

Hudson River Sloop Clearwater Recommendations to NYS Decommissioning Oversight Board

On July 20,2021, the following people met with NYS PSC CEO/Chairman John Howard and staff.

- Manna Jo Greene, Environmental Action Director, Hudson River Sloop Clearwater: mannajo@clearwater.org
- Dr. Richard Becker, Councilman, Town of Cortlandt: rhbmd01@gmail.com or RichardB@townofcortlandt.com
- James Creighton, Councilman, Town of Cortlandt: JamesC@townofcortlandt.com or jimcinny@gmail.com
- Matt Salton, Environmental Action Associate, Hudson River Sloop Clearwater: matt@clearwater.org

Below are notes from our meeting with the PSC, which we would like to submit to the NYS Decommissioning Oversight Board (DOB) for consideration. The PSC indicated that they were very open to bringing in independent experts to provide relevant information.

Key Recommendations:

- **DOB should hear from independent experts -- not just Holtec:** Richard Webster and David Lochbaum are valuable advisors, but the DOB has an opportunity to get to the bottom of some important questions regarding the decommissioning of nuclear power plants and needs to hear from experts in these and other fields. Recognized experts are cited in these comments and listed in a table at the end of the document.
- **Focus on the PSDAR: front load the meetings.** Meet more frequently in 2021 to ensure the DOB has the information it needs, especially regarding issues in question for the PSDAR and site remediation.
- **Include worst case scenarios.** Holtec's track record at San Onofre in CA and Oyster Creek in NJ includes problematic events that must not be repeated at Indian Point (IP), as well as examples of NRC violating its own regulations.
- **Consider the national context:** The NYS Decommissioning Oversight Board and decommissioning process that is implemented at Indian Point can set important precedents for other reactor communities across the nation and beyond. For example, the DOB should consider Environmental Justice (EJ) issues surrounding transportation and storage,

Key Issues:

- **Financial and Economic Considerations** re: the Decommissioning Trust Fund and community at-large
- **On-Site Storage, including the important question Canisters and Casks --** what the waste will be stored in for dry cask storage, i.e. the use of 5/8" thin vs. 12" - 18' thick-walled canisters in hardened buildings, which are employed widely in Europe and elsewhere,
- **The value of Hardened On-Site Storage (HOSS), and other nuclear waste storage issues.**
- **Rushed Decommissioning:** How long should High Burnup Fuel stay in fuel pools before being moved to dry cask storage?
- **Algonquin Pipeline:** When should the pipeline be shutdown during decommissioning and site remediation?
- **On and Offsite Monitoring** to protect workers and community members.
- **Emergency Response**
- **Transportation issues**
- **Workforce planning to ensure just transition**
- **Environmental Justice issues here and at potential so called "interim" offsite storage sites**
- **... and others.**

Background Information on Issues for DOB to Consider

While the Joint Proposal Settlement Agreement improves the prospects for a financially and environmentally responsible decommissioning process, it fails to adequately address many questions and concerns about Holtec's plans. These include removal of spent fuel from the fuel pools less than three years before it has cooled sufficiently to move (especially high burn-up fuel, which requires seven or more years of cooling), the lack of rigorous onsite and offsite radiation monitoring needed to protect workers and the surrounding community, superficial remediation of soils contaminated with radioactivity, and no remediation of radioactivity leaking into the groundwater and the Hudson, serious quality assurance, performance and safety problems with Holtec's dry storage system for spent fuel, and Holtec's intention to ship high-level radioactive waste (which may include highly irradiated spent fuel) by barge down the Hudson, past New York City, on its way to its consolidated interim storage facilities (CISF) in New Mexico and others nearby in Texas.

Financial:

The Joint Proposal (JP) does positively address major financial concerns. Holtec International would be required to maintain a minimum balance of \$400 million in the Decommissioning Trust Fund (DTF) for 10 years following the Transaction Closing Date, and a minimum balance of \$360 million in the Decommissioning Trust Fund (DTF) at partial site release from the NRC for costs related to waste management and radiological cleanup. It would be required to return 50% of the funds it recovers from the U.S. Department of Energy for spent fuel management costs to the DTF. However, we are still concerned whether they will have enough funds for spent fuel management.

- Decommissioning Trust Fund (use of for waste storage -- moving from pool to dry cask storage)
- U.S. Department of Energy (DoE) Reimbursement
- Holtec's long-standing, well-documented history of bribery, corruption and malfeasance, questionable financial solvency and history of putting profit over safety

On-site Nuclear Waste Storage: Chances for contamination continue even after Indian Point ceased operation, with nearly 2,000 tons of highly radioactive nuclear waste stored onsite.

- **Thin-Walled Canisters vs. Thick-Walled Casks**
 - There is data indicating that Holtec's thin-walled canisters could be subject to through-wall cracking and failure in as little as 16 years. Yet there is insufficient provision for monitoring, let alone stopping and repairing, radiation leaks from Holtec's dry storage canisters.
 - The NRC [acknowledged](#) in 2014 that once cracks start they can grow through the thin wall and cause component failure in as little as 16 years. High heat loads can also accelerate component failure. The NRC now approves more than doubling previously permitted heat loads for each storage canister, in order to accommodate faster transfer from fuel pools in accelerated decommissioning. It also stopped requiring verification of heat loads. When it approved the Holtec UMAX system of thin-walled, convection-cooled canisters, it did away with the requirement that licensees verify that the cooling is working. Today, as long as the utilities assert that the heat load in each canister is under 30 kW, the NRC doesn't require proof. Monitoring canisters is obviously necessary for safe extended storage or transportation of spent fuel. But given the intense heat and radiation of loaded canisters and the difficulty of transmitting sensor signals, monitoring isn't easy to do, and the NRC has refused to require it. There is therefore no reliable way to know when the canisters might become damaged and fail.
 - A 2019 DOE gap analysis acknowledged that there is currently no way to find cracks in the canisters. Even if there were a way to identify cracks, DOE also admitted there is currently no way to stop them from progressing, or to repair them. It offered no real solutions, and the industry and the NRC has adopted the stance that reparability is irrelevant since the canisters can't fail. In fact, they call such an eventuality "not credible." Speaking about Holtec's canisters at a 2014 San

Onofre Nuclear Generating Station (SONGS) Community Engagement Panel meeting, Holtec CEO Kris Singh said, “It is not practical to repair a canister if it were damaged...if that canister were to develop a leak, let’s be realistic; you have to find it...and then find the means to repair it; we think it’s not a path forward...In the face of millions of curies of radioactivity coming out of canister; we think it’s not a path forward.”

- An overpack will not solve this problem. Even if an overpack were brought to the site and a damaged canister could be inserted into it, it would not stop radiation leakage, independent experts say.
- **Spent Fuel Management:**
 - Holtec’s lack of experience doing decommissioning is concerning and requires vigilance. Note: Other decommissioning companies exist, including Energy Solutions and NorthStar, and may be using safer practices.
 - Rushing High Burnup Fuel (HBF) to Dry Cask Storage (DCS), also called Independent Spent Fuel Storage Installation (ISFSI), is also very concerning. The industry safety standard for moving conventional spent fuel is 5 years, not 3 or 2.5 which Holtec envisions in the PSDAR. 60% of Indian Point’s Spent Nuclear Fuel (SNF) is HBF; the safety standard for moving HBF is 7 years or more. Holtec has perverse incentives to move SNF much faster than is safe in order to ship it to its CISF in New Mexico, which it expects to be fully licensed in 2023. Transport of SNF by barge and/or road and rail creates a host of unsolved safety dilemmas for our region as well as for communities along the transport routes, and the CISF host community in New Mexico.
 - The JP does not address the configuration of the ISFSI, e.g., whether it will stand on a concrete pad in a “bowling pin” configuration with clear sight lines, which make it more vulnerable to attack, or whether it will be bermed or otherwise shielded. We assume Holtec plans the former because it’s less expensive, but this falls well short of the best practice of **hardened onsite storage (HOSS)** and/or hardened storage buildings, and is far inferior to systems used in Germany, Switzerland, and other countries. Using HOSS and other best practices would prevent further site contamination and reduce danger to the surrounding communities. (See Ben Wealer reference in Resources, and experts such as Arjun Makhijani and Gordon Thompson.)
- Especially given Indian Point’s location, with 20 million people living or working within a 50-mile radius, we believe the State should have a role in requiring best practices for onsite storage of Indian Point’s 2,000 metric tons of spent fuel.

Algonquin Pipeline: Under what conditions should this be shut down to prevent compromising the pipeline, detecting a leak or other dangerous condition?

- The JP states that “Holtec acknowledges the presence of the Algonquin Gas Transmission Company interstate gas transmission pipelines that traverse the Site as well as the Algonquin Incremental Market line in the vicinity of the Site,” and that it will notify the New York State Department of State (DPS) and pipeline operator Enbridge five days prior to activities that may impact the pipelines, such as excavation, spent fuel handling, or heavy crossings, and ten days prior to dredging, blasting or other explosive demolition. This is an improvement over Holtec’s previous representations, for example when it [told](#) the Cortland Town Council in February 2020 it knew nothing about the Algonquin pipeline or how it would affect decommissioning. But the provisions in the JP regarding the pipeline are still inadequate to protect the public. No matter how many days’ notice Holtec gives, continuing to operate the pipeline compounds significant radiological and other risks of decommissioning. High-level radioactive waste and high-pressure gas pipelines don’t mix.
- In a 2018 [joint letter](#) from DEC, DPS, NYS Department of Homeland Security and Emergency Services (DHSES), and NYS Department of Health (DOH), the State told the Chairman of Federal Energy Regulatory Commission (FERC), “Given the heavy excavator work that will be part of decommissioning,

FERC may need to require Enbridge, Inc. to temporarily cease gas operations during the decommissioning activities that may threaten the pipeline integrity.” We agree.

- Holtec notifying Enbridge of impactful activity is not enough to protect the public. It should also notify New York State agencies and FERC, and they should require pipeline shutdown in advance of these activities.
- Experts on the topic of pipeline safety include Rick Kuprewicz, President of Accufacts!

Monitoring Issues

- It is critical that dust and vapors created during dismantling of the reactors and associated structures and internal equipment be contained.
- There is currently little or no provision in the JP for monitoring and remediating radioactive dust, yet this is a significant risk in decommissioning. For example, in 2009-2010, as Bruce Units 1 and 2 in Ontario were refurbished, more than 500 workers were exposed to radioactive dust and volatilized isotopes while cutting channel tubes that needed replacing. The exposure was due to lack of air monitoring at the location where the work was being done. As far as we know, the same level of monitoring will be used at Indian Point. The exposed workers were not plant employees, but contracted laborers, who inhaled plutonium and other radioactive materials for more than two weeks. They were told they did not need to wear respirators. Bruce Energy had been warned to ensure proper monitoring and that workers use personal protective equipment. They ignored the warning and then covered up the incident. To protect decommissioning workers at Indian Point, air monitoring of dust on-site is crucial. Samples should be processed right away, and workers and state agencies need to be informed of the results immediately.
- Monitoring must be enhanced during decommissioning at site and in surrounding communities.
 - The arrangement that Holtec provides funding to state agencies to monitor decommissioning and onsite management of spent fuel and radioactive waste is appropriate, though the funds are modest and decrease to negligible levels in 2026, a decade before planned partial site release. This information should be publicly accessible in real time, or as soon as it is available.
 - The radiation monitoring provisions in the JP are also inadequate and reflect Holtec’s attitude that no serious radiological incident is possible. Given that decommissioning is likely to release radiation into air and water, rigorous on- and off-site monitoring and timely public notification of any detected radiological release are critically important.
 - The JP stipulates that Holtec Decommissioning International (HDI) will conduct “area” radiation monitoring around the spent fuel pools but it does not say with what kind of equipment or where it will be placed. It provides offsite response organizations with remote access to “agreed upon offsite radiological equipment” but again does not specify type, placement or the number of monitors.
 - Once all the spent fuel is in dry storage and placed on the independent spent fuel storage installation (ISFSI), all active monitoring ceases. The only radiation monitoring of the ISFSI mentioned in the JP is passive monitoring via personal thermoluminescent dosimeter (TLD). There is no provision for monitoring that could actively detect radiation leakage from the dry storage canisters, and currently no provision for repairing cracks or leaks if they were to be detected. Yet there is data indicating that Holtec’s canisters could be subject to through-wall cracking and failure. We need robust, active, ongoing radiation monitoring onsite and offsite, including at area schools, throughout decommissioning and onsite storage of spent fuel at Indian Point. We also need clear, timely public notification of radiation leaks from decommissioning activities and from the ISFSI.

Emergency Response:

- Emergency response training and preparedness must continue after operations cease.
- First responders must be adequately trained and funded. Holtec's agreement to give Westchester County \$50,000 for FY2022 and \$35,000 for FY2023 to help fund emergency preparedness functions is tokenism and inadequate. Although the risk of a meltdown ends when Indian Point's reactors shut down, decommissioning entails significant ongoing risks of radiological release from dismantling and moving radioactive components, excavating radiologically contaminated soil, handling and storing spent fuel, and shipping radioactive waste, including high-level waste offsite. The JP says Holtec will agree to participate in emergency preparedness exercises with first responders as long as spent fuel remains onsite, but it is vague on what these exercises would consist of: "The parties would mutually agree on the type and scale of exercises (e.g., seminar, workshop, tabletop, etc.) Commensurate with site risks, the type and scale of exercises will transition over time."
- Holtec's token payment for emergency preparedness over two years amounts to a declaration that it discounts and ignores any possibility that a serious radiological emergency could occur, but such an emergency is definitely a credible possibility, and the State and County have an obligation to plan for it. Protecting public health and safety and the environment demands a robust, adequately funded and staffed emergency preparedness program for the duration of decommissioning and on-site storage of radioactive waste.
- Not just for Indian Point, but for any community along the transportation routes if moved offsite.
- Dr. Irwin Redlener, Founding Director / Senior Research Scholar National Center for Disaster Preparedness, is a highly recommended expert on this topic.

Post-Shutdown Activities Report (PSDAR): Holtec's Decommissioning Plan

- Indian Point is one of the most contaminated nuclear power plant sites in the country, with documented ongoing leaks of radioactive isotopes into the Hudson and groundwater. Holtec proposes to do nothing to remediate it, only monitor it.
- Soil and groundwater at Indian Point are also heavily contaminated with radioactive isotopes which can easily migrate to surrounding communities.
- Holtec's PSDAR envisions only superficial soil remediation, for example excavating just a few feet under buildings, whereas contamination is likely to go down hundreds of feet.
- Holtec's PSDAR flags its intention to build a dock for shipping high-level waste down the Hudson by barge. This is an extremely dangerous proposition with which Holtec cannot be entrusted. More on that below.
- Waste storage on-site remains a danger due to possible fuel pool fires, failures of Holtec's dry storage system, which is plagued with quality assurance (QA) problems, as well as a track record of near-miss loading accidents when transferring spent fuel.

Just Transition for Workers: It is critically important that Indian Point workers who are not ready to retire be placed, and that those who are ready to retire be given full benefits. As many workers as possible should be retained for their valuable institutional memory.

Transportation Issues

- Barging contaminated materials down the Hudson River through NY Harbor poses a risk to river towns and the greater NYC Metropolitan area.
- Given the DOE's past intentions and route mapping for shipping spent fuel by barge, this could well be part of a plan to ship spent fuel by barge. As noted above, because of its CISF in New Mexico, Holtec has powerful perverse incentives to soft pedal or ignore the safety risks of SNF transport and ship the waste ASAP. For example, its plans utterly ignore the Nuclear Waste

Technical Review Board's recommendation that we spend another decade developing safer transport casks before attempting spent fuel shipment.

- As the high-level nuclear waste is transported across the country, it will continue to threaten the safety of communities along the transport routes, especially EJ populations in under-represented cities and rural areas.

CIS and other EJ issues

- US nuclear waste policies -- including operation and decommissioning of nuclear power plants, transportation and storage of spent nuclear fuel -- disproportionately impacts indigenous communities, Latinx and communities of color in reactor communities, such as those at and surrounding Indian Point, those along transportation routes, and at recipient communities in Tx and NM, which have been exposed to nuclear radiation since the first atomic testing at Trinity in 1945.

Lack of Adequate Independent Site Characterization

We welcome the JP's requirement that Holtec remediate the site to the DEC radiation safety standard of 10 millirems per year rather than the more lax NRC standard of 25 millirems per year. However, the JP leaves it to Holtec to conduct its own site characterization and investigation. This is in Holtec's interest, but not in the public interest.

Indian Point is one of the most contaminated reactor sites in the U.S. Holtec lacks financial or other incentives or the regulatory requirement to conduct comprehensive, objective assessments of the extent of the contamination. Clearwater and national groups including the Natural Resources Defense Council (NRDC) have long argued for independent, third-party site characterization, without which we have no reliable assessment of the degree of contamination at the site, and therefore no reliable baseline for scoping site remediation work to meet State standards for release. NRDC staff scientist Bemnet Alemayehu made this case at a public forum on Indian Point decommissioning, which Clearwater organized in 2019.

Need for Clarity in Reporting to the State

We welcome the JP's new reporting requirements and staff representation provisions that will keep state and local government apprised of decommissioning decisions and progress, and of cost estimates and how the DTF is being spent. This is an improvement over the status quo in which the licensee need not account for its DTF expenditures or report on its decommissioning decisions and actions, except in the most perfunctory terms. But beyond having representation and receiving reports, and beyond enforcing DEC guidance of remediating the site to a safety standard of 10 millirems a year, it's not clear from the JP what actual oversight authority state and local entities will have over Holtec's decisions, and this needs clarity.

Need for Cost/Benefit/Risk Analysis: Congressman Antonio Delgado asked a very relevant question: Which cost more the safest feasible on-site storage or transporting nuclear waste to CIS or a national repository? The National Decommissioning Working Group has done a good deal of research to see how we could get Congress to undertake such a study, factoring in risks associated with each. We hope the DOB will support this important undertaking.

Need for Nuclear Harvesting of reactor and related internals and other components to analyze and understand the effects of aging to develop evidence for deciding on license extension applications, etc.

Replacement Energy

- NYISO and other data show that IP's power will be entirely replaced by renewables and efficiency by 2023.
- However, Holtec has proposed installing Small Modular Reactors (SMRs), which they intend to build at Oyster Creek, and which would effectively renuclearize a closed nuclear site. There is reason for

concern that this is part of Holtec's business model. This is fundamentally incompatible with working to adequately remediate the site by decommissioning. Their prohibitive costs aside, SMRs have disqualifying safety and waste problems. They are essentially small light water reactors with unproven designs, no safety standards, and even worse spent fuel problems than conventional LWRs. SMRs and other "advanced" reactors run on unconventional, higher burn-up fuels, which yield more dangerous spent fuel, and encourage dirty, dangerous reprocessing and a reopening of the nuclear fuel cycle. Renuclearizing the Indian Point site after two decades of work and negotiation to close it equitably should be clearly ruled out.

[NRC Backgrounder on Decommissioning Nuclear Power Plants](#): The process of safely [as *safely as is possible*] closing a [nuclear power plant](#) (or other facility where [nuclear materials](#) are handled) to retire it from service after its useful life has ended. This process primarily involves [decontaminating](#) the facility to reduce residual [radioactivity](#) and then releasing the property for unrestricted or (under certain conditions) restricted use. This often includes dismantling the facility or dedicating it to other purposes. Decommissioning begins after the [nuclear fuel](#), [coolant](#), and [radioactive waste](#) are removed. For additional information, see [Decommissioning of Nuclear Facilities](#) and [Find Sites Undergoing Decommissioning](#).

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Decommissioning (video)

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When a power company decides to close a nuclear power plant permanently, the facility must be decommissioned by safely removing it from service and reducing residual radioactivity to a level that permits release of the property and termination of the operating license. The Nuclear Regulatory Commission has strict rules governing nuclear power plant decommissioning, involving cleanup of radioactively contaminated plant systems and structures, and removal of the radioactive fuel. These requirements protect workers and the public during the entire decommissioning process and the public after the license is terminated.

Discussion: Licensees may choose from three decommissioning strategies: DECON, SAFSTOR or ENTOMB.

Under DECON (immediate dismantling), soon after the nuclear facility closes, equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the NRC license.

Under SAFSTOR, often considered "deferred dismantling," a nuclear facility is maintained and monitored in a condition that allows the radioactivity to decay; afterwards, the plant is dismantled and the property decontaminated.

Under ENTOMB, radioactive contaminants are permanently encased on site in structurally sound material such as concrete. The facility is maintained and monitored until the radioactivity decays to a level permitting restricted release of the property. To date, no NRC-licensed facilities have requested this option.

The licensee may also choose to adopt a combination of the first two choices in which some portions of the facility are dismantled or decontaminated while other parts of the facility are left in SAFSTOR. The decision may be based on factors besides radioactive decay, such as availability of waste disposal sites.

Decommissioning must be completed within 60 years of the plant ceasing operations. A time beyond that would be considered

Experts:

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Resources:

March 20, 2021 Congressional Briefing Video: [Toward an Evidence-Based Nuclear Energy Policy](#)

[BACKGROUND INFORMATION FOR THE EESI CONGRESSIONAL BRIEFING: TOWARDS AN EVIDENCE-BASED NUCLEAR ENERGY POLICY: Gaps in Research, Regulation, Policy, and Practice in the U.S. Nuclear Industry, and What Policymakers Can Do to Bridge Them March 30, 2021](#)