Lee's. EP1 was completed last November; SPA was to be completed this July. The ASLB had admitted one contention for consideration in the hearing, but after a remand by the commissioners, the ASLB denied the contention on June 30. The intervenor planned to appeal this reversal.

Vogtle-3, -4, AP1000s, Southern Nuclear; Waynesboro, Ga. The review schedule could lead to the FSER in April 2011 and the FEIS in January 2010. SP1 was finished in January. An application for an ESP and a limited work authorization received approval on the contested hearing in June, and the ASLB expects to issue a decision in August on the mandatory hearing. One intervenor contention on the COLA has been admitted by the ASLB. Southern signed an EPC contract with Westinghouse and Shaw Stone & Webster on April 8, 2008.

Summer-2, -3, AP1000s, SCANA/Santee Cooper; Parr, S.C. The FSER and FEIS are both scheduled for completion in February 2011. An ASLB denied all contentions from intervenors. SCANA signed an EPC contract with Westinghouse and Shaw Stone & Webster on May 27.

Levy-1, -2, AP1000s, Progress; Levy County, Fla. The review schedule could lead to the FSER in May 2011 and the FEIS in September 2010. EP1 was finished on May 28. The ASLB was named in February, and at this writing it had not issued a ruling on intervenor contentions. On January 5, Progress signed an EPC contract with Westinghouse and Shaw Stone & Webster.

Fermi-3, ESBWR, DTE; Monroe, Mich. The NRC has requested more information on the COLA's content on accidental releases of liquid effluents and will develop the review schedule after adequate data are provided.

Comanche Peak-3, -4, US-APWRs, Luminant; Glen Rose, Texas. The review schedule could lead to the FSER in December 2011 and the FEIS in January 2011. EP1 was finished on July 2. An ASLB was named in May to review petitions to intervene.

Bell Bend, U.S. EPR, PPL/UniStar; Berwick, Pa. The review schedule could lead to the FSER in March 2012 and the FEIS in March 2011.

Turkey Point-6, -7, AP1000s, FPL; Florida City, Fla. The COLA was submitted on June 30. The acceptance review was still taking place at this writing.

Amarillo-1, -2, U.S. EPR, UniStar/Amarillo Power; vicinity of Amarillo, Texas. The COLA submission is planned for the fourth quarter of 2009, although the applicant has indicated that

it may be delayed until 2010. No formal agreement has been announced between UniStar and Amarillo Power.

Elmore, U.S. EPR, UniStar/AEHI; Elmore County, Idaho. The COLA submission is planned for the fourth quarter of 2009. No formal agreement has been announced between UniStar and AEHI.

(*Unannounced #1*), reactor model not yet announced, applicant not disclosed publicly; site not yet announced. The NRC complies with potential applicants' requests not to divulge their identity publicly before COL or ESP application submission, and at present the agency indicates that it expects this COLA around January 2010.

Blue Castle Project, reactor model not yet announced, Transition Power Development LLC; site not yet announced, but expected to be one of four sites in Utah. The NRC indicates that it expects this COLA around March 2010.

(*Unannounced #2*), reactor model not yet announced, applicant not disclosed publicly; site not yet announced. The NRC expects the COLA in late 2010.

Design certification

ABWR, 1350-MWe boiling water reactor. The original General Electric design has been certified, but any plant built from the design would face the need for modifications, notably to employ digital instrumentation and controls. The certified design also includes exclusive intellectual property of GE Hitachi; South Texas-3 and -4 would use a design in which Toshiba is replacing the GE Hitachi exclusives with its own features developed from Toshiba ABWRs in Asia. NRG's amended COL application included these changes to the design—including the ultimate heat sink, I&C, and turbine generator—which in NRG's view will not require major amendments. GE Hitachi and Toshiba have both notified the NRC that they will seek the renewal of the ABWR certification, which was granted in 1997 and expires in 2012; this would mean two separate renewals of the certification, each with its own design particulars.

AP1000, 1100-MWe pressurized water reactor. The Westinghouse design that has been certified is based on design control document (DCD) Revision 15. COL applications are referencing DCD Revision 16, which the NRC is putting through an extensive amendment process. The NRC has issued a number of RAIs on Revision 16 and related technical reports. Last September, Westinghouse submitted Revision 17, which is intended to reflect the current AP1000 design and incorporate RAI responses. The current schedule sets a target date of December 2010 for the FSER. Ten of the 19 chapters of the SER with open items

have been finished, and were reviewed by the ACRS in July.

ESBWR, 1520-MWe boiling water reactor. The design was submitted for certification by General Electric (now GE Hitachi) in 2005. The SER with open items was finished earlier this year, and the target date for the FSER is August 2010.

US-APWR, 1700-MWe pressurized water reactor. The design was submitted for certification by Mitsubishi Heavy Industries in December 2007. The review schedule, issued last May, sets a target date of September 2011 for the FSER. P1 was completed on June 19.

U.S. EPR, 1600-MWe pressurized water reactor. The design was submitted for certification by Areva in December 2007. The review schedule sets a target date of September 2011 for the FSER. P1 was completed in January.

Others: Babcock & Wilcox has announced plans to seek certification for *mPower*, a 125-MWe PWR, in 2011. GE Hitachi has informed the NRC that it is considering a certification application for *PRISM*, a sodium-cooled fast-neutron reactor, in 2011. Also recently expressing interest in applying for design certification, a manufacturing license, or both, are Toshiba, for its *4S*; Hyperion Power Generation, for its *Hyperion*; and NuScale Power, for its *NuScale*. In various ways, these latter three depart considerably from the designs with which the NRC has experience.

Financial repercussions

There has long been a school of thought asserting that any utility that orders a new reactor would immediately be shunned by the investment community, causing its stock price to plummet. Here are the stock prices and trends of companies that have signed EPC contracts for new reactors:

Company	Stock price just before EPC contract	Stock price at end of trading, May 5	Change
NRG	\$20.60 (2/24/09)	\$23.51	+\$2.91
Progress	\$40.65 (1/2/09)	\$38.08	-\$2.57
SCANA	\$40.00 (5/26/08)	\$32.43	-\$7.57
Southern	\$36.27 (4/7/08)	\$31.67	-\$4.60

All four stocks have gained over the past two months, as they did in the two months before that, following the general recovery in stock prices even as they followed the steep decline that began last autumn. There continues to be no indication that an EPC contract, or any sort of interest in new reactors, has affected any company's stock price, for good or ill.