

Rolling Stone

America's Nuclear Nightmare

The U.S. has 31 reactors just like Japan's — but regulators are ignoring the risks and boosting industry profits



The Davis-Besse nuclear generating station in Ohio, where a football-size hole overlooked by NRC inspectors nearly caused a catastrophe in 2002
Entergy Nuclear via the NRC

Five days after a massive earthquake and tsunami struck Japan, triggering the worst nuclear disaster since Chernobyl, America's leading nuclear regulator came before Congress bearing good news: *Don't worry, it can't happen here.* In the aftermath of the Japanese catastrophe, officials in Germany moved swiftly to shut down old plants for inspection, and China put licensing of new plants on hold. But Gregory Jaczko, the chairman of the Nuclear Regulatory Commission, reassured lawmakers that nothing at the Fukushima Daiichi reactors warranted any immediate changes at U.S. nuclear plants. Indeed, 10 days after the earthquake in Japan, the NRC extended the license of the 40-year-old Vermont Yankee nuclear reactor — a virtual twin of Fukushima — for another two decades. The license renewal was granted even though the reactor's cooling tower had literally fallen down, and the plant had repeatedly leaked radioactive fluid.

[Photo Gallery: See America's Worst Nuclear Plants](#)

Perhaps Jaczko was simply trying to prevent a full-scale panic about the dangers of U.S. nuclear plants. After all, there are now 104 reactors scattered across the country, generating 20 percent of America's power. All of them were designed in the 1960s and '70s, and are nearing the end of their planned life expectancy. But there was one problem with Jaczko's testimony, according to Dave Lochbaum, a senior adviser at the Union of Concerned Scientists: Key elements of what the NRC chief told Congress were "a baldfaced lie."

This article appears in the [May 12, 2011](#) issue of Rolling Stone. The issue is available now.

Lochbaum, a nuclear engineer, says that Jaczko knows full well that what the NRC calls "defense in depth" at U.S. reactors has been seriously compromised over the years. In some places, highly radioactive spent fuel is stockpiled in what amounts to swimming pools located beside reactors. In other places, changes in the cooling systems at reactors have made them more vulnerable to a core meltdown if something goes wrong. A few weeks before Fukushima, Lochbaum authored a widely circulated report that underscored the NRC's haphazard performance, describing 14 serious "near-miss" events at nuclear plants last year alone. At the Indian Point reactor just north of New York City, federal inspectors discovered a water-containment system that had been leaking for 16 years.

[Read Jeff Goodell on the Gulf oil spill, one year later](#)

As head of the NRC, Jaczko is the top cop on the nuclear beat, the guy charged with keeping the nation's fleet of aging nukes running safely. A balding, 40-year-old Democrat with big ears and the air of a brilliant high school physics teacher, Jaczko oversees a 4,000-person agency with a budget of \$1 billion. But the NRC has long served as little more than a lap dog to the nuclear industry, unwilling to crack down on unsafe reactors. "The agency is a wholly owned subsidiary of the nuclear power industry," says Victor Gilinsky, who served on the commission during the Three Mile Island meltdown in 1979. Even President Obama denounced the NRC during the 2008 campaign, calling it a "moribund agency that needs to be revamped and has become captive of the industries that it regulates."

In the years ahead, nuclear experts warn, the consequences of the agency's inaction could be dire. "The NRC has consistently put industry profits above public safety," says Arnie Gunderson, a former nuclear executive turned whistle-blower. "Consequently, we have a dozen Fukushimas waiting to happen in America."

[Read Rolling Stone's full political coverage](#)

The meltdown in Japan couldn't have happened at a worse time for the industry. In recent years, nuclear power has been hyped as the only energy source that could replace coal quickly enough to slow the pace of global warming. Some 60 new nukes are currently in the works worldwide, prompting the industry to boast of a "nuclear renaissance." In his 2012 budget, President Obama included \$54 billion in federal loan guarantees for new reactors — far more than the \$18 billion available for renewable energy.

Without such taxpayer support, no new reactors would ever be built. Since the Manhattan Project was created to develop the atomic bomb back in the 1940s, the dream of a nuclear future has been fueled almost entirely by Big Government. America's current fleet of reactors exists only because Congress passed the Price-Anderson Act in 1957, limiting the liability of nuclear plant operators in case of disaster. And even with taxpayers assuming most of the risk, Wall Street still won't finance nuclear reactors without direct federal assistance, in part because construction costs are so high (up to \$20 billion per plant) and in part because nukes are the only energy investment that can be rendered worthless in a matter of hours. "In a free market, where real risks and costs are accounted for, nuclear

power doesn't exist," says Amory Lovins, a leading energy expert at the Rocky Mountain Institute. Nuclear plants "are a creation of government policy and intervention."

They are also a creation of lobbying and campaign contributions. Over the past decade, the nuclear industry has contributed more than \$4.6 million to members of Congress — and last year alone, it spent \$1.7 million on federal lobbying. Given the generous flow of nuclear money, the NRC is essentially rigged to operate in the industry's favor. The agency has plenty of skilled engineers and scientists at the staff level, but the five commissioners who oversee it often have close ties to the industry they are supposed to regulate. "They are vetted by the industry," says Robert Alvarez, a former senior policy adviser at the Energy Department. "It's the typical revolving-door story — many are coming in or out of jobs with the nuclear power industry. You don't get a lot of skeptics appointed to this job."

Jeffrey Merrifield, a former NRC commissioner who left the agency in 2007, is a case in point. When Merrifield was ready to exit public service, he simply called up the CEO of Exelon, the country's largest nuclear operator, and asked him for a job recommendation. Given his friends in high places, he wound up taking a top job at the Shaw Group, a construction firm that builds nuclear reactors — and he's done his best to return the favor. During the Fukushima disaster, Merrifield appeared on Fox News, as well as in videos for the Nuclear Energy Institute, the industry's lobbying group. In one video — titled "Former NRC Commissioner Confident That Building of New U.S. Nuclear Plants Should Continue" — Merrifield reassures viewers that the meltdown in Japan is no big deal. "We should continue to move forward with building those new plants," he says, "because it's the right thing for our nation and it's the right thing for our future."

Such cozy relationships between regulators and the industry are nothing new. The NRC and the utilities it oversees have engaged in an unholy alliance since 1974, when the agency rose from the ashes of the old Atomic Energy Commission, whose mandate was to promote nuclear power. "For political reasons, the U.S. wanted to show something good could come out of splitting the atom," says Robert Duffy, a political scientist at Colorado State University who has written widely about the history of nuclear power. "There was great pressure on the industry to get nuclear plants built quickly." With no effective oversight by the government, the industry repeatedly cut corners on the design and construction of reactors. At the Diablo Canyon plant in California, engineers actually installed vital cooling pipes backward, only to have to tear them out and reinstall them.

But even the lax oversight provided by the NRC was more than the industry could bear. In 1996, in one of the most aggressive enforcement moves in the agency's history, the NRC launched an investigation into design flaws at a host of reactors and handed out significant fines. When the industry complained to Sen. Pete Domenici of New Mexico, a powerful nuclear ally, he confronted the head of the NRC in his office and threatened to cut its funding by a third unless the agency backed off. "So the NRC folded their tent and went away," says Lochbaum. "And they've been away pretty much ever since."

The Japanese disaster should have been a wake-up call for boosters of nuclear power. America has 31 aging reactors just like Fukushima, and it wouldn't take an earthquake or tsunami to push many of them to the brink of meltdown. A natural disaster may have triggered the crisis in Japan, but the real problem was that the plant lost power and was unable to keep its cooling systems running — a condition known as "station blackout." At U.S. reactors, power failures have been caused by culprits as mundane as squirrels playing on power lines. In the event of a blackout, operators have only a few hours to restore power before a meltdown begins. All nukes are equipped with backup diesel generators, as well as batteries. But at Fukushima, the diesel generators were swamped by floodwaters, and the batteries lasted a mere eight hours — not nearly long enough to get power restored and avert catastrophe. NRC standards do virtually nothing to prevent such a crisis here at home. Only 11 of America's nuclear

reactors have batteries designed to supply power for up to eight hours, while the other 93 have batteries that last half that long.

And that's just the beginning of the danger. Aging reactors are a gold mine for the power companies that own them. Nuclear plants are expensive to build but cheap to operate, meaning the longer they run, the more profitable they become. The NRC has done its part to boost profitability by allowing companies to "uprate" old nukes — modifying them to run harder — without requiring additional safety improvements. Vermont Yankee, for example, was permitted to boost its output by 20 percent, eroding the reactor's ability to cool itself in the event of an emergency. The NRC's own advisory committee on reactor safety was vehemently opposed to allowing such modifications, but the agency ultimately allowed the industry to trade safety for profit. "The NRC put millions of Americans at elevated risk," says Lochbaum.

Indeed, the NRC's "safety-last" attitude recalls the industry-friendly approach to regulation that resulted in the BP disaster in the Gulf of Mexico last year. Nuclear reactors were built to last only 40 years, but the NRC has repeatedly greenlighted industry requests to keep the aging nukes running for another two decades: Of the 63 applications the NRC has received for license extensions, it has approved all 63. In some cases, according to the agency's own Office of the Inspector General, NRC inspectors failed to verify the authenticity of safety information submitted by the industry, opting to simply cut and paste sections of the applications into their own safety reviews. That's particularly frightening given that some of America's most troubled reactors — including Davis-Besse in Ohio, where a football-size hole overlooked by NRC inspectors nearly caused a catastrophe in 2002 — are now pushing for extensions. "If history is any judge, the NRC is likely to grant them," says Gundersen, the former nuclear executive.

Even after a reactor is found to be at higher risk because of new information about earthquake zones — as is the case at Indian Point, located only 38 miles from New York City — the NRC has done little to bolster safety requirements. The agency's current risk estimate of potential core damage at the Pilgrim reactor in Plymouth, Massachusetts, is eight times higher than its earlier 1989 estimate — yet it has done little to require the plant to prepare for an earthquake, beyond adding a few more fire hoses and other emergency gear. The Diablo Canyon plant in California, which sits near one of the most active seismic zones in the world, is supposedly engineered to withstand a 7.5 earthquake. There's only one problem: Two nearby faults are capable of producing quakes of 7.7 or higher. Should it be shut down? "That's the kind of big question the NRC should be capable of answering," says Gilinsky, the former NRC commissioner. "Unfortunately, they are not."

The biggest safety issue the NRC faces with old nukes is what to do about the nuclear waste. At Fukushima, the largest release of radioactivity apparently came from the concrete pools where spent fuel rods, clad with a special alloy, are placed to cool down after they are used in the reactor. These spent rods are extremely hot — up to 2,000 degrees Fahrenheit — and need a constant circulation of water to keep them from burning up. But in America, most plants have no way of keeping the water circulating in the event of a power failure. Nor are the pools themselves typically housed in secure bunkers, because the NRC long considered it virtually impossible for the special alloy to catch fire. Fukushima proved them wrong. The earthquake damaged the systems that cooled the spent rods, allowing the water to drain out. The rods then heated up and the cladding caught fire, releasing cesium-137 and other radioactive particles. The rods were eventually cooled with seawater fired from water cannons and pumped in by firetrucks, but not before a significant amount of radiation had been released.

In theory, pools in the U.S. were only supposed to hold spent fuel rods for a short time, until they could be moved to a permanent disposal site at Yucca Mountain in Nevada. But the site has remained unfeasible despite two decades and \$7 billion in research, prompting President Obama to finally pull the plug on it last year. That means tens of thousands of tons of irradiated fuel continue to sit in spent fuel

pools at reactors across the country — America's largest repository of radioactive material. A release of just one-tenth of the radioactive material at the Vermont Yankee reactor could kill thousands and render much of New England uninhabitable for centuries. "Yet the NRC has ignored the risk for decades," says Alvarez, the former Energy Department adviser.

According to a 2003 study, it would cost as much as \$7 billion to move the spent fuel out of the pools and into more secure containers known as dry-cask storage. So why hasn't the NRC required such a precaution? "Power companies don't want to pay for it," says Alvarez. "They would rather let the public take the risk." Gilinsky offers another explanation. "After insisting for years that spent fuel pools were not a problem," he says, "the NRC doesn't want to admit what everyone knows after Fukushima: They were wrong."

As chairman of the NRC, Gregory Jaczko was supposed to reform the agency. He formerly served as science adviser to Sen. Harry Reid of Nevada, and won his seat on the commission in 2005 over protests from the industry. Under his leadership, however, the NRC has displayed an alarming lack of urgency in the wake of Fukushima. The agency says it is currently taking a quick look for immediate problems at U.S. reactors, and promises to follow up with a more in-depth review later. But it's an indication of how little respect the agency commands that no one expects much to change. Indeed, ever since the terrorist attacks in 2001, the NRC has become increasingly secretive. "The agency has used national security as an excuse to withhold information," says Diane Curran, an attorney who specializes in nuclear safety.

Some critics argue that it's time for an outside agency, such as the National Academy of Sciences, to take an independent look at the safety and security of America's aging nukes. A better idea might be to simply repeal the Price-Anderson Act and force the nuclear industry to take responsibility for the risks of running these old plants, rather than laying it all off on taxpayers. The meltdown in Japan could cost Tokyo Electric some \$130 billion — roughly three times what the Deepwater Horizon spill cost BP. If nuke owners had to put their own money where their atoms are, the crumbling old reactors would get cleaned up or shut down in a heartbeat.

Instead, by allowing the industry to cut safety margins in exchange for profits, the NRC is actually putting the "nuclear renaissance" itself at risk. "It has not been protesters who have brought down the nuclear industry," said Rep. Ed Markey of Massachusetts. "It has been Wall Street." Wind and natural gas are already cheaper than nukes, and the price of solar is falling fast. And with each new Fukushima, the cost of nukes — as well as the risks — will continue to rise.

"The question is not whether we will get an earthquake or a tsunami," says Lochbaum. "The question is whether we are fully prepared for unexpected events, and whether we are doing everything we can to protect the public. I don't think we are. If and when there is a nuclear disaster, I would hate to be the one who has to stand up in front of the American people and say, 'We knew about these problems, but did nothing about them.'"