

What to do until the COL comes

BY E. MICHAEL BLAKE

THE NEW ERA of power reactor licensing in the United States has been under way for more than two years, and despite setbacks for a few projects, the momentum in the direction of new nuclear capacity continues. It seems odd, therefore, to make the following statement: More than likely, nothing much will happen in 2010.

Oh, forward progress will probably continue on the projects for which the applicants for combined construction and operating licenses (COL) are the most committed, and two or more additional engineering, procurement, and construction contracts may be signed, but none of the ongoing proceedings will reach a conclusion during the year—not even those for design certification. The Department of Energy might conclude its selections for the first round of loan guarantees (which would back as much as \$18.5 billion in financing) and, if legislation permits, perhaps make an additional, larger amount available. Like the 10 CFR Part 52 licensing process, however, the loan guarantee system has never been used before, and whether it actually leads quickly to abundant financing on attractive terms remains to be seen. In most respects, 2010 may look a lot like 2009, with a lot of muddling through, eyes kept on the prize.

Conditions in the wider world have grown more favorable, with perhaps the strongest indication being the Kerry-Boxer bill (the Clean Energy Jobs and American Power Act, S. 1733) in the Senate. While its nuclear-related text thus far is made up

(1) *Dig holes.*

(2) *Build roads, docks, laydowns, etc.*

(3) *Raise money.*

mostly of platitudes, the fact that its sponsors have in the past been opponents of nuclear power is significant. The subsequent bill (the Clean Energy Act of 2009) from Sens. Lamar Alexander (R., Tenn.) and Jim Webb (D., Va.) mainly authorizes funding for small modular reactor development and nuclear workforce education and training. Several legislators have been quoted as saying that they expect a substantial “nuclear title” in whatever cap-and-trade legislation, if any, makes it through Congress.

If some sort of federal law is passed to reflect more appropriately the true costs of fossil fuel combustion, new nuclear generation will certainly get a boost, if from nothing else than heightened public awareness of the technology’s emission-free nature. At this writing, the health care debate appeared likely to occupy Congress for the remainder of the 2009 session, so cap-and-trade (or some form of disincentive on carbon dioxide from energy production) might become the main focus for Congress in 2010.

There have been other moves in the 111th Congress with the declared intent of encouraging new nuclear power, including an earlier Alexander bill that didn’t go very far. As written, none of the bills address what is already slowing down the process, and would slow it even further if several more license applications and reactor designs

were to come along: the size and budget of the Nuclear Regulatory Commission. The agency has already hired hundreds of new staffers, and its annual budget now tops \$1 billion (the vast majority of it recovered through fees to licensees), but in order to maintain the essential focus on its mission to uphold public health and safety in the existing uses of nuclear energy and radioactive materials, the NRC has had to prioritize its technical reviews of COL applications, taking more time on projects with commercial operation dates after 2018—and this is with work on five of the 18 docketed applications having been suspended or slowed by the applicants themselves. The logjam might clear somewhat after 2011 as the four design certification applications in the pipeline are completed, but by then two separate renewals of the ABWR certification will have been submitted, along with a number of small/modular reactor designs.

Simply put, there cannot be a large, sustained expansion of nuclear power in the United States without a large, sustained increase in the NRC’s budget authority. Previous boosts have not been controversial, because fee recovery leaves relatively little money to be provided by the federal Treasury. The NRC’s mission is not to encourage more use of nuclear energy, but significant expansion cannot take place unless the

agency has the means to review all applications expeditiously.

Speaking of the NRC, it is likely that sometime this year (if it hasn't happened already) the nominees for the two vacancies on the commission, George Apostolakis and William D. Magwood IV, will be confirmed by the Senate.

Arrival of the earthmovers

With an early site permit (ESP) and limited work authorization (LWA) in hand, Southern Nuclear Operating Company can begin excavations and other activities on the land set aside for the two AP1000 reactors planned for the Vogtle site near Waynesboro, Ga. As it is, there has already been activity there (such as the demolition of some buildings no longer used to support Units 1 and 2). Work was to begin in January on the building that will house the NRC's site office. LWA work is to begin in February, with excavation for the nuclear island to be followed by the placement of engineered backfill, deemed necessary because of the unsuitability of the soil as it currently exists.

Southern Nuclear has applied for a second LWA, but other applicants believe that they can begin some site work without formal NRC permission. STP Nuclear Operating Company (STPNOC) gave a presentation to NRC staffers last year on the company's planned preconstruction activities for the South Texas Project site. While safety-related construction requires NRC approval and oversight, some nonsafety-related construction may not. STPNOC showed, among other things, where and when it would add service roads, storage facilities, and the docking complex that would receive the modules for the twin Toshiba ABWRs planned for the site. (Construction-related activity has emerged as a potential issue in the Vogtle COL proceeding with the submission of a new contention on the effects of dredging in the Savannah River.)

Much of the activity at the other COL sites is more directly related to the applications, as geological, hydrological, and meteorological data are gathered in response to requests for additional information from the NRC. Work is also ramping up at the Shaw Group's site in Louisiana for the production of AP1000 equipment, and construction has begun at the joint Areva/Northrop Grumman site in Virginia for a facility that will eventually produce U.S. EPR components. Ground will also be broken this year on another important structure, the NRC's third headquarters building in Rockville, Md.

Meanwhile, some potentially useful experience in power reactor construction is being gained by hundreds of workers on a project outside of the 10CFR52 licensing regime: the Tennessee Valley Authority's Watts Bar-2 in Tennessee, which is being

built the old-fashioned way with a reactivated 10CFR50 construction permit. The construction techniques themselves, however, have evolved considerably from those in use 30 years ago, so that someone working on the Watts Bar project may be able to apply the experience gained there to a COL site, where there should be considerable demand for skilled personnel.

The NRC's target date for the full-power licensing of Watts Bar-2, an 1177-MWe pressurized water reactor, is September 2012, with TVA planning commercial operation for 2013. In 2009, some of the NRC milestones were met ahead of schedule. At the site itself, construction has been ongoing since 2008, and the staff of the operating Watts Bar-1 has had to adjust to the extra activity at what had effectively been a single-reactor site for about 10 years.

Back in the real world

At the United States' 104 operating power reactors, of course, licensees are hoping for as uneventful a year as possible, because this would be conducive to continuing the strong performance that has made it possible for people to consider new reactors. There will, of course, still be developments (and debates) in areas such as digital instrumentation and controls, risk assessment (including fire-related probabilistic risk assessment), and containment sump strainers.

During 2010, the license renewal applications for Pilgrim and Vermont Yankee should be resolved as the appeals in federal courts are heard and judged. In particular, the Commonwealth of Massachusetts has challenged the NRC's dismissal of an appeal of the Atomic Safety and Licensing Board's (ASLB) initial decision on Vermont Yankee. As noted below, the most contested renewal proceeding to date—Indian Point—will go to public hearings this year, and another much protested plant—Diablo Canyon—will undergo the first phases of its own renewal proceeding.

Hotly contested renewal proceedings are the exception. Most renewals proceed fairly routinely, and in 2010, license renewals should be approved for Prairie Island, Kewaunee, Cooper, and Arnold. The Palo Verde and Crystal River-3 proceedings are expected to continue into 2011.

Exelon stated last year—after its bid to buy into NRG Energy was rejected—that it plans to expand its nuclear capacity through power uprates. This coming year, the com-

pany may specify what increases it will seek and for which reactors. (Clinton has already been fully uprated, and Dresden and Quad Cities have little room left for expansion. That leaves 12 other reactors in the fleet with the potential to have their output expanded substantially.)

Unlike the structured and fairly predictable license renewal process, the NRC's power uprate review system treats each application as a unique entity, geared to the specific changes required for that reactor's hardware and the type of uprate sought (with the more extreme uprates—and the requisite hardware and operational changes—getting the more elaborate scrutiny). TVA's 15 percent uprate applications for Browns Ferry have been under review for more than five years (partly because of TVA's changes to the application), but other pending extended uprates have completion targets within two years of submittal. By the end of this year, extended uprates (ranging from 12 to 17 percent) could be approved for Monticello, Nine Mile Point -2, and Point Beach. FPL is expected to apply for extended uprates at St. Lucie this year, and a 17 percent hike for Fort Calhoun is to be sought in 2011. Entergy applied in November for a 13 percent uprate at Grand Gulf-1, intended to go into effect in 2012 (see page 25).

Because a large uprate is expensive and time-consuming, it is not something that a

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licensee would treat lightly. Still, if the United States is looking for a significant expansion of nuclear power in the near term (say, from now through 2015), the only source available (other than Watts Bar-2) is the uprating of existing reactors. Current regulations make it possible for any reactor to obtain uprates to raise its peak thermal power 20 percent above its originally licensed level. Only five reactors have maxed out their uprates. If every other reactor did the same, the nation's nuclear generating capacity would rise by as much as 14 GWe—roughly the equivalent of 12 AP1000s—which is entirely within the basic power plant infra-

structure that is already in place. (Only 11 of the 104 licensed reactors have never been uprated—including all seven of Duke Power Company's reactors, with more than 1400 MWe of potential.)

Stories likely to be told

Here are the main things that I will be watching for in 2010, in no particular order of importance or chronology:

- The Indian Point license renewal hearing, and what may be the inevitable subsequent court challenges. Much of the work of an ASLB is done outside of public view, as the judges and their aides pore over long, elaborate, and (to me, at least) boring documents and exhibits. This will probably reach a new peak in the Indian Point proceeding, in which 17 contentions have been admitted. The public hearings themselves may have relatively little to do with the resolution of any of the issues, but they will almost certainly have moments of high drama, by ASLB standards. The application may not be resolved during 2010, but if the Indian Point licenses are ultimately renewed, the just-submitted application for Diablo Canyon should probably not be seen as being in any danger.

- Westinghouse's efforts to get the AP1000 over the hump. Like it or not—and the other reactor vendors probably don't—the AP1000 is already the most widely adopted new reactor design, in the United States and worldwide, by any measure. Do the math: AP1000, 10 reactor sales, 11 000 MWe; EPR, four reactor sales, 6400 MWe; ABWR, two reactor sales, 2700 MWe (with the projects in Asia belonging to a different era, built with earlier techniques); Doosan's APR-1400, four reactor sales, 5600 MWe (all in South Korea); Atomstroyexport's AES-2006, four reactor sales, 4800 MWe (all in Russia). Nobody else is on the scoreboard.

Despite the adverse publicity on the AP1000 shield building and the NRC's displeasure with Westinghouse's submissions on generic safety issue 191 (the sump strainer), as 2010 begins, it appears that Westinghouse is addressing the agency's main concerns. The schedule will probably slip some more, perhaps by three to six months, but during the year, the to-do list on what is essentially a recertification will be a steadily shrinking inventory of decreasingly important open items. Whether this will mean that a final design is approved in time for full hearings on the Vogtle COLs, and COL issuance, before the end of 2011 is uncertain.

- Who else, if anyone, wants to get into the game? The NRC expects three COL applications to be submitted during 2010, one from a nonutility venture called the Blue Castle Project (a submission that David Matthews, director of the Division of New Reactor Licensing in the NRC's Office of

New Reactors, says might be for an ESP instead), and the others from entities that have declined to reveal themselves publicly. If the two unknowns are deep-pocketed veterans of the industry—say, Arizona Public Service Company and American Electric Power—I’ll take them seriously. If not, I won’t. I feel the same way about Amarillo Power and Alternative Energy Holdings, both nonutility ventures that have deferred their COL applications into 2010 or later. There might be a sort of populist sympathy out there for a handful of outsiders trying to break into the nuclear power club, to the dismay of entrenched fat cats, but when it comes to actually building and operating reactors, it seems to me that one would want as many resources as possible. A while back I heard from someone affiliated with the Institute of Nuclear Power Operations who said of the nonutility entities seeking to apply for COLs, “We don’t want amateur night.”

■ Reactors that aren’t large light-water reactors, and whether they matter. In a field that seems to benefit from standardization, organizations large and small are insisting that a wider range of technologies should be given a chance, notably through NRC approval for certification or manufacture-licensing. The NRC has assigned project numbers to five of them—Hyperion, 4S, NuScale, PRISM, and mPower—while stating that budgetary factors discourage any serious work until 2011 at the earliest. This isn’t just an outsider issue: Toshiba, GE Hitachi Nuclear Energy, and Babcock & Wilcox are behind the 4S, PRISM, and mPower designs, respectively.

Campaigning is also going on—not yet at the NRC level—for still more approaches, from the traveling-wave reactor to thorium fuel cycles and beyond. Some federal funding might be allotted for some of these in the DOE’s fiscal year 2011 budget request, and to the extent that the DOE should be involved in reactor development, the efforts of these designs’ proponents should probably be directed there—to demonstrate reliable operation, scalability, fuel performance, and so forth—rather than at the NRC.

■ New reactor geography. Last year, NRG chairman David Crane gave an interesting speech in which he suggested that different electricity sources are best suited for different regions, with the southeastern United States as the optimal locale for new nuclear. (NRG, therefore, may be a bit on the edge in seeking to build reactors in Texas.) The states in the region are politically and socially conservative, generally still under traditional electric rate regulation, and somewhat familiar with most aspects of the field because of the longtime presence of the national laboratories at Oak Ridge and Savannah River. In fact, the majority of new reactor projects are in the Southeast, which

also has greater electricity demand growth than the rest of the country and thus more need for baseload additions. This being the case, if any state with a law banning new reactor construction is repealed—Wisconsin is a possibility—it may have no practical effect if there isn’t enough demand growth or rate recovery options to support new nuclear.

■ ITAAC. The NRC and its licensees are doing a whole lot of multitasking because of the unavoidable reality that 10CFR52 licensing has never been used before. The most visible aspect of this is the concurrent reviews of COL applications and their not yet certified reactor designs, but there is also the development of the inspections, tests, analyses, and acceptance criteria (ITAAC) to be carried out by the applicant and endorsed by the NRC before a reactor with a COL will be able to go critical and produce electricity. Much has already been done to bring this process into focus, and the fact that both this year and (probably) next will pass before a COL is

issued may allow further refinement in areas, for example, such as how much of an ITAAC carried out early in construction would have to be redone before fuel loading. Some site-related tasks being carried out now, at Vogtle and elsewhere, factor in to ITAACs, so defensible techniques and documentation are already necessary.

One person’s opinion

People keep asking me to give what they seem to think is an informed opinion on which new reactor projects have the best chances of being licensed, built, and operated. I try to explain that I work in suburban Chicago and have only the most fleeting contacts with people who have genuine influence over events, but this does not seem to dissuade them. Even the most astute insider would run up against the same basic problem I have: This has never been done before.

Have I given enough caveats and covered myself enough? I’m going to take a stab at this, of course. If nothing else, when the question comes up again I can simply refer everyone to this article, and once I’m proven ridiculously wrong, mumble something about its seeming like a good idea at the time. In what follows, projects in **bold** are those that I expect to be built; projects in *italics* are those that I give a good chance

of being built; and projects in plain text are those that I consider unlikely to be built or at a stage where it’s too early to tell.

1. Vogtle-3 and -4. Southern Company has gotten just about everything on its wish list: an ESP/LWA, state-level approval at the end of a long and demanding process, pre-operation rate recovery for some costs, and at least final due diligence for a loan guarantee. The project is being transitioned to the status of reference COL for AP1000s, so basic issues will be resolved here before being addressed on subsequent COLs for AP1000s. The single contention on low-level waste accepted by the ASLB may be

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overcome with details for on-site storage facilities. The 2008 engineering, procurement, and construction (EPC) contract was followed last year by a full notice to proceed. The company’s faith in the process, and in its ability to work through it, is indicated by its declared intent to apply for another COL, probably in 2012.

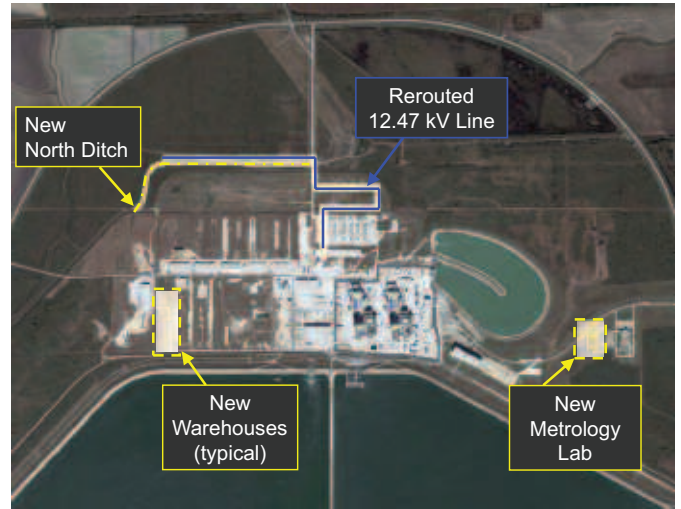
2. South Texas-3 and -4. Somebody has to be second, but after Vogtle the situation gets very cloudy. NRG Energy has thus far stayed close to the nuclear expertise it gained when it bought the largest single share of STPNOC, but NRG itself, and its merchant-based business model, remain outside the traditional nuclear power establishment. On the upside, the Toshiba ABWR does not appear to need an amendment review as extensive as the AP1000’s, an EPC contract has been signed, and South Texas is one of the “due-diligence four” in the loan guarantee race (although the DOE has never said that any applicant is ahead of any other). On the downside are five admitted contentions, including those on the potentially touchy issues of water use and effluent temperature. Startup in 2016 might be questionable; 2017 may be more likely.

3. North Anna-3. If Dominion were to announce a reactor choice—or, in the view of this observer, just admit that it will stay with the ESBWR—the project might be a

August 2009: Existing Site Conditions



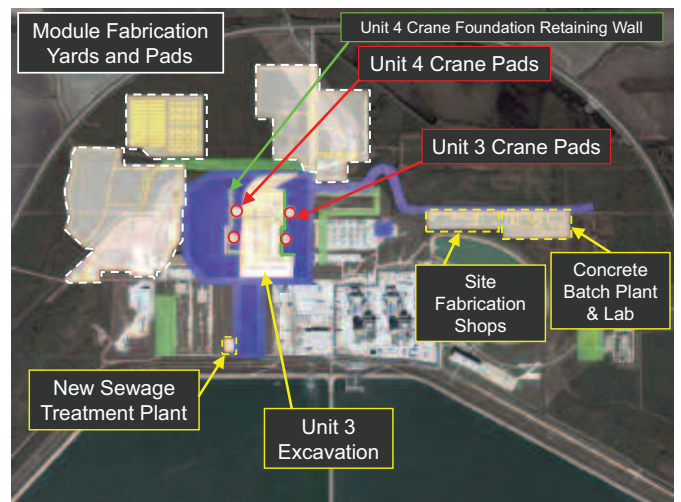
July 2010 Scheduled Progress



April 2011 Scheduled Progress



Early 2012 Scheduled Progress



In a recent presentation to the NRC, STP Nuclear Operating Company showed what it hopes to accomplish at South Texas before the COL is issued. (Graphics: STPNOC)

clear second. North Anna-3 has zoomed through NRC staff work, completing the third phases of both the safety and environmental reviews far ahead of every other application. The only admitted contention, on LLW, has been narrowed to the point of having almost no influence on the licensing process. Dominion has always had its own ideas about how to do this—getting its own Nuclear Power 2010 grant, not joining NuStart, switching from the ACR-700 to the ESBWR, adding a cooling tower, and often stating that it could abandon the whole project—and it either didn't give the DOE what the agency wanted to see in a loan guarantee application or didn't apply at all. At this stage, I still think that North Anna-3 is in for the long haul, but I may be proven wrong before this issue goes to print. Dominion had stated earlier that its decision on a reactor model, thrown open a year ago when the company broke off talks with GE Hitachi, could be announced around the start of 2010, and if the choice is not an ESBWR, the technical reviews might have to start over.

4. Sumner-2 and -3. SCANA and Santee Cooper have the good fortune of operating in South Carolina, with access to LLW disposal. This had much to do with their COL application's moving through ASLB review with no admitted contentions, with the result that only a mandatory hearing will be held. Sumner is also among the four much-cited but not-yet-confirmed loan guarantee "finalists." There have been some slow patches in technical reviews, but the project looks to be in good shape overall.

5. Calvert Cliffs-3. The approval by Maryland regulators of EDF's buy-in to Constellation Energy's nuclear business has deepened the pockets of the two companies' joint venture, UniStar Nuclear Energy, and alleviated the money troubles that have dogged Constellation for years. This is the fourth of the four loan guarantee due-diligence projects, indicating that I may be giving this too much weight if I think all four will be built. The technical reviews have been rocky thus far (compared with most other projects), but things seem to be

settling out, and the U.S. EPR appears to be progressing toward certification in 2012. Like South Texas, the process will take longer than originally planned, but Areva's desire to enter the U.S. market should keep it active. A term sheet for the project was announced last year, and EPC negotiations are ongoing. The presiding ASLB has accepted three contentions from intervenors.

6. Levy-1 and -2. Yes, an EPC contract has been signed and the state government is behind the project all the way to the highest level (Florida's governor and cabinet acted as an official approval body, as required by state law). There's enough uncertainty here, however, for me to put this one in italics. Progress still hasn't signed an EPC for its other twin AP1000 project, Harris-2 and -3 in North Carolina, so in theory the hardware bought for Levy could be used on Harris (thanks to standardization) if Levy has a long delay. And there appears to be a lot to work out on Levy, especially in the environmental review. While Progress Energy's Crystal River-3 is less than nine miles away and uses the same water source, Levy is a

greenfield site. Three contentions have been accepted by the ASLB.

7. *Comanche Peak-3 and -4*. Mitsubishi's original APWR design is still awaiting its first go-ahead in Japan (for what would be Tsuruga-3 and -4), and the US-APWR has

been adopted only by Luminant. Is this a weakness or a strength? Mitsubishi has bought 12 percent of this project, and its financial connections could make DOE loan guarantees irrelevant. A term sheet was worked out last year, and an EPC could fol-

low this year. Mitsubishi clearly wants to get this design established and may need the U.S. entry more than Areva does. The US-APWR will almost certainly be the last of the designs to come out of the certification pipeline, but only by a few months. Luminant made a point of canceling coal plants a few years ago for environmental reasons and touts nuclear as emission-free. Two contentions have been admitted, with another not yet decided at this writing, and five more have been submitted by petitioners.

8. *Turkey Point-6 and -7*. This was the 18th COL application submitted, but mostly that's because of FPL's expected timing of the project (startup around 2020 and 2022). It has just about the same support from officialdom in Florida as Levy does, and FPL may be in a position to wait for the next round of loan guarantees, or even do without them. At this writing, the NRC had still not issued a schedule for technical reviews, and there had not yet been a ruling on contentions.

9. *Harris-2 and -3*. Progress Energy's pair of AP1000s in North Carolina is planned for later startup than Levy and is being prioritized accordingly by the NRC in technical reviews. The project got a boost when its only admitted contention was remanded by the commissioners and ultimately stricken by the ASLB. If Progress Energy is indeed one of the have-nots in loan guarantees, it may have some issues in trying to finance four new reactors.

10. *Bell Bend*. Although Pennsylvania does not have access for the disposal of LLW, the ASLB denied all submitted contentions, leaving only a mandatory hearing. Perhaps later this year it may be possible to discern whether the lack of a contested hearing translates to favorable financial terms. PPL has been an antagonist to Exelon's (failed) acquisitions aimed at greater access to the PJM transmission corridor. The addition of more nuclear capacity (in this case, a U.S. EPR) could improve PPL's position.

11. *Lee-1 and -2*. Early in 2005, Duke Energy was the first company to declare an intent to move outside the Nuclear Power 2010 cost-sharing program and apply for a COL on its own. So why is this project lagging? Like Summer, Lee has parlayed its South Carolina site into an ASLB's finding of no admitted contentions, but its responses to NRC requests for additional information have often been slow and incomplete. The startup dates have been delayed, and Duke has so far obtained rate recovery only in South Carolina, and not in the more populous North Carolina.

12. *Nine Mile Point-3*. This one just barely makes it into italics. UniStar insists that it asked the NRC to slow down technical reviews so that the company could deal with its projects in order, giving precedence to Calvert Cliffs-3. That may be so, but even with the EDF buy-in, UniStar probably

How should construction be regulated?

The Nuclear Regulatory Commission and the Nuclear Energy Institute, representing the federal government and the nuclear industry, respectively, have developed what appears on the whole to be an effective working relationship. When a generic issue arises, the two parties can be expected to begin with different views and agendas, but through flexibility and technical rigor they eventually arrive at a consensus that satisfies the regulator and, to some extent, responds to the industry's concerns.

On November 16, the NRC held a public meeting in Rockville, Md., on the development of the agency's construction inspection program for new reactors. Because the full-scale construction of reactors licensed under 10 CFR Part 52 cannot begin until at least the latter part of 2011, the NRC, the NEI, and various other stakeholders (such as state agencies) have plenty of time to develop the process. It has already advanced to the point where there is substantial agreement on its overall structure, which will be much like that of the reactor oversight process (ROP). This is expected to facilitate the transition of a project from construction to operation as it moves from the ROP-like construction assessment process (CAP) to the ROP itself.

The meeting was part of the development of the CAP into the form of an NRC options paper that sets out various approaches for the commissioners to consider. This paper is currently scheduled for completion in November 2010, and so it is another item to watch for in the year ahead.

The meeting began with presentations by NRC staffers, industry representatives, and other stakeholders, followed by a facilitated discussion among the panelists, with input from some of the 50 or so attendees. What follows are some observations.

■ Region II Administrator Luis Reyes, listing lessons learned from the construction of the reactors now in service, mentioned that this time around, NRC resident inspectors will have a much larger presence at plant sites. This, in turn, will make the agency's budget for each site higher than it was for a site in the earlier generation. Reyes also said that the CAP will draw from experience

with the power reactor construction project that is now in progress, the Tennessee Valley Authority's Watts Bar-2, which remains under the original 10 CFR Part 50 licensing process but is adapting some construction techniques expected to be used on the 10CFR52-licensed reactors.

■ Frederick Brown, director of the Division of Inspection and Regional Support in the NRC's Office of Nuclear Reactor Regulation, warned of the possibility that "latent defects" could be created during the construction process. He said that the CAP's significance determination process—to be used by the staff to determine the severity of a violation, another carryover from the ROP—may need to cover latent defects, some of which may not arise before fuel is loaded in a reactor.

■ One stakeholder that took the opportunity for involvement seriously is the Georgia Department of Natural Resources (DNR), which has to make its own adjustments quickly because of the imminence of limited work authorization activity at Southern Nuclear's Vogtle site. The DNR has suggested the early implementation of ROP cornerstones in emergency planning, occupational radiation safety, public radiation safety, and physical protection, with a phase-in one or two years before fuel loading. The CAP cornerstones for initiating events, mitigating systems, and barrier integrity would be used until operation begins.

■ The NRC and NEI may not be in complete agreement yet on some aspects of the program. NEI believes that ROP-style performance indicators are not appropriate, because a construction project does not have operating experience. Michael Johnson, director of the NRC's Office of New Reactors, said in his presentation that all aspects of the ROP must be considered and evaluated, including performance indicators.

■ In the ensuing discussion, Brown said that the ROP cornerstones make it clear how to describe a situation to the public, while the cornerstones of NEI's proposal, the Construction Inspection Assessment Program, are not as clear. Brian Dolan, of Duke Energy, conceded the point, noting that latent issues would be the key.—E.M.B.

doesn't have money to burn. Maybe waiting for reference COL issues to be resolved will save time and money in subsequent COL reviews. We'll see.

13. Bellefonte-3. Yes, it has come to this: The project that NuStart used to launch its voyage into new reactor licensing now strikes me as unlikely to be finished. De-

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spite what's written on the COL application, I can no longer say "Bellefonte-3 and -4," because the TVA's own draft environmental impact statement for the Alabama site now anticipates at most one reactor—either an AP1000 or one of the two unfinished reactors there—or no new capacity at all. This, on top of the huge undertaking needed to gain hydrology and seismology data (perhaps to be finished next year) makes me believe that an AP1000 here is an unsafe bet.

14. Fermi-3. This is an active project, and the only one with an ESBWR that hasn't publicly expressed misgivings about GE Hitachi, but so far Detroit Edison has taken a strongly adversarial tone both with the NRC (disputing three recent violation notices) and with intervenors (appealing an ASLB ruling on intervenor standing and

drawing a rare instance of NRC staff opposition to an applicant position; the commissioners dismissed the appeal). It is also not clear to me that demand growth in Michigan is enough to support the project, unless cap-and-trade legislation makes fossil-

fired power in the region prohibitively expensive. (Note to Detroit Edison: I am not against Fermi-3. I am merely expressing my opinion of the project's prospects at this point in time. I'd be glad for you to prove me wrong.)

15. Grand Gulf-3. Entergy procured ultraheavy forgings for an ESBWR, then suspended both this project and River Bend-3 and stopped talking to GE Hitachi. Entergy insists that the project remains viable and is just postponed. Are forgings being sold at a

loss somewhere outside of public view?

16. River Bend-3. See 15. Will there really be a significant nuclear expansion in this country if Entergy and Exelon, the two largest fleet owners, stay on the sidelines?

17. Callaway-2. UniStar's George Vanderheyden says this can still be a viable project, and he is working with Ameren to keep it going. The NRC's David Matthews has stated publicly that he considers it canceled. AmerenUE has had nothing new to say since it asked the NRC to suspend the project last year, after prospects for rate recovery faded in the Missouri legislature. AmerenUE estimated its total spending on the project (forgings and other commitments) at \$160 million. If it's possible to walk away from that much sunk cost, there may be no project on this list that's a sure thing.

18. Victoria. No unit numbers here, because this is morphing into an ESP application. Exelon already has an ESP, for Clinton, but has no declared intention of using it.

I won't attempt to prognosticate on applications that haven't been submitted. I will predict that all of the pipeline designs will eventually be certified, and that no new designs after that should be expected to get through before 2015. Next year I'll probably do this again, and hope that everyone has a short memory. **■**
