Renaissance now?

BY E. MICHAEL BLAKE

Progress on the first license applications, funding availability for loan guarantees, and a presidential election are among the factors that could influence whether orders for new reactors are actually placed in the United States during 2008.

IS THIS THE year? Will even one organization finally stop issuing denials and make a firm commitment during 2008 to buy and build a new power reactor? Or will everyone just continue with license applications and state-level permitting until after a new administration takes over in Washington?

The year 2008 promises to be the most active for the nuclear community—electricity providers and regulators alike—at least since the mid-1970s (and perhaps ever, with the added prospect of a license application for a high-level waste repository at Yucca Mountain, in Nevada). There are almost certain to be at least 10 combined construction and operating license (COL) applications in the Nuclear Regulatory Commission's hands by the end of the year, for four different reactor technologies. At this writing (December 2007), the most immediate concern raised by this prospect is the stasis in funding for the NRC, which since October 1 has been operating with the same budget it had in fiscal year 2007, despite the need to hire dozens more staffers to process and review the applications. The NRC has sought a steep increase in funding for FY 2008, and the longer the continuing resolution remains in place, the later the agency will obtain the resources it needs.

Experience suggests that the budget issue will be resolved eventually. NRC funding is generally not controversial, especially because, by statute, nearly all of it is recovered from licensees through user fees. And so, although there may be some delays, it seems likely that the NRC will ultimately be able to handle the applications.

If the NRC budget can be cleared up early in the year, it is possible to look ahead to the rest of the year, and the other potential factors. This look ahead at 2008 begins with a rundown of where things stand as the year begins.

What to build

Thus far, every new project for baseload nuclear generation is based on a reactor design that has already been certified by the NRC, is under review for certification, or is to be submitted for certification, perhaps by the time this magazine is printed. Under 10 CFR Part 52—the regulations governing the licensing process for new reactors—certification resolves all of a reactor's nuclear safety issues, so these issues (ideally) would not be subject to review or challenge during the licensing of specific projects.

The various reactor designs anticipated for use in the United States and their status are as follows:

■ The only candidate reactor design for which the certification process appears to have been completed is the **Advanced Boiling Water Reactor** (ABWR), originated by General Electric. It has been built in the real world by GE's licensees in Japan, Hitachi and Toshiba. It is the only candidate with which there is operating experience, as well as a growing body of knowledge on the modular construction techniques intended to reduce the time required for a plant to be built. ABWRs in the United States are expected to be rated at 1350 MWe each.

■ Westinghouse's **AP1000,** a pressurized water reactor that would be rated at 1100 MWe or slightly higher, was certified in January 2006, but the vendor has since submitted amendments to the design. So far, the NRC has viewed these amendments as needing only staff-level review, rather than a completely new certification process. The reviews of these amendments are not expected to cause any delays with license applications that employ the AP1000.

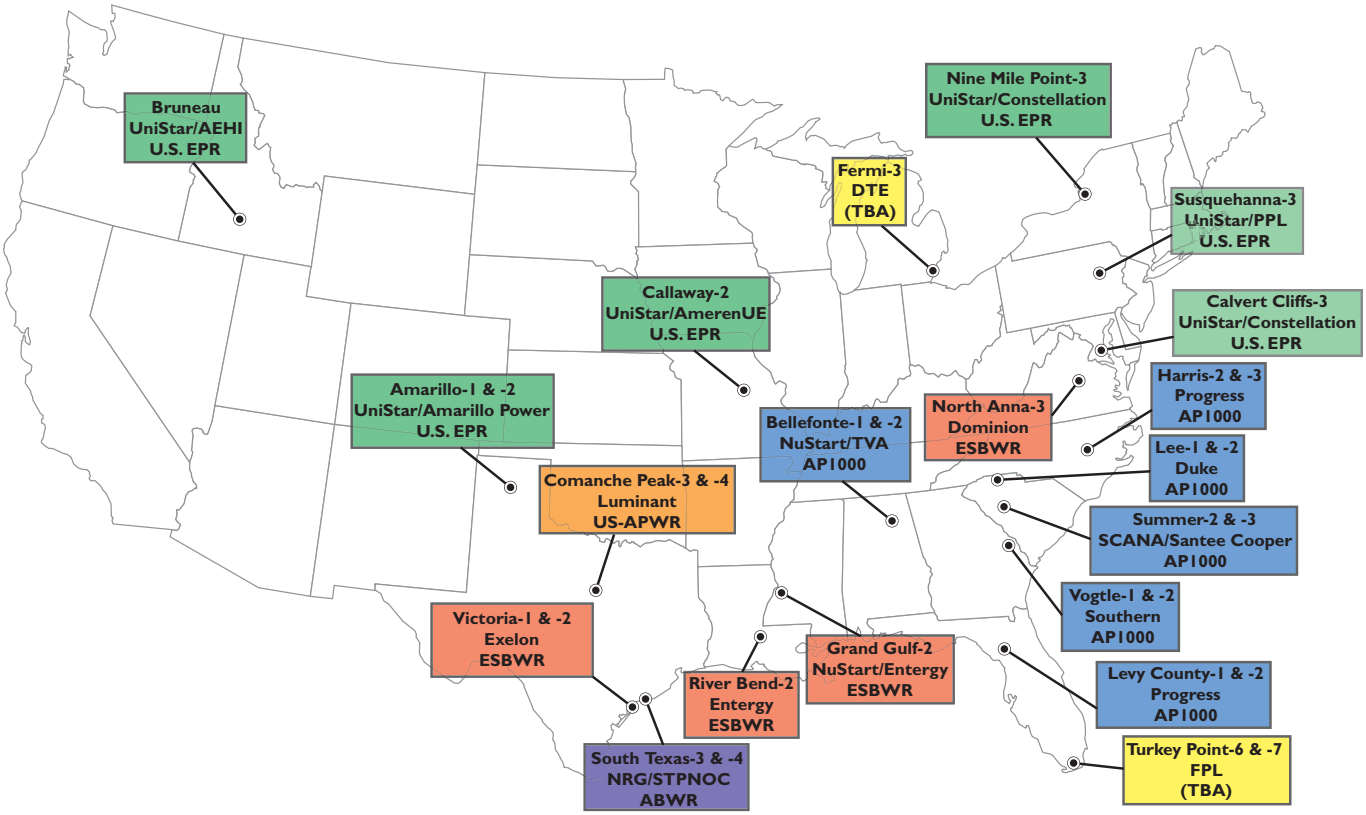
■ GE applied in August 2005 for the certification of its **Economic Simplified Boiling Water Reactor** (ESBWR) design, which when built would be rated at 1400–1500 MWe. The application cites safety features of both the ABWR and GE's Simplified Boiling Water Reactor, which has also been certified, and much of the review effort has involved the NRC's informing GE that more detail is needed of the ESBWR design, with less presumption of similarity to other designs. The NRC has finished about half of the chapters in the safety evaluation report (SER) with open items. It is believed that with the approval conveyed through the SER, the licensing of specific plants can begin, and the remainder of the design certification process can be done in parallel. (See story on page 20 for more details.)

It should be remembered, however, that the 10CFR52 licensing process has not been used before now, and despite detailed preparation and extensive guidance documents for use by both applicants and regulators, expectations may not always match reality. As is noted below, early-stage work

. . . and Duke makes five

Writing news for a monthly publication often entails the pursuit of moving targets. This article has already gone through a number of updates because of important developments in late November and early December, but eventually one has to give the layout and production people a decent chance to remain on schedule, and so the following item is not included in the text:

Duke Energy submitted its application for a combined construction and operating license for the Lee plant in South Carolina to the Nuclear Regulatory Commission on December 13. This is the fifth COL application to date. More general information on the project is included in this article, and more details on the application are provided in a news item in the Late News section of this issue. Because this issue will not reach readers until January, it should be borne in mind that other data presented as status reports might have become outdated.—*E.M.B.*



THE MAYBE MAP: Shown above are the projects for which the Nuclear Regulatory Commission has announced that it has been notified of intent to apply for licenses, with the boxes colored to indicate the chosen reactor model (blue = AP1000, green = U.S. EPR, orange = US-APWR, purple = ABWR, red = ESBWR, yellow = no decision yet). As of this writing, there is still not a single project that has reached the point of a firm commitment to build—which, in this era, is considered to be a signed contract for engineering, procurement, and construction (EPC). As the term suggests, an EPC would bring together equipment vendors and architect-engineers, and for some of the projects shown above there already exist partnerships assembled among the potential suppliers. Several of the potential buyers routinely speak these days in terms of *when* they will build, and not *if,* but until EPCs are signed, *NN* will consider all information about new power reactors in the United States to be speculative. Not included on the map are expressions of interest by American Electric Power Company, Arizona Public Service Company, the Fresno Nuclear Energy Group, MidAmerican Energy Holdings, Pacific Gas & Electric Company, and Public Service Electric and Gas Company—or rumors concerning others.

on the first few COL applications has already led to some disagreements on whether the submissions are sufficient.

Reactor safety experience dating back to the Three Mile Island-2 accident in 1979 has persuaded the main players in the U.S. nuclear industry that new reactor designs should depend less on engineered safety features and more on "passive" processes, such as natural circulation, to ensure ultimate safe shutdown, even in the event of a catastrophic accident. This philosophy is reflected in the AP1000 and the ESBWR, which are seen as "American" designs, even though Westinghouse is now owned by Toshiba of Japan, and GE has linked up with Japan's Hitachi for ESBWR work.

■ For the most part, the non-U.S. reactor vendors have headed in the opposite direction. Areva's **U.S. EPR,** a PWR that would be rated at about 1600 MWe, takes engineered safety features even further than earlier designs had, with four separate trains of reactor shutdown capability. (The original European Pressurized water Reactor design is used in a reactor under construction in Finland and in another soon to be built in France; the U.S. version has been modified somewhat.) After over two years of pre-application reviews of topical reports submitted to the NRC in the hope of resolving some specific issues in advance, Areva applied to the NRC for certification of the U.S. EPR design on December 11. Because the first full COL application for an EPR is to be submitted in the first quarter of 2008, there will be even more work to be done in parallel on design certification and licensing than there is with the ESBWR.

■ The last key player in reactor design (at least this year) is Mitsubishi Heavy Industries (MHI), with its **US-APWR**. A PWR rated as high as 1700 MWe (although the version for the U.S. market would probably generate about 1600 MWe), it also depends mainly on engineered safety features, but not to the extent of the U.S. EPR. It is the latest entry in the field, although MHI has tried to catch up by spending less than a year and a half in pre-application, aiming to apply for design certification at about the same time as Areva.

Who might build

The first phase of the industry's exploration of 10CFR52 ended in November, when the last of three early site permit (ESP) applications submitted in 2003 was approved by the NRC. Dominion's ESP for North Anna, in Virginia, like the one granted earlier in the year to Entergy for Grand Gulf, in Mississippi, will be used directly in a license application. With the environmental issues addressed in an ESP now resolved for up to 20 years, the COL reviews for North Anna and Grand Gulf can focus on plant construction and operation. The third ESP, for Exelon's Clinton, in Illinois, will remain unused for the time being. Exelon has no plans to seek a COL for Clinton, and current Illinois law would impede the construction of new reactors in the state.

The only ESP application now under review is from Southern Nuclear Operating Company, submitted in August 2006 for its Vogtle site in Georgia, in preparation for the submission of a COL application early this year (see below). Southern is also seeking a limited work authorization in connec-

tion with the ESP proceeding in order to allow some work to be done on the site before the COL can be issued. The only other prospects for ESPs are two sites in the Carolinas for which Duke Energy has expressed interest but has not announced a schedule for submission, and an application proposed for mid-2010 from an entity that has asked not to be identified.

COLs submitted

■ The first submission related to a COL was a partial application on July 13 (with two later supplements) for **Calvert Cliffs -3**, a U.S. EPR at the site near Lusby, Md., where Constellation Energy operates two PWRs. A partial submission dealing mainly with environmental issues is permitted under 10CFR52. The NRC, however, informed UniStar Nuclear on August 23 that the agency had suspended its review of whether the application was acceptable for docketing, because even the supplements did not provide enough information. UniStar responded on October 30 with a plan to provide the needed information, and with some of the information itself. The plan stated that the remaining information was to be provided by December 14.

Among the many differences between the earlier generation of nuclear power and what may be the new one is that there may no longer be a single event that can be seen as a "reactor order." UniStar was the first to take the step of arranging for the large forgings necessary for fabrication into the major components of a new power reactor (and whenever this takes place, it is almost always referred to as "procuring," not "ordering"). UniStar is a joint venture of an electricity provider (Constellation Energy) and a reactor vendor (Areva), but to date neither UniStar nor either partner has announced a commitment to ordering.

Outlook for 2008: When the partial application was submitted, UniStar told the NRC that the submission of the rest of the application, including the plant's safety analysis report, was planned for no later than March 15, 2008. At this writing, there had been no statement to the effect that this would change. Calvert Cliffs-3 is intended to be the reference COL application (R-COL) for the U.S. EPR, under the NRC-encouraged approach for design-centered licensing. In November, UniStar sought state-level permitting in Maryland for the project, and approval at this level may have to take place before there is a firm decision to build the reactor.

■ The first submission of a full COL application was by STP Nuclear Operating Company (STPNOC) and the owner of its largest share, NRG Energy, on September 24 for **South Texas-3 and -4,** twin ABWRs at the site near Palacios, Tex., where two PWRs are now in operation. NRG, a merchant electricity provider that bought the assets of Texas Genco in 2006, exists in an entirely different environment from that of the state-regulated, service area–based utilities that operate nearly all of the existing power reactors in the United States. With no rate base through which to charge customers for investments such as new generation, NRG often pre-sells a proposed plant's electricity to buyers (known as "off-takers"), and it took this approach with South Texas-3 and -4. Once enough off-takers are lined up, NRG uses their commitments to arrange financing for the project.

On November 29, NRG/STPNOC earned the distinction of having the first docketed COL application. Even as it accepted the application, however, the NRC said that it needed more information in order to work out a schedule for its reviews. More details are provided on page 15.

Outlook for 2008: NRG appears to be closer than anyone else to making a genuine commitment to ordering the nuclear steam supply systems and major components for new reactors. Company representatives have stated that they expect to place the order this year, perhaps as early as January. While the initial U.S. marketing of the ABWR was done by GE, in August NRG signed a project services agreement with Toshiba (which, along with Hitachi, has made hardware for the ABWRs now in service), giving that company the inside track to getting the engineering, procurement, and construction contract that now counts as a formal commitment to the construction of a reactor.

■ The 10CFR52 licensing process was to have been tried out initially by one of the recipients of cost-sharing support under the Department of Energy's Nuclear Power 2010 program, but after the licensing demonstration project was launched in 2004, interest in new nuclear power spread, and COL plans began popping up everywhere, without cost-sharing. One of the NP2010 partners—the NuStart consortium, made up of utilities and reactor vendors—on October 30 became the third COL applicant, for **Bellefonte-1 and -2,** two AP1000s for a TVA Nuclear site near Scottsboro, Ala., where two earlier PWRs had been started but never finished.

Bellefonte is the R-COL for the AP1000, the design for which there are currently the most expected subsequent COL (S-COL) applications (see below). Because of the cost-sharing aspect of NP2010, there is some uncertainty about how the federal budget (not just the time spent under the continuing resolution, but the eventual appropriation amount for FY 2008) might affect what can be done. Pursuit of the COL application might be set, but NP2010 contributions to design certification and first-of-a-kind engineering have yet to be clarified.

Outlook for 2008: Because so many S-COLs might depend on it, the NRC's acceptance review of the Bellefonte application (still ongoing) could determine whether as many as six applications stay close to their original schedules or are delayed. Beyond that, dramatic announcements this year seem unlikely. TVA just brought Browns Ferry-1 back on line in 2007 and has committed to finishing Watts Bar-2. TVA has stated that it might need more capacity in the 2015–2020 time frame but will have to spend more time studying demand growth and the effectiveness of conservation measures before deciding whether to order two new reactors.

■ The other NP2010 partner is Dominion, whose early and continued involvement (going back to the ESP application) has often been paired with corporate skepticism about the value of the process. By mid-2007, however, Dominion was permitting its employees to refer to its still-uncommitted effort as **North Anna-3,** which would be an ESBWR built at the site of two PWRs operating near Louisa, Va. Dominion has also procured large forgings. On November 27, Dominion became the fourth COL applicant, with what became the R-COL for the ESBWR (see page 13, this issue).

North Anna-3 has undergone two major changes since it was initially envisioned. The first reactor choice was AECL Technologies' ACR-700, a heavy-water reactor that would use slightly enriched uranium. Dominion, however, later switched to the ESBWR. Then, when there were environmental challenges by citizen organizations on the adequacy of cooling water from the lake that Dominion had earlier created for the first two units, Dominion decided to add cooling towers for any new nuclear capacity at the site. The latter decision forced some reviews to be redone, delaying the issuance of the ESP.

Outlook for 2008: Once the NRC accepts the application, the main point of interest will be the extent to which the level of approval in the ESBWR certification indeed allows the license reviews to be carried out meaningfully. As for whether an order would be placed, Dominion has said that for the reactor to go on line in 2015, a commitment to build would have to be made by sometime in 2009, so there may be no action on that front this year.

COL submissions scheduled

This summary continues in what has been, approximately, the order of scheduled submissions of COL applications.

■ Duke Energy was the first organization to announce (early in 2005) a licensing effort outside of NP2010, and it has designated the site of its canceled Cherokee plant near Gaffney, S.C., the **William States Lee III Nuclear Station,** in honor of the company's late president and nuclear pioneer. We will henceforth refer to the two AP1000s as **Lee-1 and -2**. Previously

targeted for an October 2007 COL submission, Lee's application had not been handed in by early December.

Outlook for 2008: Lee is likely to be one of the first S-COLs for the AP1000. If the Bellefonte acceptance review requires changes or extra information, the same might have to be provided in the S-COLs when they are submitted. Duke officials have said that they are in negotiations with Westinghouse on contract terms, and while there have been no clear indications on when the order or the engineering, procurement, and construction contract might be placed, Duke has been a serious player all along and clearly would prefer to build reactors for new generation.

■ By current standards, SCANA—the parent company of South Carolina Electric and Gas Company—is a small fry among nuclear licensees, with a modest service area and a single power reactor in operation. In partnership with South Carolina's main public power agency—Santee Cooper, which takes its name from a hydroelectric dam—SCANA has nonetheless pursued prospects for **Summer-2 and -3,** twin AP1000s for its reactor site near Parr, S.C., so eagerly that it appeared for a while that its COL application might be ready before any of the others for AP1000s. If the new reactors are built, the site might one day be able to boast involvement in more generations of power reactors than any other: Parr was also the site of the Carolinas-Virginia Tube Reactor, a 17-MWe heavy-water reactor that operated during the mid-1960s.

Outlook for 2008: Like Lee, this appears to be an early S-COL for the AP1000. SCANA has generally had little to say about when or if it would place an order, neither dropping hints nor issuing denials, and so it is unclear whether anything will take place this year.

■ NuStart has a BWR project to go with its PWR project at Bellefonte: **Grand Gulf -2,** a single ESBWR for Entergy's site at Port Gibson, Miss. Although Grand Gulf received its ESP before North Anna did, the latter became the R-COL for the ESBWR. During 2007, Entergy announced a slight delay in the COL submission, to January 2008. Entergy has procured forgings for one ESBWR but has not stated whether they are for Grand Gulf-2 or its own non-NuStart project at River Bend (see below).

Outlook for 2008: The acceptance review for North Anna-3 could influence the submission date for Grand Gulf-2, perhaps leading to a further delay. Entergy has been in negotiations with GE-Hitachi over issues such as setting a fixed price. For years, Entergy has been eager to revive nuclear power, and a firm order for Grand Gulf-2 might be placed this year, before one for North Anna-3.

■ Progress Energy has proposed the largest nuclear capacity addition of any announced applicant: four AP1000s, with a total capacity of about 4500 MWe. The first COL application would be for **Harris-2 and -3,** at the company's site near New Hill, N.C. Despite the planned January submission, however, Progress last year announced a delay in the project of about two years, along with the cancellation of its coal-fired projects in the Carolinas and the adoption of demand-side management.

Outlook for 2008: Progress has thus far stayed with its submission date despite the project delay. If the NRC's budget flatline continues, there might be discussion on whether this S-COL needs to be reviewed on the original schedule. The delay suggests that reactor orders this year are unlikely.

■ Southern has scheduled its COL application submission for **Vogtle-3 and -4,** twin AP1000s at its site near Waynesboro, Ga., for March. While the company has been clear about its general preference for new nuclear, the Georgia Public Service Commission threw Southern a curve in 2007, approving the request for new capacity but requiring that Southern open it up to any provider and fuel type.

Outlook for 2008: The state ruling has put Southern in the position of telling Westinghouse that if the new reactors' pricing cannot compete favorably with whatever options might be made available, the project must end. It seems unlikely that any other provider could suddenly emerge and make more than 2200 MWe of new capacity available by 2015, so conditions seem to favor the project's going ahead. Still, the prospects of a reactor order this year, which otherwise seemed likely, are currently uncertain.

■ Separately from NuStart, Entergy has decided to seek a license for **River Bend-2,** an ESBWR for the site near St. Francisville, La. The application is scheduled for submission in May.

Outlook for 2008: Entergy's procurement of one set of forgings, with no formal assignment to one project or the other, keeps the company's options open in case one of the projects has to be deferred or canceled. With Grand Gulf-2 in the lead, there does not appear to be the sort of urgency with River Bend-2 that would lead to a reactor order this year.

■ Progress Energy operates in two regions, each with its own set of conditions. The retrenchment noted above applies specifically to the Carolinas. In northern Florida, demand-side management and similar initiatives are already considered to have gone about as far as they can. Thus, **Levy County-1 and -2** remain on schedule to be available for service around 2016. While this site is only a few miles from the company's Crystal River plant and shares the same water source, this is the first project set at what counts as a completely greenfield location. The sites mentioned above have all been previously approved for nuclear plant construction.

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Outlook for 2008: The greenfield site may make this proceeding a relatively long one, even with the benefit of an S-COL that has some issues resolved at the R-COL stage. Progress clearly wants to use more nuclear power, but there may not be a need to get a deal done for reactor hardware this year.

■ In April 2007, AmerenUE became the first major electricity provider other than Constellation Energy to plan a license application with UniStar Nuclear (of which Constellation is an owner). **Callaway-2** would be a U.S. EPR at the site of AmerenUE's operating reactor near Fulton, Mo. As things stand now, Callaway-2 would be the first S-COL for the U.S. EPR. The application is planned for the third quarter of the year.

Outlook for 2008: AmerenUE has also procured forgings, and so the project appears to be fairly serious. The UniStar model, however, is unique, with UniStar not only licensing and building reactors but also operating them, with outside parties such as AmerenUE considered investors rather than owners, essentially providing the site and marketing the electricity. It seems fair to predict that deciding and agreeing on the roles of the parties will take some time, and that an order during 2008 is not likely.

■ The company now known as Luminant, after the private-equity takeover of TXU engineered last year by Kohlberg Kravis

Roberts, has scaled down its original plans for as much as 6000 MWe of new nuclear capacity at as many as three sites in Texas, to **Comanche Peak-3 and -4** at the company's existing reactor site near Glen Rose. Luminant has chosen MHI's US-APWR for both reactors, the only applicant thus far to do so. The submission is scheduled for December.

Outlook for 2008: Like the U.S. EPR, the US-APWR will be in the early stages of the design certification process when the COL application is submitted. The applicant's new owner has thus far agreed with the previous owner on the general idea of building new reactors, but ordering seems unlikely this year, or any time until the certification and licensing are seen to be making headway.

■ UniStar has envisioned that U.S. EPRs would be built in fleets, with the reactors in each fleet standardized all the way down to operator training. As part of establishing the first fleet, Constellation offered up not just Calvert Cliffs-3 but also **Nine Mile Point -3,** at the company's site near Scriba, N.Y. Submission is planned for the third quarter, probably after Callaway-2.

Outlook for 2008: With forgings already procured, progressing to an order is possible this year. More interesting developments may arise in later years. If license renewal at Indian Point, in downstate New York, is blocked or delayed, the state may need more power fairly quickly.

■ The second outside company to take serious interest in the U.S. EPR is PPL Energy, which in June 2007 announced plans to apply for a COL for **Susquehanna-3,** at the site of the company's BWRs near Berwick, Pa. The submission is scheduled for the third quarter of 2008.

Outlook for 2008: Unlike AmerenUE, PPL has not announced the procurement of forgings, and so it seems reasonable to predict that there will not be an order placed here until some time after the order is placed for Callaway-3.

■ Exelon Generation, unable to build new reactors in Illinois and declaring an unwillingness to build them anywhere until the high-level waste disposal situation is resolved, nonetheless announced in September 2006 that it will apply for a license for new nuclear capacity in Texas. In November 2007, Exelon decided that the reactor model would be the ESBWR, and in December the company procured forgings through GE-Hitachi for two reactors (see page 17). The site would be greenfield, about 20 miles south of **Victoria**. Submission is scheduled for September 2008.

Outlook for 2008: Exelon has not appeared to be as eager to build reactors as some of the other players, but the forgings deal shows continued progress. A reactor order this year still seems unlikely.

■ DTE Energy announced last February that it will apply for a COL for new capacity at its existing reactor site, **Fermi,** near Newport, Mich. At this writing, the reactor type had not been announced. Submission is expected sometime late this year.

Outlook for 2008: DTE representatives have been quoted as being very much in favor of new reactors, but the project appears to be too new to advance to the point of an order this year. The reactor type should be announced sometime before submission.

■ If NRG and UniStar differ from the established model for nuclear licensees, at least they involve substantial organizations with experience in large-scale electricity production. This cannot be said of Amarillo Power, which despite the name has no assets in electricity production or distribution and is a venture of a real estate developer and former nuclear-project welder. **Amarillo-1 and -2** would both be U.S. EPRs, built at an as-yet-unannounced greenfield site near Amarillo, Tex. The submission is planned for the fourth quarter of this year.

Outlook for 2008: Because this project would come under UniStar, it might ultimately be viable, because UniStar would provide all of the expertise, but there would still have to be an enormous investment. Two U.S. EPRs at full power would produce more than three times as much electricity as is consumed by the entire Texas Panhandle. Of the eight new reactors currently planned in Texas, these two appear to be the least likely to be built.

■ Also outside the conventional electricity industry is Alternate Energy Holdings, Inc., a Virginia-based partnership that has proposed to build a U.S. EPR as part of an energy park near **Bruneau,** Idaho. AEHI principals have some background in nuclear power and finance and have stated that they have financing available. A COL application is to be submitted in January 2009.

Outlook for 2008: No applicant has indicated that a reactor order would be placed before a COL application is submitted, and AEHI will not submit its application until 2009.

■ At the end of the line is FPL Group, whose Florida Power and Light Company unit intends to apply sometime in 2009 for COLs for **Turkey Point-6 and -7,** at the site near Florida City where two PWRs are now in service. The reactor choice has not been announced, but the company has informed state regulators that there would indeed be two reactors and has requested a certificate of need for the new capacity.

Outlook for 2008: The reactor choice will probably be announced, although an order seems unlikely. The late filing does not indicate a lack of interest. FPL expects to need the power starting around 2020 and sees no need to start sooner.

Further expressions of interest

The above covers every action, ongoing or expected, that has been reported by the NRC. Beyond that, there have been some expressions of interest that have not reached the point of licensing projects.

Arizona Public Service Company stated in 2006 that it is considering more reactors for its Palo Verde site. Pacific Gas and Electric Company has aired the possibility of building new reactors outside California, beyond the reach of the state law that would impede their construction. The California law may be challenged in a ballot initiative by the Fresno Nuclear Energy Group, a business organization that has proposed building a U.S. EPR. PSEG Nuclear has floated the possibility of a new reactor at Hope Creek/Salem, in New Jersey. A subsidiary of MidAmerican Energy Holdings is performing tests on land in Idaho to determine whether it is suitable as a reactor site. American Electric Power Company officials have expressed interest in a possible COL application. Public officials in Utah and Kansas have encouraged reactor development in their states. Potential developments such as these will probably stay in the background this year, although a ballot initiative against the California law would draw a great deal of attention.

In the wider world

Different companies have different reasons for choosing to become license applicants—or, to put it another way, the reasons are about the same for everyone, but they have varying influence on each applicant. The incentives in the Energy Policy Act of 2005 (EPAct) are sometimes given as the main cause for the current level of interest, but Duke and Southern started their projects before the law was passed, and at that time the energy bill's prospects looked no better than they had been the previous two years, when the bill was voted down. Some applicants, such as NRG and AmerenUE, have mentioned the EPAct incentives as having spurred their decisions to apply for licenses. Other factors include availability of financing, state regulatory climate, and projected demand growth. All applicants, however, appear to have a genuine willingness to try nuclear again, at least under the current approach of trying out some of the licensing process before committing to the purchase of a new plant.

While loan guarantees were made possible by EPAct, the amount of money to be made available—as Treasury backing, although this is treated like an appropriation—was debated in Congress all last year, and until an amount for a fiscal year is approved, the DOE has limited ability to approve guarantees. Some applicants may want to see that the guarantees will definitely be available before progressing much further.

Continued

The extent to which licensing under 10CFR52 would actually be less cumbersome than it was under 10CFR50 has yet to be determined, and it may be that other potential reactor customers will watch and wait until a few applicants get all the way through to operation—at least seven years from now—before deciding whether the process is worthwhile. The NRC, the Nuclear Energy Institute, and the various design-centered working groups have held frequent meetings in an effort to learn what will actually be needed to get through the process, especially the innovation of ITAAC (inspections, tests, analyses, and acceptance criteria), which is the key to getting from the end of construction to approval for operation. The licensees carry out ITAACs, and the NRC determines whether they satisfy the conditions of the license. All parties are now working on more detailed guidance.

Thus far, citizen organizations opposed to nuclear power have not made discernable headway in 10CFR52 proceedings. Nuclear opponents, however, have responded to the interest in new reactors by reviving the debate through the news media and Internet sites. The focus may be less on individual COL applications than on The Issue That Won't Go Away: spent fuel/high-level waste/Yucca Mountain. The DOE plans to apply to the NRC in 2008 for a license to build and operate a final repository at the Nevada site. While a licensed repository is not strictly necessary for new reactors, the increased attention to the issue may affect public opinion—and the perceptions of the investment community—on nuclear power in general, including new reactor construction.

Finally, there is an event later this year that may affect every aspect of this supposed renaissance: the presidential election. Even if this were to have little practical effect on license applications or plant ordering, the perception of the outcome might be enough to delay some decision-making until after the first week of November. In essence, the general belief is that another Republican president would either accept or encourage new reactors, while a Democrat would oppose them, and so orders that might otherwise be placed early in the year could instead be held back and committed only if a Republican wins.

Judging from the candidates' own Web sites and public statements and, frankly, ignoring the candidates who have shown no signs yet of having a chance to be nominated, a new era of nuclear construction does not appear to depend much on the next occupant of the White House. The Republicans are indeed in favor of more nuclear power as part of their energy policies, but the major Democrats (except John Edwards, something of a long shot) have made a point of including new nuclear, at least as something to be "on the table." New reactor designs, climate change, and the recent performance of existing reactors provide the contenders with the justification—if they feel they need it—for accepting nuclear without appearing to abandon the party's stances on environment and nuclear safety.

The loss of Republican influence need not prevent new reactor ordering. The Democrats took over both houses of Congress in 2006, and the push for new licenses has continued unabated. Decades of high-level waste debate and stagnation have not stopped existing reactors from operating (with older spent fuel going to dry storage), and so the issue may not interfere with the licensing and building of new reactors. (Low-level waste might turn out to be a bigger problem, with the expected closure of the disposal site in Barnwell, S.C., to all but three states.)

And so it begins—what may be the pivotal year in Generation III+. Is now the time to recruit and train new craft workers, upgrade existing U.S. manufacturing facilities to N-stamp level, maybe even encourage someone to develop an alternative to the effective monopoly of Japan Steel Works on heavy forgings? We may get the message very soon, perhaps from South Texas. NN