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Groups Win Appeal for DOE Reports

The Environmental Defense Institute (EDI) and Keep Yellowstone Nuclear Free (KYNF) filed a Freedom of Information Act (FOIA) with the Department of Energy (DOE) for copies of Advanced Test Reactor Updated Safety Analysis Report. DOE responded by only sending parts of the report.

EDI and KYNF subsequently filed an appeal with the Office of Hearings and Appeals (3/14/11) that ruled in our favor – thus forcing DOE to provide all documents requested. DOE did eventually comply but only sent a partial copy of the report – which is a significant win in terms of providing the public insight into safety issues at the Advanced Test Reactor – located at the Idaho National Laboratory.

However, DOE's document shipment was heavily redacted (censored). At least 96 pages (many pages had numerous redactions) were censored including 6 pages in the Severe Accident section. DOE claims "FOIA Exemption 3 Unclassified Nuclear Information (UCNI) and Exemption 71 (national security)" for its redactions. Consequently, the public continues to be denied access to crucial information that presents an emanate threat to our collective health and safety.

Why is Advanced Test Reactor (ATR) a public hazard?

ATR was built in the 1960s applying building codes enforced at the time and with a design life of 20 years. DOE intends to operate the ATR for many more years (2040) – long past its design life.¹

Neither the Nuclear Regulatory Commission nor the Defense Nuclear Safety Board have oversight jurisdiction over the ATR thanks to Congress' exemption for the Navy Nuclear Propulsion Program that extensively uses the ATR. So, the ATR is unregulated by any independent safety analysts. Based on EDI's analysis of limited DOE reports, the ATR has had 12 unscheduled emergency shutdowns (scrams) between 2007 and 2010. No regulated U.S. commercial nuclear power plant would be allowed to operate with this safety record. This safety record is a clear indication that the ATR has major safety system problems and the public continues to be kept uninformed about the risks imposed on them.

DOE's ATR Safety Analysis Report states that the reactor core contains 1,290,000,000 (1.29 E +09) curies (at scram) of radioactivity available for release to the environment in the event of a severe loss-of-coolant accident.² Loss-of-coolant to the ATR fuel storage canal would result in an additional 318,300,000 (3.184 E +8) curies available for release to the environment.³

Basically, that is what happened at the Japan Fukushima Daiichi 40-year old reactors when: "the earthquake hit, it knocked out the plants electric power, halting cooling to its six reactors. The tsunami then washed out the plants back-up generators 40 minutes later, shutting down all cooling and starting the chain of events that would cause the world's first triple meltdown. Problems with the fractured, deteriorating, poorly repaired pipes and the coolant system have been pointed out for years. By the time the tsunami arrived and knocked out all the electrical systems, at about 3.37 pm, the plant was already

¹ See EDI April and May 2011 newsletter.

² Upgraded Final Safety Analysis Report for the Advanced Test Reactor (herein after SAR-153), page 12-26 to 31.

³ SAR-135 page 20-43.

on its way to melt down.”⁴ Without coolant, the reactor and fuel pools boiled off the residual coolant producing hydrogen gas that exploded - releasing huge radioactive clouds into the air. Large regions around Fukushima are now un-inhabitable.

As reported in the pages in May by Tami Thatcher (former risk assessment analyst for DOE); “ATR - a low pressure and low temperature reactor with stated doses below 1 rem to the “maximally exposed individual” sounds safe. But that individual has to be over 34 miles from the facility in favorable wind conditions. According to recent contractor calculations for one accident, an individual at the site boundary in 95% worst meteorology could receive a whopping 286 rem total-effective-dose-equivalent (TEDE) and 3410 rem thyroid dose. Don’t be in the wrong place at the wrong time and do pray for favorable winds.”

The ATR is fueled by highly-enriched uranium (95% U-235) in contrast with generic commercial nuclear power reactor that use 2-4% U-235 fuel. Thus, the loss-of-coolant accident emissions at the ATR are larger than a commercial reactor.⁵

Based on Centers for Disease Control’s final INL report these releases between 1952 and 1992 were **10,848,480 curies**.⁶ This past radiation imposed on the deliberately non-informed public is unconscionable. Current radiation burden on residents living near INL and nuclear bomb downwinders must not be increased with an additional potential catastrophic ATR accident.

“The Chernobyl disaster triggered the release of substantial amounts of radiation into the atmosphere in the form of both particle and gaseous radioisotopes, and is the most significant unintentional release of radiation into the environment to date. It has been suggested that the Chernobyl disaster released as much as 400 times the radioactive contamination of the Atomic bombings of Hiroshima and Nagasaki. The radioactivity released at Chernobyl tended to be more long lived than that released by a bomb detonation hence it is not possible to draw a simple comparison between the two events.”⁷

According to Robert Alvarez’s review; The World Association of Nuclear Operators (WANO) provided an estimate for the total quantity of various radionuclides released at Chernobyl at 100 million curies. And 2.5 million curies Cesium-137 were estimated to have been released at Chernobyl.⁸

Jannett Sherman, MD, editor of the New York Academy of Science’s report “Chernobyl” states that over 985,000 deaths resulted from the reactor meltdown in Russia.⁹

Governments in Japan, Russia, and the U.S. collectively keep the public un-informed about the magnitude/impact of these horrendous nuclear disasters. Economic interests of nuclear power operators and nuclear weapons proponents have so far won the cover-up battle. Equally significant, is the U.S government’s need to avoid accountability/liability of the nuclear bomb testing in Nevada, Hanford and INL plutonium production and the massive health impact on Downwinders. DOE – 50 years later – continues to fight Downwinder’s compensation litigation.

⁴ McNeill, David ; “The Explosive Truth Behind Fukushima’s Meltdown”, The Independent/UK, 8/17/11.

⁵ SAR-135, page 3-47.

⁶ Final Report; Identification and Prioritization of Radionuclide Releases from the Idaho National Engineering Laboratory; Centers for Disease Control and Prevention; Department of Health and Human Services; October 8, 2002; Risk Assessment Corporation, page 53. This report is part of CDC’s INEL Dose Reconstruction Project.

⁷ Wikipedia; “Chernobyl Disaster Effects,” citing International Commission for Radiation Protection (ICRP), and 53 other sources. Herein after referred to Wikipedia. http://en.wikipedia.org/wiki/chernobly_disaster_effects

⁸ <http://www.world-nuclear.org/info/chernobyl/info07.html>

⁹ Jannett Sherman, MD; toxdoc.js@verizon.com

Mackay Dam: A Preventable Disaster

By David B. McCoy and Jill Frawley

What do the residents of Mackay, Idaho have in common with the town folk of Fukushima? They believe they are safe and they believe what their government tells them. They believe what the nuclear industry tells them. They have no idea of the catastrophic danger they are in. Like the residents of Fukushima, Mackay residents will have no advanced warning of an imminent dam collapse. At this time, there is no electronic or human warning system in place to allow evacuation.

Mackay Dam was built nearly a century ago without any thought given "to conform to seismic or hydrologic design criteria." The Utah Construction Co. had no previous experience in reservoir construction. No one knows how safe the dam will be during the next earthquake or major flood. Mackay Dam lies 11 miles from the Borah earthquake fault that caused a 7.3 earthquake (1983).

The State of Idaho classifies Mackay Dam as a Category 1 "high hazard." The dam receives safety inspections every two years. Since the last inspection was in 2009, the Idaho Department of Water Resources report does not reflect that Mackay Dam was overtopped in 2010 and 2011 from high run-off.

The Idaho 2009 dam inspection report states:

“Much about this dam is not known due to poor documentation during initial construction and subsequent modifications. The amount of leakage observed at the right-center toe of the dam is cause for concern despite claims by the owner that ‘it has always leaked like that’.”

The flow of water from the base of the middle of the dam is now leaking at a rate greater than 1 cu ft. per second, enough water to fill a backyard swimming pool about every 30 minutes.

Mackay Dam, should it not hold, threatens to send an 80 ft. wall of water towards the town of Mackay within 20 minutes. Further, there are thirteen 300,000 gallon underground tanks filled with high level nuclear waste at the Idaho National Laboratory. The flood water would spread the contamination across the Snake River plain. Should Mackay dam not hold, the safety systems for a nuclear reactor at INL may not function. A nuclear meltdown could occur spreading an enormous amount of radiation.

On the west side of the dam, the emergency spillway lies beneath a large mass of rock with a continuous crack from top to bottom. This area is susceptible to massive rock movement should an earthquake occur. The steep cliff above the spillway constantly sheds rock into the spillway channel. There is no abutment on the east side of the dam. The concrete spillway channel has numerous cracks throughout.

The State of Idaho has a history of ignoring potential disasters. In 1976, the earthen Teton Dam began eroding due to a leak at its base, then burst, resulting in 11 deaths and over a billion dollars in property damage. Teton Dam, built during the same era and of similar design, was only 125 miles away from Mackay Dam.

Can a similar occurrence be prevented? Recommendations to consider are:

- Install an electronic warning system and 24 hour monitoring
- Create an emergency plan for evacuation
- Make annual inspections and an action plan to correct deficiencies
- Repair leakage
- Spillway repairs
- The federal government should take over ownership of Mackay Dam due to national security issues,
- The current owner must carry adequate liability insurance for loss of life and property damage

- Access to the dam should be blocked to prevent sabotage

Ideally, the Department of Energy should purchase the site and provide a well-constructed dam that can withstand natural disasters and protect existing nuclear facilities. The town of Mackay does not have to be another Fukushima.

*David B. McCoy, Esq., Board of Directors Environmental Defense Institute
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August 11, 2011*

Fixing America's Nuclear Waste Storage Problem

By Robert Alvarez

6/20/11

In March 1992 George Galatis, a nuclear engineer at the Millstone nuclear power station in Waterford, Connecticut, became alarmed during a refueling. The reactor had to be shut down and the full radioactive core of the Unit 1 reactor, which held thousands of rods, was removed and then dumped into the spent fuel pool—a blatant violation of Nuclear Regulatory Commission (NRC) safety requirements.¹⁰

In mid-October of 1805, after being saved from starvation by Indians, the exhausted Corps of Discovery led by Captains Lewis and Clark finally reached the Columbia River Basin -- gateway to the Pacific. Leslie Groves, the military leader of the Manhattan Project, chose Hanford, in eastern Washington near the Lewis and Clark campsite, for the World's first large nuclear reactor. The Indians were promptly banned from their homes and from religious, fishing and medicine-gathering sites, and farmers were uprooted. Within about two and a half years the Hanford "B" reactor had made enough plutonium to destroy Nagasaki, Japan, on August 9, 1945. In the late 1980s, the U.S. government finally acknowledged its responsibility for Hanford and other similar sites around the country and began the largest, most expensive and most challenging environmental cleanup program in US history. In August 2002, the Columbia River Basin Fish Contaminant Survey, a study conducted by Indian tribes and the Environmental Protection Agency (EPA), reported that nonradioactive contamination, such as PCBs in fish -- which are eaten in far greater numbers by tribal people than by non-Indians -- are found at the highest levels in the section of the river that runs through the site known as the Hanford Reach. About 80 percent of Chinook salmon, an economic, environmental and cultural icon of the Pacific Northwest, spawn in the Hanford Reach, and they represent a significant portion of wild salmon harvest in British Columbia and Alaska.

Washington continues to evade responsibility for forty-seven years of contamination. The pool was already quite full. It wasn't designed to suddenly hold those very radioactive and thermally hot fuel rods, which give off so much radiation that an unshielded person nearby would receive a lethal dose in seconds. In a previous incident around that time, a worker's boots melted during this procedure. Because the pool could overheat, and possibly cause the pumps and cooling equipment to fail, the NRC had required reactor operators to wait for sixty-five hours before performing this task—with good reason.

¹⁰ [The Legacy of Hanford \(Government, World Leaders, Regions and Countries\)](#)

NRC studies over the past thirty years have consistently shown that even partial drainage of a spent fuel pool that exposed highly radioactive rods could release an enormous amount of radioactivity into the environment. Arnie Gundersen, a nuclear engineer with many years of experience at US nuclear reactors, describes this kind of accident as “Chernobyl on steroids.”

Northeast Utility (which sold the Millstone reactors to Dominion Power in 2000) was standing to lose about \$500,000 a day for replacement power if it followed the rules calling for a shutdown that would last more than two months. It had taken this shortcut for many years, while the NRC deliberately looked the other way.

By this time, the corporations that owned the nation’s nuclear reactors were stuffing about four times more spent fuel into storage pools than the pools were designed to accommodate, with the NRC’s blessing. It took several years for Galatis to force the NRC to take action at Millstone, at the expense of his career. His whistleblowing landed him on the cover of Time and embarrassed the NRC into performing a more thorough inspection of the reactor. The agency found a host of problems and ordered Unit 1 closed in 1996. The reactor was [permanently shut down](#) in 1998, but the spent fuel remains in a pool while the reactor is still being decommissioned, thirteen years later.

In the tradition of no good deed going unpunished, the Republican-controlled Congress, led by then-Senator Pete Domenici, was outraged over Millstone 1’s closure and made sure that the NRC would never do this again. In his autobiography, Domenici proudly notes that he sought to cut 700 jobs at the NRC in 1999, effectively gutting its regulatory efforts. “While many NRC requirements had questionable impact on safety,” Domenici said, “their impact on the price of nuclear energy was far more obvious. This ‘tough love’ approach was necessary.”

Domenici had his way. By 2000, the NRC sharply curtailed its oversight activities and became more of an enabler of nuclear power than a regulator. To this day, it remains overly dependent on nuclear industry self-reporting of problems.

Nearly twenty years after George Galatis began his lonely struggle to improve safety of spent fuel pools, the Fukushima catastrophe in Japan has once again turned a spotlight on this serious hazard in the United States. The explosions at the Fukushima Dai-Ichi station left the spent fuel pools at three reactors exposed to the open sky, as Tokyo Electric Power (Tepco), the company that owns the crippled power station, desperately try to keep them cool with thousands of tons of water. Spent fuel in one pool is believed to have caught fire and exploded. American reactors have generated about 65,000 metric tons of spent fuel, of which 75 percent is stored in pools, according to Nuclear Energy Institute data. No other nation has generated this much radioactivity from either nuclear power or nuclear weapons production.

Nearly 40 percent of the radioactivity in US spent fuel is cesium-137. The 4.5 billion curies of radioactive cesium-137 in US spent reactor fuel is roughly twenty times more than what was released by all worldwide atmospheric nuclear weapons tests. American spent fuel pools hold about fifteen to thirty times more cesium-137 than the 1986 Chernobyl accident released. For instance, the pool at the Vermont Yankee reactor, a BWR Mark I (a boiling-water reactor, the same design as the four crippled reactors in Fukushima), currently holds nearly three times the amount of spent fuel stored at Dai-Ichi’s Unit 4 reactor. The Millstone reactors, which have the largest spent-fuel inventory in the United States, hold over five times more radioactivity than the combined total in the pools at the four wrecked Dai-Ichi reactors.

Even though they contain some of the largest concentrations of radioactivity on the planet, US spent nuclear fuel pools are mostly contained in ordinary industrial structures designed to merely protect them against the elements. Some are made from materials commonly used to house big-box stores and car dealerships.

The United States has thirty-one boiling water reactors with pools elevated several stories above ground, similar to those at Dai-Ichi. As in Japan, all spent fuel pools at nuclear power plants do not have steel-lined, concrete barriers that cover reactor vessels to prevent the escape of radioactivity. They are not required to have back-up generators to keep used fuel rods cool if offsite power is lost.

For nearly thirty years, NRC waste-storage requirements have remained contingent on the opening of a permanent waste repository that has yet to materialize. Now that the Obama administration has canceled plans to build a permanent deep-disposal site at Yucca Mountain in Nevada, spent fuel at the nation's 104 reactors will continue to accumulate and is likely remain onsite for decades to come.

Domenici and the nuclear industry have often said that spent nuclear fuel could be stacked on a football field ten feet deep. There's a problem with this assertion. First, it's not remotely feasible and, most certainly, ill advised to squeeze the largest concentration of radioactivity on the planet onto a field. This would unleash chain reactions involving enough plutonium to fuel about 150,000 nuclear weapons, and could ignite a radiological fire that would cause long-term land contamination that would make Chernobyl and Fukushima look like pimples on a pumpkin. It would deliver lethal radiation doses to thousands if not millions of people hundreds of miles away. In other words, storing the entire nation's spent fuel in one place would be a mistake.

The nuclear catastrophe at Chernobyl illustrated the damage cesium-137 can wreak. Nearly 200,000 residents from 187 settlements were permanently evacuated because of contamination by cesium-137. The total area of this radiation-control zone is huge. At more than 6,000 square miles, it is equal to about two-thirds the area of the State of New Jersey. During the following decade, the population of the region declined by almost half because of migration to areas of lower contamination.

On June 7 the Japanese government reported to the International Atomic Energy Agency that the amount of radioactivity released into the atmosphere during the first week of the accident was twice its previous estimate. The government failed to mention that an equally large amount was discharged into the sea, indicating that the Fukushima accident may have released more radioactivity into the environment than was released at Chernobyl. Around the same time, the Nuclear Waste Management Organization of Japan reported that cesium-137 contamination from the accident had rendered an area about seventeen times bigger than Manhattan [uninhabitable](#).

I co-authored a report in 2003 that explained how a spent fuel pool fire in the United States could render an area uninhabitable that would be as much as sixty times larger than that created by the Chernobyl accident. If this were to happen at one of the Indian Point nuclear reactors—located about twenty-five miles from New York City—it could result in as many as 5,600 cancer deaths and \$461 billion in damages.

The US government should promptly take steps to reduce these risks by placing all spent nuclear fuel older than five years in dry, hardened storage casks—something Germany did twenty-five years ago. It would take about ten years and cost \$3.5–7 billion to accomplish. If the cost were transferred to energy consumers, the expenditure would result in a marginal increase of less than 0.4 cents per kilowatt-hour for consumers of nuclear-generated electricity. Despite the destruction wreaked by the earthquake and tsunamis in Japan, the dry casks at the Fukushima site were unscathed.

Another payment option is available for securing spent nuclear fuel. Money could be allocated from \$18.1 billion in unexpended funds already collected from consumers of nuclear-generated electricity under the Nuclear Waste Policy Act to establish a disposal site for high-level radioactive wastes. After more than fifty years, the quest for permanent nuclear waste disposal remains illusory. One thing, however, is clear, whether we like it or not: the largest concentrations of radioactivity on the planet will remain in storage at US reactor sites for the indefinite future. In protecting America from nuclear

catastrophe, safely securing the spent fuel by eliminating highly radioactive, crowded pools should be a public safety priority of the highest degree.

With a price tag of as much as \$7 billion, the cost of fixing America's nuclear vulnerabilities may sound high, especially given the heated budget debate occurring in Washington. But the price of doing too little is incalculable.

Robert Alvarez, an Institute for Policy Studies senior scholar, served as senior policy advisor to the Secretary of Energy during the Clinton Administration and wrote the recently released report *Spent Nuclear Fuel Pools in U.S.: Reducing the Deadly Risks of Storage*, available at www.ips-dc.org also see [The Legacy of Hanford](#) ([Government](#), [World Leaders](#), [Regions and Countries](#))

Anti-Nuclear Groups Shower Federal Regulators with Legal Challenges

By Andrew Restuccia

Published by *The Hill*, 8/11/11 in *Common Dreams*

More than two dozen groups will file challenges with the Nuclear Regulatory Commission Thursday calling for a moratorium on reactor licensing until the agency addresses a series of safety concerns laid out by a federal task force last month.

In total, the groups — which include nuclear critics like Friends of the Earth, Public Citizen and the Southern Alliance for Clean Energy — will file 19 separate challenges with the NRC.



The challenges, known as “contentions,” urge the commission to conduct additional environmental review of pending applications based on the federal task force’s findings before deciding to license or relicense a reactor. “What we’ve learned in the wake of Japan’s nuclear disaster — and what the Nuclear Regulatory Commission’s experts concluded — is that current regulations are fundamentally inadequate,” said Phillip Musegaas, an official with Riverkeeper Inc., which will file one of the challenges Thursday. The filings, which might foreshadow lawsuits, signal an escalating effort by the groups to use the March disaster at Japan’s Fukushima Daiichi power plant to slow U.S. nuclear development.

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review of pending applications based on the federal task force's findings before deciding to license or relicense a reactor.

"What we've learned in the wake of Japan's nuclear disaster — and what the Nuclear Regulatory Commission's experts concluded — is that current regulations are fundamentally inadequate," said Phillip Musegaas, an official with Riverkeeper Inc., which will file one of the challenges Thursday.

"The law requires regulators to take this information into account before issuing any licenses for reactors. Our filing today is intended to force them to do so."

Last month, a task force made up of senior NRC staff called on the commission to make [wide-ranging improvements](#) to the NRC's "existing patchwork of regulatory requirements and other safety initiatives." But the task force, which was set up by President Obama in the aftermath of Japan's nuclear disaster, stressed that current NRC regulations pose no "imminent threat" to safety.

The task force's findings have set off a debate in Washington over nuclear safety, with some liberal Democrats calling for speedy regulatory changes and Republicans cautioning against imposing potentially costly new rules without further review.

NRC Chairman Gregory Jaczko has called on his fellow commissioners to [make decisions](#) on the task force's 12 recommendations within 90 days and implement any necessary changes within five years. While the NRC commissioners agree that they must move quickly to evaluate the task force's report, some have said they [don't believe it can be done in three months](#).

The groups, in their contentions, argue that the National Environmental Policy Act (NEPA) requires that NRC issue a supplemental environmental impact statement based on the new information in the task force's report.

Mindy Goldstein, acting director at the Turner Environmental Law Clinic at Emory University School of Law, said the groups could take legal action in federal courts if NRC rejects their contentions.

"This could eventually end up in court. This information is important and it needs to be considered now," said Goldstein, who worked with various groups on the contentions.

The contentions target all of the licensing and relicensing proceedings currently before the NRC. These include a slew of the country's nuclear power plants, including Calvert Cliffs in Maryland, Diablo Canyon in California and Indian Point in New York."

U.S. Floods and Wildfires Trigger New Fears over Nuke Safety

by Portia Crowe

Published on Friday, July 1, 2011 by [Inter Press Service](#)

NEW YORK - Just 100 days after a deadly earthquake and tsunami devastated the Fukushima Daiichi nuclear power plant in Japan, concerns are being raised about several U.S. nuclear stations that are facing natural disasters of their own.

Rising floodwaters from the Missouri River are threatening to damage Nebraska's Fort Calhoun Station and Iowa's Cooper Nuclear Station, while a raging forest fire is advancing towards the



[Los Alamos National Laboratory](#) in New Mexico..

[Fort Calhoun Nuclear Power Plant, Nebraska-June 28, 2011: This is a satellite image showing flooding at the Fort Calhoun Nuclear Power Plant. The plant is adjacent to the Missouri River which is at near maximum levels due to a due to the Missouri River basin receiving nearly a years supply of rainfall in May. \(credit:DigitalGlobe\)](#)

The Los Alamos lab has been shut down since Monday, one day after a wildfire was sparked in the Santa Fe National Forest, while Fort Calhoun has been closed since mid-April for routine refueling. It remains closed, as floodwaters have crept up to 306 meters above sea level – 2.4 meters short of the plant's threshold "design base".

Floodwaters at Cooper station are also below shut-down levels, "and the river would have to rise several feet even beyond that to reach a point where we'd be talking about Cooper's design base," [Nuclear Regulatory Commission](#) (NRC) spokesperson Scott Burnell told IPS.

Still, many are comparing the United States' readiness for a disaster with Japan's emergency response in March.

"There's certain ways we're a little bit better [prepared], because 9/11 happened in this country and not in Japan," Dave Lochbaum, director of the [Union of Concerned Scientists](#) (UCS) nuclear safety project, told IPS.

He noted that after the Sep. 11, 2001 terror attacks, the NRC required plant owners to upgrade their protection, and most plants now have portable power generators and pumps.

"While that equipment was installed to protect against acts by terrorists, they would also be useful... to help against acts of nature," he explained.

He added, however, that no plant could withstand the devastation at Fukushima. "If you give any plant in the world that kind of challenge," he said, "they're all going to end up in that same position. They just weren't designed for that."

The NRC's Burnell described the safety regulations at sites across the country. In Florida, for example, plants are designed to withstand hurricane-force winds, while in the Midwest, engineers plan for "the most significant earthquake that could be expected".

"The bottom line is, the United States nuclear power plants are designed to safely withstand the most severe events that can be expected at each individual site," Burnell said.

But for some, those assurances are not enough. New York Governor Andrew Cuomo has expressed his intention to shut down the [Indian Point Energy Center](#), located 56 kilometres north of Manhattan.

A top advisor in Cuomo's administration met with Indian Point staff last week and discussed the governor's intentions for the Buchanan plant, which lies near a fault line.

While, according to Burnell, "the NRC continues to find that all 104 nuclear power plants in the United States are meeting their requirements to operate safely," Paul Gunter of the watchdog Beyond Nuclear had a different response.

He pointed to NRC oversights in terms of electrical circuitry, cables unqualified to be submerged underwater, and inadequate plans for safe shutdowns.

"There are a whole host of issues," he told IPS, describing a "very cozy relationship between the federal regulator and the nuclear power industry".

The UCS's Lochbaum noted another major concern: about half the country's plants do not meet fire protection regulations, and, he said, nothing is being done about it.

"The NRC does a really good job of setting the regulations at the right height," he explained. "We very seldom complain that the NRC needs to raise the safety bar to better protect the public.

"But," he added, "what we find is that the NRC is letting plants limbo beneath that bar and not enforcing the regulations."

Global action towards decommissioning

"While these nuclear accidents can be remote in occurrence," warned Gunter, "the consequences are unforgiving." That is why an array of nations are taking action to phase out nuclear power, from heavily industrialized Germany, to Bulgaria, Malaysia, and Thailand, who have begun suspending licensing for new reactors.

"There is this broader recognition now that the verdict is in on nuclear power, and it is dirty, dangerous, and expensive," Gunter said. But he laments that the U.S. is straggling in the global shift to other energy sources.

"It was the United States that invented solar power," he chastised, "and yet countries like China are going to be the leaders in the manufacturing of this safer and increasingly less expensive renewable energy source."

While the USC also advocates for renewable energy, Lochbaum cautioned that the transition must be gradual. "As today's nuclear power plants shut down... they'll be replaced by cheaper technologies, or better, technologies," he predicted.

"The renewables in the United States really aren't ready to step in and fill the void, but over the course of the next two decades or so, as today's nuclear power plants reach their lifetime, it's more likely to occur," he said, cautioning that too abrupt a switch could lead to the re-opening of coal-fired plants.

For Gunter, however, the shift cannot happen fast enough.

"While the costs of nuclear power are rapidly rising, along with the risks associated with this inherently dangerous technology, we're seeing tremendous advances in global expansion from renewable energy resources like solar and wind," he said.

He pointed to the association between nuclear power and nuclear weaponry, and emphasized the need to abandon both.

"There is this connection that [with] the spread of nuclear power, you have the trafficking of basic materials to build nuclear weapons," he explained, noting the possibility of technology falling into the hands of "countries like India, Pakistan, and North Korea".

He also noted the 'Superpower Mentality' – the idea that nuclear power and nuclear weapons signify global superpower status. "I believe that this is going to be an increasingly dangerous concept," he said.

The answer, for Gunter, is simple.

"We need to abandon this inherently dangerous industry for more affordable, safer, cleaner alternatives," he said. "That's where the energy renaissance truly is."