Where new reactors can (and can't) be built

BY E. MICHAEL BLAKE

With license applications expected soon for 30 or more new power reactors, here is a survey of state laws that could block siting and thus influence where new nuclear power will be developed.

AFTER DECADES OF stagnation, the gathering momentum for new power reactor license applications over the past two years might seem wildly rapid, but in fact things are still moving pretty slowly by any objective measure. The expected time required for the various steps of the approval process, and the fact that the new licensing regime has never actually been used and is thus an unknown quantity, ensures that no new reactors will be in service before 2014 at the earliest. Even that date is a long way off from the perspective of the merchant-oriented power market that exists now in several states. In the next nine to 12 months, the first construction/operating license applications are to begin arriving at the Nuclear Regulatory Commission, and only then will the nuclear community see how quickly new reactor projects can get going, if they can at all.

If all goes well for the first license applicants, the power industry in general might decide that their experience warrants a jump onto the nuclear bandwagon, and there might be applicants from far beyond the states and companies that are already familiar with nuclear power. Some states, however—including some that are already quite nuclear—have laws on the books that would block new reactor projects, generally because they require developments over which the nuclear community has no control. This seems like an appropriate time, therefore, to examine the laws of various states in order to get a clearer view of where new nuclear power might be welcomed, and where it might not.

The author assembled the data for this article by combing the online statute data base of each state. This generally went smoothly, but for whatever reason, one state—Pennsylvania—has thus far declined to make its laws available for examination online. This made it necessary to look elsewhere for information on that state. A few states have made a point of warning that the online statutes should not be considered 100 percent accurate down to the last punctuation mark, but it appears that the intentions of the various pieces of nuclear legislation have survived intact. From this spadework, it has been concluded that nine states have laws in effect that block the addition of new reactors until there is at least progress toward high-level waste disposal, and five other states make the construction of new reactors a special case that would require extra approval beyond ordinary state-agency permitting. In the other 36 states, prospective reactor builders would undergo much the same level of permitting as they always have. Following are the nine states with HLW-related restrictions.

California

There may be only a few states with laws that can impede new reactor projects, but this one is critical, not just for the economic prospects of the nuclear industry but for the environmental impact on and energy supply adequacy for the nation's most populous state. As Enron's power marketing machinations in the early 2000s showed, California's transmission connections are insufficient to allow it simply to buy vast amounts of electricity from elsewhere. As wind power's performance (about 10 percent capacity factor) in this past summer's heat wave showed, environmentally benign renewable energy sources may never contribute enough to allow reductions in fossil-fired greenhouse gas emissions. But as electricity providers elsewhere in the country have begun exploring the option of new reactors, those in California have not even made preliminary moves in that direction.

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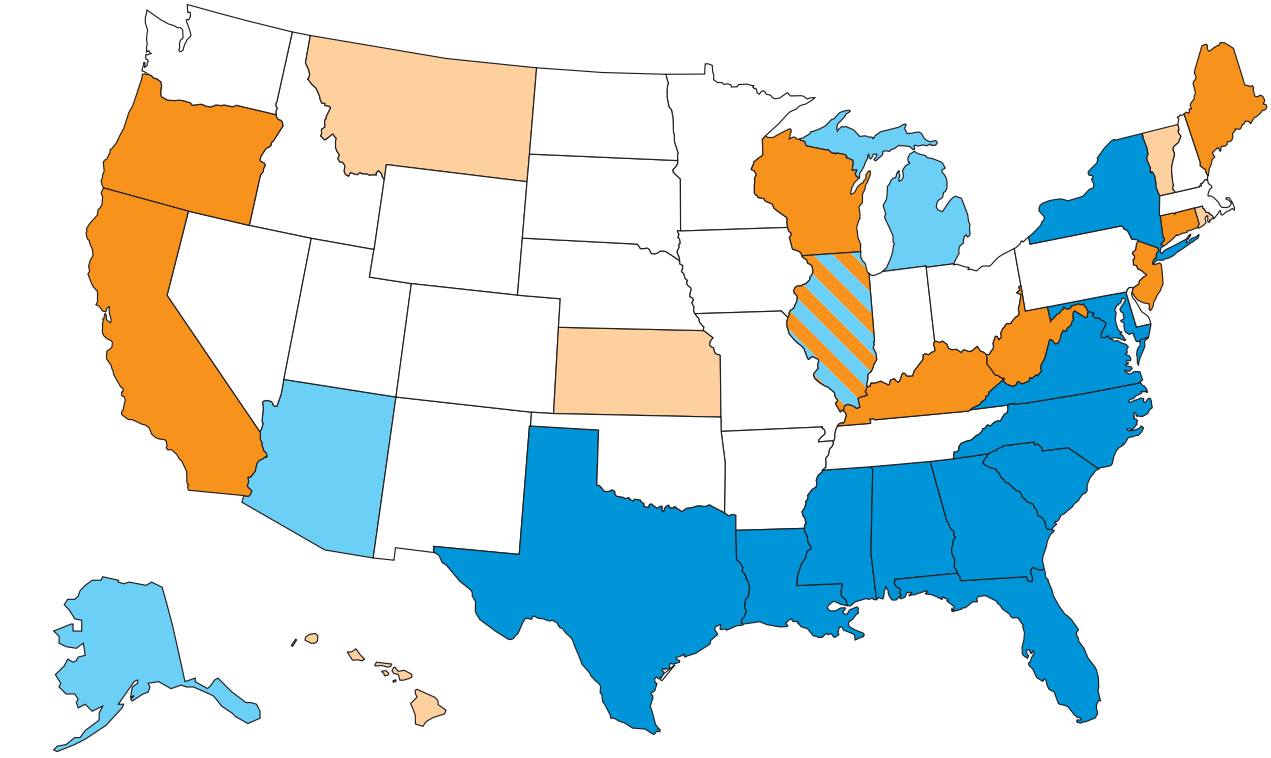
California law prohibits the construction of any new nuclear power plants in the state until the state's Energy Commission determines that a technology has been demonstrated for the disposal of spent fuel from power reactors and the federal government has approved the technology. This is actually less demanding than laws in some other states, because it does not require that an HLW repository be built, licensed, and opened for business. It could be argued that the Waste Isolation Pilot Plant (WIPP), the final repository for defense-related transuranic waste, demonstrates a disposal technology, and a congressional endorsement of the NRC's Waste Confidence Decision might be seen as federal government approval of the technology. WIPP is a salt deposit, and the Yucca Mountain site where the Department of Energy would build its repository for civilian HLW is a tuff deposit, so the logic of using them together might be strained. Even so, it appears that the California law does not require a complete resolution of all disputes related to Yucca Mountain. Still, there is no sign that any potential reactor builders in California are seriously trying to use the law as it stands; nuclear advocates would like the law to be repealed altogether.

Connecticut

One of the lasting achievements of nuclear power opponents was the creation of a linkage (in the minds of some decision-makers) between the expansion of nuclear power and the disposal of HLW, either as spent fuel or as the by-products of reprocessing. During the 1970s and 1980s, campaigns were pursued at various levels of government to require some degree of progress on HLW disposal before more power reactors could be built. In different states, however, the laws that passed had varying requirements.

In Connecticut, there is a moratorium on new power reactor construction until the federal government "has identified and



States with laws that effectively block new reactors until some progress is made on high-level waste disposal

States with laws that make nuclear power a special case, making new reactor approval somewhat more difficult than approval of other power plants

States with sites for which construction/operating license applications are in active preparation

States with sites for which there are ongoing preliminary studies, but no intent yet for license applications

The map shows states with restrictive laws in orange, and states with active new reactor licensing plans in blue. The only overlap shown is in Illinois, where Exelon applied for an early site permit for Clinton in 2003 but has declared no intention to build new reactors (in Illinois or elsewhere) without a resolution of the high-level waste issue; despite this, Exelon has declared intent to apply for a license for new reactors somewhere in Texas.

approved a demonstrable technology or means for the disposal of high-level nuclear waste." As in California, the law clearly does not require a final waste repository to be in operation. Also, because the law was enacted before Millstone-1 and Haddam Neck closed, what is prohibited is construction "on a fifth nuclear power facility." With only Millstone-2 and -3 now operating, two new reactors might be claimed as the third and fourth, which the law does not prohibit. Even if such an argument could be upheld, however, the prospects for siting new reactors in this small, densely populated state appear to be very remote—except perhaps at Millstone, where emergency planning is already well established.

Illinois

With 11 reactors in operation, Illinois has by far the most nuclear generating capacity of any state. Either despite this or because of it, Illinois joined the legislative move toward setting HLW progress as a condition on new construction. This law, however, is less restrictive than the ones in California and Connecticut. No new reactor construction can take place, according to the law, until the federal government "has identified and approved a demonstrable technology or means for the disposal of high-level nuclear waste, or until such construction has been specifically approved by a statute enacted by the General Assembly." In Illinois, "General Assembly" refers to both houses of the legislature.

This provides a second option for a new reactor: a specific bill in favor of it. The bill could be enacted without the repeal of the existing law, and so, in effect, new reactors could be judged on a case-by-case basis. At present, the owner of the state's reactors—Exelon Generation—has not declared that it intends to build new reactors in Illinois, even though the company has applied for an early site permit for Clinton, which could be approved late next year. There is some local support for a second reactor at Clinton, but to date no legislation has been introduced in Illinois to authorize a new reactor or repeal the existing restriction.

Kentucky

There is not now, nor has there been, a power reactor in Kentucky, but fuel cycle–related operations have existed in the state for decades. The experience has not always been favorable, and the argument has been made that Kentucky has borne the environmental burden of the nuclear fuel cycle without seeing significant benefits. The Paducah Gaseous Diffusion Plant and the closed low-level waste disposal site near Maxey Flats have been frequently criticized by state residents and elected officials.

The Kentucky law goes a step further than those in California, Connecticut, and Illinois by stating that a power reactor cannot be certified by the state's Public Service Commission unless a disposal site for HLW either already exists or would be available by the time the reactor needs disposal capacity. The commission also could not certify the project unless it finds that the cost of HLW disposal "is known with reasonable certainty."

Maine

Maine's law is basically the same as Kentucky's, but without the need for HLW disposal costs to be determined accurately. It calls for either the existence of a disposal facility or a guarantee that one will be available when needed. The tone of the language is permissive rather than prohibitive. It states that the Public Service Commission "may certify a nuclear power plant" if the HLW-related conditions are met, rather than that the commission must not certify

the plant unless the conditions are met. This makes no practical difference, however.

Maine is one of the two states in which it can be judged that the opponents of nuclear power emerged victorious on both key battle fronts: Existing nuclear power in the state was halted before the end of the license term, and the addition of new nuclear power has been impeded by a requirement that is beyond the influence of potential license applicants.

New Jersey

This law uses prohibitive language (shall not/unless) but does not require the existence of an HLW facility. It does, however, call upon the commissioner of the Department of Environmental Protection to find that the proposed HLW disposal method is safe, conforms to NRC standards, and "will effectively remove danger to life and the environment from such waste material."

The use of state permitting authority to place HLW-based restrictions on reactor projects has withstood court tests and has given nuclear opponents an opening to achieve what they could not at the federal level. The federal laws on nuclear energy almost entirely reserve authority to federal agencies, and this has always been upheld in court. No state agency, for instance, can unilaterally order a reactor to close. While this has generally shielded existing reactors from opposition, special-case additions to state permitting processes have mainly survived court tests and continue to be obstacles to new reactor projects.

Oregon

This is the other state in which nuclear opponents have had dual victories: ending a power reactor's operation before its time, and adding impediments to new reactors. The law here is more stringent than any of the ones listed above, because before a site certificate for a power reactor can be issued, the state's Energy Facility Siting Council must find that an HLW repository has been licensed to operate.

As in Kentucky, the debate in Oregon was not strictly about nuclear-generated electricity, but included concern over environmental issues related to nuclear facilities in general. There are a number of laws on the books in Oregon that are critical of operations at the DOE's Hanford Reservation in neighboring Washington. Fair or not, the public's perception of one nuclear facility has often influenced its perception of all other nuclear facilities.

West Virginia

Like Kentucky, West Virginia has never had nuclear power generated within its borders. Apart from its proximity to the Portsmouth (Ohio) Gaseous Diffusion Plant, West Virginia has had little to do with any aspect of the nuclear fuel cycle, but it has long been a prolific producer of coal.

West Virginia has the most restrictive nuclear power law of all. Not only must a repository be licensed, but it must be "proven safe, functional, and effective by a minimum of twenty-four months' operation or experience." The law doesn't specify HLW, referring to "any and all radioactive wastes."

Wisconsin

This state's law has drawn the most attention recently because of the possibility that it might be repealed. Bills have been introduced since 2003 to strike the law from the books but have not been passed. Still, state Rep. Mike Huebsch may introduce a new bill in 2007.

The Wisconsin law is not as restrictive as some of the others. It prevents state-level certification of power reactor projects unless it is found that a repository "will be available, as necessary, for disposal of the waste."

Other states

In the following states, the laws might not prevent reactor siting, but they at least make nuclear power a special case.

- In *Hawaii,* neither power reactor construction nor radwaste disposal can occur without a two-thirds vote in favor by both houses of the legislature.
- In *Kansas,* any part of a nuclear power facility that is deemed to be excess capacity can be blocked from cost recovery if no "technology or means" for HLW disposal exists at the time.
- In *Montana,* all decisions on whether major nuclear facilities are built are reserved to the people of the state. It is not clear whether this is through elected representatives or by referendum.
- In *Rhode Island,* final approval for the siting of either a power reactor or an oil refinery rests with the state legislature.
- Similarly, in *Vermont,* the legislature has final approval authority for the state-level permitting for a new power reactor.

Other laws that make nuclear power a special case may not actually affect whether reactors are built in those states. Although the Oklahoma Municipal Power Authority is barred from owning a share of any nuclear power plant, it is mainly a facilitator that serves the generating plants of only a few dozen towns in the state, and none of its major cities. Also, there are a number of states that have expressed themselves quite adamantly against any involvement of their states in HLW disposal but have placed no restrictions on nuclear power.

Where the action may be

The accompanying map shows three zones of different interest: states that have taken legal steps to avert (or at least defer) new reactor development, states that have neither laws against nor apparent interest in new reactors, and states without restrictions and with declared intent to pursue new reactor licensing. The latter group has just emerged in the past three years, and while it has grown rapidly, there is no assurance that it will continue to do so.

For most expected license applicants, the exploration of new nuclear capacity has been spurred by a combination of favorable factors, such as high projected demand growth, federal incentives, concerns about rising prices of and emissions from fossil fuels, and prospects for return on investment (as through rate recovery in states that have not deregulated electricity). If not enough favorable factors apply in a certain state, it may not matter what nuclear laws are on the books. If Wisconsin repeals its law tying new reactors to HLW disposal, its demand growth may still be too modest to encourage new reactor projects.

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New reactors in upstate New York could make more nuclear power available in Connecticut, Maine, and New Jersey, so even if the laws in these states remain in force, there might be no impact on whether nuclear power revives in the United States. Even Illinois would be unlikely to add much nuclear capacity soon—beyond, say, Clinton-2—either if its law were repealed or the legislature-vote exception case were used; demand growth is not as vigorous there as it is in the South. Only in California would a change in the law open a major opportunity for nuclear power, and even then the environmental issues (especially related to cooling water) would still be contentious.

Also, it should not be assumed that the roster of restrictive states will remain static. The Iowa Democratic Party has as one of its platform planks for the 2006 election a ban on new reactor construction in the state. Just because nuclear proponents have made headway recently in some areas does not mean that the struggle between proponents and opponents is over. NN

Corrections

On page 4 of the November issue, in Nuclear Notes, it was stated that "a few" power reactors in the United States are now using mixed-oxide (MOX) fuel. In fact, there is only one: Catawba-1, which is still running with some MOX lead test assemblies.

Also in the November issue, the article on page 23 failed to include two states that have laws restricting the addition of new nuclear generating capacity: Massachusetts (with a law requiring the existence of an operable high-level waste repository before new reactors could be authorized), and Minnesota (the only state that flatly prohibits new power reactors under any circumstances). The accompanying map updates the one on page 24 of the November issue, with Massachusetts and Minnesota added to the restriction states, and Idaho added as a state where there is an intent to apply for a new power reactor license.