NATIONAL REVIEW ONLINE

LOU DOLINAR

MARCH 30, 2011 4:00 A.M.

It Can’t Happen Here

U.S. nuclear reactors are far stronger than their Japanese counterparts.

Would U.S. nuclear reactors fare better in some ultimate crisis than those in Japan? For weeks now, we’ve been lectured by nuclear critics who say the design and failures of the Fukushima Daiichi installation presage catastrophic failures in our own reactors. There’s good reason to believe the critics are wrong, though certainly the industry will learn lessons and apply technical tweaks.

Why? After 9/11, American nuclear plants underwent top-to-bottom safety review and upgrades unique in the world. Measures taken to protect against terror attacks can incidentally deal with the destruction of large areas of the plant, as well as subsequent catastrophic loss of electrical power, controls, and pumping equipment (among other dire scenarios) that fail in a fashion similar to what happened in Japan.

“You can have a tsunami, or an explosion, or an airplane hit the plant, but the plant must have on-site and off-site resources to prevent the release of radiation,” says Dr. Nils J. Diaz, former chairman of the Nuclear Regulatory Commission under President George W. Bush. Diaz was the key figure in developing the emergency-response plans.

President Obama referred obliquely to these measures when he said, “Our nuclear power plants have undergone exhaustive study and have been declared safe for any number of extreme contingencies.” The administration’s calm response to the crisis — in sharp contrast with, for example, Germany chancellor Angela Merkel’s, or even its own during the *Deepwater Horizon* oil spill — appears based on the fact that American facilities are uniquely hardened against disaster.

As usual in a major crisis, the mainstream media has maintained a strict blackout on saying anything good about the Bush administration, along with the robust nature of American nuclear power. “I’ve been on TV 28 times — from MSNBC to CNN to Fox News — and several times I’ve mentioned it, I’ve tried to be reassuring, but every time the point they try to make is how

bad things are." says Diaz, who's even written a couple of unpublished op-ed pieces. By contrast, the alarmists, including the Union of Concerned Scientists, Friends of the Earth, the Institute for Policy Studies, and some Democratic-party officials, including New York governor Andrew Cuomo and Massachusetts congressman Ed Markey, have virtually monopolized the national discussion. Their failure to include the post-9/11 upgrades is disingenuous. As stories go, this is a pretty hard one to miss. It's even laid out in some detail on the NRC website.

To be fair to the media, the government and the nuclear industry have been cagey about details that terrorists could exploit, which invariably triggers an itch of distrust among journalists. Some things aren't public. In addition, experts say cultural factors are also at work in dampening the discussion: Information and advice flows more freely when Japanese managers are treated collegially, rather than lectured about their shortcomings. The U.S., in other words, can't be seen by the Japanese as bragging about its own nuclear prowess.

Power operations are a good example of the difference between response here and in Japan: The Fukushima Daiichi cooling systems apparently functioned for a time on battery backup power, but when that ran out, emergency generators failed, and the reactors began heating up, eventually leading to explosions and further damage that still has the plant on shaky footing. An early power-up could have prevented all that, but the Japanese took days to string new lines to the site.

U.S. plants appear better able to maintain cooling and power — and to restore both fairly quickly if lost. A Tennessee Valley Authority facility recently displayed for the *New York Times* and several other outlets have portable backup batteries and some manual controls onsite to manage critical systems. As the *Times*'s Matthew Wald wrote, "One cart could power the instruments that measure the water level in the reactor vessel, an ability that Japanese operators lost a few hours after the tsunami hit. Another could operate critical valves that failed early at Fukushima.

"They're like a backup to the backup," Keith J. Polson, the T.V.A.'s vice president for the Browns Ferry site told the *Times*. "That's what we think the Japanese didn't have."

Wald didn't see important hardware that was dispersed both onsite and off — hardware developed during anti-terror preparations. These include generators, fuel oil, pumps, safety gear, more batteries, lights, and radiation suits, according to Eric Lowen, chief consulting engineer at GE-Hitachi, which designed the Japanese plants. For security reasons he couldn't specify the location or say how quickly this equipment could be deployed, but one expert on emergency response estimated that within twelve to 24 hours, possibly less, would be enough. We're also

told there are now mutual-aid pacts between plant operators, to coordinate cross-training and the sharing of personnel.

Decision-making may be another problem that's plagued the Japanese, and is also something U.S. planners examined closely after 9/11. Absent power, according to Lowen, plant operators followed protocol to flood the reactor with "fire water" — as its known in the business. There's even a standard fitting to connect pumps or a fire truck, and standard guidelines for when to apply external water. Sea water or water from a hydrant works fine for cooling and ending the immediate emergency, but it is a highly destructive step: Anything other than distilled water will damage the plant and force its owners to decommission it.

Media reports suggest TEPCO delayed too long in flooding the reactor with sea water, in part because managers were unwilling to write off a multi-billion-dollar investment. Lowen and other industry experts are more sympathetic; they say the sheer level of destruction, the loss of life, and the personal loss in the country may have crippled decision making. Anthony Pietrangelo, chief nuclear officer with the Nuclear Energy Institute, says there's still an information vacuum: "We don't know whether they moved fast or slow."

Still, judging from comments by operators and the NRC, there's a stronger chain of command in place in the U.S., in part because of reforms after the Three Mile Island accident, where the plant operator delayed informing the NRC (which had minimal authority at the time anyway), and partly as a result of an increased emphasis on potential terror attacks. U.S. plant technicians also benefit from stepped-up safety drills, based on computer modeling, in which the NRC runs simulations at a faster pace than occurs in real life until workers' every move becomes automatic, observes NRC spokesman Scott Burnell. People in the industry won't come right out and say it, but one gets the distinct impression that a U.S. operator, to prevent a meltdown or radiation release, would not dither over sacrificing a reactor by flooding it with seawater. "I think we have the protocol in place where the action will be taken," says Pietrangelo.

Post-9/11, the NRC verified some theoretical problems at nuclear plants the hard way: They ran so-called Red Team operations. Among the scenarios: flooding, airplanes crashing into facilities, and the successful penetration of a site by terrorists equipped with explosives. They've studied various vulnerabilities to cyber attacks and inside jobs. The NRC website indicates that they've also come up with methods for dealing with spent fuel pools like those that have plagued the Fukushima Daiichi plant, as well as dry storage casks for nuclear waste that are also considered problematic.

Besides the post-9/11 emphasis on security, there are other reasons why it is dubious to equate U.S. reactors to Japan's.

While there are similarities among Japanese plants and the 23 GE Mark 1 plants in the U.S. – including the principal component (i.e. the reactor and the containment systems) — the overall design, which includes electrical systems and generators, is site-specific. For example, according to GE's Lowen, TEPCO wanted to minimize the amount of space occupied by the six reactors. This creates a situation where problems with one reactor can interfere with another. In the U.S., operators generally opt to spread out their reactors or have fewer reactors on one site. Brown's Ferry plant that the *Times* toured, for example, has three reactors; the Fukushima Daiichi has six. Conversely, Japanese plants are generally more earthquake resistant that those in the U.S. that don't sit on geological faults.

Critics of the GE design typically cite a 1972 report that said, under some circumstances, the Mark I reactors, among the oldest still in use, could "tear containment apart and create an uncontrolled release," as Dale Bridenbaugh was quoted as saying recently by ABC News. Bridenbaugh resigned from GE over the issue and later became a consultant to the film *The China Syndrome*. Another frequently quoted critic from the '70s is Steven Hanauer, then a safety official with the NRC.

There are flaws in that argument. First, no reactor has torn itself apart. There have been unconfirmed stories of possible leaks. If there are indeed leaks, we won't have a clue for months as to what caused them. For example, there was a report yesterday that one reactor may have melted down and breached containment — an apparent failure of cooling, not the reactor vessel. (The NRC, meanwhile, was saying that the situation appears to be stabilizing.) Given the magnitude of the earthquake and the tsunami, the reactors appear to have held up well beyond seismic and pressure design specs.

Second, GE issued a series of fixes, including the addition of bracing, to the Mark I in the 1980s to address criticisms, and those fixes were made mandatory in the U.S. by the NRC. GE says it doesn't know whether those upgrades were ever implemented in Japan.

Finally, Bridenbaugh told ABC that the refits addressed the concern that prompted his resignation, even though "the Mark I is still a little more susceptible to an accident that would result in a loss of containment." But in the nuclear industry, every new generation of plants is

more robust than the one that proceeded it. The NRC, including Hanauer, greenlighted the revised design as well.

The one legitimate systemic issue is overcrowding of spent fuel rods in the cooling pool. In fact, many U.S. facilities have even more spent fuel than the Fukushima Daiich plant that should be disposed of elsewhere. In the United States, however, there's one guy to blame: Senate majority leader Harry Reid, along with his gambling buddies in Las Vegas, who have blocked safe long-term storage at Yucca Mountain, near Las Vegas, to protect the tourism industry from radiation-induced paranoia.

Overall, Diaz says, "we have the best system in the world to deal with large scale damage to the plants, including explosions and other external hazards. Could it be better? Sure. Is it continuing to be reviewed? Sure. Maybe additional changes will need to be made, but they will be minor."

— *Lou Dolinar is a retired columnist and reporter for* Newsday.