

NUKEWATCH QUARTERLY



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News & Information on Nuclear Weapons, Power, Waste & Nonviolent Resistance

Spring Melt: Three Mile Island, Chernobyl & Fukushima Taint the Season

By Arianne Peterson

“Following the accident at the nuclear power plant, government authorities realized to their horror that their existing plans for such an emergency were too vague to address the challenges now facing them. Making matters worse, technical experts disagreed about the state of the crippled reactor and what might happen next. Some confidently asserted that events were ‘under control,’ while others warned that ongoing radioactive emissions might portend an imminent release of catastrophic proportions. More worryingly still, no one could predict the likelihood or timing of such a development confidently enough to inform decisions about ordering evacuations. Should the local population be evacuated, or would that measure only incite unnecessary panic? Proximity to the capital gave the situation extra urgency. Might it, too, have to be evacuated, with all the unfathomable costs that might entail? Without reliable measurements of the total radioactivity released to the environment or estimates of how large it might grow, policy makers had no choice but to answer these fraught questions on the basis of guesswork.”

This account of a major nuclear reactor catastrophe appeared in an April 2014 *Bulletin of the Atomic Scientists* article by Edward M. Geist, Nuclear Security Fellow at RAND. But which disaster was Geist recounting? Was it Three Mile Island, Chernobyl, or Fukushima? In fact, his description applies to all three. This narrative played out exactly the same way three separate times over the past thirty-six years.

As we at NukeWatch sat down to choose the content for this issue, we noticed another pattern: all three of these disasters began in the spring—Three Mile Island on March 28, 1979; Chernobyl on April 26, 1986; and Fukushima on March 11, 2011.

Thus, spring—which otherwise brings promises of new life here in the frozen north—now portends the potential self-destruction and long-lived pollution that compound the costs of nuclear power. As we ponder which of the world’s 438 nuclear power reactors might melt down next, we brace ourselves for the idea that, if this pattern holds true, the next disaster will happen in spring. If



Crime scene: The control room at Chernobyl’s Reactor 4 in 2005—nearly 20 years after the meltdown. Photo: Gerd Ludwig, National Geographic.

there are any more of these awful anniversaries to commemorate, we’ll have to add extra pages to every spring *Quarterly*.

As Geist’s narrative illustrates, there are more common elements among these three catastrophic events than their seasonal timing—similarities that should inform a public interested in protecting itself and the planet from complete devastation. The overall pattern shows clear evidence that neither can we handle nuclear technology safely, nor do we have any reason to believe we are more prepared to deal with a major “accident” (we’re unsure the term applies to an event precipitated by gross corporate and government negligence) now than we were in 1979, 1986 or 2011. Here, we review in more detail just a few of the common elements of these spring nuclear catastrophes—and their implications for future meltdowns.

Operators, regulators and corporations ignored warnings.

In the case of Three Mile Island (TMI), at least three individuals testified to the president’s Kemeny Commission after the partial meltdown with evidence that their efforts to warn operators of the likelihood for a disaster were thwarted. Two safety engineers at Babcock and Wilcox (which built TMI’s reactors), Joseph J. Kelly and Bert M. Dunn, testified that they

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Obama Administration's Nuclear Warhead Production Budget Larger than under Reagan and Bush—Again

By Greg Mello, Los Alamos Study Group

ALBUQUERQUE—On February 2, the Obama Administration released its proposed fiscal year 2016 budget, including its budget for the Department of Energy and the nation's nuclear warhead program in the National Nuclear Security Administration (NNSA). In it, NNSA warhead activities are proposed to increase from roughly \$8 billion in the current fiscal year, to over \$8.8 billion in fiscal year 2016—an increase of \$839 million or 10.5 percent.

US nuclear warhead design and production is fully privatized and the above figures do not include the costs for NNSA's administration of the program, which in fiscal year 2016 is expected to be \$284 million. So, a more accurate total warhead program cost is \$9.131 billion.

This is well above the comparable Reagan peak of \$8.13 billion in 1985 for the same kind of work, the G.W. Bush peak of \$8.28 billion in 2004, and Obama's previous record last year of \$8.27 billion.

The budget request explains that in 2014, the Nuclear Weapons Council* decided to "refresh," that is replace, the conventional high explosive in the W-88 high-yield warhead for the Trident, submarine-launched ballistic missile, when those warheads are taken to Pantex, Texas, to be fitted with upgraded arming and firing systems beginning in 2020. The purpose is to extend the use of the W-88 into "the late 2030s," allowing further postponement of the proposed first "interoperable" warhead. Last year, the Obama Administration and Congress deferred the "interoperable" warhead program for five years. Multiple sources told the Los Alamos Study Group that the Navy does not support the program and is not budgeting money or missiles for testing the new warhead.

The NNSA's budget proposal notes these new details for its planned plutonium warhead core ("pit") production at New Mexico's Los Alamos National Lab (LANL):

- The Chemistry and Metallurgy Research Nuclear Facility—opposed for years by the Los Alamos Study Group and the object of years of litigation—has been formally cancelled.

- A new \$675 million project is announced to modify, partially bring up to code, and re-equip the brand-new, \$396 million Radiological, Utility, and Office Building to handle larger quantities of plutonium. This brings the project's total investment to \$1.07 billion, making it by far the most expensive single construction project in the history of New Mexico.

- A new \$1.365 billion project is announced to modify the interior of the main LANL plutonium facility and in-

Fire at Rio Tinto's Open Pit Rössing Uranium Mine in Namibia

1,000 Evacuated

A fire erupted in a uranium processing building of the Rio Tinto-owned Rössing Uranium Mine in Namibia, the company said in a February 12 statement. The cause of the fire and possible damage to equipment was under investigation, Rio Tinto said.

The fire broke out in the Final Product Recovery (FPR) building where barrels are filled with processed uranium called "yellow cake." The Chinese news service Xinhua reported February 12 that 1,000 workers had been evacuated and that a member of the fire brigade reportedly said, "It [the fire] was incredibly hot, it was bad."

The British-Australian giant Rio Tinto, one of the world's largest mining companies, owns 69 percent of the mine, which is near the town of Arandis, 40 miles from the coastal city of Swakopmund.

Although Rio Tinto said mining operations in areas not affected by the blaze "continued as normal and there were no injuries," a local paper reported February 13 that some workers and members of the Swakopmund fire brigade were tested for radiation exposure. The German newspaper *Allemeine Zeitung* reported that fire fighters had to undergo urine tests and hand over their protective clothing to Rio Tinto officials.

Rio Tinto said February 13 that "affected employees were evacuated and the fire was extinguished"—after two hours.

A worker who declined to give his name told Xinhua, "The fire happened in a sudden and spread quickly within the plant.... Our only worry now is the possibility of a radiation leakage as this is the final plant where we pack uranium."

The mine's spokesperson Botha Ellis told Xinhua, "We are aware of such a possibility, but it is too early to comment on it...." Adam Hartman, reporting in *The Namibian* February 13, said, "Fears of radiation exposure were raised by people as far as Swakopmund, but attempts to get further comments from the mine regarding the alleged radiation screening of workers, and the possibility of mine closure for an extended period due to radiation fears, were unsuccessful." —JL

—Mining Weekly, Feb. 13; Sapa, Feb. 13; *The Namibian*, Feb. 13; Xinhua, Feb. 12, 2015

stall new equipment to handle higher production rates, in addition to multiple other items.

Obama's military budget request would accelerate development of the air-launched Long-Range Standoff Cruise missile by 1.25 fiscal years. Work on this proposed warhead, a W-80 modification, has been moved up by two years.

Strategic bombers are counted as "one warhead" under New START, even though each B-52H bomber can carry up to 20 nuclear-armed Cruise missiles and/or many nuclear-armed gravity bombs. (The B-2 bomber also carries Cruise missiles and the Long-Range Strike Bomber is being designed for this mission as well.) Long-Range Standoff warheads will not be counted under New START.

Overall this is a *status quo* budget, one that generally follows prior projections and plans. The proposed big spending increase was expected. There are no sudden departures. Contractor greed and waste are still being rewarded in the three big national labs [Los Alamos, Lawrence Livermore, and Sandia]. The contractors are still basically in charge. The dead-man-walking "interoperable warhead" program is still on the books despite its lack of support in the military. No old warhead types are being retired. No ICBM bases are being closed.

Pentagon Announces U-turn on Depleted Uranium Attacks Against Iraq & Syria



A US Air Force A-10 "Thunderbolt" or "Warthog" being loaded with 30 millimeter high explosive incendiary, or HEI, ammunition. It can fire either HEI alone, or its standard combat load, which includes armor-piercing depleted uranium ammunition made of waste uranium-238. It cannot select between ammunition types once airborne, which is why DU has historically been used against a far wider range of targets than just tanks.

By PAX, March 3, 2015

The Pentagon has announced that depleted uranium (DU) munitions have not, and will not be used by US warplanes in the conflict against Islamic State (IS) in Iraq and Syria. The policy U-turn contrasts with statements made over previous months where Pentagon officials claimed that DU would be used "if needed." The decision reflects a growing stigmatization of the controversial armor-piercing shells.

Since the decision to send twelve A-10 Thunderbolt gunships to the Middle East as part of Operation Inherent Resolve last December, concerns have been raised that the US would once again use DU in Iraq—already the world's most DU-contaminated country. Just months before the deployment was announced, Iraq had called on the United Nations for technical assistance in dealing with the legacy of the 404 metric tons of DU (445 US/short tons) that was fired by the US and UK in the conflicts in 1991 and 2003. Iraq also argued in favor of a global treaty ban on the weapons.

In spite of Iraq's clear and highly visible position against DU weapons, a Pentagon spokesperson said in October that 30 millimeter DU ammunition would be loaded onto the A-10 gunships and used as needed. "If the need is to explode something—for example a tank—[depleted uranium] will be used," the Pentagon said.

However, in a remarkable change in policy, and in response to questioning from a journalist working with IRIN [news service], the Pentagon said its "Combined Joint Task Force can confirm that US and Coalition aircraft have not been, and will not be, using depleted uranium munitions in Iraq or Syria during Operation Inherent Resolve."

PAX's Wim Zwijnenburg welcomed the U-turn, arguing that the conflict is complex enough. Zwijnenburg said, "The further use of these chemically toxic and radioactive munitions would have been yet another burden on the Iraqi population. They are already facing a humanitarian crisis and have grave concerns over the health legacy of historic DU use. The Iraqi government is still struggling with the

Looking deeper, morale and management problems will continue and are certain to explode in unpredictable ways. The fiasco created by LANL at the Waste Isolation Pilot Project in New Mexico is a harbinger of further trouble down the line, because nothing fundamental has been fixed. (See p. 6)

There is no way to have a well-managed nuclear weapons program. It's a fiasco-generating contradiction that NNSA has to live with every day.

Sooner or later nuclear weapons will be gone. The question they pose is whether we will exit at the same time—either because we finally open the "nuclear umbrella," or because our investments in the mushroom cloud preclude the solidarity needed to save a living planet from the other threats we've created.

In this budget we see NNSA's nuclear weapons "life extension program." What about a life extension program for humanity, for our civilization?

—Greg Mello is a Director of the Los Alamos Study Group.

*The five-member Nuclear Weapons Council, operated jointly by the departments of Defense and Energy, includes the Under Secretary of Defense for Acquisition, Technology, and Logistics; the Vice Chairman of the Joint Chiefs of Staff; the Energy Department Under Secretary for Nuclear Security; the Under Secretary of Defense for Policy and the head of US Strategic Command.

clean-up of past US DU use, with Iraqi workers and civilians at risk of exposure."

Depleted uranium isn't becoming any more acceptable

Since last October, campaigners and parliamentarians in Belgium, the Netherlands and UK have urged their governments to challenge the US on the issue. The decision to deploy the A-10s came days before 150 countries backed a UN General Assembly resolution calling for international assistance to states affected by DU and for greater transparency over past use to allow clean-up.

International Coalition to Ban Uranium Weapons (ICBUW) Coordinator Doug Weir said, "The overwhelming majority of states have grave concerns about DU weapons. ICBUW believes that this U-turn by the US reflects the growing global stigmatization of DU." Weir also said, "Coalition partners are responsible for the actions of their peers and it would have been unthinkable for the US to once again use DU on the territory of a country that has so recently called for a global ban on the weapons."

Fears that DU would be used in attacks against IS recently emerged in the besieged Syrian town of Raqqa, where concern has been expressed over the long-term public health and environmental legacy of the Coalition's use of the anti-tank munitions.

Identifying, assessing and cleaning-up DU-contaminated military scrap metal in Iraq remains a daunting problem even a decade after the conflict. Iraq's effort to reduce the risks that DU poses to civilians continues to be hampered by the US military's refusal to hand over wartime firing coordinates, in spite of calls to do from Congress and US civil rights organizations.

The Pentagon's statement referred only to the use of DU by coalition aircraft. In the event that US land forces are employed in the conflict, there is still a risk that DU may be used by US armored vehicles and tanks.

—PAX, based in The Netherlands, seeks to accelerate global nuclear disarmament by stigmatizing, outlawing and eliminating nuclear arsenals.

Fukushima Updates

Officials Push Additional Mass Dumping of Tainted Water

The head of Japan's Nuclear Regulation Authority said contaminated water stored at the Fukushima complex should be released into the ocean to ensure safe decommissioning of the reactors. Shunichi Tanaka, Chair of the NRA, made the comment Dec. 12. "I was overwhelmed by the sheer number of tanks (holding water tainted with radioactive substances)," Tanaka told reporters, indicating they pose a danger to decommissioning work. "We have to dispose of the water."

Likewise, inspectors with the International Atomic Energy Agency said Feb. 17 that the roughly 160 million gallons of contaminated water stored on-site pose massive logistical challenges and strongly urged Japan to discharge it to the Pacific Ocean once it is treated. The conditions per liter of water reportedly are: that radioactive cesium is less than 1 Becquerel; radioactive substances that emit beta rays are less than 3 Becquerels; and the level of tritium is less than 1,500 Becquerels. —*Asahi Shimbun*, Dec. 13, 2014, & Jan. 22, 2015; & *Los Angeles Times*, Feb. 17, 2015

Waste Fuel Removed from Vulnerable Cooling Pool

After almost four years of anxiety, Tepco announced it had removed all the highly radioactive waste "spent" fuel from the damaged cooling pool above reactor 4. The building was wrecked by a powerful hydrogen explosion March 15, 2011, and since then experts have warned that another major quake could cause massive radiation releases. Each of the 1,533 fuel assemblies holds 60 to 74 fuel rods, so all 91,980 to 113,442 rods have been transferred to a less vulnerable area of the compound, the company said. Tepco faces the prospect of removing melted fuel wreckage from the cores of units 1, 2 and 3; fuel so badly mangled and emitting so much radiation that removal will take over 40 years. Some experts say removal is not even possible, only entombment. —*New York Times*, Dec. 20, 2014

Fukushima Radiation Plume Reaches US West Coast

A radiation plume from the March, 2011 accident in Fukushima, Japan took about 2.1 years to cross the wa-

ters of the Pacific Ocean and reach the shores of North America, according to a study published December 29 in the Proceedings of the National Academy of Sciences. The study said that peak concentrations of Fukushima fallout in the Pacific could come this year and in 2016. The report claimed that levels of cesium-137 in the Pacific "are still well below natural levels of radioactivity in the ocean," but cesium does not occur in nature and is found in the oceans only as a result of nuclear bomb testing. The bomb tests dispersed roughly 36 million curies of cesium-137. Emergency radiation monitoring by the US lasted only from March until May 2011, and no federal agencies monitor offshore waters for radiation. —*Santa Cruz Sentinel*, Dec. 26; *Christian Science Monitor*, & *Washington Post*, Dec. 29, 2014

A crane removes debris at the No. 3 reactor building at Tokyo Electric Power Co.'s Fukushima No. 1 nuclear power plant on February 23, 2012. *Yomiuri Shimbun* Photo



Towns to Store Cesium-Tainted Soil "Temporarily"

The mayors of Futaba and Okuma and the Governor of Fukushima Prefecture have agreed to conditional, "temporary" storage of radioactively contaminated soil and waste collected during clean-up work in the exclusion zone.

The mayors agreed to the construction of "interim" storage sites in exchange for large sums of cash and a legal commitment to again move the material somewhere outside the prefecture for final disposal within 30 years. The two towns will share about \$645 million for research and construction of the sites. About 29 million cubic meters of surface soil tainted with cesium, an area the size of Luxembourg, may need permanent storage space.

—World Nuclear News, March 3, 2015

Spike in Ocean-Dumped Waste Water

Cleanup crews at Fukushima monitoring a drainage gutter Feb. 22 detected a huge spike in radiation levels in wastewater pouring into the Pacific Ocean. Tepco later said the water was 70 times, or 7,000 percent more radioactive than what is allowably dumped into the sea. The company said it stopped up the drainage because of the extremely high radiation levels, and four days later admitted it first learned of the leak in April, 10 months ago. Bone-seeking strontium-90 in the water measured up to 7,230 Becquerels per liter, when 5 Bq/L is the legal limit.

—Global Research, Mar. 1; *Japan Times*, Feb. 22; & NHK Public TV, Feb. 24, 2015

Sailors' Lawsuit Vs. Tepco & GE

Several hundred US sailors are suing Fukushima operator Tepco and reactor builder General Electric for \$1 billion in damages, alleging the illnesses they suffer come from exposure to radiation that contaminated the *USS Ronald Reagan* during relief operations. In a report to Congress last summer the Pentagon confirmed

that, "the *Ronald Reagan* encountered the radioactive plume from Fukushima ... on March 13," but added, "We believe it is implausible that these low-level doses are the cause of the health effects reported by the ... sailors."

Attorney Charles Bonner, who represents more than 200 sailors and Marines, says the Navy is just wrong. "The fallacy of that is that low levels of radiation are just as dangerous as high levels.... And even at 100 nautical miles they were taking on 30 times more radiation than is normal," he said. The 2014 Pentagon report admitted it is still finding and removing radiation from the *USS Reagan*.

On Feb. 12, GE asked the judge to dismiss the suit, arguing the sailors are asking for "something extraordinary and unprecedented"—compensation under domestic law for exposure to radiation emitted by a foreign nuclear power. Lawyers for the sailors lashed out at GE's motion March 3, saying the GE reactors' "design defects contributed to the meltdowns and, by extension, to plaintiffs' harms." Judge Janis Sammartino's decision is pending.

—KOMO TV News, Feb. 12; Law360, Mar. 3, & Feb. 12, 2015

Marshall Islands Vs. United States Dismissed, Appeal Pending

Last April, the Republic of the Marshall Islands (RMI) boldly sued nine nuclear weapons states in the International Court of Justice for refusing to negotiate nuclear disarmament, in violation of the 1968 Nuclear Non-Proliferation Treaty or NPT. (See Summer 2014 *Quarterly*.) The RMI also filed a separate suit against the United States in Federal District Court in California, alleging the US is violating legal obligations under the treaty, which was ratified by the US Senate in 1972.

The case is raising awareness of the NPT just as arms control organizations, disarmament groups and international law activists prepare for the UN's 2015 Non-proliferation Treaty Review Conference in May. Thousands of nuclear weapons opponents will descend on New York City April 24, 25 and 26 for meetings, rallies and marches.*

"The Marshall Islands are desperately trying to rescue the 1968 Nuclear Nonproliferation Treaty," wrote James Carroll January 5 in the *Boston Globe*—and the NPT clearly needs saving. As John Burroughs, Director of the Lawyers Committee on Nuclear Policy told the *New York Times*, "There have never even been any multilateral negotiations to eliminate nuclear weapons."

In the opening legal battle, lawyers for the RMI asked California's Northern District federal court to reject the US government's July 2014 claim that it cannot be compelled to comply with its NPT obligations. Then on Feb. 3, Federal District Judge Jeffrey White dismissed the RMI suit, ruling that the tiny state lacked standing to bring the suit, that the case was "nonjusticiable" because it involved a political question, and that the injuries claimed "could not be redressed by compelling the specific performance by only one Party to the Treaty."

Attorneys for the RMI will appeal California's lower court ruling while they pursue the cases at The Hague. —JL

* See *International Peace & Planet Conference, April 24-25, & register at <www.peaceandplanet.org>*

Fracking's Radioactive Waste:

North Dakota Considers Weakened Landfill Rules, Less Oversight

By John LaForge

Radioactive waste produced by hydraulic fracturing or "fracking" is making headlines all over gas land. The cover story of Nukewatch's summer 2014 *Quarterly* reported some of the illegal dumping by fracking companies—on Indian Reservations no less—in North Dakota where a gigantic gas fracking boom is underway in the Bakken oil field.

National news coverage of the scandal led North Dakota's legislature to consider changes to radioactive waste control law so that fracking's contaminated wastes can be dumped in ordinary landfills.

One bill under consideration would permit fracking radioactive waste in state landfills to be contaminated with ten times the radioactivity that state law currently allows—as long as it's covered with 10 feet of soil. The rad' waste that's not being haphazardly and illegally discard—no Victoria, nefarious dumping probably hasn't ended—is now being trucked out of state at some expense.

House Bills 1113 and 1114—reportedly requested by the ND State Health Department—are being contested by some law makers and journalists who have questioned the right of the department to set its own rules.

The ND Newspaper Association and the ND Broadcasters Association complained that the bill eliminates requirements for public hearings and instead permits them "when appropriate" and even cancels public notification of the permitting process for disposition of radioactive materials.

Dave Glatt of the State Health Department told the *Bismarck Tribune* that the SHD commissioned Argon National Laboratory in Chicago to study the question and make recommendations. The department wanted to know "radiation limits that would be safe for workers and the public." Glatt forgets that there are only legally permitted doses, no safe ones.

Radioactive isotopes that contaminate fracking industry waste and its machinery include radon, uranium-238, and thorium-232. According to the Health Department's website, these long-lived pollutants come in six forms:

- 1) "Produced water," which is injected underground but later brought to the surface as waste;
- 2) "Sulfate scales," which are hard, insoluble deposits that accumulate on frack sand and inside drilling and processing equipment;
- 3) Sludge and "filter cake" solids of mud, sand, scale and rust that precipitate or are filtered out of contaminated "produced water." They build up in waste water storage tanks and in "filter socks";
- 4) Filter socks, contaminated by "produced water";
- 5) Synthetic "proppants" or sand; and
- 6) Contaminated soil and machinery.

Locals are Worried

"We don't want to have when this oil and coal is gone, to be nothing left here, a wasteland, and I'm afraid that's what might happen" said Underwood farmer Gene Wirtz to KXNET News Reporter Ben Smith in January. Wirtz is worried about the increased radioactivity in local landfills. "Any amount of radiation beyond what you're already getting is not a good thing," he said to Smith.

A case in point came Jan. 6, 2015, when three-million gallons of waste water sprang from a North Dakota pipeline rupture, in Williams County north of Williston, the biggest ever in the current Bakken oil rush. Attempted containment of the leak was underway January 23 as berms were set up across Blacktail Creek to prevent the waste water from flowing into the Missouri River. The *New York Times* reported that the leaked waste water "may contain residue from hydraulic fracturing."

"Potential for harm" called "no problem" by *Forbes*

Writing Jan. 26 in *Forbes* online, James Conca turned upside-down the results of a recent Pennsylvania study of the risks of radiation exposure from gas fracking wastes.

The Pennsylvania Department of Environmental Protection studied so-called "Technologically-Enhanced Naturally Occurring Radioactive Material," or TENORM, and analyzed the levels of radioactivity associated with oil and gas extraction in the state.

Mr. Conca's column was headed, "Radiation from Fracking? No Problemo." And Conca wrote that the PDEP study found there is "no concern of radiation exposure from fracking wells for oil or gas."

On the contrary, the PDEP study explicitly warns of increased radiation risk from various aspects of fracking. In particular, the PDEP report warned of:

- Limited potential for radiation exposure to the public and workers from the development, completion, production, transmission, processing, storage, and end use of natural gas;
- Potential radiological environmental impacts from fluids if spilled; and
- Little potential for radiation exposure to the public and workers from landfills receiving waste from the oil and gas industry.

The PDEP report recommended additional study of radiological impacts from the use of "brine" or "saltwater" waste, called "produced water" by the ND Health Dept., from the oil and gas industry currently used for dust suppression and road stabilization.

Although the *Forbes* article trivializes and distorts Pennsylvania's findings, it did say this: "With 15 million Americans living within a mile from a fracking well, this is an important result."

NUCLEAR SHORTS

Government Calculus: How Much is Your Life Worth?

WASHINGTON, D.C.—Your life is worth \$6 million less if you die in a nuclear reactor disaster than if you die in a car crash, according to Bloomberg's analysis of US government statistical models. When the Nuclear Regulatory Commission (NRC) and Transportation Department consider safety upgrades to nuclear power stations and highway systems (respectively), they analyze the cost of the improvement compared to its potential to save lives, assigning dollar values to both variables.

The difference? The Transportation Department values human lives at \$9 million each, while the NRC assigns just \$3 million per person theoretically saved. Even if we accept the problematic assumption that human lives can be represented in dollars, the question remains: why the discrepancy?

"Using this low value has a significant effect on nuclear license renewals and new reactor approvals," Union of Concerned Scientists physicist Ed Lyman told Bloomberg. "Nuclear plants are not required to add safety systems that the NRC deems too expensive for the value of the lives they could save."

Even with lives valued at just \$3 million per head, the nuclear industry complains that current safety requirements are too expensive. "If the NRC more accurately estimated the cost of its regulatory requirements, it would find that many of its requirements do not pass a simple cost-benefit test," said Nuclear Energy Institute Senior Vice President Anthony Pietrangolo at a December 3 Senate hearing. —Bloomberg, Dec. 10, 2014

Desperate "Small Modular Reactor" Promoters Want Clean-up Funds, State Subsidies

AIKEN, South Carolina—Operators of the US Department of Energy's Savannah River Site (SRS) improperly diverted \$750,000 in taxpayer funds—budgeted for clean-up of the site's extensively contaminated nuclear weapons production facilities—to small modular reactor research in 2012. The federal Office of Management and Budget learned of the shift later the same year and ordered SRS to stop misusing the funds. However, the mismanagement of taxpayer dollars did not become public until this January, after the watchdog group SRS Watch discovered it through a federal open records request.

SRS officials did not respond to questions from reporters on whether the money was ever restored to the cleanup budget—which many argue is already inadequate. In recent years, interest in the still-unproven small modular reactor technology has waned despite other, more straightforward government subsidies. Even Babcock & Wilcox which was awarded a \$150 million government grant in 2012 to pursue the technology has significantly scaled back the investment of its own funds in "cookie cutter" reactors.

However, the Washington State Senate does not seem to have gotten this memo. Among the bills proposed there by Republican State Senator Sharon Brown in February are those that would provide a sales tax exemption for small-scale reactor production, require the state's Commerce Department to support market development for small reactors, and modify the state's renewable energy definition to include electricity from small nuclear reactors. —*The State* (South Carolina), Jan. 7; *Augusta Chronicle*, Jan. 11; AP, Feb. 24, 2015.

Pilotless Drones Not So Precise

LONDON—A new analysis of data available to the public about drone warfare, conducted by the human-rights group Reprieve, indicates that even when operators target specific individuals—the most focused effort of what President Obama calls "targeted killing"—they kill vastly more people than those targeted, often needing to strike multiple times. As of late November, attempts to kill 41 men resulted in the deaths of an estimated 1,147 people. The human rights group Reprieve, using reports compiled by the Bureau of Investigative Journalism, examined cases in which specific people were targeted by drones multiple times. "Drone strikes have been sold to the American public on the claim that they're 'precise.' But they are only as precise as the intelligence that feeds them. There is nothing precise about intelligence that results in the deaths of 28 unknown people, including women and children, for every 'bad guy' the US goes after," said Jennifer Gibson, who spearheaded Reprieve's study. —*Space Alert!*, Winter/Spring 2015

Workers Die, Cancer Victims Sue South Korean Nuke Operator

SEOUL—Three workers died December 26 as a result of inhaling toxic gas while building a new nuclear power facility in Ulsan, South Korea. A spokesperson for the utility in charge of the site, the state-run Korea Hydro and Nuclear Power Co., said the company suspected that a nitrogen leak was to blame for the deaths. Korea Hydro was on high alert at the time because of threats from computer hackers who had recently claimed they could disable the control systems of the company's 23 reactors.

Food for Thought: The Banana Comparison



long-lived radioactive elements, commonly found in Earth's crust, are very weakly radioactive.

"Note that potassium-40 has a specific activity of 71 ten-millionths of a curie-per-gram. Compare that to 88 curies per gram for cesium-137 and 140 curies per gram for strontium-90. In other words, cesium-137 is 12 million times more radioactive than potassium-40. This is like comparing an atomic bomb to a stick of dynamite. Strontium-90 releases almost 20 million times more radiation per unit mass than potassium-40. Which one of these would you rather have in your bananas?"

—Steven Starr, "The Contamination of Japan with Radioactive Cesium," *Crisis Without End*, Helen Caldicott, Ed., The New Press, 2014, p. 46.

Earlier in December, a group of 1,336 plaintiffs, including 301 thyroid cancer patients and their families, filed a lawsuit against Korea Hydro. The cancer patients, who all live in close proximity to four of the nuclear giant's facilities, are seeking \$13,800 in compensation each, while their family members are asking for under \$3,000 per person in damages. The plaintiffs decided to sue after a court ordered Korea Hydro to pay \$13,800 to a single thyroid cancer patient, Park Geum-sun, in compensation for her suffering. The case is the first class-action lawsuit brought against the South Korean utility.

Ye Bu-hae, a 69-year-old rice farmer whose wife underwent thyroid cancer surgery, joined the suit along with 66 other thyroid cancer patients from his village of 3,000 people near the Kori nuclear facility. "Our action is for our next generation," he told Reuters.

—Reuters, Dec. 16; AP, Dec. 26, 2014

Three Minutes and Counting

CHICAGO—The Doomsday Clock now shows only "3 minutes to midnight," according to a January announcement by the *Bulletin of the Atomic Scientists* Science and Security Board. The group cited "unchecked climate change, global nuclear weapons modernizations and outsized nuclear weapons arsenals" as the reason for moving the clock two minutes closer to catastrophe than they had set

it in 2014.

"World leaders have failed to act with the speed or on the scale required to protect citizens from potential catastrophe. These failures of political leadership endanger every person on earth," the group said. The Science and Security Board has maintained the Doomsday Clock since 1947. Originally designed to give the public a sense of the imminent threat of the global nuclear weapons arsenal, the clock began to include the threat of global climate change in its measurements in 2007.

In its press release, the Science and Security Board wrote, "We implore the political leaders of the world to take coordinated, quick action to drastically reduce global emissions of heat-trapping gases, especially carbon dioxide, and shrink nuclear weapons arsenals. We also implore the citizens of the world to demand action from their leaders. The threat looms over all of humanity. Humanity needs to respond now, while there is still time."

—*Bulletin of the Atomic Scientists*, Jan. 19, 2015

UN Calls on Israel to Renounce Nukes

NEW YORK—In December, the UN General Assembly approved a resolution calling on Israel to renounce its nuclear weapons and place its nuclear facilities under international oversight. Titled, "The risk of nuclear proliferation in the Middle East," the resolution passed 161 to five. The US and Canada were among the four countries that joined Israel in opposition to the measure.

Israel is widely understood to possess about 200 nuclear weapons, but refuses to confirm its nuclear status. It is also the only Middle Eastern country that is not part of the Treaty on the Non-Proliferation of Nuclear Weapons. The resolution called on Israel to "accede to that treaty without further delay" and "not to develop, produce, test or otherwise acquire nuclear weapons, to renounce possession of nuclear weapons." It also asked Israel to put its nuclear facilities under the oversight of the UN's International Atomic Energy Agency.

Resolutions of the UN General Assembly are not legally binding, but they do carry moral and political weight as

they represent decisions that include all 193 UN member states. —AP, Dec. 2, 2015

Call Them Cancer Salons: Melanomas Again Tied to Indoor Tanning

TEQUEST, Florida—According to the National Cancer Institute, the use of commercial indoor tanning beds causes roughly 400,000 cases of skin cancer in the United States every year, and 6,000 of them come in the form of melanoma, the deadliest form. Still the salons are allowed to promote themselves by promising beauty and, believe it or not, "better health." Tanning salons are big business with about 14,000 salons nationwide in 2014. There are more tanning sites in sunny Florida than there are McDonald's restaurants. And the "beauty" treatment is cheap, about \$7 for 20 minutes. The good news is that because of the growing concern over tanning's cancer risks—melanoma has risen by one-third in women under 40 since the early '90s—40 states have restricted its use by minors, and nine have adopted outright bans for minors. In addition, the government documented the first ever drop in tanning among teenage girls and a recent decline in the overall number of tanning salons. —*New York Times*, Jan. 11, 2015

Pilgrim Reactor's Blizzard Shutdown Causes Concern

PLYMOUTH, Massachusetts—The blizzard "Juno" forced Entergy Corp's Pilgrim Nuclear Power Station to shut down on January 27, and a coalition of local citizens' groups are asking the NRC to keep it closed. The facility lost off site power during the snow storm, which required it to switch to diesel-powered back-up generators. The severe weather also caused a problem in the switch yard, meaning the power station was unable to send electricity back to the grid.

Pilgrim has experienced similar problems during past storms, which Entergy has not adequately addressed, according to the groups asking for the long-term shutdown: Pilgrim Coalition, Cape Downwinders, Cape Cod Bay Watch and Concerned Neighbors of Plymouth. Citizens called for a proactive shutdown on Jan. 26, when the storm began, citing the fact that an evacuation of the area around the troubled reactor site would be impossible in blizzard conditions. The same day, the NRC itself issued a report stating that Pilgrim had "not provided the assurance level to fully meet all of the inspection objectives and [the NRC] correspondingly determined that Pilgrim will remain in the Degraded Cornerstone of the Action Matrix," meaning that the reactor operator had failed to correct serious problems identified at the facility one year earlier. —Pilgrim Coalition, Feb. 3, 2015

Resources

- * **Beyond Nuclear**, 6930 Carroll Av., #400, Takoma Park, MD 20912; (301) 270-2209; Email: info@beyondnuclear.org; Web: beyondnuclear.org
- * **Bulletin of the Atomic Scientists**, PO Box 422, Hopedale, IL 61747-0422; Phone: (773) 702-6301; Email: admin@thebulletin.org; Web: thebulletin.org
- * **Canadian Coalition for Nuclear Responsibility**, 53 Dufferin Road, Hampstead QC, H3X 2X8 Canada, (514) 489-5118; Web: ccnr.org; Email: ccnr@web.net
- * **Fairewinds Energy Education**, 70 S. Winooski Av. #289, Burlington, VT 05401; Phone: (802) 865-9933; Email: contact@fairewinds.org; Web: www.fairewinds.org
- * **Fukushima Fallout Awareness Network**, Member Websites: ffan.us; beyondnuclear.org; citizens.org; eon3.net; nuclearfreeplanet.org; nirs.org
- * **Ground Zero Center for Nonviolent Action**, 16159 Clear Creek Rd. NW, Poulsbo, WA 98370; Phone: (360) 930-8697; Email: info@gzcenter.org; Web: gzcenter.org
- * **International Coalition to Ban Uranium Weapons**, Bridge 5 Mill, 22a Beswick Street, Ancoats, Manchester, M4 7HR, UK; Web: bandepleteduranium.org
- * **Int'l Physicians for the Prevention of Nuclear War**, 66-70 Union Square, #204, Somerville, MA 02143; Phone: (617) 440-1733; Email: ippnwbos@ippnw.org; Web: ippnw.org
- * **IRIN**, non-profit news organization; Web: irinnews.org
- * **James Bay Cree Against Uranium**, Web: standagainsturanium.com; Twitter: @JBCAUranium
- * **Los Alamos Study Group**, 2901 Summit Place Northeast, Albuquerque, NM 87106; Phone: (505) 265-1200; Email: gmello@lasg.org; Web: lasg.org
- * **Natural Resources Defense Council**, 40 W. 20th St., New York, NY 10011; Phone: (212) 727-2700; Email: nrdcinfo@nrdc.org; Web: nrdc.org
- * **Physicians for Social Responsibility**, 1111 14th St., NW, #700, Washington, DC, 20005; Phone: (202) 667-4260; Email: psmatl@psr.org; Web: psr.org
- * **Pilgrim Coalition**, 55 Landing Road, Kingston, MA 02364; Web: pilgrimcoalition.org
- * **Reprieve**, PO Box 72054, London, England EC3P 3BZ; Email: info@reprieve.org; Web: reprieve.org
- * **Space Alert! Global Network Against Weapons & Nuclear Power in Space**, PO Box 652, Brunswick, ME 04011; Phone: (207) 443-9502; Email: globalnet@mindspring.com; Web: space4peace.org
- * **Southwest Research and Information Center**, 105 Stanford SE, PO Box 4524, Albuquerque, NM 87196; Phone: (505) 262-1862; Email: Info@sric.org; Web: sric.org
- * **SRS (Savannah River Site) Watch**, Phone: (803) 834-3084; Email: srswatch@gmail.com; Web: srswatch.org
- * **Voices for Creative Nonviolence**, 1249 W Argyle St., #2, Chicago, IL 60640; Phone: (773) 878-3815; Email: info@vcnv.org; Web: vcnv.org

Spring Melt (continued from cover)

had written numerous memos attempting to convince their supervisors to notify Babcock and Wilcox (B & W) reactor operators of the risk of a loss-of-coolant accident after a similar emergency at another B & W reactor, Davis-Besse, in 1977. Corporate officials thwarted the engineers' attempts to let operators know what to look for—and, more importantly, exactly how to deal with such an emergency.

Similarly, an inspector for the Nuclear Regulatory Commission (NRC), James Creswell, testified that he warned his supervisors just a few weeks before the accident that all B & W reactors should be shut down in order to properly address the safety concerns raised by the Davis-Besse incident. NRC officials dismissed his concerns. Also, a broken cooling valve contributed to the disaster—the eleventh such valve failure at the facility within one year. Clearly, operators should have identified and addressed this problem.

In 2003, Ukraine released more than 100 previously secret intelligence files proving that government officials knew the Chernobyl nuclear facility was flawed from the start of its operation. The files show that operating authorities ignored KGB warnings about the use of sub-standard building materials and technicians ignoring safety regulations, with twenty-nine accidents occurring between 1977 and 1981. A 1979 KGB report stated, “According to operational data, there were deviations from design and violations of technology procedures during building and assembling works. It may lead to accidents.” After an inspection of the nuclear facility just one week before the meltdown, engineers recommended the reactors be shut down because conditions at the facility were so dangerous.

In his May 2011 book *Fukushima Meltdown: The World's First Earthquake-Tsunami-Nuclear Disaster*, Takashi Hirose refutes claims by the Japanese government and Fukushima Daiichi reactor owner Tepco (Tokyo Electric Power Company) that the devastation caused by the earthquake and tsunami to the six-reactor complex was “beyond expectation.” In August of 2010, Hirose published a warning that was partly an attempt to amplify the conclusions of a well-known seismologist, Ishibashi Katsuhiko. Katsuhiko had been warning of the potential for what he called a *genpatsu shinsai* (“nuclear-power-plant-earthquake-disaster”) since the late 1990s. Hirose asserts that Katsuhiko's work was so well-known it would have been impossible for Tepco officials not to have seen it. In *Fukushima Meltdown*, Hirose asks, “If I, neither a scholar nor a specialist, was able to foresee this, and the nuclear power specialists from Tepco and from the government's nuclear-related agencies were not, then for what do they exist?”

Evacuation efforts were grossly inadequate.

The government never issued an evacuation order to protect residents living near the Three Mile Island facility, and Pennsylvania Governor Dick Thornburgh held off for two days before issuing an evacuation advisory for pregnant women and preschool children living within five miles of the reactors. Former nuclear industry executive Arnie Gunderson maintains that under the Nuclear Regulatory Commission's own rules, an evacuation should have been ordered on March 28, the first day of the disaster, due to calculated radiation exposures in the town of Goldsboro, Penn. reaching 10 rems per hour. Given the authorities' inability to measure the nature and amount of radioactive elements released, the decision not to evacuate is inexcusable at best, if not an act of reckless endangerment, based on long-term death toll estimates.

Soviet officials did not begin evacuating residents from around Chernobyl until 36 hours after the explosions that spewed radioactive particles from Unit 4 around 1:30 a.m. on April 26, 1986. Though residents could see the graphite fire burning on the roof of the facility and many felt ill within hours of the explosion, they were not immediately informed of the disaster, and the evacuation of the eighteen-mile exclusion zone around the reactors did not begin until 2:00 p.m. on April 27. Health workers and volunteers did not start distributing potassium iodine, which blocks the absorption of radioactive iodine in the thyroid, until more than 24 hours after the initial release. Measurements in the city of Pripjat, next to the reactor complex, showed street-level radiation as high as 6.5 roentgens per hour (an exposure to 500 roentgens in five hours is usually lethal for human beings), with 50 percent of the radioactive particles containing radioactive iodine-131. Residents were told that they only needed to evacuate for three days—when in reality most were never able to return. Authorities later reported they had to scrap their original and grossly inadequate emergency plans and start from scratch during the catastrophe, in order to reformulate how to handle the evacuation of 135,000 people.

After the tsunami hit Japan's shores in the late afternoon of March 11, 2011, the government knew that all six of the reactors at Fukushima Daiichi were in danger of melting down due to the loss of coolant at the facility. Yet, just like their United States and Soviet counterparts, Japanese officials moved slowly in evacuating residents, only completing the first evacuation—from within a radius of less than two miles around the facility—the next morning. Officials kept slowly expanding the evacuation zone, and only after the massive explosion in reactor 1,

which occurred at 4:30 p.m. on March 12, did they expand the zone to a radius of 12.5 miles. Months later, on July 20, the US State Department restated its advisory that US citizens keep 50 miles away from the wrecked reactor complex. Later, a former senior US diplomat in Japan disclosed that the original plan of evacuating all 90,000 US citizens in Tokyo at the time of the meltdown was rejected not because it was unnecessary but because “it could have ... caused panic among the Japanese.”

Officials could not—or would not—adequately measure, track or publicize radioactive releases.

In all three nuclear disasters, evacuation and other disaster mitigation efforts were significantly hindered by uncertainty about “source term,” or the total amount and type of radiation released. Though operators of nuclear facilities usually have a good understanding of which isotopes are inside a reactor, the nature of the source term can change upon release depending on the means by which they escape containment and their interaction with the surrounding environment. Nuclear experts have had difficulty reconstructing the source term, even after catastrophic events, and predicting them in advance is almost impossible. Essentially, this means that even the best emergency response plans are still based on guesswork.

During the meltdowns at Chernobyl and Fukushima as well as the partial meltdown at Three Mile Island, radiation monitors in the immediate vicinity of the reactors either maxed out or were destroyed (23 of 24 monitors at Fukushima were wrecked by the giant earthquake). We have only computer modeling to determine how much radioactive material was dispersed to the winds during the melting. Our understanding of the total radiation released—and thus, potential long-term health and environmental impacts—is extremely limited and difficult to predict. This uncertainty enables regulators and industry lobbyists to assume a minimum amount of damage and resist citizen-driven attempts for more rigorous safety standards.

Though technology for measuring the amount and nature of isotopes released during a radioactive release is still dangerously inadequate, operators at Fukushima did have access to a modern system for tracking the direction of the radioactive plume in real time (dubbed System for Prediction of Environmental Emergency Dose Information, or SPEEDI). It is more sophisticated than those available at TMI and Chernobyl decades earlier. But we operate nuclear reactors in a political and economic atmosphere, rather than just a scientific landscape. Just having access to this data was not incentive enough for Japanese officials to make use of it to protect their own populations.

In a lengthy investigative August 2011 report, the *New York Times* found that Japanese authorities deliberately endangered even the most vulnerable individuals—women, children, infants and the elderly—by at first denying and then covering up its own data about wind direction and radioactive fallout. According to the report, Japan's SPEEDI radiation tracking program, “had been churning out maps and other data hourly since the first hours after the catastrophic earthquake and tsunami.” But officials withheld this data until March 23, even from rescue workers and local authorities, in violation of the prime minister's own nuclear disaster manuals. This meant that the residents of the town of Namie, which is outside of the evacuation zone, carried on life as usual for three days while being exposed to the highest levels of radiation in the area—directly under the radioactive plume that, it turns out, was visible on the government's real-time maps.

We keep operating nuclear reactors the same way, expecting different results.

Reactor operators and government officials around the world continue to ignore warning signs that more nuclear reactor meltdowns are imminent. In the United States, the Nuclear Regulatory Commission (NRC) continues to extend the operating licenses and approve power “uprates” at its aging fleet of nuclear reactors for as much as twenty years beyond their originally planned forty-year lifetimes. In January of this year, the NRC rejected a petition, signed by 10,000 members of the US public and submitted by watchdog group Beyond Nuclear, asking the agency to suspend operating licenses at the US's twenty-two General Electric Mark I boiling water reactors. These reactors are identical to those that melted down at Fukushima Daiichi and, experts have long argued, they have major design flaws.

Though the US State Department recommended an evacuation radius of 50 miles for its citizens near the Fukushima disaster zone, the NRC refuses to require evacuation and communication planning for areas more than 10 miles from our 99 operating reactors. This kind of negli-



On the day of the Chernobyl meltdown, children played in this kindergarten in Pripjat, Ukraine, the town next to the reactors. Authorities evacuated the area the next day. Photo by Gerd Ludwig, *National Geographic*, 2005

gence could lead to a disaster with an impact on a scale we have never seen—for example, if one of the reactors at New York's Indian Point melted down. Indian Point is less than 40 miles from Manhattan and New York's roughly 8.5 million residents, who live close enough to be severely affected by a radiation release—but not close enough that the government requires anyone to plan for their evacuation. Similarly, should a meltdown occur at the Pilgrim nuclear facility in Massachusetts, over 200,000 Cape Cod inhabitants could be forced to flee toward the source of the radiation in order to escape a radioactive plume, through the bottlenecks of only two bridges that connect them with the mainland.

How many more times must we relive this horror story before we decide to shut down all nuclear reactors for good?

Kathy Kelly

(continued from back cover)

patients. How bleak and unnecessary it is to confine people for decades. My friend Brian Terrell, who was incarcerated in Yankton, South Dakota for six months after crossing the line at Whiteman AFB, told me that while in prison he saw signs on the walls recruiting prisoners to train for medically assisting geriatric male prisoners. I shudder to think of our culture's pervading callousness, pointlessly consigning so many aged people to languish in prison.

I will be free in three months, but our collective future is most assuredly shackled to a wrongheaded criminal justice system. I hope this compulsively vengeful and diseased criminal justice system will change during my lifetime. And I hope that my short sojourn inside Lexington's prison walls will help me better understand and perhaps help shed some small light on the systems that affect other people trapped there.

During recent visits with concerned communities focused on drone warfare, many have helped me see a connection between the drone killings across Central Asia and the Middle East and the casual executions and incarceration of young black males in our own country.

In Afghanistan, where the noise of air strikes and civil war have faded to the buzz of drones and the silence of empty promises, our friends in the Afghan Peace Volunteers (APVs) continue their peace building efforts. Last week, 80 street children walked from the APV center to the Afghan Independent Human Rights Commission office to assert their right to education. Their signs expressed their determination to help create a school for street children. One sign said, “We don't want your charity. We want dignity.”

Our young friends wish to provide a better life for the very children whose only other means of getting off the streets may well include joining the Taliban, criminal gangs, or some other militia. Meanwhile, the United States' vengeful stance as a nation, concerned with protecting its wealth and status at all costs and its safety above all considerations of equity or reason, destroys the lives of the impoverished at home as it destroys those abroad.

The “Black Lives Matter” protests need our support, as do the protests to “Shut Down Creech” Air Force Base in Nevada. Our friends in the Afghan Peace Volunteers continue to do vital work for peace and solidarity, in Kabul, that needs our support. It's encouraging to know that thousands of committed people seek and find work to make our world less like a prison for our neighbors and ourselves.

My address through April 23 is:

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Kathy Kelly co-coordinates *Voices for Creative Non-violence in Chicago*. For more information, please contact VCNV at info@vcnv.org.

Watching the Nuclear Watchdog

Government to Report on Cancer Risks Among Neighbors and Down-Winders Near US Nuclear Reactors

By Janette Sherman

Despite scientific findings linking low-level radiation exposure and cancer that go back as far as Madam Marie Curie in the 1930s, the nuclear power industry in the US has evaded rigorous examination of the risks its reactors pose to their neighbors and down-winders.

Senator Ted Kennedy demanded a study of cancer risks 27 years ago. For an industry that has been splitting uranium atoms to heat water and create electricity since 1957, one study hardly seems adequate. A second study is pending, but industry watchdogs worry it is so compromised that its results will be predictable.

Last year, the National Academy of Sciences (NAS) Nuclear and Radiation Studies Board issued a "Phase 2 pilot planning report." The report was designated "planning" because executives at the agency have yet to decide how to conduct the study.

The current federally-sponsored study of cancer rates near nuclear reactors is now nearly six years old, and will take at least five more years, maybe more, to complete. The planning is being shaped by regulators closely aligned with an industry that stands to lose if nuclear reactors are linked to cancer.

To appreciate how flawed the process has been, a little history is needed. The building of nuclear power reactors in the US began in 1943 to produce atomic bombs. It was not until 1957 that reactors began to produce electricity. In the 1980s, the number of power reactors peaked at 112. The number is now 99 and falling.

Despite known environmental releases of radiation from these reactors and a connection between radiation exposure and cancer that is now widely accepted among medical researchers, federal officials spent decades declaring there was no risk of developing cancer to anyone living near a reactor—without conducting any studies to support their claims.

That ended in 1988, when Ted Kennedy wrote a letter to James Wyngaarden, Director of the National Institutes of Health. Kennedy had learned of an article in the

medical journal the *Lancet* describing high leukemia rates around the Pilgrim Nuclear Power Station near Boston. Wyngaarden took the senator's not-so-subtle hint, and responded three weeks later:

"The National Institutes of Health is actively involved in studying the adverse effects of ionizing radiation, and we concur with your view that the risks at low levels need further clarification ... We are currently correlating county mortality data from the 1950s through early 1980s with reactor operations."

Wyngaarden wasn't truthful about his staff "currently correlating" cancer data. No such process had begun until Kennedy's letter arrived. Wyngaarden also demonstrated his pro-industry bias by writing: "The most serious health impact of the Three Mile Island (TMI) accident that can be identified with certainty is mental stress to those living near the reactor, particularly pregnant women and families with teenagers and young children."

Following Kennedy's request, the National Cancer Institute issued a report in July 1990, concluding, "The survey has produced no evidence that an excess occurrence of cancer has resulted from living near nuclear facilities." Researchers, however, for the most part only surveyed cancer deaths, not incidences, thus limiting the consideration of radiation-sensitive cancers like thyroid and childhood cancer, which most victims survive. The safety of nuclear reactors was subsequently ignored by officials except when they cited the 1990 report as evidence that it is "safe" to live near the reactors.

Then in May 2009, seemingly out of nowhere, the Nuclear Regulatory Commission (NRC) posted a "pre-solicitation" notice for experts to conduct a cancer study near US reactors.

As encouraging as that might appear, an NRC-sponsored study of cancer risks near the reactors it regulates is a blatant conflict of interest. Approximately 90 percent of NRC funding comes from licensing fees paid by companies that own the reactors that the commission regulates.

Bad news about cancer and nuclear reactors is bad news for the Nuclear Regulatory Commission.

Moreover, NRC officials do not have medical backgrounds. They are mostly physicists and engineers, typically moving through the revolving door connecting the regulatory community and the industry. Most employees either have worked at nuclear reactors or they will work at reactor sites when they leave the agency.

To direct the study, the NRC approved a no-bid contract to the Oak Ridge Institute for Science and Education. Located in Tennessee at the world's oldest nuclear weapons complex, the institute has extensive contracts with the US Energy Department, which is strongly invested in nuclear development.

That conflict was too obvious. After protests by activists, Massachusetts Senator Ed Markey intervened and the NRC responded by moving the study to the National Academy of Science, whose National Academy Nuclear and Radiation Studies Board would direct the project.

The Radiation Study Board's Chair was Richard Meserve, himself a former NRC Chair—and an illustration of how compromised our nation's nuclear regulators are.

Meserve has been a senior counselor to a law firm that works for the nuclear industry, a board member of nuclear energy companies in Texas and California, and board advisor to a French-US conglomerate with plans to build new nuclear plants in the US.

Protests by anti-nuclear activists compelled Meserve to recuse himself from the project. Yet while other members of the study board are not as compromised as Meserve, few have backgrounds in public health or medicine, and none has ever published a peer-reviewed article on cancer near nuclear plants.

By now critics of this process expect a report that finds "no link" between cancer risk and living in proximity to a reactor. Yet science uncompromised by relations with the industry has reached a different conclusion. At least 60 published, peer-reviewed studies have linked cancer to low-level exposure to radiation (particularly among children, who are most susceptible).

Examples? A 2012 study of nuclear reactors in France found elevated levels of child leukemia in the vicinity of the reactors. A 2008 study in Germany came to a similar conclusion regarding child leukemia and that country's 17 reactors [leading to their phaseout].

A study in *Archives of Environmental Health* in 2003 found cancer rates in children that were 12.4 percent higher than nationwide rates in 49 counties surrounding 14 nuclear reactors in the eastern US. (The author was one of the five researchers.)

The obligation among government employees and scientists to maintain their objectivity and to protect human health is on the line with this upcoming study. That unbiased research is unlikely unless grass roots organizations and individuals keep the pressure on elected officials.

—Janette Sherman, a physician and author specializing in toxicology and chemical- and radiation-related illnesses, was Consulting Editor of *Chernobyl: Consequences of the Catastrophe for People and the Environment*, 2009, published by New York Academy of Science.

Fukushima's Cesium-137 Release Trumps Chernobyl's

Most news reports about Fukushima's triple reactor meltdowns call it the second worst radiation disaster after Chernobyl. But the Korea Atomic Energy Research (KAER) Institute, south of Seoul, reports that the Fukushima meltdowns may have emitted two to four times as much cesium-137 as the single reactor catastrophe at Chernobyl.

To determine its estimate of the total cesium-137 that was released into the environment from Fukushima, the cesium-137 release fraction (4% to the atmosphere, 16% to the ocean) was multiplied by the cesium-137 inventory for the three melted reactor cores (760 to 820 quadrillion Becquerel, or Bq), with these results:

- Ocean release of cesium-137 from Fukushima: 121.6 to 131.2 quadrillion Bq (16% x 760 to 820 quadrillion Bq)
- Atmospheric release of cesium-137 from Fukushima: 30.4 to 32.8 quadrillion Bq (4% x 760 to 820 quadrillion Bq)
- Total release of cesium-137 into the Environment from Fukushima: 152 to 164 quadrillion Bq
- Total release of cesium-137 into the environment from Chernobyl: 70 to 85 quadrillion Bq

The cesium-137 reactor inventory of 760 to 820 quadrillion Bq used by the KAER Institute is significantly lower than the US Department of Energy's estimate of 1,300 quadrillion Bq, so it is possible the Korean estimates are low. —*Progress in Nuclear Energy*, Vol. 74, July 2014, pp. 61–70; ENENews, Oct. 20, 2014

CHERNOBYL

How much radiation was released?

A Nukewatch Fact Sheet

The Chernobyl disaster's explosions and 40-day-long fire that began in Ukraine in the former USSR April 26, 1986, spread radioactive materials to every country in the northern hemisphere—but how much? Vastly different estimates of total dispersed radiation have come from a variety of institutions, commissions, agencies and committees and are based on limited information about the amount of melted fuel and graphite left in the reactor's wreckage in Ukraine.

- The disaster "[R]eleased a globe-girdling cloud of radiation that the US Lawrence Livermore National laboratory estimates to have exceeded 4.5 billion curies. Other estimates range as high as 9 billion curies."

- "A staggering amount of radioactivity was released during the meltdown," according to Joe Mangano in his book *Mad Science*. "Never before in history had this amount of radiation entered into the environment at one time."

- In 2006, "The Other Chernobyl Report" (TORCH) concluded that the sum total of radioactivity released was 12×10^{18} Becquerels, or about 324.3 million curies. * TORCH estimates that about 30 percent of the reactor's 190 tons of fuel was distributed over the reactor building and surrounding areas, about 1-2 percent was ejected into the atmosphere, and the reactor's total inventory of radioactive noble gases (xenon and krypton) was released.

- In 2006, the Institute for Environmental and Energy Research in Maryland reported that, excluding noble gases, this largest single nonmilitary radiation release was estimated at 100 to 200 million curies.

- In 2005, the Chernobyl Forum, comprising more than 100 scientists, eight UN agencies and the governments of Russia, Belarus and Ukraine, found the total amount of radioactivity released over 10 days reached 14 "exabecquerels" (14×10^{18} Becquerels)—or 378.3 million curies.

- In 1996, Vladimir Chernousenko, a fellow of the Institute of Theoretical Physics of the Ukrainian Academy of Sciences and chief scientific supervisor of the "clean up" team inside the 10-kilometer zone around the Chernobyl reactor, wrote that independent experts have estimated that 80 percent of the reactor's radioactivity escaped—about 6.4 billion curies.

- *Time* magazine reported in 1989 that perhaps "one billion or more" curies were released rather than the 50 to 80 million curies estimated by Russian authorities.

- The Russian government and the International Atomic Energy Agency (IAEA) claimed in a 1986 report that 50 million curies of radioactive debris, plus another 50 million curies of rare and inert gasses were discharged. MIT nuclear engineer Alexander Sich concluded, in his 500-page doctoral dissertation, that between 200 million and 250 million curies of radioactive material were released "in the first 10 days." Sich said the complete core melt-

down spewed "far worse contamination than previously reported."

- In May 1986, Joseph Hendrie, a former Chair of the US Nuclear Regulatory Commission, said, "They have dumped the full inventory of volatile fission products from a large power reactor into the environment. You can't do any worse than that." Likewise, the Union of Concerned Scientists' Kennedy Maize concluded in 1987 that "the core vaporized"—a reference to all 190 tons of fuel and its 9 billion curies of radioactive material.

- Geneticist Valery Soyfer, a molecular biologist in the former Soviet Union, analyzed the USSR's 1986 report to the International Atomic Energy Agency, which has since been condemned as a cover-up. Soyfer says that if only 100 million curies were vented, then world "background radiation doubled at once." In November 1987, nineteen months after Chernobyl, the US National Council on Radiation Protection (NCRP) doubled its estimate of the average "background" radiation to which people in the US are exposed—from 170 millirem (mR) to 360 mR per-year. In 2009, the NCRP again nearly doubled its estimated average annual dose, from 360 mR per-year to 620 mR.

The NCRP said the additional doses were "coming from exposure to medical tests such as body scans." These medicinal scans are not safe. Some CT scans deliver the radiation equivalent of 400 chest X-rays. According to Professor David Spiegelhalter of Cambridge University, "Because more than 70 million CT scans are carried out each year, the US National Cancer Institute has estimated that 29,000 Americans will get cancer as a result of the CT scans they received in 2007 alone."

The article "Estimated Risks of Radiation-Induced Fatal Cancer from Pediatric CT," published in 2001 in *American Journal of Roentgenology*, concluded: "In the US, of approximately 600,000 abdominal and head CT examinations annually performed in children under the age of 15 years, a rough estimate is that 500 of these individuals might ultimately die from cancer attributable to the CT radiation."

- The US Argonne National Laboratory in Chicago estimated in June 1986 that 30 percent of Chernobyl's total radioactivity—three billion of an estimated nine billion curies—was released.

* One curie is a very large amount of ionizing radiation: 37 billion atomic disintegrations, or Becquerels, per second. There are 37 billion Becquerels in every curie.

—A footnoted version of this retrospective is available among the Fact Sheets at www.nukewatchinfo.org.



Hearings Completed on Lake Huron Dump Proposal

By Beyond Nuclear

Canada has closed its formal public review of a proposed "Deep Geologic Repository" (DGR), underground dump, for radioactive waste conducted by the federal Joint Review Panel, the Canadian Nuclear Safety Commission and the Canadian Environmental Assessment Agency. In a November 18 notice, the panel said it will make a recommendation to Canada's Environment Minister by May 2015. The Minister will then make a recommendation to the Prime Minister's Cabinet, by-passing Parliament.

The DGR is an industry-sponsored plan to save money by burying radioactive wastes next to one of its biggest reactor complexes—Bruce Nuclear Generating Station (NGS)—near the shore of Lake Huron on Ontario's Bruce Peninsula, northwest of Toronto and Detroit—about 50 miles east of the tip of Michigan's "thumb." Bruce NGS includes nine reactors altogether, eight still operable (four reactors at Bruce A, and four at Bruce B). It is one of the largest nuclear power sites in the world.

The dangerous Keystone XL tar sands pipeline proposal has made TransCanada Pipelines a household word, but it is not well known that TransCanada is a major shareholder in Bruce NGS. TransCanada and its partners took over operations at Bruce in 2002, after its previous operator, British Energy, went bankrupt.

Ontario Power Generation (OPG) owns Bruce NGS, but TransCanada Pipelines and its partners lease and operate the reactors. Thus, TransCanada has been generating radioactive waste there for over 13 years and plans on decades of additional radioactive waste production.

OPG proposes burying all of Ontario's so-called "low" and "intermediate" level radioactive wastes in a DGR on the Lake Huron shore at Bruce. Radioactive wastes generated by Bruce's eight reactors, combined with additional radioactive wastes from a dozen more OPG-owned reactors east of Toronto—eight at Pickering, four at Darlington—would be buried at the DGR. TransCanada's radioactive waste generated at Bruce would comprise a large

fraction of the deadly material to be buried on the Lake Huron shore less than a mile from the water's edge.

The proposed DGR at Bruce NGS would be for burial of so-called "low-" and "intermediate-level" radioactive wastes, originating from 20 OPG-owned reactors. There is speculation that once approved, the "low" and "intermediate" level waste DGR would simply morph into a catch-all for high-level waste. During public hearings by the Joint Review Panel attended by Nukewatch in September 2014, government witnesses testified that current legislation does not prevent high-level waste from eventually being buried in the "low-level" DGR.

The Great Lakes serve as the drinking water supply for 40 million people in eight US states, two Canadian provinces and a large number of Native North American First Nations. A leak of into the lakes, due to a transport accident, chronic dump failure, or intentional attack could be catastrophic.

Search for High-Level Waste Dump Site Also Underway

By Gordon Edwards

The Canadian government is simultaneously searching for a community to construct a deep dump site for all of the nuclear industry's high-level radioactive waste (used nuclear reactor fuel) for permanent storage. The used fuel remains highly radiotoxic for millions of years. The waste producers—Ontario Power Generation, TransCanada Pipelines and others—want to bury and eventually abandon it in order to cut their losses, limit their liability—and get a "green light" from decision makers to extend reactor operations and indefinitely continue producing radioactive waste.

Once abandoned, the nuclear waste will no longer be their problem—but a public liability. The nuclear industry's socialism means private profit now and public risk forevermore.

Public Interest Groups: High-Level Waste Dump "All Risk and No Reward for Texas"

By John LaForge

A high-level radioactive waste "parking lot" proposed for West Texas poses both terrible and unnecessary risks for people throughout the country—Texas in particular—and should not be built, according to a coalition of public interest groups that declared its opposition to the plan Feb. 9.

The proposal was announced February 6 by Waste Control Specialists (WCS), which currently operates a low-level radioactive dump at its 14,000 acre site in Andrews County, Texas, near the New Mexico border. WCS, in partnership with the French nuclear giant AREVA, plans to submit its application for accepting high-level radioactive waste to the Nuclear Regulatory Commission (NRC) next year.

About 70,000 tons of such high-level waste fuel is now stored at about 70 reactor sites around the country. The waste is some of most long-lived, deadly and dangerous material known to science, radioactive for over half-a-million years. "High-level" waste specifically refers to fuel rods from the nuclear power industry and plutonium-contaminated military waste; "low-level" is actually a broad term that encompasses the rest of the radioactive waste spectrum.

If federal agencies approve its application, the private partnership could begin accepting spent fuel from the US's operating nuclear reactors by 2020.

"It was irresponsible even to generate high-level nuclear waste without a plan for how to dispose of it," said Robert Weissman, president of Public Citizen, in a press release. "It would be doubly so to ship it across the country, with no serious plan to protect it in transit or in its new temporary destination. Hiding the problem of high-level

nuclear waste in West Texas doesn't make it go away, it makes it worse."

Diane D'Arrigo, radioactive waste project director at Nuclear Information and Resource Service, said, "Moving nuclear waste to a supposedly temporary consolidated storage place gives the delusion of 'a solution' when in fact it will at least double the risks and create a de facto permanent dump near one of the largest aquifers in the country."

D'Arrigo called the plan part of an elaborate, unnecessary shell game. "WCS is really volunteering to make the US nuclear problem worse by putting the deadliest radioactive wastes from nuclear power on the same highways, railways and waterways we all use every day," she said. The government said 20 years ago that the waste could safely be kept at reactor sites for 100 years.

"This plan is all risk and no reward for the state of Texas," said Tom Smith, director of Public Citizen's Texas Office. "It poses transportation and accident risks around the

The waste generators created the Nuclear Waste Management Agency (NWMO) to carry out the site selection process. Originally there were 22 communities—3 in Saskatchewan, the rest in Ontario—that expressed interest in receiving financial compensation in order to find out more about the NWMO's plans. Each community is given \$400,000 for participating, even if it later opts out. However, the list of potential host communities is shrinking and is now down to 9 after two more areas—Creighton, Saskatchewan, and Schreiber, Ontario—were recently taken off the list. Dr. Mahrez Ben Belfadhel, Director of Geoscientific Site Evaluations at the NWMO, said March 3; "[T]here is limited potential in the areas of Creighton or Schreiber to find a site...."

Further site selection studies are ongoing near the nine Ontario communities of Blind River, Central Huron, Elliot Lake, Hornepayne, Huron-Kinloss, Ignace, Manitowadge, South Bruce and White River.

Mike Krizanc, NWMO's Manager of Communications, said in a statement March 3 that the agency's purpose is to develop and implement the management and long-term "care" of Canada's used nuclear [reactor] fuel that is "socially acceptable, technically sound, environmentally responsible and economically feasible." It will take several more years before a site can be confirmed.

—Gordon Edwards is the President of the Canadian Coalition for Nuclear Responsibility.

Take action:

Concerned readers should write or call local, state and federal lawmakers demanding they urge the Canadian government to reject the proposed dump.

On Sept. 18, 2014, US Senators Carl Levin, Debbie Stabenow, Mark Kirk and Tammy Baldwin introduced Senate Res. 565 urging the Canada not to allow a permanent radioactive waste repository to be built in the Great Lakes Basin. The parallel in the US House is HR 716.

For details see: stopthegreatlakesnucleardump.com



Containers of radioactive waste being buried at the Waste Control Specialists' dump in Andrews, Texas.

country. We don't need Fukushima Freeways," he said.

Public Citizen outlined five key objections to the plan, most of which were raised by Texas's own Commission on Environmental Quality (TCEQ) last year:

1. Waste shipments would be targets for sabotage or blackmail by terrorists. TCEQ noted that the waste is more vulnerable to accidents or attacks while in transit than if left it where it is, because security is lighter then and fewer radiation shields would be available. Shipments from reactors around the country—passing through dozens of population centers—could last over 24 years. The Energy Department estimates that there would be about 10,700 shipments if done by rail; about 53,000 shipments (others say 100,000) if done by truck.

2. WCS would have only limited liability, while the public would be put at risk from transport accidents, leaks and terrorism.

3. So-called "short-term" storage may become permanent—an unearned trophy for the nuclear industry. The complex scientific analysis required for any permanent waste site would take about ten years and has not been done.

4. The WCS site is too close to the Ogallala Aquifer, which provides water to eight states.

"The federal government has made a mess of nuclear waste policy," said Arjun Makhijani, president of the Institute for Energy and Environmental Research. "The highly radioactive spent fuel from nuclear reactors should be stored on-site, in hardened configurations while Washington sorts it out. Putting the deadliest nuclear waste on the roads needlessly increases risks."

The only plausible rationale for moving high-level waste away from reactor sites has come from those warning about tsunami risks on the West Coast, and from environmental justice advocates who note that radioactive waste is often placed—as with Xcel's Prairie Island reactors in Minnesota—near Native American communities.

Rose Gardner lives about five miles from the WCS site. "Here they go again, moving forward their dangerous ambitions," she said. "These people at WCS haven't even given the most affected community, Eunice, New Mexico, a chance to get used to their existing 'low-level' radioactive waste dump, and now they're trying to cram a high-level nuclear waste storage site into an area next to us. These are selfish and greedy people. Andrews County may profit, but not Eunice, which will bear great risks."

Former Texas State Rep. Lon Burnam of Fort Worth said, "The site isn't even dry—a minimum safety prerequisite for safe storage or disposal of radioactive waste. Recently, 22 percent of test wells at the existing low-level radioactive waste site had water present. ... WCS admits the Ogallala Aquifer is nearby. What would happen if radioactive waste contaminated water that lies beneath eight states?"

This is just one of many urgent questions to be answered before deciding what to do with radioactive waste.

WIPP'ed Energy Department Shirks Responsibility for Leak

The US Department of Energy (DOE) has appealed the \$54 million in fines the New Mexico Environment Department (NMED) imposed December 6 for 30 permit violations that led to the radioactive waste barrel explosion and radiation release at the Waste Isolation Pilot Plant (WIPP) near Carlsbad on Feb. 14, 2014. Calling the fines "capricious," federal officials also threatened to pay them from the cleanup fund already allocated toward relieving New Mexico of the radioactive burden it has borne since it began hosting US nuclear weapons development with the Manhattan Project more than half a century ago.

"Essentially, DOE is threatening to punish states by doing less cleanup work if states attempt to hold it accountable for violating federal and state environmental laws," NMED Secretary Ryan Flynn said February 20. Frustrated by the federal agency's refusal to take responsibility for the gross mismanagement at its WIPP and Los Alamos National Laboratory (LANL) facilities, Flynn confirmed that his office is preparing new compliance orders imposing well over \$100 million in DOE fines.

"When you think of a container of radioactive material exploding without any kind of ignition switch that was stored above ground and transported on highways, and you think about what could have occurred if it exploded at ground level at Los Alamos or on the road, I don't think \$54 million is too much to pay, if you're talking about protecting New Mexicans and their lives," Flynn stated.

Greg Mello of the Los Alamos Study Group has noted that the Obama administration's proposed increase in nuclear weapons spending would pay "all the NMED-imposed fines a few times over."

Last September a DOE report confirmed that LANL's use of organic instead of inorganic kitty litter in packing material contributed to the barrel explosion and subsequent radiation leak that shut down WIPP and exposed almost two dozen workers to radiation a year ago. The report also attributed the policy change that called for "an organic" instead of "inorganic" litter to a handwritten note misread by the LANL procedure writer.

Officials estimate that cleanup of the WIPP site will cost upward of half a billion dollars and take until at least 2018 or 2019. As the nation's only current option for storing high-level radioactive waste, the continued closure will significantly slow, if not halt, clean-up of early nuclear weapons production and testing facilities throughout the country. More than 500 of the 5,565 mis-packaged and mislabeled LANL waste drums, like the one that exploded, remain underground at WIPP. —ASP

—AP, Jan. 10; *Current-Argus* (Carlsbad), Feb. 12; *Albuquerque Journal*, Feb. 9, 13 & 21, 2015.

Editor's note: Nukewatch has covered the WIPP leak continuously over the past year; for more background on the situation, see our Spring, Fall, and Winter 2014 Quarterly issues, which are accessible online at www.nukewatchinfo.org.

Tesla Battery Can Boost Renewables, Helping Phase Out Nuclear

Energy Analysis

Though the transition from nuclear- and fossil-fueled to renewable electricity sources has the potential to address two imminent catastrophes facing the human race—radioactive contamination and climate change—several hurdles have stood in the way of a full-out energy revolution. Soon, Tesla Motors, Inc. may be breaking one of these barriers, unveiling new battery technology that allows for efficient storage of energy produced by renewable technologies—such as photovoltaic solar collectors and wind turbines.

On February 11, Tesla CEO Elon Musk announced the company's new project in a conference call. "We are going to unveil the Tesla home battery, the consumer battery that would be for use in people's houses or businesses fairly soon," Musk said.

Musk added that he expected to introduce the new battery within two months. "We have the design done, and it should start going into production in about six months or so."

Already known for its all-electric Model S sedan, Tesla is an established leader in lithium-ion battery technology. Musk is also the chairperson of SolarCity, which has successfully pioneered a residential rooftop solar installation strategy that allows people to lease photovoltaic panels for less than their regular electricity bill. Musk has promised that residential SolarCity units would come with battery storage within five to 10 years, enabling customers to more easily live "off-grid." This kind of solar power, he said, would be cheaper than natural gas (and thus much cheaper than nuclear, which is struggling to cut costs in the face of booms in "fracking" gas extraction and clean energy).

Enabling the average homeowner to access viable electricity through a combination of rooftop solar power and efficient battery storage could pose a major threat to electric utilities, which have been slow to move away from "base load" power sources like coal and nuclear. Production facilities that use these dirty fuels are slow to start up and shut down, meaning they're not compatible with more intermittently-produced renewable sources on an electric grid. Efficient energy storage, like a Tesla battery, could put the final nail in the coffin of archaic base load electricity generators.

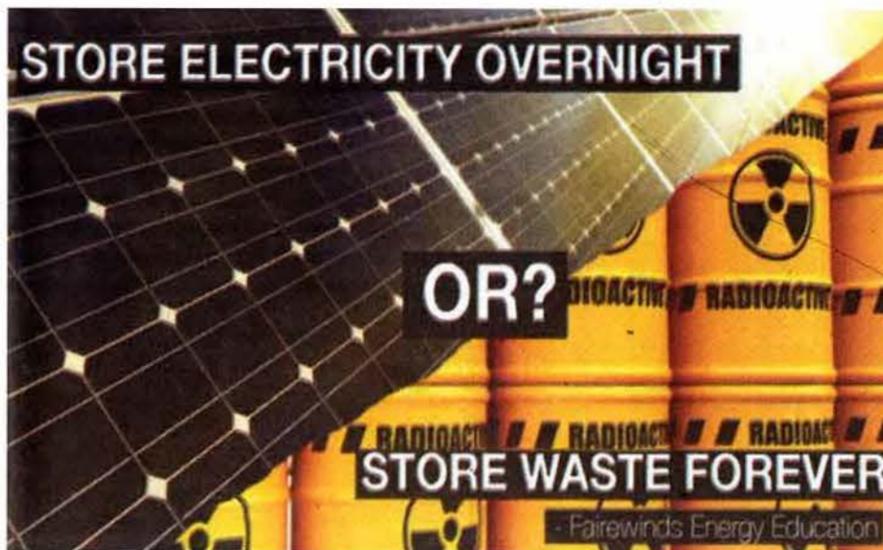
Some utilities and states have adopted a process of "net metering," which allows producers of home solar and wind power to sell excess electricity back through the grid. (The Nukewatch office and the Plowshares Land Trust is now

electrified this way using the 10,000 watt, grid-tied solar panel system we installed in 2013.)

Others—motivated by nuclear industry lobbyists to artificially make nuclear power appear competitively priced—are causing outrage among their customers by trying to lower the rates at which they buy net-metered renewable energy or even fully eliminating net-metering. With new battery storage technology, these customers could have the option of walking away from their utilities altogether.

But many experts have argued that renewable energy production and storage will work most efficiently on a grid of significant scale, with many distributed production sources, flexible storage options, and consumer-level efficiencies. There is a role for utilities in this emerging energy system, if they are able to adapt quickly enough to fill it. Both Tesla and SolarCity do extensive outreach to existing utilities. But there is no role for nuclear or coal-based power—at least not within a society that values its own well-being.

Some may question whether a market-based corporate technology can really solve our energy problems, which arguably have been caused by the greed of other corporations (along with the failure of public policy to regulate them). Indeed, if their common vision is realized, Tesla and SolarCity will largely control markets for electricity-producing solar panels, the batteries that regulate energy storage, and the electric cars powered by renewable electricity. But in the face of a nuclear industry that insists on operating its aging reactors at full capacity even in the wake of a global disaster like the one at Fukushima—not to mention a fossil fuel industry that is irreversibly destroying our planet's ecosystem through climate change—the rise of a dominant renewable energy industry might feel like a breath of fresh air. —ASP



Nuclear Giant Areva Lost \$5.38 Billion in 2014

Reactor Plans Falling Like Dominoes

In a letter dated February 25, the French nuclear industry giant Areva asked the US Nuclear Regulatory Commission to indefinitely halt the review process for certification of its new US EPR (European Pressurized Reactor) design, developed initially by Framatome (now Areva), EDF in France and Siemens in Germany. Areva made the decision to drop the US EPR project as part of an overall restructuring following its record losses of \$5.38 billion in 2014.

Areva's CEO Philippe Knoché made clear reference to more profitable reactor construction futures elsewhere. World Nuclear News reported, "the company planned to emphasize growth in China, which he described as the 'new frontier' of global nuclear power." China's business climate doesn't have to compensate for union labor, quality control standards, disaster preparedness plans, or financial liabilities which make the US reactor business costs just too high.

Areva's announcement led Unistar Nuclear Energy and its giant partner Constellation Energy to withdraw their application for construction and operating licenses for the proposed Calvert Cliffs 3 reactor in Maryland. Their application referenced the US EPR design and could not have been approved before Areva's new reactor was certified. The reversal means writing off a large investment by EDF/Unistar/Constellation, which pursued the Calvert Cliffs 3 licenses for eight years, initially applying to the NRC in 2007.

Calvert Cliffs 3 represented the last active plan for new reactors involving the US EPR design. In 2013, Unistar withdrew its application for a US EPR at Nine Mile Point in New York. AmerenUE dumped its plan for Callaway 2 in Missouri in 2009, and PPL Electric Utilities suspended its application for Bell Bend in Pennsylvania in 2014.

—World Nuclear News; & Engineering360, Mar. 6, 2015

Cree Youth Walk Over 500 Miles to Stand Against Uranium Extraction

A group of about 20 young people from the Cree Nation walked almost 530 miles over three weeks this winter to deliver a message to Montreal's environmental protection agency: "We stand against uranium mining." The young people endured frigid conditions and covered about the distance of a marathon each day on their journey. The Stand Against Uranium Walk started in the community of Mistissini in northern Quebec on November 24 and culminated with the group's participation in a public hearing on uranium mining in Montreal, December 15.



Youth leaders expressed their concerns about uranium mining to government officials in Quebec. Photo by Julia Page, CBC News

The group opposes a plan by the firm Strateco Resources that has been exploring uranium extraction in the Mistissini area since 2006. The company claims it has invested \$120 million in its Mistissini uranium project over the last 10 years. In 2013, the Quebec government issued a moratorium on uranium mining and exploration. Now, Strateco is suing the province for its investment mistake, and Quebec has been holding public hearings on the subject.

Stand Against Uranium walkers reported overwhelming support for the ban among people they encountered on their long journey. The walkers passed through several towns affected by uranium mining, broadening the base of support for their efforts.

"Some people understand the effects of uranium, but there's such a large number who just aren't aware of this project. We're the ones taking the initiative to be ambassadors to Quebec; Canada and the world," said Youth Grand Chief Joshua Iserhoff.

"We're protecting the land for future generations, not just for the Cree people or Aboriginal people, but for everybody." —ASP

—CBC News, Dec. 5 & Dec. 14; Red Power Media, Dec. 19, 2014

Japan to Permanently Close Five More Reactors

In the ever-expanding wake of the Fukushima nuclear catastrophe, in January the Japanese nuclear industry announced preliminary plans to permanently close five more of the country's nuclear facilities. So far, in the four years since the disaster, Japan has maintained "zero nuclear" power generation. This decommissioning announcement reduces the number of the country's operable (but suspended) reactors to 43. All six units at Fukushima Daiichi have been permanently closed, including Units 1 through 4 which were destroyed in the March 2011 accident, as well as the undamaged Units 5 and 6.

Two of the newly announced closures are Shimane Unit 1 and Tsuruga Unit 1, both GE Mark I boiling water reactors identical to Fukushima Units 1-5. The other three reactors, Genkai Unit 1 and Mihama Units 1 and 2, are aging pressurized water reactors. Company officials with Kyushu Electric, Kansai Electric, Chugoku Electric and Japan Atomic Power Company decided to decommission the reactors rather than comply with newly required expensive safety upgrades.

—Beyond Nuclear, Press Release, Jan. 15, 2015



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“You Can’t Surrender to a Drone”

By Kathy Kelly

The Federal Bureau of Prisons contacted me January 22, assigning me a prison number and a new address: for the next 90 days, beginning January 23, I’ll live at FMC Lexington, in the satellite prison camp for women, adjacent to Lexington’s federal medical center for men. Very early January 23, Buddy Bell, Cassandra Dixon, and Paco and Silver, two house guests whom we first met in protests on South Korea’s Jeju Island, will travel with me to Kentucky and deliver me to the prison.

In December 2014, Judge Matt Whitworth sentenced me to three months after Georgia Walker and I had attempted to deliver a loaf of bread and a letter to the commander of Whiteman Air Force Base in Missouri, asking him to stop his troops from piloting lethal drone flights over Afghanistan from within the base. Judge Whitworth allowed me over a month to surrender myself to prison, but whether you are a soldier or a civilian, a target or an unlucky bystander, you can’t surrender to a drone. (For more on drone strikes, see “short” on page 3.)

When I was imprisoned at Lexington prison in 1988, after a federal magistrate in Missouri sentenced me to one year for planting corn on nuclear missile silo sites, other women pris-



Activist, educator, and author **Kathy Kelly** co-coordinates **Voices for Creative Nonviolence**.

oners playfully nicknamed me “Missiles.” One of my sisters reliably made me laugh today, texting me to ask if I thought the women this time would call me “Drones.”

It’s good to laugh and feel camaraderie before heading into prison. For someone like me, very nearly saturated in “white privilege” through much of this arrest, trial and sentencing process, 90 percent (or more) of my experience will likely depend on attitude.

But, for many of the people I’ll meet in prison, an initial arrest very likely began with something like a “night raid” staged in Iraq or Afghanistan, complete with armed police surrounding and bursting into their home to remove them from children and families, often with helicopters overhead, sequestering them in a county jail, often with very little oversight to assure that guards and wardens treat them fairly. Some prisoners will not have had a chance to see their children before being shipped clear across the country. Some will not have been given adequate medical care as they adjust to life in prison, possibly going without prescribed medicines and often traumatized by the sudden dissolution of ties with family and community. Some will not have had the means to hire a lawyer and may not have learned much about their case from an overworked public defender.

In the US, the criminal justice system disproportionately incarcerates people of color for petty offences. Many take plea bargains under threat of excessive, punitive sentences. If I were a young black male, the US penal system quite likely would not have allowed me to turn myself in to a federal prison camp.

I’ll be incarcerated in the “geriatric” camp outside a medical facility where I expect the wards are crowded with geriatric

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