

Renaissance Watch

An update on developments that may lead to new power reactors

In what follows, **BOLD CAPITALS** are used for projects under (or approved for) construction; **bold** indicates a submitted application; *italics* means that an application is forthcoming. Acronyms: ACRS, Advisory Committee on Reactor Safeguards; ASLB, Atomic Safety and Licensing Board; COL, combined construction and operating license; COLA, COL application; CS, proposed date for the start of commercial operation; EPC, engineering, procurement, and construction; ESP, early site permit; FEIS (DEIS), final (draft) environmental impact statement; FSER

Under construction

WATTS BAR-2, 1177-MWe Westinghouse pressurized water reactor, Tennessee Valley Authority; Spring City, Tenn.; 86 percent complete, but subject to rework. CS: September to December 2015, although further delay to mid-2016 is considered possible by TVA officials. FSER: December 2013, though perhaps with supplements later; FEIS: February 2013. The supplemental draft EIS was issued in November 2011. One contention has been admitted for an operating license hearing.

BELLEFONTE-1, 1213-MWe Babcock & Wilcox PWR, Tennessee Valley Authority; Scottsboro, Ala.; 55 percent complete. CS: 2018–2020. On-site construction will not resume until Watts

(DSER), final (draft) safety evaluation report; ITAAC, inspections, tests, analyses, and acceptance criteria; MH, mandatory hearing and final decision; RAI, request for additional information; TBD, to be determined.

In many cases, detailed schedules for the Nuclear Regulatory Commission staff's technical reviews are in effect, and the following abbreviations are used for their phases in design certification: P1 (RAIs issued by the NRC); P2 (SER with open items); P3 (ACRS review of SER); P4 (advanced SER); P5 (ACRS review of advanced SER); P6 (FSER). COLAs have been based on the same six phases (referred to below as SP1 through SP6), but in some cases, the NRC is using a four-phase safety review with letters instead of numbers (SPA through SPD), essentially skipping SP2 and SP3. The COLA environmental review has four phases: EP1 (scoping); EP2 (DEIS); EP3 (comments on DEIS); EP4 (FEIS).

License Applications

Both to save space and to keep focus on the most active projects, the following list excludes Ameren Missouri's Callaway-2, Entergy's Grand Gulf-3 and River Bend-3, TVA's Bellefonte-3 and -4, and UniStar's Nine Mile Point-3, which have been suspended at the request of the applicants.

Calvert Cliffs-3, U.S. EPR, UniStar; Lusby, Md. CS: TBD; FSER: TBD; **FEIS issued May 13, 2011**. SP1 completed, April 2010; SP2 due, TBD (12 whole chapters are complete, as are parts of three others). The licensing proceeding has been terminated by the ASLB, on the grounds of UniStar's foreign ownership, but the NRC staff is still carrying out technical reviews and UniStar could apply later to reopen the proceeding.

South Texas-3, -4, Toshiba ABWRs, Nuclear Innovation North America (NINA); Palacios, Texas. CS: "as early as" June 2018 and July 2019, according to NINA. FSER: TBD; **FEIS issued February 24, 2011**. SP1 completed, September 2009. Two intervenor contentions have been resolved in NINA's favor; the hearing on the third was not scheduled at this writing. An EPC contract was signed with Toshiba in February 2009; the contract was assigned to the Shaw Group in November 2010.

North Anna-3, US-APWR, Dominion Generation; Mineral, Va. CS: 2022; FSER: TBD; FEIS: TBD. SPA due, TBD. Because a final EIS had been issued when the applicant planned to use an ESBWR, there will be a draft and a final supplemental EIS. The NRC issued an ESP in November 2007. The hearing record is closed, but a new contention has been submitted in connection with the August 2011 earthquake near the site.

Lee-1, -2, AP1000s, Duke Energy; Gaffney, S.C. CS: 2022 or later; FSER: TBD; FEIS: TBD; MH: March 2013. SPA completed, May 2010; SPB due, TBD, as Fukushima Daiichi lessons-learned issues are addressed. EP3 completed, June 2012. There are no intervenor contentions.

Harris-2, -3, AP1000s, Duke (formerly Progress) Energy; New Hill, N.C. CS: 1Q2026, 3Q2027; FSER: September 2013; FEIS, January 2014. SPA completed, April 2010; SPB due, April 2013. EP1 completed, November 2008; EP2 due, January 2013. There

Bar-2 loads fuel; procurement and other project spending is under way.

VOGTLE-3, -4, 1100-MWe Westinghouse PWRs (AP1000s), Southern Nuclear Operating Company; Waynesboro, Ga.; completion percentage not yet stated. CS: November 2016, November 2017. **The COLs were issued on February 10, 2012**. ITAAC status: One completed on Unit 3, not yet confirmed by the NRC.

SUMMER-2, -3, AP1000s, SCANA/Santee Cooper; Parr, S.C.; completion percentage not yet stated. CS: late 2016, mid-2018. **The COLs were issued on March 30, 2012**. ITAAC status: not yet stated.

are no intervenor contentions.

Levy-1, -2, AP1000s, Duke (formerly Progress) Energy; Levy County, Fla. CS: 2024, 2025–26. FSER: October 2012; **FEIS issued April 27, 2012**. SPC completed, January 2012. One intervenor contention is in the hearing process, and the hearing was held October 31 and November 1, 2012. Progress signed an EPC contract with Westinghouse and Shaw Stone & Webster in January 2009.

Fermi-3, ESBWR, DTE Energy; Monroe, Mich. CS: June 2020; FSER: May 2013; **FEIS issued January 4, 2013**. SP1 completed, August 2010; SP2 due, TBD, because of NRC reexamination of ESBWR benchmarking (17 chapters are done, as is part of one other). Two intervenor contentions have been admitted into the hearing process.

Comanche Peak-3, -4, US-APWRs, Luminant; Glen Rose, Texas. CS: Spring 2021, Summer 2022; FSER: June 2015; **FEIS issued May 13, 2011**; MH: November 2015. SP1 completed, October 2009; SP2 due, March 2014 (seven chapters done). There are no intervenor contentions.

Bell Bend, U.S. EPR, PPL/UniStar; Berwick, Pa. CS: December 2018; FSER: TBD; FEIS: TBD. The NRC has begun a supplemental scoping process because of the relocation of the nuclear island. There are no intervenor contentions.

Turkey Point-6, -7, AP1000s, FPL; Florida City, Fla. CS: 2022, 2023; FSER: TBD; FEIS, TBD; MH: TBD. SPA due, TBD. EP1 completed, December 2010; EP2 due, TBD. One intervenor contention is currently admitted into the hearing process.

Clinch River, two to six mPowers, TVA; Clinch River, Tenn. This would be a 10 CFR Part 50 application with separate proceedings for construction permits and operating licenses.

Callaway, one to five WSMRs, Ameren Missouri; Fulton, Mo. This would be a COL application under the 10 CFR Part 52 system being used for other new reactor projects.

Payette, reactor TBD (perhaps APR-1400), Alternate Energy Holdings Inc.; Payette, Idaho. The NRC has not expected submission of a COLA, but the applicant has stated an intention to submit one in the third quarter of 2014.

Early Site Permits

PSEG site, reactor TBD, PSEG; Salem, N.J. FSER: July 2014; FEIS: June 2014. SPA due, November 2012. EP1 completed, December 2010; EP2 due, June 2013.

Blue Castle Project, reactor TBD, Blue Castle Holdings; Green River, Utah. The NRC expects the application in early 2013.

Callaway, reactor TBD, Ameren Missouri; Fulton, Mo. This has been proposed for submission in late 2013, but may be sup-

planted by the WSMR COLA.

Piketon, reactor TBD, Duke Energy; Piketon, Ohio. This is aimed at the creation of the Southern Ohio Clean Energy Park. Areva is a partner in the project, but the ESP will not specify a reactor model. The NRC does not project a submission date, and Duke has said that if an application is submitted, it will not be before the end of fiscal year 2013.

Design Certification

ABWR, 1350-MWe boiling water reactor, GE Hitachi Nuclear Energy or Toshiba. The original General Electric design was certified in 1997. The Toshiba version, for South Texas-3 and -4, had its **final certification rule published on December 16, 2011, and effective January 17, 2012**. GE Hitachi and Toshiba have both applied for the renewal of the ABWR certification, which was to expire in 2012. The NRC has docketed both applications, with no review schedules issued as of this writing.

AP1000, 1100-MWe pressurized water reactor, Westinghouse. This design was certified in 2006. In 2007, Westinghouse applied to amend the design. **Final certification rule published, and immediately effective, on December 30, 2011**.

ESBWR, 1520-MWe BWR, GE Hitachi. The approval process for the final rule is on hold pending resolution of benchmarking errors; they were found in a power uprate proceeding, but may also apply to this reactor design.

U.S. EPR, 1600-MWe PWR, Areva. The certification target date is December 2014. P3 completed, May 2012; P4 due, March 2014.

US-APWR, 1700-MWe PWR, Mitsubishi Heavy Industries.

The certification target date is August 2015. P1 completed, January 2009; P2 due, November 2013 (11 chapters done).

APR-1400, 1400-MWe PWR, consortium led by Korea Electric Power Corporation. Kepco has stated that the application will be submitted in July 2013.

Westinghouse SMR, 225-MWe integral PWR, Westinghouse. The application is expected in mid-2013.

mPower, 180-MWe integral PWR, Generation mPower (Babcock & Wilcox/Bechtel). The application is currently expected in late 2013.

NuScale, 45-MWe integral PWR, NuScale Power. The application is currently expected in early to mid-2014.

Also: There are no other declared certification candidates at the moment, but there are many other designs being developed, among them Gen4 Energy's liquid metal-cooled *Gen4 Module*, Holtec International's iPWR *SMR-160*, and Areva's high-temperature gas-cooled *SC-HTGR*, which has been named the preferred design of the NGNP Industry Alliance—even as the DOE is not pursuing licensing for the NGNP and no public-private partnership has been established.