



1. **POLICY: A bullet aimed at the nuclear energy 'renaissance'** (03/14/2011)

Peter Behr, E&E reporter

In the debates about the prospects for a U.S. nuclear power rebirth, there was one thing advocates, foes and regulators seemed to agree on: The industry could not afford another Three Mile Island accident.

Now, in the midst of Japan's worst human and economic catastrophe since World War II, emergency crews have been battling to prevent core meltdown at three crippled nuclear reactors whose primary and backup core cooling systems were left without power by last week's huge tsunami. Units 1 and 3 at Electric Co.'s Fukushima Daiichi nuclear plant suffered a partial core meltdown and hydrogen explosions that blasted the roofs off the outer containment structures but apparently spared the essential primary containment around the reactors, authorities said.



An aerial view of Tokyo Electric Power Co.'s Fukushima Daiichi nuclear power plant, near Okuma, Japan. Photo courtesy of ICJT.

The ongoing crisis at the reactor site on Japan's northeast coast was triggered by the worst earthquake ever recorded in Japan and the resulting tsunami, not the mechanical failures and operator errors that caused the partial core meltdown at the TMI reactor near Harrisburg, Pa., in 1979.

But that distinction may not make a difference politically for the U.S. nuclear industry, at least for the foreseeable future.

Until the weekend, the nuclear industry could point to expansion in China and the Middle East, and 14,000 reactor years since the Chernobyl reactor explosion without a major accident. Now the prospects for building new U.S. reactors, already burdened by comparatively high costs versus other generation options, must overcome shocking news and images from Japan: of nearly 200,000 people forced to evacuate from the

reactors' vicinity; a hydrogen explosion ripping off a nuclear plant roof; crews pumping seawater into containment buildings, and technicians in white protective suits testing children for radiation.

"I do think this will force a further re-examination of future nuclear construction plans in the United States," said Peter Fox-Penner, a principal with the Brattle Group consultancy.

"The debate has been altered -- at least in the near term," Christine Tezak, an energy analyst with Robert W. Baird and Co., wrote to clients Monday. "Inexpensive natural gas in the United States has made it difficult to move forward with nuclear projects in areas of the country that no longer rely on regulated rate base investment."

Constellation Energy withdrew from its planned expansion of the Calvert Cliffs, Md., nuclear plant, she noted. "And the South Texas project sponsored by NRG Energy still searches for a purchased power agreement (PPA). We cannot imagine that the Fukushima Daiichi situation makes negotiating a PPA any easier."

Penner and other experts cautioned that the full impact of the emergency depends on its final outcome.

2 possible storylines

Richard Meserve, president of the Carnegie Institute for Science and a former chairman of the Nuclear Regulatory Commission, said it was too early to judge public reaction to the events.

"The anti-nuclear groups will say this is evidence that nuclear technology is too dangerous. Advocates are waiting to see whether a significant environmental release can be prevented," he said. If so, that would represent a victory for the old reactor structures at Fukushima Daiichi that withstood an earthquake far greater than designers had contemplated a half-century ago, he said. "There are two stories. Which way it will play, we don't know."

The NRC judges the existing U.S. reactors to be operating safely. Improvements to equipment, operating procedures and training, supervision and NRC oversight have made plants generally safer now than at the time of the TMI accident, according to a 2007 analysis by the Keystone Center and other reviews. The new reactor designs under review now by the NRC have "fail safe" features that are supposed to prevent a loss of coolant accident like the incidents at Fukushima.

But the Japanese crisis could alter public and political views on nuclear safety, experts said.

A member of a presidential blue-ribbon panel on nuclear waste policy, who declined to be quoted by name, said simply: "Different possible outcomes will have profoundly different implications."

The impacts in the United States may include new challenges to an application by Pacific Gas and Electric Co. to relicense two reactors at its Diablo Canyon plant near San Luis Obispo on the California coast, extending their operating lives for another 20 years; closer scrutiny in an ongoing Nuclear Regulatory Commission review of seismic threats to reactors east of the Rocky Mountains; and perhaps new safety questions about the security of spent fuel at some U.S. reactors in earthquake-vulnerable areas, industry officials and nuclear critics said.

Political fallout in Congress

Up to last weekend, most Republican energy strategies included a larger role for nuclear power. Legislation introduced this month by Rep. Devin Nunes (R-Calif.) would mandate construction of 200 new reactors by 2040, and would pressure the NRC to complete new reactor licensing on a fixed schedule. "New streamlined regulations and a system to manage waste will help drive private sector investments in these facilities, which today are mired in red tape, lawsuits and the liability associated with the storage of used fuel," he said in a statement.

Following the disaster in Japan, Rep. Fred Upton (R-Mich.), chairman of the House Energy and Commerce Committee, issued a statement that put the emphasis elsewhere, declaring "our unwavering commitment to the safety of U.S. nuclear sites."

One of the sharpest critics of nuclear power in the House, Rep. Edward Markey (D-Mass.), issued a statement Friday calling on President Obama to ban construction of new reactors in seismically vulnerable areas and to order the strengthening of existing reactors in those areas.

"The unfolding disaster in Japan must produce a seismic shift in how we address nuclear safety here in America," Markey said.

Later this year, Sen. Jeff Bingaman (D-N.M.), chairman of the Senate Energy and Natural Resources Committee, and its ranking Republican, Sen. Lisa Murkowski (R-Alaska), are expected to seek passage of an energy bill including a new national "clean energy standard" that could include new nuclear reactors as well as wind and solar generation.

"There will be a real fight by public interest groups to define new nuclear power out of that bill," said Tom Clements of Friends of the Earth.

There is Senate support for a proposed Clean Energy Deployment Administration -- a federal "green bank" that could make loan guarantees to new nuclear projects. This, too, sharply divides nuclear power proponents and foes.

'Forces beyond anyone's control'

"I understand those who oppose nuclear power will see this as an opportunity," said Robert Dillon, committee spokesman for Murkowski, speaking of the Japanese crisis. "We don't see this as having been caused by the nuclear industry or nuclear power, but by forces beyond anyone's control. It's premature to attack the nuclear industry," he added. "We want to make sure Japan has all the assistance we can give them. We'll deal with the political implications later."

The most direct consequences of the Japanese crisis may come in an ongoing review of seismic threats to reactors in the central and eastern United States.

The NRC requires that reactors and plant components with significant safety importance be designed to withstand the most severe earthquakes or other natural hazards reported in their surrounding areas. It has concluded that "no concern exists regarding adequate protection and that the current seismic design of operating reactors provides a safety margin to withstand potential earthquakes exceeding the original design basis" -- the threat profile on which the reactor design is based.

However, the NRC staff is considering whether new estimates of the probabilities of seismic hazards to plants east of the Rocky Mountains during earthquakes warrant additional steps to strengthen reactors and systems.

When U.S. reactors were designed and licensed decades ago, regulators did not have probability-based analysis to assess risks like earthquake hazards, said Alexander Marion, vice president for nuclear operations at the Nuclear Energy Institute. Now those analytical tools exist, but there aren't enough experts trained in applying them to earthquake threats to carry out reviews for U.S. plants, he said. "We don't have the infrastructure to support it right now," he said. The industry is developing an alternative way assessing seismic risks.

Kamal Manoly, NRC senior level technical adviser with the Office of Nuclear Reactor Regulation, said the staff is likely to issue a letter to reactor operators on whether "cost beneficial backfits" -- additional measures to strengthen reactors against earthquakes -- should be considered.

"It could result in plants having to do something," Marion said. "I don't think they'll have to do anything major."

"This has to cause a reassessment of earthquake impacts for all reactors, particularly on the coast of California and in the Midwest, said Clements. The NRC "is going to have to be much more thorough in considering earthquake impacts now. It's gong to slow the process down."

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SPOTLIGHT

1. **POLICY:**
A bullet aimed at the nuclear energy 'renaissance'
2. **NUCLEAR:**
Desperate attempts to save 3 Fukushima reactors from meltdown

TODAY'S STORIES

3. **ENERGY EFFICIENCY:**
Google, Microsoft execs tout benefits of soaring information technology energy use
4. **BUDGET:**
Republicans offer budget talks extension and more cuts
5. **ENERGY:**
Coal industry worries about a 'shale gale' damaging future business
6. **RISK:**
Republicans tackle deeply bankrupt U.S. flood insurance system (not a fun job)
7. **FOOD SECURITY:**
African maize yields plummet steadily with high numbers of hot days
8. **SCIENCE:**
Thawing permafrost causes unstable soils
9. **WILDLIFE:**
Longer summers in Yellowstone could be harming wildlife, study finds
10. **WEATHER:**
Extra-cold winters fuel skeptics' anti-climate change conclusions
11. **ELECTRIC CARS:**
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