Nuclear Decommissioning Specialists: Quick and Dirty, or Lean and Clean?

A backgrounder compiling publicly available information on Holtec, NorthStar and Energy*Solutions*

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An aerial picture of the Zion Nuclear Plant (Illinois), which is being decommissioned by Energy*Solutions* (Photo courtesy of Daniel Rucci, April 2018)

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Nuclear Decommissioning Specialists: Quick and Dirty, or Lean and Clean?

Three companies positioning themselves as decommissioning specialists, Holtec, NorthStar and Energy*Solutions*, are rapidly acquiring closed or closing nuclear plants in the Northeast region and nationally.

In New York, Indian Point's reactors will shut down in 2020 and 2021, and its owner Entergy has applied to transfer the licenses to subsidiaries of Holtec International. Holtec has already acquired the shuttered Oyster Creek plant in New Jersey, and has signed agreements to purchase Entergy's Pilgrim plant in Massachusetts. Holtec and partners have deals pending to acquire Palisades Nuclear Generating Station in Michigan as well as Entergy's decommissioned Big Rock Point Nuclear Power Plant site in Michigan, which also hosts an Independent Spent Fuel Storage Installation (ISFSI). Holtec is also contracted to handle transfer of spent fuel from fuel pools to dry storage at the San Onofre Nuclear Generating Station (SONGS) in California, owned by Southern California Edison.

In Vermont, a joint venture between Orano USA and NorthStar bought Vermont Yankee and decommissioning there is well underway. NorthStar has also signed an agreement with Duke Energy to acquire the Crystal River nuclear plant in Florida.

In Pennsylvania, Energy*Solutions* is negotiating to acquire Three Mile Island Unit 2, which suffered a partial meltdown in 1979 and has yet to be fully decommissioned. The negotiations are complicated by the fact that TMI's two reactors are owned by two different companies. Exelon, owner of TMI1, obtained a license to store waste from TMI1 at TMI2, which is owned by FirstEnergy. It's therefore unclear when TMI2 will be sold and fully decommissioned. Energy*Solutions* decommissioned the Zion Nuclear Power Station in Illinois, and is gradually decommissioning the La Crosse Boiling Water Reactor in Wisconsin.

Nationally, some 20 reactors at 15 commercial nuclear power plants are either undergoing decommissioning or have ceased operating and will be decommissioned soon. Traditionally, the decommissioning process takes many decades to complete. Owners typically planned to mothball plants and spent fuel for 20 to 50 years to allow radioactivity to decay and decommissioning trust funds to grow. For example, before it announced selling Indian Point to Holtec, Entergy planned to delay decommissioning for 50 years after IP3 shut down, arguing "the delay will result in lower working area dose rate (from natural decay of the radionuclides produced from plant operations)."[1]

But the decommissioning specialist companies have created a new private market for their services by promising to dismantle shuttered plants in five to eight years, or perhaps even faster.

> These newly formed companies use a "rip and ship" [approach], which saves time and limits worker exposure to dangerous levels of radiation.

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[1] PRELIMINARY DECOMMISSIONING COST ANALYSIS for the INDIAN POINT ENERGY CENTER, UNIT 3, December 2010 https://www.nrc.gov/docs/ML1035/ML103550608.pdf

> "They used to decontaminate the floor drains and it was hard to do," said Bruce Watson, who heads the NRC's decommissioning branch and has overseen shutdowns at Maine Yankee and Rancho Seco. "Now you go up, you hit it with a hammer, break the concrete, yank the pipe out and put it in a low level waste bin. You don't waste your time cleaning it. You just measure it and put it in the bin."[2]

This accelerated approach is a key part of the companies' business model, which requires decommissioning nuclear plants as quickly and inexpensively as possible, in order to maximize the money left over in the ratepayer-funded decommissioning trust funds, and claim that money as profit. Holtec and Orano are also setting up "consolidated interim storage" sites in Texas and New Mexico to accept nuclear waste from their decommissioned plants, which would be another source of profit for them, and entail shipping nuclear waste across the country. Energy*Solutions* already operates nuclear waste disposal sites in Utah and South Carolina.

On its face, license transfer to these companies for fast, cheap decommissioning seems like an attractive proposition for reactor communities. It's definitely attractive to nuclear plant owner/operators because after the lucrative operations phase during which massive amounts of radioactivity built up on site with nowhere to go (since a geological repository for nuclear waste at Yucca Mountain never materialized), license transfer relieves them from the responsibility and liability for decommissioning and remediating the site. But license transfer to these private companies raises vital questions that reactor communities, officials and citizens need to grapple with.

What will fast-track decommissioning that keeps costs down and private profits up mean for public health and safety? Private, for-profit nuclear plant decommissioning is a new market, and the companies are in effect learning on the job. Are they equipped to deliver fast decommissioning safely and cost-effectively?

Holtec has never decommissioned a nuclear plant before. Its experience is in spent fuel handling, and it is working to build and export small modular reactors (SMRs). Prior to partnering with Orano and working on decommissioning Vermont Yankee, NorthStar's experience was in tearing down large hotels and casinos. *USA Today* reported, "The companies are privately owned, so much information about their finances remains secret, and the public has no way of knowing if they can even afford the undertaking."[3]

Energy*Solutions* has a decommissioning track record at Zion, Illinois, but it is not necessarily positive. The company views the operation as a success, but it depleted the decommissioning trust fund and left the community burdened with stranded waste.[4]

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[2] "Dismantling nuclear plants is a gold mine for some, but at what risk to you?" by Thomas C. Zambito, *Rockland/Westchester Journal News, June* 19, 2017 https://www.lohud.com/story/news/investigations/2019/06/19/nuclear-plant-decommissioning-is-a-gold-mine-for-some-but-at-what-risk/1269407001/

[3] ibid.

[4] "Spent fuel rods stored in Zion raise safety, economic concerns" by Sheryl Devore, *Lake County News-Sun,* October 30, 2015 https://www.chicagotribune.com/suburbs/lake-county-news-sun/ct-lns-zion-nuclear-plant-st-1031-20151030-story.html

Once decommissioning companies have made their money, and the trust funds are gone, what's to prevent more reactor communities from getting stuck with long-term health and safety impacts, and bearing the economic costs and risks of continued site contamination and stranded waste?

When nuclear plants were sold off to private owners under utility deregulation, the fundamental social contract was the companies that profited from operating the plants would also retain liability and be responsible for securing the waste after the plants closed. Changing laws and regulations designed to accommodate new decommissioning specialist companies now risk bending that basic deal past the breaking point. Lax oversight, coupled with the companies' control over the ratepayer-financed decommissioning trust funds and complex subsidiary structure limiting their liability, could end up foisting more of the risks onto reactor communities. Given the relative lack of oversight and the wide-ranging autonomy decommissioning companies enjoy under current federal laws and regulations, which now stand to get wider, how can local and state government, task forces and citizen advisory bodies have meaningful input into decommissioning decisions?

The fact these companies are also in the business of nuclear waste storage means they have an economic incentive not only to decommission quickly and move spent fuel from wet storage to dry storage as fast as possible, but also to ship radioactive waste including spent nuclear fuel across the country to their storage facilities. That prospect raises a host of unsolved technical and infrastructure problems and safety dilemmas, not only for the reactor communities and surrounding populations (for example a likely scenario for shipping spent fuel from Indian Point involves sending it down the Hudson River on barges, past New York City), but also for the thousands of communities along the waste transport routes.

Some scientists and watchdog groups argue that in most cases, it would ultimately be safer for everyone, not to mention more environmentally just, to keep spent fuel on the site of the decommissioned plant using Hardened On-Site Storage (HOSS). But by selling nuclear plants to decommissioning specialist companies incentivized to transfer and ship nuclear waste as fast as they can, are we effectively foreclosing the HOSS option or otherwise prejudicing decisions about what to do with the waste?

It's the Nuclear Regulatory Commission and the Department of Energy that have jurisdiction over nuclear plant safety and spent fuel, not state or local governments. But states do have some authority over decisions that impact their economies. What ultimately happens to the waste, the site, and the workers has important consequences for the economy as well as for public health and safety. To what extent will license transfer pre-determine these outcomes, and what can state and local governments and citizens of reactor communities do to affect them? Given their financial incentives and considerable autonomy, once decommissioning specialist companies become licensees, are they likely to be willing partners with communities in serving the public interest, as they claim? Or will they be adversaries serving their own self-interest?

These are not rhetorical questions; they're vital questions that need answering. There are many unknowns, but there is also publicly available information on the decommissioning specialist companies and their track record so far. By taking stock of what we do know about them, and seeking to learn more, communities can become better informed and more effectively engaged in decommissioning decisions that will affect them for many years to come.

The following is a digest of relevant, publicly available information about these three companies, most of which can easily be found online, including in media coverage, investigative reporting and public documents. These sources are excerpted and/or closely paraphrased below with attribution,

along with some introductory, explanatory or transitional language knitting them together as needed.

Holtec /SNC-Lavalin/ CDI

The entity that has acquired or is in the process of acquiring the Indian Point, Oyster Creek, Pilgrim and Big Rock Point nuclear plants is commonly referred to as "Holtec," but it's more complicated than that, and involves various subsidiaries and joint ventures. Holtec Decommissioning International (HDI) is a wholly owned subsidiary of Holtec International, headquartered in Camden, New Jersey. HDI functions as the licensed operator for Holtec owned nuclear power plants. HDI provides the licensee oversight of Comprehensive Decommissioning International (CDI), Holtec and SNC-Lavalin's jointly owned decommissioning general contractor. HDI also manages the decommissioning trust fund and other owner interests, such as licensing strategy, insurance, land and government interface.[5]

Comprehensive Decommissioning International, LLC (CDI), also headquartered in Camden, New Jersey, is new a joint venture between Holtec International (USA) and SNC-Lavalin (TSX: SNC), formed in 2018. According to its boilerplate, CDI "seeks to become an industry-leading decommissioning company by providing comprehensive project solutions for retiring nuclear power plants…[and] is committed to the enhancement of the communities in which it operates, and employing financially sustainable business practices that ensure the upholding of obligations made as a trusted steward of legacy nuclear materials."[6]

Holtec International is a privately held energy technology company with operation centers in in the US, Brazil, Dubai, India, South Africa, Spain, UK and Ukraine. Its boilerplate says it is specialized in the handling spent fuel, including what it calls "densifying" or reracking fuel pools to store more waste in them than they were originally designed to hold, "deferring the need for and expense of alternative measures by as much as two decades," putting spent fuel into dry storage, and transporting it. It also points out Holtec is "pioneering…the world's first below-ground Consolidated Interim Storage Facility being developed in New Mexico and a 160-Megawatt walk away safe small modular reactor, SMR-160." It emphasizes financial stability: "Holtec has no history of any long-term debt and enjoys a platinum credit rating from the financial markets."[7]

SNC-Lavalin Group Inc. is a Canadian company based in Montreal that provides engineering, procurement, and construction (EPC) services in various industries.[8] It specializes in building demolitions, something Holtec has no experience in. SNC-Lavalin describes itself as "a global fully integrated professional services and project management company and a major player in the ownership of infrastructure… Our teams provide comprehensive end-to-end project solutions – including capital investment, consulting, design, engineering, construction management, sustaining capital and operations and maintenance – to clients across the EDPM (engineering, design and project management), Infrastructure, Nuclear and Resources businesses…. SNC-Lavalin maintains

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[5] https://holtecinternational.com/productsandservices/decommissioning/

[6] www.cdi-decom.com

[7] www.holtecinternational.com

[8] https://en.wikipedia.org/wiki/SNC-Lavalin

exceptionally high standards for health and safety, ethics and compliance and environmental protection."[9]

Yet Holtec and SNC-Lavalin are embroiled in ongoing scandals and controversies that weigh against their claims of high standards in ethics, compliance, financially sustainable business practices and trusted stewardship of nuclear materials.

In 2010, SNC-Lavalin was part of the consortium that won a $1.3 billion contract to design, build and maintain the McGill University Health Centre's Glen Site. That contract became the subject of a criminal investigation, and was called "the biggest fraud and corruption investigation in Canadian history" by a Quebec provincial police detective. Three SNC-Lavalin employees were charged with offering bribes.[10]

An investigation by CBC News and *The Globe and Mail* found SNC-Lavalin used a secret internal accounting code that former employees said was for bribes on projects across Africa and Asia.[11]

In 2013, the World Bank found SNC-Lavalin was engaged in a pattern of bribery and corruption in several countries, and banned it for ten years from bidding on any contracts funded by the Bank, "following the company's misconduct in relation to the Padma Multipurpose Bridge Project in Bangladesh, as well as misconduct under another Bank-financed project…. in relation to the World Bank-financed Rural Electrification and Transmission project in Cambodia…. SNC-Lavalin's misconduct involved a conspiracy to pay bribes and misrepresentations when bidding for Bank-financed contracts."[12]

In February 2015, Canadian police charged SNC-Lavalin and two of its subsidiaries with corruption and fraud in connection with its dealings in Libya. After raiding SNC-Lavalin's Montreal headquarters, Canadian police alleged that between 2001 and 2011, the company offered Libyan government officials under the Moammar Gadhafi regime bribes worth $47.7 million to influence decisions. They also charged that the company defrauded the Libyan government and other entities of "property, money or valuable security or service" worth approximately $129.8 million. Three former SNC-Lavalin employees were charged.[13] A former SNC-Lavalin vice president with close ties to the Gadhafi family in Libya went to prison in Switzerland, charged with "fraud, money-laundering, and corruption of officials." Another SNC-Lavalin consultant who worked to get members of the Gadhafi family into Mexico went to prison there under charges of "consorting with organized crime, falsifying documents, and human trafficking."[14]

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[9] https://www.snclavalin.com/en/investors/corporate-overview

[10] "A closer look at SNC-Lavalin's sometimes murky past" CBC News, February 8, 2019, https://www.cbc.ca/news/canada/snc-lavalin-corruption-fraud-bribery-libya-muhc-1.5010865

[11] "SNC-Lavalin International used secret code for 'bribery' payments" by Dave Seglins, CBC News, May 15, 2013 https://www.cbc.ca/news/canada/snc-lavalin-international-used-secret-code-for-bribery-payments-1.1386670

[12] "World Bank Debars SNC-Lavalin Inc. and its Affiliates for 10 years," April 17, 2013 https://www.worldbank.org/en/news/press-release/2013/04/17/world-bank-debars-snc-lavalin-inc-and-its-affiliates-for-ten-years
"Justin Trudeau Faces Calls to Resign" by Chantal da Silva, *Newsweek*, February 28, 2019 https://www.msn.com/en-us/news/world/justin-trudeau-faces-calls-to-resign/ar-BBUcCnQ?li=BBnbfcL&ocid=iehp

[13] "A closer look at SNC-Lavalin's sometimes murky past" CBC News, op. cit.

[14] https://columbusfreepress.com/article/dark-dawning-age-nuclear-waste-begins

Despite all this, in 2015 Canada's then Conservative government led by Prime Minister Stephen Harper put SNC-Lavalin and its corporate partners (also accused of corruption) in charge of cleaning up Canada's radioactive waste, as well as all federally owned nuclear facilities. The consortium is paid about a billion dollars in public money each year. In its role as steward of Canada's nuclear waste, it attracted the opposition of 140 municipalities, NGOs and nuclear experts for its plan to permanently store a million cubic meters of mixed radioactive wastes on the surface next to the Ottawa River at Chalk River National Labs. Opponents of the proposal include former senior Chalk River scientists.[15]

The same consortium is actively working to build, test and deploy a whole new generation of "Small Modular Reactors" (SMNs) using Canadian federal lands and facilities. The Canadian Nuclear Safety Commission actively lobbied the government to exempt most of these new SMRs from any independent environmental assessment under Canada's Impact Assessment Act. Last November (2018) NRCan published a "Road Map" for SMRs, which envisions hundreds of such small modular reactors deployed widely in Canada. But they face public opposition. "I ask you: If experimental, unproven nuclear reactors don't have to undergo impact assessment, then what's the point?" said Green Party MP candidate Keller-Herzog. "In other words, the Liberal government, Minister McKenna and senior public servants are lining up their ducks to pave the way for the plans of SNC-Lavalin and its American partners. Does that sound familiar?"[16]

Revelations of SNC-Lavalin corruption did become familiar to Canadians, and did not end with the World Bank disbarment or the charges stemming from the Libya scandal. For example, the company is facing criminal charges for its tactics to win a new hospital construction contract in Montreal,[17] and another criminal probe related to a Montreal bridge contract. A former Canadian federal official pleaded guilty in 2017 to accepting more than $2.3 million in payments from SNC-Lavalin in connection with the bridge project, and court documents lay out a $127 million bribery scheme.[18]

In 2018, Canada's federal election watchdog reported SNC-Lavalin made more than $117,000 in illegal political contributions to both parties. A former SNC-Lavalin executive was charged with soliciting employees to make the contributions and concealing their identities.[19] He pleaded guilty this year before the case went to trial and no others were charged, even though there is evidence other executives were involved. A compliance agreement signed by SNC-Lavalin refers to the involvement of "certain former senior executives" in a scheme to encourage employees to donate to

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[15] Information from Dr. Gordon Edwards, nuclear consultant, scientist and President of the Canadian Coalition for Nuclear Responsibility

[16] "Greens talk radioactive waste, Chalk River and SNC-Lavalin – and why Ottawans should care" by Taylor Blewett, *Ottawa Citizen*, September 5, 2019 https://ottawacitizen.com/news/local-news/greens-talk-radioactive-waste-chalk-river-and-snc-lavalin-and-why-ottawans-should-care

[17] https://www.theglobeandmail.com/canada/article-former-snc-lavalin-ceo-pleads-guilty-in-fraud-case/

[18] "SNC-Lavalin could face criminal charges over Montreal bridge contract, court documents reveal," by Christopher Reynolds, *National Post*, February 12, 2019 https://nationalpost.com/news/canada/snc-lavalin-faces-criminal-probe-over-montreal-bridge-contract-documents-reveal

[19] "Former SNC-Lavalin exec charged with illegal federal political contributions" by Ross Marowits, May 17, 2018 https://business.financialpost.com/pmn/business-pmn/former-snc-lavalin-exec-charged-with-illegal-federal-political-contributions

federal political parties, then get reimbursed by the company through "false refunds for personal expenses or payment of fictitious bonuses."[20]

Allegations of the Trudeau administration acting to protect SNC-Lavalin have prompted calls from Trudeau's political opponents for him to resign as Prime Minister. In a new report, ethics commissioner and political scientist Mario Dion found Trudeau violated the Conflict of Interest Act in 2018 when he tried to pressure Canada's Minister of Justice and Attorney General, Jody Wilson-Raybould to overrule a federal prosecutor's decision to send SNC-Lavalin to trial on corruption charges.[21] Wilson-Raybould described a coordinated effort by senior officials close to Trudeau to discourage her from prosecuting SNC-Lavalin for fraud and corruption around government contracts in Libya. If convicted of the charges, SNC-Lavalin could face a decade-long ban from competing for federal government contracts. Wilson-Raybould said she was barraged with demands and even veiled threats asking her to shut down the case and pursue a deferred prosecution agreement instead, which would have allowed SNC-Lavalin to pay a fine to address the allegations. She refused and pursued the corruption case. But after four months, she was demoted to veteran affairs minister.[22] The scandal threatens to bring down the Trudeau government and swing the next election toward conservatives.[23]

Like SNC-Lavalin, Holtec's track record is problematic. It includes scandal, bribery, lack of transparency, lying to officials, attracting public opposition and pushing private agendas. Holtec is a family-owned company founded by India-born CEO Krishna 'Kris' Singh. Singh and Holtec were involved in a bribery scandal at the Tennessee Valley Authority (TVA).

Holtec had been awarded a contract to build a storage facility for spent nuclear fuel at TVA's Browns Ferry Nuclear Plant in Alabama. John Symonds, a TVA supervisor pleaded guilty in 2007 to a federal charge of failing to disclose the receipt of about $55,000 in payments from a Holtec contractor.[24] As a result of a criminal investigation, the TVA created a formal suspension and debarment process and in 2010, in an unprecedented move, debarred Holtec from doing business with it for 60 days. Holtec was also reportedly forced to agree to pay a $2 million "administrative fee" and to submit to independent monitoring of its operations for twelve months. Holtec subsequently restored its relationship with the TVA and continues to hold contracts with the agency.[25]

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[20] "Key figure in illegal election financing scheme quietly pleads guilty" by Elizabeth Thompson, CBC News, January 19, 2019 https://www.cbc.ca/news/politics/election-financing-snclavalin-charbonneau-1.4984823

[21] "SNC-Lavalin report vindicates Jody Wilson-Raybould, says political scientist" CBC Radio, August 14, 2019 https://www.cbc.ca/radio/asithappens/as-it-happens-wednesday-edition-1.5246796/snc-lavalin-report-vindicates-jody-wilson-raybould-says-political-scientist-1.5246798

[22] "Justin Trudeau Faces Calls to Resign" by Chantal da Silva, *Newsweek*, February 28, 2019 https://www.msn.com/en-us/news/world/justin-trudeau-faces-calls-to-resign/ar-BBUcCnQ?li=BBnbfcL&ocid=iehp

[23] *The Guardian*, March 4, 2019 https://www.youtube.com/watch?v=Cjq1ccXV6hE

[24] https://columbusfreepress.com/article/dark-dawning-age-nuclear-waste-begins

[25] ibid.

Being privately held, Holtec's finances remain undisclosed,[26] and some of its subsidiary and liability structures are mysterious.[27] "[Little] is known about Holtec's decommissioning venture Comprehensive Decommissioning International, which is co-owned with SNC-Lavalin, a large Canadian engineering firm," according to *The North Jersey Record.* "The company is secretive about its finances, refusing to disclose basic information about its revenue, assets or ability to handle contingencies."[28]

As such, it's unknown whether Holtec has the financial depth or accountability to take responsibility for decommissioning and nuclear waste stewardship if decommissioning trust funds and other public moneys prove insufficient. "If a plant's decommissioning trust fund goes broke before the site is clean, utilities in states with regulated electricity markets can seek money from ratepayers to make up the deficit, according to the Nuclear Energy Institute," *USA Today* reports. "If the trust fund goes broke in a deregulated state, taxpayers may be on the hook to cover additional cleanup costs, experts say."[29] In the Northeast, all states except Vermont are "deregulated" as far as electricity generation is concerned.[30]

But published reporting and other information do show that Holtec has sought to leverage ratepayer-financed decommissioning trust funds, state subsidies and federal funds in questionable and sometimes illegal ways.

In 2017 then New Jersey Governor Chris Christie announced Holtec had been awarded a $260 million "Grow NJ" tax credit from the state's Economic Development Authority (EDA), to be paid out in ten annual installments of $26 million. It was the second-largest tax break in New Jersey's history. But it was put on hold after the first installment when investigative reporting by WNYC and ProPublica found Singh's sworn certification in the application to EDA claimed Holtec had never been barred from doing business with a state or federal agency. In fact, it had been barred from doing business with the TVA due to the bribery scandal.

Holtec's tax break applications and the response to the suspension were handled by the law firm Parker McCay where Philip Norcross is managing partner. He is the brother of Democratic Party leader George Norcross, one of the wealthiest people in New Jersey,[31] who sits on Holtec's board. He is also the brother of Congressman Donald Norcross (D-NJ). Emails obtained under a public records request show that Parker McCay and Philip Norcross were involved in rewriting tax break laws in 2013 that gave special advantages to companies that moved to Camden,[32] including Holtec, where George Norcross is on the board, the insurance company Conner Strong & Buckelew where George Norcross is executive chair, and Cooper University Health Care System, where George

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[26] *Rockland/Westchester Journal News,* op. cit.

[27] https://miningawareness.wordpress.com/2019/07/06/another-cyprus-mystery-company-related-to-holtec-international-nuclear-jupiterics-ltd/

[28] "Investors see huge profits from old nuclear plants, but it could cost taxpayers" by Chris Maag, North Jersey Record, June 19, 2019 https://www.lohud.com/story/news/watchdog/2019/06/19/nuclear-plant-decommissioning-holtec-other-firms-see-profit/1456809001/

[29] "We investigated what nuclear plant shutdowns mean for your wallet and your safety. Here's what we found." USA Today, June 19, 2019 https://www.lohud.com/story/news/investigations/2019/06/19/nuclear-plant-decommissioning-findings-usa-today-network/1372318001/

[30] https://www.electricchoice.com/map-deregulated-energy-markets/

[31] https://en.wikipedia.org/wiki/George_Norcross#Insurance

[32] "Emails Reveal Norcross Family's Pull Over NJ Tax Breaks" by Nancy Solomon and Jeff Pillets, WNYC News, May 21, 2019 https://www.wnyc.org/story/emails-reveal-norcross-familys-pull-over-nj-tax-breaks/

Norcross is board chair and Philip Norcross is a trustee. WNYC and ProPublica found that companies linked to George Norcross and Philip Norcross' law firm Parker McCay received at least $1.1 billion worth of tax breaks from New Jersey.[33]

The New Jersey tax break program is now under investigation by the New Jersey Attorney General and a task force appointed by Governor Murphy. Recently the EDA, which administers the program, received a state grand jury subpoena to provide information about several tax breaks awarded to companies with ties to George Norcross. Norcross filed a lawsuit challenging the task force's authority, and sued to prevent its report from being made public.[34] However, that suit failed and the report was published with harsh criticism of the treatment Norcross-linked firms received, including taking EDA staff to task for not pointing out Holtec had been disbarred from doing business with a government entity, which could have been discovered through a mere Google search.[35]

During the task force proceedings, it also came to light that Singh personally had been investigated by the TVA's Office of the Inspector General, which convinced an employee there to allow it to secretly record a call with Singh. "The OIG report found, based on witness testimony, that this unnamed Holtec representative engaged in the funneling of money to Mr. Symonds and courting him with future employment in order to secure the TVA nuclear contract for Holtec," task force Counsel Jim Walden said during the hearing. "Essentially, the OIG found a bribe." Walden said the report makes clear Singh "played a role in, or at least at a minimum, had been aware of the underlying activity" involving payments to Symonds.[36]

Holtec and Parker McCay had argued that failing to mention the TVA debarment in Singh's sworn application to the New Jersey EDA for tax breaks was just an "inadvertent mistake." Yet it was not the only misleading omission: Singh also claimed that number of other states, including Ohio and South Carolina, had offered "robust proposals" to persuade Holtec to leave New Jersey and move to them. But he didn't mention that just weeks before he submitted the New Jersey application, Ohio stripped Holtec of state tax credits for failing to create the jobs it had promised as part of a similar tax break program.

According to records obtained by WNYC and ProPublica, none of the 200 jobs Holtec had pledged in 2009 to bring to Orrville, a small town outside Akron, Ohio, ever materialized. Holtec, in a letter to Ohio regulators, blamed it on the failure of new manufacturing equipment that led to a "major setback." The company also said it was suffering an overall "decline in orders" caused by "lower quality overseas competitors." Ohio and South Carolina officials and economic development staffers said in interviews that they knew of no approved package of incentives their states had offered Holtec. New Jersey EDA officials confirmed that Holtec did not disclose its Ohio troubles to them.

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[33] "The Norcross Connections," by Nancy Solomon and Jeff Pillets, WNYC, May 3, 2019 https://www.wnyc.org/story/norcross-connections/

[34] https://en.wikipedia.org/wiki/George_Norcross#Insurance op cit.

[35] "EDA task force issues scathing report with heavy focus on Norcross-linked firms" by Matt Friedman and Katherine Landergan, Politico, June 17, 2019 https://www.politico.com/states/new-jersey/story/2019/06/17/eda-task-force-issues-scathing-report-with-heavy-focus-on-norcross-linked-firms-1065486

[36] "Task force uncovers bombshell report on Holtec," by Ryan Hutchins, *Politico*, July 10, 2019 https://www.politico.com/newsletters/new-jersey-playbook/2019/07/10/task-force-uncovers-bombshell-report-on-holtec-454824

"This was not reported in Holtec's application or legal questionnaire," said Virginia Pellerin, a spokeswoman for the authority.[37]

When the sale of New Jersey's Oyster Creek nuclear plant to Holtec was completed in July, Singh said in a press release, "Our primary goal is to decommission Oyster Creek safely and with the community's best interests in mind. Many of the excellent plant staff will join our exceptionally qualified engineers as we set a new bar in decommissioning excellence."[38]

But since then, multiple unions have objected to Holtec hiring less expensive, lower-skilled workers to do the decommissioning work, accusing the company of endangering workers and neighbors thereby. Oyster Creek Vice President Jeff Dostal admitted labor costs are being considered in Holtec's decisions, because the company must complete all cleanup and demolition using Oyster Creek's nearly $1 billion decommissioning trust fund. But Dostal said that safety was an integral focus of Holtec and its staff. "You can't say 'safety' when you have people (working) who have never touched a pipe before," said Randall Davis, who worked inside Oyster Creek for years as a member of the United Association of Plumbers & Pipe Fitters Local 9. In addition to holding various technical and safety certifications, Davis said he had to pass a background check and a week of testing before he was permitted to work on pipes and valves inside the plant.[39]

For more than a year, local residents around Oyster Creek have been calling for an advisory panel to oversee to Holtec's decommissioning activities. Last week Governor Murphy responded to the call and announced the creation of a new Oyster Creek Safety Advisory Panel headed by New Jersey Department of Environmental Protection Commissioner Catherine R. McCabe will head the new Oyster Creek Safety Advisory Panel, which will also include members of the New Jersey State Police, the Office of Homeland Security and Preparedness, and the Board of Public Utilities. "Providing the public with an opportunity to participate in the robust public input process is critical to ensuring transparency during the decommissioning process," Murphy said. Citizens' groups generally welcomed the announcement, but some noted the panel was composed entirely of officials (it does have one independent scientist) and didn't include advocacy groups or concerned citizens.[40]

Massachusetts is another state where Holtec has gotten significant push-back from state officials. Holtec's acquisition of the Pilgrim nuclear plant in Plymouth was recently approved by the NRC, over strong objections of state environmental officials and the Massachusetts Attorney General's office. They had petitioned the NRC to hold a hearing on their concerns about Holtec's lack of experience, qualifications and finances before ruling on the sale.

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[37] "A Huge Tax Break Went to a Politically Connected Company in New Jersey Despite Red Flags," by Jeff Pillets and Nancy Solomon, WNYC, and Alex Mierjeski, ProPublica June 26, 2019 https://www.propublica.org/article/a-huge-tax-break-went-to-a-politically-connected-company-in-new-jersey-despite-red-flags

[38] "Oyster Creek nuclear plant sale to Holtec is complete" by Amanda Oglesby, *Asbury Park Press*, July 2, 2019 https://www.app.com/story/news/local/land-environment/2019/09/24/unions-oyster-creek-cuts-corners-risks-safety-hiring-cheap-labor/2379570001/

[39] "Unions: Oyster Creek cuts corners, risks safety by hiring cheap labor" by Amanda Oglesby, Asbury Park Press, September 24, 2019 https://www.app.com/story/news/local/land-environment/2019/09/24/unions-oyster-creek-cuts-corners-risks-safety-hiring-cheap-labor/2379570001/

[40] "Murphy panel ordered to ensure Oyster Creek decommissioning won't be dangerous," by Amanda Oglesby, *Asbury Park Press*, October 3, 2019 https://www.app.com/story/news/local/land-environment/2019/10/03/oyster-creek-nuclear-plant-decommissioning-phil-murphy-panel/3843335002/

The NRC declined and approved the sale to Holtec without giving state officials a hearing. Along with the license transfer, NRC approved a regulatory exemption Holtec had requested to be allowed to use $541 million of the $1.1 billion decommissioning trust fund for spent fuel management – for example building canisters and pads to store spent fuel and roads to transfer it. Ordinarily the trust funds are strictly reserved for decommissioning activities per se, such as dismantling and clean-up of the facility.[41] Experts say that allowing Holtec to use the fund for nuclear spent fuel expenses as well threatens to deplete the trust fund before decommissioning is complete. The procedure would allow Holtec to reimburse itself in advance for what it spends on spent fuel management from the decommissioning fund, then turn around and sue the Department of Energy for breach of contract (DoE had undertaken to remove spent fuel to a geologic repository, but Yucca was suspended so DoE never took the fuel) to recover that money, in effect getting paid for twice for the same work. NRC staff confirmed that any funds Holtec recovers from DoE for spent fuel management would not go back into the decommissioning trust fund, but into Holtec's pocket.[42]

The NRC's action to approve the Pilgrim license transfer to Holtec without hearing state officials' concerns drew strong opposition from Governor Baker's administration, Senator Ed Markey and Attorney General Maura Healey. Healey's office filed suit in federal court against the NRC to challenge the decision.

The AG's complaint says the NRC "acted arbitrarily and capriciously, abused its discretion" and violated the law in failing to provide Massachusetts with a "meaningful opportunity to participate in the process." "The NRC has repeatedly rubber stamped Holtec's plans, despite serious concerns about the company's financial capacity, technical qualifications, and competency to safely decommission and clean up the Pilgrim site," said Healey in a statement. "We are asking the Court to exercise its authority to vacate the NRC's misguided and unsupported actions."[43]

In her petition to the NRC, Healy pointed out that Holtec set aside only a very small portion of the decommissioning fund for contingency planning, and said "Holtec's attempt to account for contingencies and uncertainty risk is woefully deficient." She also warned the exemption allowing Holtec to use the decommissioning trust fund 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."[44]

Four state senators and six state representatives -- Sens. Viriato deMacedo, Julian Cyr, John Keenan and Patrick O'Connor along with Reps. William Crocker, Josh Cutler, Dylan Fernandes,

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[41] "NRC could get earful on Pilgrim nuclear plant license transfer" by Christine Legere, *Cape Cod Times* September 9, 2019 https://www.capecodtimes.com/news/20190909/nrc-could-get-earful-on-pilgrim-nuclear-plant-license-transfer

[42] Information from presenters at the October 10, 2019 regional forum on decommissioning nuclear plants in the Northeast, including Mary Lampert, director of Pilgrim Watch, and Bob Alvarez, former senior policy advisor to the US Department of Energy and senior scholar, Institute for Policy Studies.

[43] "Healey sues federal nuclear regulators over Plymouth plant transfer" by Danny McDonald Boston Globe September 26, 2019 https://www.bostonglobe.com/metro/2019/09/26/mass-healey-sues-federal-nuclear-regulators-over-plymouth-plant-transfer/iloDF9bwYAjNl9bULYiJPL/story.html

[44] "Investors see huge profits from old nuclear plants, but it could cost taxpayers" by Chris Maag, *North Jersey Record*, June 19, 2019 https://www.lohud.com/story/news/watchdog/2019/06/19/nuclear-plant-decommissioning-holtec-other-firms-see-profit/1456809001/

Sarah Peake, Kathleen LaNatra and Tim Whelan -- issued a statement in support of Healey and the Baker administration.[45]

US Senator Edward Markey also weighed in, saying the NRC "is abdicating any responsibility for protecting public health and safety with its rushed and uninformed license transfer for the Pilgrim nuclear power plant. The opaque process that disregarded local resident and state input reflects the Commission's choice to prioritize industry timelines over due diligence and transparency. Holtec's math on how it will pay for decommissioning does not add up. Holtec's unwillingness to even negotiate an agreement with local stakeholders -- the ones who will be living next door to nuclear waste for years to come -- is unacceptable. I have repeatedly called on Holtec to be a good neighbor and for the Commission to be a good regulator, but those calls of concern were ignored."[46]

Holtec's activities in related fields outside of decommissioning proper point up additional concerns for how it will approach decommissioning at the sites it is acquiring, and have also drawn strong opposition from state and local officials and citizens' groups.

At the San Onofre Nuclear Generating Station (SONGS) in southern California, Holtec is contracted with owner Southern California Edison to transfer spent fuel into dry storage, just above a popular surfing beach, inches above the water table, 100 feet above current sea level, located in an earthquake and tsunami zone. Holtec makes the dry-storage canisters for the project, which are welded shut and designed for interim storage, not approved for shipment off site. It has been revealed they are getting scratched and gouged in the loading process. Edison says the scratches are inconsequential, but watchdog groups say they accelerate corrosion in the moist salt air and could lead to early failure. [47]

In 2014 Holtec's CEO Kris Singh said publicly he didn't believe it was practical to repair the canisters if they were damaged.[48] Theoretically, damaged canisters could be unloaded and reloaded in a robotically operated dry transfer facility or "hot cell." Hot cells are expensive and there are no plans to build one at SONGS. Asked about reloading damaged canisters at a meeting of the San Onofre Citizen Engagement Panel, an Edison executive said it was possible to do, but hadn't been done yet, and would require research. He also cast doubt on the safety or feasibility of attempting it inside a fuel pool. That leaves no clear provision for dealing with a damaged canister at SONGS.

Yet Holtec canisters are not immune to damage and safety problems. Around the time of the TVA scandal, Holtec was the subject of scathing safety reviews by a U.S. quality assurance engineer who was later terminated for suspected whistleblowing. A federal Nuclear Regulatory Commission specialist in nuclear cask safety, Dr. Ross Landsman, said at the time, "As far as I am concerned,

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[45] "Regulators approve nuclear transfer over governor, AG protests" by Colin A. Young, STATE HOUSE NEWS SERVICE, August 23, 2019 https://www.masslive.com/news/2019/08/regulators-approve-nuclear-transfer-over-governor-ag-protests.html

[46] ibid.

[47] https://nonukesca.net/halting-holtec-a-challenge-for-nuclear-safety-advocates/

[48] https://www.youtube.com/watch?time_continue=1&v=euaFZt0YPi4

Holtec has no quality assurance. This is the same kind of thinking that led to the NASA Space Shuttle disaster."[49]

In February 2018 SONGS workers were preparing a Holtec canister for loading when they discovered a loose, stainless-steel bolt inside, about four inches long. An investigation revealed that Holtec had altered the canister design without permission from the NRC,[50] adding pins to the canister bottoms to facilitate the flow of cooling. Holtec considered the change too minor to require NRC scrutiny. The NRC disagreed and called the unauthorized changes "safety significant." "Holtec's design review process for the change did not adequately consider all potential impacts that could adversely affect the safety-related functions," the NRC said. Nevertheless, the NRC declined to fine Holtec, and let the unauthorized changes stand.[51]

In August 2018, a whistleblower revealed a near miss at SONGS as a 50-ton Holtec canister was being loaded into an 18-foot concrete silo. Holtec's Hi-Storm UMAX system canisters at SONGS are thicker than the ones workers practiced loading. Thicker canisters mean a tighter fit and less room going into the silos. One of the 50-ton canisters got stuck on a shield ring near the top of the vault. Workers didn't realize the slings supporting the canister's massive weight went slack, and it hung there unsupported for close to an hour, in danger of dropping. "The big lesson is, we need to be more intrusive over all our contractors and we will be more intrusive," said Ron Pontes, Edison's environmental decommissioning strategies manager. "This is nuclear and industrial safety. We lost sight of that a little bit in this process. We didn't demand that rigor out of our contractors."[52] The NRC fined Edison $116,000 for the incident, then after a brief investigation, allowed loading to resume. But critics say the dangers have not been resolved.

All of this has sparked intense community concern and criticism of Holtec's handling of SONGS' spent fuel. The SONGS Community Engagement Panel chair and two of its members wrote a memo to Edison, with a copy to Holtec, expressing their "increasing concern about a key variable in the process: Holtec" and its role the cascade of recent problems.

"Such events–in effect, unforced errors–are not acceptable," the CEP members wrote. "Along the way, [Holtec's] most senior management has been tone deaf in how it deals with the public." The memo went on to complain that "the corporate governance of Holtec is opaque, with some pretty significant warning signs," including lack of relevant experience among Holtec's board members, and spreading itself too thin.

"The new business lines for Holtec are REALLY different from the traditional engineering business," the memo argued. "Taking over licenses here in the USA–as Holtec is doing by purchasing the Oyster Creek plant, for example–is much more management intensive and requires skill sets that

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[49] https://theenergymix.com/2019/03/10/hot-garbage-grifters-snc-lavalins-plan-to-turn-nuclear-waste-into-long-term-gold/

[50] "Moving nuclear waste at San Onofre sparks war of words between contractor, community panel," by Teri Sforza, *Orange County Register*, May 15, 2019 https://www.ocregister.com/2019/05/15/moving-nuclear-waste-at-san-onofre-sparks-war-of-words-between-contractor-community-panel-spar-over/

[51] "At San Onofre, NRC rejects fine against Holtec for changing design of nuclear waste canisters without permission" by Teri Sforza, *Orange County Register*, April 29, 2019 https://www.ocregister.com/2019/04/29/nrc-decides-holtec-does-not-deserve-fines-for-canister-violations-at-san-onofre/

[52] "Edison makes changes at San Onofre, ready to resume loading nuclear waste" by Teri Sforza, *Orange County Register*, March 18, 2019 https://www.ocregister.com/2019/03/18/edison-makes-changes-at-san-onofre-ready-to-resume-loading-nuclear-waste/

are completely different from the core engineering business. Moreover, these tasks come with a lot of community and regulatory exposure–areas where Holtec has not excelled in the past… The company is investing in a small modular reactor (SMR), along with dozens of other firms–yet another business that will draw management attention and capital. And the list goes on."[53]

This drew a vitriolic personal response from Holtec CEO Kris Singh, making clear the disregard he had for the Citizen Engagement Panel and its concerns: "Our nuclear program is the envy of the world, your cheap shots notwithstanding. We note that you have held a string of CEP meetings without Holtec's participation, where the antinuclear activists have repeatedly filled the air with irresponsible attacks on our company. Your memo is very much in the tradition of irresponsible claptrap that dominates your CEP meetings. An inflammatory memo unsupported by facts is little more than a hatchet job."[54]

Another of Holtec's new business lines that has drawn strong opposition is Consolidated Interim Storage (CIS) of high-level radioactive waste at a facility it owns in southeast New Mexico and is in the process of getting NRC licenses for, named HI-STOR CISF. Located on a 1,000-acre property outside Carlsbad and Hobbs and near the Eddy-Lea county line, it would hold up to 120,000 metric tons of spent nuclear fuel about 40 feet underground in large steel casks. The Eddy-Lea Energy Alliance (ELEA), a joint venture with numerous local organizations, owns the surface rights, the New Mexico State Land Office owns the mineral estate beneath the surface.

The HI-STOR CISF site is located in the oil- and gas-rich Permian Basin. The International Atomic Energy Agency (IAEA) has warned against co-locating high-level radioactive waste storage or disposal facilities in areas also hosting fossil fuel extraction, as too high risk. For example, certain fracking activities can induce significant artificial earthquakes, that can damage CISFs.

Up to 2,500 oil, gas and mineral wells or sites are operated in the area by 54 businesses within a 10-mile radius of the site, says New Mexico State Land Commissioner Stephanie Garcia Richard, who opposes the CIS project, citing "serious safety concerns." "We are talking about storing over 120,000 metric tons of nuclear waste in an extremely active oil field without a clear picture of the potential hazards of that combination." She questioned any contention that hydraulic fracturing can occur safely beneath a nuclear storage site, or that the waste can be safely transported through New Mexico.[55]

According to Garcia Richard, Holtec "falsely" stated it secured agreements with nearby oil and gas operators to restrict extraction operations near the proposed site and assured the NRC that oil and gas drilling would only occur at depths greater than 5,000 feet. But Garcia Richard said no such agreements exist for the mineral estate owned by the Land Office, except for one with Intrepid Mining that had yet to be approved. She accused Holtec of making misleading statements on the matter in submissions to the NRC including its environmental reports. "I understand that we need

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[53] "Moving nuclear waste at San Onofre sparks war of words between contractor, community panel," by Teri Sforza, *Orange County Register*, May 15, 2019 https://www.ocregister.com/2019/05/15/moving-nuclear-waste-at-san-onofre-sparks-war-of-words-between-contractor-community-panel-spar-over/ and https://columbusfreepress.com/article/dark-dawning-age-nuclear-waste-begins

[54] https://scng-dash.digitalfirstmedia.com/wp-content/uploads/2019/05/Holtect-Letter-to-David-Victor.pdf

[55] "New Mexico State Land Office: Holtec mislead federal government on nuclear waste site near Carlsbad" by Adrian C. Hedden, *Carlsbad Current-Argus*, June 20, 2019 https://www.abqjournal.com/1330808/new-mexico-state-land-office-holtec-mislead-federal-government-on-nuclear-waste-site-near-carlsbad.html

to find a storage solution," she said, "but not in the middle of an active oil field, not from a company that is misrepresenting facts and unwilling to answer questions, not on our state trust lands."[56]

In addition to citizens' groups, active opponents of Holtec's HI-STOR CISF project include New Mexico's Governor Michelle Lujan Grisham. In a letter the to the NRC and DoE, she argued it would be "economic malpractice" to open such a site in an oil-rich region that's also home to agricultural operations, that the project poses significant risk to New Mexico's environment and economy, and that transporting the spent fuel could place a financial burden on both the state and local communities. "Transporting material of this nature requires both well-maintained infrastructure and highly specialized emergency response equipment and personnel that can respond to an incident at the facility or on transit routes," she said in her letter. "The state of New Mexico cannot be expected to support these activities."[57]

Recently in the licensing procedure for HI-STOR CISF, NRC's Atomic Safety Licensing Board dismissed all 50 objections brought by intervenors, including the contention that U.S. law clearly prohibits nuclear waste being moved to interim facilities before a permanent storage site has been identified.[58] With the way cleared for licensing the New Mexico facility, Holtec now says construction could start in 2021, it could be ready to accept spent fuel shipments beginning in 2023.[59]

If that happens, it would give Holtec an additional economic incentive to seek to ship spent fuel from the US reactors it is acquiring to its HI-STOR CISF facility as fast as it can, perhaps as soon as 2023. Nuclear plant operators keep spent fuel in fuel pools for at least five years, and 10 years is the industry norm, according to the Nuclear Regulatory Commission. That allows time for the rods to cool radioactive isotopes to decay before fuel assemblies are moved. But Holtec asserts it can move spent fuel out of fuel pools and into dry storage in just *two* years. Regulators, activists and others question whether the accelerated timetable is safe.[60] And as noted above, spent fuel transport offsite is fraught with unsolved problems and safety dilemmas, both for the reactor communities and the thousands of communities along the transport routes.

There's some question whether Holtec's investment in another sideline, small modular reactors, could affect its plans for Indian Point, Oyster Creek, and Pilgrim. At the ribbon-cutting ceremony for its Krishna P. Singh Technology Campus in Camden, NJ last year, Singh declared it to be Ground Zero for the renaissance of nuclear energy and heavy manufacturing in America. "We will build nuclear reactors here, and they will sail from the port of Camden to hundreds of places around the world."[61] According to *Power* magazine, "Entergy officials had said they were not interested in redevelopment of the Indian Point site, but Holtec officials said they may revisit that decision."[62]

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[56] ibid.

[57] "Gov. slams planned nuclear waste storage site," by Dan Boyd, *Albuquerque Journal*, June 7, 2019 https://www.abqjournal.com/1325681/gov-lujan-grisham-against-planned-nm-nuclear-storage-facility.html

[58] https://nukewatch.org/2019/05/08/6369/

[59] "Holtec clears hurdle for proposed nuclear-waste storage facility" by Jim Walsh, *Cherry Hill Courier-Post*, May 9, 2019 https://www.courierpostonline.com/story/news/2019/05/09/holtec-lea-county-new-mexico-storage-site-uranium-nuclear-waste/1155441001/

[60] "Speedy reactor cleanups may carry both risks and rewards" by Bob Salsberg, Associated Press, May 21, 2019 https://www.apnews.com/651923b9359b4d64a807aa677999dc03

[61] https://www.indiawest.com/news/global_indian/indian-american-entrepreneur-opens-camden-facility-offers-fast-track-mini/article_b3a3d540-ad56-11e7-822d-4331c45b3a26.html

[62] https://www.powermag.com/holtec-adds-indian-point-nuclear-plant-to-decommissioning-portfolio/

Holtec's plan to build SMRs in Camden "has led some to speculate whether Holtec is looking to put the reactors into use at the nuclear power plants it plans to purchase" [i.e., Indian Point, Oyster Creek and Pilgrim] according to *The Journal News*. "For now, though, the reactors are being marketed overseas." Holtec plans to build its first SMR for Ukraine.[63]

Orano/NorthStar/ADP

Holtec's biggest competitor in the decommissioning business is NorthStar, which had experience knocking down large hotels and casinos[64] prior to forming a joint venture to undertake the decommissioning of Vermont Yankee, which it now seeks to parlay into a wider nuclear decommissioning portfolio that includes the Crystal River plant in Florida. In 2017 NorthStar formed a new joint venture with AREVA Nuclear Materials named Accelerated Decommissioning Partners (ADP).

"The ADP joint venture is designed to contain all required management, regulatory, technical and financial qualifications to decommission U.S. nuclear energy sites safely and in accordance with all NRC and state requirements," according to the ADP press announcement. "ADP will combine the core competencies of AREVA in nuclear component dismantling and used fuel management with NorthStar's extensive demolition and environmental remediation expertise to deliver certainty to the industry and the public about this final stage of shutdown reactor sites."[65]

AREVA was a French-based multinational company with extensive holdings in nuclear and other energy generation. After a global rebranding in January 2018, AREVA Nuclear Materials became Orano USA. The rebranding followed AREVA's reorganization after it incurred record losses of €4.83 billion in 2014. Plagued by delays and cost overruns at Olkiluoto 3 and Flamanville 3, as well as at a research reactor construction project, and financially hemorrhaging from renewable energy contracts, AREVA's finances began to fall into disarray. In 2015, the French electric utility EDF moved to snap up between 51% and 75% of the troubled nuclear giant's reactor business. The name Orano is derived from Ouranos, the primal Greek sky-god, (violently deposed by his offspring) and who in Roman mythology became "Uranus" for whom uranium was named. For Orano, the name is important because it "symbolizes a new start," said CEO Philippe Knoche.[66]

Like Holtec, Orano is not without skeletons in its closet, including Areva's involvement in Niger uranium mining implicated in Tuareg genocide, pollution of the Atlantic Ocean with radioactive waste, an epidemic of high-level radioactive waste shipments that leaked contamination and an associated cover up.[67]

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[63] "Dismantling nuclear plants is a gold mine for some, but at what risk to you?" by Thomas C. Zambito, *Rockland/Westchester Journal News,* June 19, 2017 https://www.lohud.com/story/news/investigations/2019/06/19/nuclear-plant-decommissioning-is-a-gold-mine-for-some-but-at-what-risk/1269407001/

[64] ibid.

[65] http://us.areva.com/EN/home-3858/anm-areva-and-northstar-form-joint-venture-for-decommissioning-and-launch-process-to-acquire-nuclear-facilities.html

[66] https://www.powermag.com/as-nuclear-giant-areva-reforms-framatome-is-resurrected/

[67] Information from Kevin Kamps, Radioactive Waste Specialist, Beyond Nuclear http://static1.1.sqspcdn.com/static/f/356082/28087681/1551331652257/updated+2+22+19+Presentation.pdf?token=jQMXXUeMRLXAIy85Pe87KyROJX0%3D

Also like Holtec, NorthStar/Orano/ADP's finances are secret. It's not known how much capital it could draw on if decommissioning funds proved insufficient to complete work, or to what extent that might eventually put taxpayers at risk for paying for cleanup. What is known is that its companies were recently bought by J. F. Lehman & Co., a hedge fund founded by President Ronald Reagan's Secretary of the Navy, John Lehman.

Lehman retired from the navy before the Tailhook scandal broke, but military investigators found as Secretary he countenanced and participated the sexual harassment and assault for which the Tailhook meetings became infamous.[68] In the wake of the scandal, in 2011 he caused a stir by complaining the backlash from Tailhook mired the Navy in excess political correctness and lamented the "swagger" and daring of the Navy's culture had given way to a focus on integrating women and gays.[69]

Lehman's company invested $1.9 billion primarily in defense and aerospace industries, according to the company's website. In 2016, it sought to raise $700 million, and soon attracted more than 48 investors, including "leading public and private pension funds" which together invested $883 million. In June 2017, seeking a foothold in the growing and potentially lucrative decommissioning industry, Lehman acquired NorthStar. The following month, it announced a partnership with Orano. In January 2018 it bought Waste Control Specialists (WCS). Important details about Lehman's companies remain unknown, including how much cash each keeps for emergencies.[70]

WCS is an ADP (NorthStar/Orano) affiliate which owns a Consolidated Interim Storage facility in west Texas, just across the border from Holtec's proposed CIS site in New Mexico. WCS is the only site authorized to dispose of Class A, B and C nuclear wastes, and is the only site pursuing a permit for disposal of Greater Than Class C (GTCC) waste.[71]

Like Holtec, NorthStar/Orano's investment in CIS represents a kind of vertical integration which would allow it to profit from nuclear waste at both ends – both from the trust fund once plant decommissioning was complete, and from storing spent fuel and other decommissioning wastes at its CIS facility. Also like Holtec that may create an incentive for NorthStar to move spent fuel out of fuel pools, into dry storage and offsite to its CIS facilities sooner than it might have otherwise, which could potentially pose increased risks to reactor communities and communities along the transport routes.

Just as Holtec did at Pilgrim, NorthStar sought and obtained an exemption to use $425 million of the Vermont Yankee decommissioning trust fund for spent fuel management, which may entail some of the same risks to the adequacy of the fund as Attorney General Healey flagged regarding Pilgrim. But unlike Massachusetts and Holtec, the state of Vermont reached a settlement with NorthStar that

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[68] "McCain Picks Tailhook Sexual Harassment Scandal Vet To Oversee Transition," by David Corn, Mother Jones, October 20, 2008 https://www.motherjones.com/politics/2008/10/mccain-picks-tailhook-sexual-harassment-scandal-vet-oversee-transition/

[69] "Lehman rocks Navy with complaints about political correctness" by Rowan Scarborough, *The Washington Times*, September 18, 2011 https://www.washingtontimes.com/news/2011/sep/18/lehman-rocks-navy-complaints-about-political-corre/

[70] "Investors see huge profits from old nuclear plants, but it could cost taxpayers" by Chris Maag, *North Jersey Record*, June 19, 2019 https://www.lohud.com/story/news/watchdog/2019/06/19/nuclear-plant-decommissioning-holtec-other-firms-see-profit/1456809001/

[71] http://us.areva.com/EN/home-4267/orano-adp-decom.html

assures funds recovered from the DoE for spent fuel management will go back into the decommissioning fund, and not into NorthStar's pocket. [72]

Like Holtec's HI-STOR CISF, WCS has also attracted staunch opposition from citizens and environmental groups and from fossil companies operating in the area.[73] But at the same time, NorthStar/Orano/ADP does not appear to have attracted opposition from governors, attorney generals and other public officials as Holtec/SNC-Lavalin/CDI/HI-STOR CISF has. Nor has NorthStar been officially accused or convicted of or sanctioned for bribery, corruption, improperly seeking subsidies, or lying to public officials as Holtec and SNC Lavalin have. Unlike Holtec, NorthStar has not been barred from doing business with public entities. Nor has it shown contempt for citizen advisory bodies. Since Vermont is a deregulated state, the Vermont Public Utilities Commission had jurisdiction over the transfer of Vermont Yankee's license to NorthStar, and approved it, citing "oversight by Vermont agencies during cleanup," and "support for the deal by the public, the state, and regional bodies."[74]

Energy*Solutions*

Energy*Solutions* is headquartered in Salt Lake City, Utah, with operations across the United States, Canada and Japan. According to its website, it has more than 1500 employees worldwide, provides integrated services and solutions to the nuclear industry and has state-of-the-art facilities to safely recycle, process and dispose of nuclear material.[75]

The company was founded by 2007 through the merger of four waste disposal companies: Envirocare, Scientech D&D, BNG America, and Duratek. Envirocare of Utah purchased the Connecticut-based Scientech D&D division in October 2005. On February 2, 2006, Envirocare announced the $90 million purchase of BNG America, a subsidiary of British Nuclear Fuels (BNFL) based in Virginia. The merged company changed its name to Energy*Solutions*. A few days later, Energy*Solutions* announced it would buy Maryland-based Duratek, a publicly traded company, for $396 million in an all-cash deal. The leveraged buyout was financed by banks led by Citigroup, effectively taking the company private.[76]

Like Holtec, EnergySolutions' predecessor Envirocare had a founder entangled in a bribery scandal. The company was founded by Iranian immigrant Khosrow Semnani in 1988. It disposed of Class A low level radioactive waste (LLRW) in an engineered landfill in Clive, Utah. Semnani served as president of the company until May 1997, when Envirocare's largest customer, the Department of Energy, requested that he step down due to bribery allegations.

They concerned some $600,000 in payments Semnani made to Larry F. Anderson, former director of the Utah Division of Radiation Control. According to court documents. "Mr. Semnani publicly

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[72] Information from Mary Lampert, director, Pilgrim Watch

[73] https://www.newswest9.com/article/text/news/unlikely-alliance-texas-environmentalists-oil-industry-officials-unite-in-opposition-to-nuclear-waste/513-b2276c5c-6144-4dca-bce3-402546a22ffe

[74] "Vermont Yankee Transfer Approved, NorthStar Will Decommission Plant" by John Dillon, Vermont Public Radio, December 6, 2018 https://www.vpr.org/post/vermont-yankee-transfer-approved-northstar-will-decommission-plant#stream/0

[75] https://www.energysolutions.com/

[76] https://en.wikipedia.org/wiki/EnergySolutions

admitted, in court filings, that he had secretly paid Mr. Anderson hundreds of thousands of dollars in cash, gold coins, and a ski resort condominium. These payments were made by Mr. Semnani to Mr. Anderson during the period in which Mr. Anderson was the chief official responsible for issuing the Envirocare license, granting the Envirocare exemption, and allegedly authorizing disposal of DOE waste at the Clive, Utah site." According to a 1997 complaint filed against the US DOE by competitor Waste Control Specialists (now the NorthStar/Orano/ADP affiliate owned by Lehman), "Each of the documents on which DOE relies– the disposal license, the exemption, and the letter to Envirocare allegedly authorizing receipt of DOE radioactive waste — were issued by Anderson, who personally signed each document in that official capacity." Semnani pled guilty to the most lenient sentence allowed under Federal guidelines and agreed to pay a $100,000 fine, while Anderson was sentenced to a jail term of 2.5 years.[77]

Unlike Holtec and NorthStar, Energy*Solutions* has substantial prior decommissioning experience, including at Zion Nuclear Power Station in Illinois and the La Crosse Boiling Water Reactor in Wisconsin, which it says is the largest decommissioning project in U.S. history, and at the SEFOR Test Reactor in Arkansas. It is also in partnership with AECOM to decommission SONGS in southern California and has made an agreement with the Omaha Public Power District to partner in decommissioning the Fort Calhoun Nuclear Power Plant in Nebraska. Energy*Solutions* is currently negotiating to acquire and fully decommission Three Mile Island 2 in Pennsylvania.[78]

In the case of Zion, which closed in 1998, in 2010 NRC approved the transfer of Exelon's license to Energy*Solutions*, which then created ZionSolutions to decommission the plant. ZionSolutions says it will complete the job in 2020.[79] Unlike the newer Holtec and NorthStar business model, Energy*Solutions* will not retain the license after decommissioning is complete and the buildings are dismantled. At that point, the license will revert back to Exelon.

Zion moved some 1500 tons of spent fuel out of fuel pools into dry storage canisters, and then sealed the canisters into 157-ton casks, each about the size of a garage and made of 26 inches of reinforced concrete. The casks now sit on a concrete pad just 300 feet from Lake Michigan. In 2015 as the waste was being transferred it was acknowledged Zion's decommissioning trust fund was running out of money. Recently Entergy*Solutions* acknowledged it is still running a multimillion-dollar shortfall in the trust fund, but claims it has the money needed to cover any gap.[80] The company sees its decommissioning of Zion as a success story, benefitting the community by finishing 12 years ahead of Exelon's plan to allow earlier "beneficial reuse" of the site, providing cost certainty and avoiding further levies on ratepayers to fund the work, and assuring public health and safety.

But that's not how Zion's former Mayor Al Hill sees it. The plant's closure took away 75% of Zion's tax base, and the city has never recovered. That combined with the housing crash in 2009 left the community devastated, with high unemployment, 66% of housing becoming rental property (20%

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77 https://miningawareness.wordpress.com/2016/02/21/radioactive-waste-dump-owner-semnani-paid-govt-official-600000-official-went-to-jail-got-cancer-semnani-got-fined-became-iran-policy-expert-philanthropist/

78 https://kjzz.com/news/local/energysolutions-in-negotiations-to-acquire-decommission-three-mile-island

79 http://www.zionsolutionscompany.com/

80 https://www.exchangemonitor.com/no-funding-issue-zion-decommissioning-despite-shortfall-energysolutions-says/?failed_auth=c2tlbnRAa2VudGNvbS5jb20%3D

is a healthy ratio), a disproportionate amount of Section 8 housing, and attendant effects on property values, schools and crime.

"That's our case study," Mayor Hill said. "We did a lot of things wrong." The plant site has become a dump for 2.2 million pounds of radioactive waste, stored 300 feet from Lake Michigan, which supplies water for 16 million people. "We want [the waste] moved and we want to develop the site to increase our tax base," said Hill, "or else get compensated for being a de facto waste dump."

The 1982 Nuclear Waste Policy Act has provisions for federal payments to communities impacted by nuclear waste storage, as high as $15 per kilogram. In Zion's case, that would mean up to $15 million, which should be allocated to the units of local government most severely affected. But so far, Zion's efforts to get the federal money haven't succeeded. The Stranded Act (S.1985) introduced by Senator Tammy Duckworth (D-IL) would compensate communities for spent fuel left on site, but it hasn't been enacted.

"Nobody cares about the local community – not Exelon, not DoE, not NRC," said Hill. "Exelon told us to go pound sand. My job is to make them care. I'm going to call every mayor and public official in reactor communities with spent fuel, and we'll ask you to support [the Stranded Act]." Hill's advice to reactor communities facing decommissioning is to start planning for the impacts of nuclear waste now.[81]

[81] https://www.eesi.org/files/Nuclear_Plant_Decommissioning-Backgrounder.pdf