



## DECOMMISSIONING TRUST FUNDS

### **What States Can Do to Stop Waste, Fraud, and Abuse, and Protect Their Citizens**

A growing number of civilian nuclear power reactors across the U.S. are reaching the end of their operating lives and entering the decommissioning phase, where their buildings and infrastructure get dismantled, and the reactor sites get remediated and radioactively decontaminated. Irradiated nuclear fuel, commonly known as “spent” fuel, the highly radioactive waste left by plant operations, gets removed from temporary fuel pools and put in dry storage canisters.

From the peak of 129 reactors in the U.S. civilian nuclear fleet, 35 have shut down permanently. Some are considered to have completed decommissioning, at others the process is still underway, while more plants are about to begin it. Nationally, some 20 reactors at 15 commercial nuclear power plants are either undergoing decommissioning or have ceased operating and will be decommissioned soon.

#### SHORTFALLS AND ABUSES OF DECOMMISSIONING TRUST FUNDS

The US Nuclear Regulatory Commission (NRC) and the Government Accountability Office analyses generally have argued that decommissioning trust funds (DTFs) are sufficient for decommissioning needs, or will be when the time comes to spend them. But independent analysis consistently shows large shortfalls. The independent investment consulting firm Callan Institute conducts an annual nuclear decommissioning funding study. Its most recent study (2019) found that private and public utility nuclear DTFs totaled \$68 billion, but that projected decommissioning costs totaled \$96 billion, leaving a shortfall of \$28 billion, or 30%. And that was before 2020’s economic upheavals, which stand to reduce the value of the funds.

Current practices give licensees virtual autonomy to decide how to spend the DTF, and how to approach decommissioning work. The NRC has to approve those decisions, but it has a record of especially lax oversight on decommissioning, rubber-stamping licensees’ filings and regulatory exemption requests, effectively giving them carte blanche. In fact, the NRC is in the process of a new rulemaking for decommissioning which would codify what are now routine granting of exemptions and waivers into new regulations, so that it won’t even be necessary to request exemptions.

Meanwhile, licensees often seek and obtain exemptions from NRC regulations which require DTFs be used exclusively for dismantling nuclear plants and cleaning up radiological contamination at reactor sites, and for no other purpose. There typically is no site characterization done before decommissioning starts, and therefore no objective way to determine what cleanup really means or to what standard a site will be remediated. Cleanup is generally whatever the licensee says it is, which the NRC inevitably approves. Watchdog groups often bitterly dispute licensees’ assertion that the level of cleanup they choose will be adequate to protect public health and safety and the environment.

But beyond the question of the adequacy of licensees' decisions about decommissioning, there's the compounding problem of licensees raiding the DTFs for purposes other than decommissioning, which exacerbates DTF shortfalls and violates NRC regulations. The NRC routinely waives those regulations and grants licensees exemptions to spend DTF money for other purposes, such as paying their local taxes and their lawyers and lobbyists, reimbursing themselves for the cost of transferring "spent" fuel from pools to dry storage, and for ongoing dry storage of "spent" fuel onsite, which can last for many decades.

Although now widespread and routine, this is an abuse of the regulatory framework, which was established to protect the integrity of the decommissioning process. Using DTFs for non-decommissioning purposes depletes the funds faster and creates perverse incentives for licensees to skimp on decommissioning and cleanup.

### FAST-TRACK DECOMMISSIONING

Traditionally, decommissioning takes 20–50 years to complete, and onsite "spent" fuel storage and site monitoring can continue long after that. But several companies are positioning themselves to dominate the growing decommissioning market (including Holtec, NorthStar, and EnergySolutions) by greatly accelerating the timeline, promising they can complete the process in as little as five years.

Fast-tracking decommissioning seems like an attractive proposition for reactor communities. However, there are several catches. The accelerated approach cuts corners, entails a raft of regulatory waivers and exemptions, and raises many thorny public safety issues. For example, it exposes plant workers, and potentially the public, to higher doses of radiation since reactor sites have much less time for radioactivity to decay to before decommissioning begins.

The federal Nuclear Regulatory Commission has jurisdiction over nuclear plant radiological safety issues; state governments don't. But it has shown no interest in using its authority to regulate how licensees use the DTFs and apparently doesn't consider the economic impacts of decommissioning within its purview. As an NRC staff economist told a 2015 public meeting on decommissioning the Zion, Illinois nuclear plant, "The Nuclear Regulatory Commission does not regulate commerce, it regulates safety."

The NRC acknowledges that adequate funding is key to conducting successful decommissioning that meets NRC standards. "[The NRC] recognizes that in order to do anything safely, it takes money," the staff economist said. But the NRC has demonstrated studied indifference to how licensees use the money, and does not require their procurement and allocation processes to be transparent. In fact, it does not even require licensees to adhere to standard accounting practices and principles or hire an auditor for decommissioning projects. This creates ripe conditions for waste, fraud, and abuse. Licensees performing decommissioning work take over the DTFs as their own asset, with the intention of pocketing any leftover money, yet they have hardly any accountability for how they spend it. Even though DTFs are public monies, paid for by ratepayers through surcharges on their electric bills, licensees aren't required to seek state approval for expenditures, or even reveal how they have spent the money. In the case of the Zion nuclear plant, EnergySolutions did file a so-called "audit report."

But it fit on just two pages, one of which was a cover letter, with a handful of vague line items purporting to certify the legitimacy of roughly \$300 million in expenditures from the DTF. This is not transparency or accountability – quite the opposite.

In fast decommissioning, the licensee's incentive is to decommission a nuclear plant as quickly and inexpensively as possible, in order to maximize the money left over in the DTF, which it claims as profit. Decommissioning licensees are invariably structured as limited liability corporation subsidiaries of their parent companies. They bring no capitalization of their own to the project. That means that if there are insufficient DTF funds to complete decommissioning, the LLC can declare bankruptcy without harming the parent company, walk away, and leave the state and the reactor community stuck with the cleanup costs and ongoing impacts and risks.

### BAD OUTCOMES ASSOCIATED WITH BAD DTF MANAGEMENT

The combination of licensees' own lack of capitalization, their dependency on leveraging public funds for profit, the risk of inadequacy of the DTF, and the perverse incentives and NRC permissiveness that lead the licensee to misuse the DTFs, have been a factor in bad decommissioning outcomes, where sites are left unremediated, radiological contamination persists, and the public is left bearing the ongoing impacts, risks, and costs.

At Massachusetts' Yankee Rowe plant, decommissioning plans were based on overly optimistic assumptions about the extent of site contamination, which turned out to be false. Tritium was found in groundwater at depths of 300 feet, raising concerns about it getting into the Deerfield River and residents' wells. As decommissioning cost estimates skyrocketed after the discovery, the licensee opted for "derubblization," scraping off the top few feet of topsoil at the site and calling it remediated. Radioactive and toxic contamination of the soil and water was left after decommissioning. Rowe has the fourth highest cancer rates in Massachusetts, and a significant Down's syndrome cluster.

The Zion, Illinois nuclear plant, located on Lake Michigan, closed in 1998, taking away 75% of the City of Zion's tax base. In 2015, the licensee EnergySolutions began to run out of money to complete decommissioning, and hurriedly transferred Zion's 2.2 million pounds of irradiated nuclear fuel from the fuel pools to dry storage onsite. The waste is now stored in dry casks critics say are unsafe and leak-prone, 300 feet from Lake Michigan. Lake Michigan is the nation's largest source of fresh water; it's also the headwaters for the rest of the Great Lakes. 40 million people in eight U.S. states, two Canadian provinces, and a large number of Native American First Nations depend on it for drinking water.

Zion was a thriving lakefront community before the plant shut down and the waste was stranded on the Lake Michigan shore. Afterwards, it had high unemployment, a disproportionate amount of Section 8 housing, and attendant effects on property values, schools, and crime. It's a prime illustration of the need for the STRANDED Act, introduced by U.S. Senators Tammy Duckworth (D-IL) and Susan Collins (R-ME). It would compensate former nuclear power plant host communities like Zion for the long-term dry cask storage of nuclear waste, and help reactor communities where waste from closed plants is stored make a just transition.

Michigan's Palisades and Big Rock Point nuclear plants are also located on Lake Michigan. When it acquired the Palisades reactor in 2007, Entergy raided the DTF, taking out about [ ] \$316 million that ratepayers had paid into it. Entergy gave around \$100 million to the previous owner, kept around \$100 million for itself, and kicked back around \$100 million to ratepayers as a deal sweetener, albeit an illusionary one. If the remaining money in the DTF proves inadequate to complete decommissioning (as is likely) ratepayers will still have to pay that \$100 million back through new surcharges on their utility bills. In addition, Michiganders might also have to pay higher taxes to finance the completion of decommissioning.

Despite an outcry from the ratepayers, the Michigan Public Service Commission approved Entergy's raid, which needlessly depleted the DTF. By 2019, the DTF had recovered somewhat, but was still inadequate compared to the estimated cost of decommissioning. Then the covid-19 crisis hit, subjecting the DTF to stock market volatility.

Big Rock Point, a 67 Megawatt-electric (MWe) experimental reactor, started as a commercial power reactor, then produced medical isotopes. It was plagued with operational problems, including emitting more than 3 million curies of radiation, which led to health effects downwind, including hypothyroidism and statistically significant spina bifida in newborns. It was closed in 1997. Despite its relatively small size, decommissioning it cost \$390 million. High-level radioactive waste remains on site, in the form of "spent" fuel in dry storage, and soil and water contamination.

The NRC approved unrestricted use of the supposedly fully decommissioned Big Rock Point site. Yet highly hazardous plutonium, and very likely other radionuclides, remain in the site surface and subsurface environment. Neither the discharge canal entering Lake Michigan, nor the shoreline sediments, have ever been checked for contamination levels, despite 35 years of radiological discharges into the surface water.

#### A BAD ACTOR IN THE DECOMMISSIONING MARKET

Now Palisades and Big Rock Point are in the process of being acquired by Holtec, a company that wants to be a dominant player in the growing decommissioning market. Holtec and its partner SNC-Lavalin have a long history of malfeasance, including bribery, fraud, and disbarment from doing business with the Tennessee Valley Authority or from bidding on World Bank contracts, as well as a track record of conflict and litigation with state governments where it operates.

Holtec's business model involves a sort of vertical integration, where it seeks to profit from public money all along the decommissioning and "spent" fuel value chains. Its decommissioning LLCs will use DTFs to dismantle reactors quickly and keep the money left over as profit. It is seeking, and will likely obtain, exemptions to pay for spent fuel management costs out of the DTF, then will turn around and sue the US Department of Energy (DOE) to recover those same costs and pocket that money, too, effectively using public funds to get paid twice (this much is true of other decommissioning companies as well). Meanwhile, these licensees decline to spend the money to implement vitally necessary safety and security upgrades for on-site or near-site "spent" nuclear fuel storage, such as hardened on-site storage (HOSS), arguing they're too expensive.

Holtec's "integrated" business model proposes to leverage profits for itself in ways that violate public safety and current law. Part of the reason Holtec seeks to acquire closed or soon-to-close reactors, including Big Rock Point and Palisades, is because it seeks ownership of their "spent" fuel as a source of more profits. It intends to ship the fuel across the country to its proposed consolidated interim storage facility (CISF) in New Mexico, for which it would be paid by the federal government to store the waste in shallowly buried casks.

CISFs are putatively temporary, but they are "interim" in name only. Nuclear experts including former NRC Chair Gregory Jaczko acknowledge that they would be *de facto* permanent storage sites. Their licensing is advancing in the absence of a permanent geological repository, but they are no solution for permanent disposition of "spent" fuel. Transporting highly radioactive "spent" fuel from reactor sites across the country to CISFs in New Mexico and Texas is fraught with dangers known and unknown. Consequently, Holtec is working concertedly, with NRC cooperation, to change existing laws and upend the protections in the Nuclear Waste Policy Act, so that the DOE would be permitted to take title to the "spent" fuel before it leaves the reactor site. This would relieve the licensee of title and liability for the waste, so it could be transported across the country to CISFs without nuclear owners being responsible for what happens to it *en route*.

If current applicable laws were changed in this way, liability for the waste would fall on federal taxpayers, and that would be a fundamental reversal of decades of settled law. Under existing law, interim storage of a nuclear plant's "spent" fuel, short of repository disposal, is the responsibility of the private owner.

The Nuclear Waste Policy Act of 1982 (as Amended) explicitly states the federal government cannot take title to the waste, which means the licensees cannot be relieved of their liability for it, unless and until a permanent repository is licensed, open, and operating. Yucca Mountain is not licensed, hasn't opened, and will never operate, since the site was declared "unworkable" by the Obama administration. Current estimates put 2048 as the soonest a geological repository could open elsewhere, and that's probably overly optimistic. Until a geologic repository exists — decades from now or likely longer — the DOE can't legally take title to a nuclear plant's spent fuel.

Nonetheless, Holtec, as well as its competitor (a partnership between an Orano subsidiary and Waste Control Specialists which owns the other CISF in Texas), are counting on the DOE to do just that, in the next few years. They are looking to the DOE, which is to say to federal taxpayers, to assume liability for the waste and all costs related to CISFs, including a generous profit margin for themselves. The NRC has so far rubber-stamped their CISF permit applications, which nuclear watchdog and environmental groups are currently suing to overturn in the US Court of Appeals for the DC Circuit.

Holtec is also working to build small modular reactors (SMRs), another gambit for accessing federal money for R&D. Its focus on SMRs has raised speculation it may intend to have its "spent" fuel reprocessed into high-assay low-enriched uranium fuel for reuse in those reactors. Reprocessing entails chopping up solid "spent" nuclear fuel, and then liquifying it. That process, combined with uranium and/or plutonium extraction, generates large-scale hazardous radioactivity emissions to air and water. Waste generated by reprocessing is some of the most dangerous radioactive waste there is

-- even harder to contain and control than solid "spent" fuel. Enriching "spent" fuel also aggravates the risk of nuclear weapons proliferation.

Holtec is under criminal investigation for lying to state officials in New Jersey, where it has acquired the shuttered Oyster Creek plant and has begun dismantling it — its first decommissioning job. Already it has been accused of cutting corners, hiring unskilled workers to save money, and ignoring safety and local concerns, prompting the state to set up an Oyster Creek Safety Advisory Panel. It flouted local zoning laws and regulations by doing demolition work without seeking a permit, which required a local judge to issue a temporary restraining order.

When the NRC approved license transfer of the shuttered Pilgrim nuclear plant in Plymouth, Massachusetts to Holtec, Massachusetts Attorney General Maura Healey sued because the state was cut out of the process and denied even the opportunity to participate in hearings. Healey objected to Holtec's cavalier attitude toward financing Pilgrim's decommissioning. Her petition stated, "Holtec's attempt to account for contingencies and uncertainty risk is woefully deficient," and warned the exemption granted Holtec allowing it to use the DTF for spent fuel management "poses a significant risk that insufficient funds will exist" to clean the site, leaving "taxpayers to bear the financial burden and responsibility for finishing the work."

Other state AGs filed an amicus brief supporting Healey's suit (spearheaded by New York Attorney General Letitia James and joined by the AGs of Connecticut, Illinois, Iowa, Maryland, Michigan, Minnesota, New Jersey, New Mexico, Oregon, Pennsylvania, and Vermont). These AGs cited "significant concerns about Holtec's ability to successfully oversee the facility's decommissioning," and charged that the NRC's approval of transferring Pilgrim's license to Holtec without adequate state participation violated the NRC's own rules as well as the federal Atomic Energy and Administrative Procedure Acts.

The Massachusetts suit was settled in exchange for Holtec's agreement to send monthly reports to the state, maintain minimum funding levels for cleanup and site restoration and onsite "spent" fuel storage, carry pollution liability insurance, secure bonds for certain contracts and fund emergency management preparedness in case of a radiological emergency. That may sound like a victory, and it's better than nothing, but it doesn't resolve the issues the AGs raised, because the dollar figures are modest and won't adequately protect the state. To secure their interests, other states with nuclear plants undergoing decommissioning will need to do better.

In New York, where Holtec is seeking to acquire the Indian Point nuclear plant and its DTF worth more than \$2 billion, the same concerns about lack of financial assurance and potential abuse of the DTF have been raised. Attorney General James also expressed serious doubts about Holtec's competence to hold Indian Point's licenses: "I have multiple, grave concerns about the application now before the Nuclear Regulatory Commission that would hand off the responsibility for Indian Point's decommissioning to a company with absolutely no experience in such an enormous, complex, and consequential undertaking," she said.

## STATES CAN AND SHOULD ASSERT THEIR AUTHORITY

The above examples illustrate the stakes of getting decommissioning right (or wrong), and states 'vital interests in overseeing it. They also show that the economic, environmental and public health and safety dimensions of decommissioning overlap, and ultimately aren't separable.

Although the NRC has jurisdiction over radiological safety issues, states have jurisdiction over other, related issues, including surface water protection (i.e. from thermal heat pollution and non-radiological impacts), impacts on future energy policy and future land use, impacts on tourism and recreation, and other broad economic impacts. States also have some authority over hazardous material and toxic chemical contamination which applies to nuclear sites. States have the authority to oversee and intervene in decommissioning activities and outcomes at nuclear power plants. They also have an obligation protect their jurisdictional interests on behalf of their own residents and citizens.

The fact that the NRC declines to regulate "commerce" (i.e. the economic impacts of decommissioning) in effect leaves that power to the states. Since the adequacy of DTFs and how they are spent affect public health and safety and the environment, and since states have authority over economic impacts of decommissioning, they are not powerless to affect safety outcomes, either, despite "federal preemption" (i.e., the NRC's established jurisdiction over nuclear safety issues).

For example, the NRC directly acknowledges that state public utility commissions have jurisdiction over any funds in the DTF left over once decommissioning is completed. That means states have something to say about decommissioning companies 'emerging business model, which seeks to maximize leftover DTF money in order to claim it as profit. Through their authority over economic dimensions of decommissioning, states can also have some influence over its public health and safety outcomes.

It's imperative that they exercise it. State Comptrollers, Attorneys General, public utilities commissions and other relevant state officials and agencies have a compelling interest and responsibility to assert their authority over decommissioning -- particularly over decommissioning trust funds -- and demand accountability from licensees.

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