



**Department
of Public Service**

Three Empire State Plaza, Albany, NY 12223-1350
www.dps.ny.gov

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September 12, 2023

VIA EMAIL

Hon. Michelle L. Phillips
Secretary to the Commission
3 Empire State Plaza
Albany, NY 12223-1350

Re: Matter No. 21-01188 – In the Matter of the Indian Point Closure Task Force and Indian Point Decommissioning Oversight Board.

Dear Secretary Phillips:

Please accept for filing in the above-captioned matter, Holtec Decommissioning International's responses to July 2023 Indian Point Decommissioning Oversight Board public forum questions. Should you have any questions regarding this filing, please contact me. Thank you.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Tom Kaczmarek".

Tom Kaczmarek
Executive Director
Indian Point Closure Task Force
Indian Point Decommissioning Oversight Board

1. **Do Holtec employees and contractors get paid to attend DOB meetings?**

No. Holtec employees and supplemental personnel (i.e., contractors) attend on their own time without compensation.

2. **Are there any available job retraining programs for former employees at Indian point, to retrain them on working with Solar or Wind energy equipment?**

A job fair was held on site on August 16th where 24 vendors from various local industries and utilities were available to IPEC employees to seek job opportunities. The companies that attended do incorporate wind and solar generation in their portfolios.

In addition, Holtec International is very interested in retaining employees either in the upstart SMR program and / or the Palisades Nuclear Plant re-start project. The job fair was a joint venture between the NYS DOL and Holtec Human Resources Department.

3. **Please provide the chemical and radiological content of the prior to treatment and then treated effluent, including levels of PFAS, PFOS, PCBs, Boron, Tritium, Krypton-85, Krypton-85m, Cesium-137, Strontium-90, Carbon-14. Please provide the % which was filtered, and the amount of picocurie of each radionuclide in the effluent.**

Pretreated sampling and analysis are conducted as part of the effluent program at the Site. However, the data is not collated to provide a simple comparison to the releases presented in the Annual Radioactive Effluent Release Reports.

HDI does have post-release data that shows the actual amounts released and reports on the proximity to USNRC release limits annually for radionuclides and as required by SPDES permit NY#0004472. This data is presented in the Annual Radioactive Effluent Release Reports and is publicly available here: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

IPEC is prohibited from releasing PCBs from any liquid effluent as noted in Special Condition #24 of SPDES permit NY#0004472.

IPEC does not sample for PFAS or PFOS nor is it required. Either compound is most likely not present in spent fuel or reactor pools due to the very robust chemical control program employed at the Site.

4. **What is the depth of material that will be scraped off the sides of the spent fuel pools?**

Material will not be scraped off the Spent Fuel Pool walls. Decontamination of pool walls will be done after the pools have been drained and will most likely involve pressure washing or the application of removable coatings which only flushes away or sloughs off surface debris. Chemically, removed material will be principally borated salts and metal oxides that are no different than what would be found on any industrial stainless steel tank containing water. Radionuclides would be essentially the same mix as that found in the water. Any solid material will be disposed of as solid radioactive waste in accordance with all required regulations.

5. **Will the scraped materials be included in the effluent being proposed to be dumped into the Hudson River?**

Refer to Question #4. To clarify and educate, Holtec properly treats and discharges effluents in accordance with applicable site procedures as well as Federal and State regulations.

6. **What is the chemical and radioactive composition of the scraped off materials?**

Refer to Question #4. To clarify and educate, Holtec properly treats and discharges effluents in accordance with applicable site procedures as well as Federal and State regulations.

7. **How is the scraped off materials disposed?**

Refer to Question #4. Solid material is disposed of as solid radioactive waste in accordance with all required regulations.

8. **Has the ground around the reactor containment areas and spent fuel pools been tested for radiation? Please provide test results.**

Not at the present time. IPEC will utilize the guidance outlined in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) to perform Radiological Site Characterization in preparation for License Termination. MARSSIM is a guidance document developed by various United States government agencies, including the Environmental Protection Agency (EPA), the Department of Defense (DoD), the Department of Energy (DOE), and the Nuclear Regulatory Commission (NRC) and provides detailed guidance for planning, implementing, and evaluating environmental and facility radiological surveys

conducted to demonstrate compliance with a dose- or risk-based regulation. The MARSSIM guidance focuses on the demonstration of compliance during the final status survey following scoping, characterization, and any necessary remedial actions.

9. **What testing has been done on the content of the scraped off materials?**

Refer to Question #4.

10. **Do we know if spent fuel water contains PFAS? If not, when will we know?**

IPEC does not sample for PFAS or PFOS nor is it required. Either compound is most likely not present in spent fuel or reactor pools due to the very robust chemical control program employed at the Site.

11. **What is the % of the amount of krypton-85 that will be filtered out of the effluent from spent fuel pools and reactors #2 and 3?**

Kr-85 is a fission gas and is not filtered out during liquid waste processing. Kr-85 is not detected in the Fuel Pools and is not present in the most recent Annual Radioactive Effluent Release Reports which is publicly available here:

<https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

12. **What is the total amount krypton-85 and krypton-85m in gallons and curies in spent fuel pools and reactors #2 and #3?**

Refer to Question #11.

13. **What is the total amount of krypton -85 and krypton-85m that has already been released from Indian Point during its operations?**

This data is in Annual Radioactive Effluent Release Reports and is publicly available here:

<https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

14. **What is the total amount of krypton-85 and krypton-85m that has already been released since decommissioning started?**

Negligible. This data is in Annual Radioactive Effluent Release Reports and is publicly available here: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

15. **What is the total amount of krypton-85 and krypton-85m that remains on the Indian Point site?**

The majority (>99%) of any remaining Kr-85 and Kr-85m are inside the fuel elements. All spent fuel is expected to be transferred to the ISFSI pad by the end of 2023 and the Kr radioisotopes will be fully contain within the sealed fuel canisters (i.e. the MPCs). Indian Point will not generate additional amounts of krypton-85 or krypton-85m since the reactors are shut down.

16. **Why was 21% of the krypton-85 not filtered out of the Indian Point #1 effluent?**

Kr-85 is a fission gas and is not filtered out during processing of liquid effluents. The ~21% reduction is a result of additional water inventory that was added for dilution to the Unit 1 fuel pool in preparation for processing and draining.

17. **Can 100% of the krypton-85 and krypton-85m be filtered from the effluent? If so how? And if so what is the cost?**

Historically, these noble gases have been of negligible or zero concentrations in our effluents and therefore there is no practical need or mechanism to remove them. Additionally, there are presently no detectible concentrations of these isotopes in the effluents as documented in the most recent Annual Radioactive Effluent Release Report. This data is publicly available here: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

18. **What is Holtec’s plan to clean up radionuclides from the fractured bedrock under Indian Point which has been previously acknowledged by the NRC to contain large quantities of leaked and untreated radioactive effluent?**

This is part of the regulated decommissioning process and will occur as necessary following the guidance in MARSSIM. Removal of radionuclides from bedrock fractures has been done at other nuclear sites via physical excavation and other means. This will occur here to ensure we meet the required regulatory limits we have agreed to with NRC and NYS.

19. **How much of the untreated nuclear effluent leaked into the fractured bedrock remains on the Indian Point site?**

In 2008, the results of a two-year comprehensive hydrogeologic site investigation was conducted by GZA GeoEnvironmental, Inc. The results of the investigation are available to the public here: <https://www.nrc.gov/docs/ML0803/ML080320600.html>

This will be further evaluated during NRC required radiological site characterization following the guidance in MARSSIM.

20. **How much will clean up the leaked radioactive effluent into the fractured bedrock at Indian Point cost?**

In 2019, HDI developed a Post Shutdown Decommissioning Activities Report (PSDAR) for IPEC. This HDI DECON PSDAR was submitted to the NRC and describes HDI’s decommissioning plan and includes HDI’s DECON Site Specific Decommissioning Cost Estimate (DCE). The information is publicly available here:

<https://www.nrc.gov/docs/ML1935/ML19354A698.pdf>

21. **How long will clean up of the leaked radioactive effluent into the fractured bedrock at Indian Point take?**

In 2019, HDI developed a Post Shutdown Decommissioning Activities Report (PSDAR) for IPEC. This HDI DECON PSDAR was submitted to the NRC and describes HDI’s decommissioning plan and includes HDI’s DECON Site Specific Decommissioning Cost Estimate (DCE). The information is publicly available here:

<https://www.nrc.gov/docs/ML1935/ML19354A698.pdf>

22. **Has Holtec submitted an application to the NRC for any storage tanks at Indian Point? If so when, and please provide the application.**

No. The NRC is not the governing body to approve construction of storage tanks on site. In addition, it has been stated at DOB meetings that permits for installation of temporary water storage tanks at IPEC would not be approved.

23. **Has Holtec submitted any applications to the NRC for storage tanks at any other facility? If so when, and please provide the applications and decisions.**

Information regarding Holtec is available on the company website. Inquiries of the other Holtec sites can be found there and contact information is provided to address non-IPEC related questions.

24. **For how many years has Holtec guaranteed that spent fuel casks will not leak? Please provide the guarantee.**

The design life of the HI-Storm System is 60 years. This is accomplished by using materials of construction with a long-proven history in the nuclear industry and specifying materials known to withstand their operating environments with little to no degradation. An Aging Management Program (AMP) is implemented to ensure the service life of the HI-Storm will exceed its design life of 60 years, much like an operating nuclear facility performing the correct preventive maintenance tasks which would support life extension.

The goal of the AMP is to ensure that the integrity of the HI-Storm 100S system is maintained and to initiate corrective actions if needed. Aging Management Activities are performed in accordance with the site Quality Assurance Program to ensure requirements for inspections, inspectors, evaluations, follow-up inspection actions, instruments calibration and maintenance, record retention, and document control are completed in accordance with the program. Inspection results shall be documented and made available for NRC inspection upon request.

The AMP is first implemented after the first cask is on the ISFSI Pad after a 20-year interval based on the regulations stated above. For IPEC, the first cask was placed on our ISFSI Pad in January of 2008. The AMP for IPEC will therefore start in the 4th quarter of 2027.

Information on the Aging Management Program implemented at IPEC for the Hi-Storm 100 was previously provided to the Decommissioning Oversight Board in a letter dated September 13, 2022 and is publicly available here:

<https://dps.ny.gov/system/files/documents/2022/10/indian-point-dob-faqs-2022-july-part2pdf.pdf>

25. **Have any of Holtec spent fuel casks leaked, at Indian Point or at any other site?**

There are no damaged, cracked, or leaking canisters at any nuclear plant using Holtec's spent fuel storage systems. The Holtec canisters (MPC's) are designed to meet or exceed the standards set forth by the NRC. The materials, fabrication procedures, and personnel qualifications are closely controlled to ensure high and reproducible quality. Using these tenants, the NRC approved and certified Holtec's technology. The MPC's themselves are subjected to multiple tests in the factory including radiography and leak testing before they are sent to their respective nuclear plants for use. At the plant, the spent fuel is loaded into MPC's, and the lids are robotically welded and then subjected to several tests including liquid penetrant and Helium leak testing. MPC's are required to pass all tests prior to being placed into storage. Holtec's testing of MPC's that have been in service for several years at other nuclear facilities has resulted in zero abnormalities found, again lending credence to Holtec's fabrication standards and practices. This information was previously provided to the Decommissioning Oversight Board in a letter dated September 13, 2022 and is publicly available here:

<https://dps.ny.gov/system/files/documents/2022/10/indian-point-dob-faqs-2022-july-part2pdf.pdf>

26. **What is the projected rate of leakage or damage of the spent fuel casks?**

The Holtec International HI-STORM 100 System for dry spent nuclear fuel storage consists of these major components (Note: Below is not all a list of all the components of the Hi-STORM 100 System, only components related to this question are provided to prevent confusion):

1. A multi-purpose canister (MPC) that contains the fuel.
2. The steel and concrete overpack (HI-STORM) that provides natural ventilation heat removal, radiation shielding, and structural protection for the MPC during storage operations.
3. The ISFSI concrete storage pads on which the loaded overpacks (HI-STORMs) are placed for long-term storage operations.

The design features of the HI-Storm System are intended to meet the following principal performance characteristics under all credible modes of operation:

- Maintain subcriticality.
- Prevent unacceptable release of contained radioactive material.
- Minimize occupational and site boundary dose.
- Permit retrievability of contents.

The HI-STORM 100 confinement boundary is the MPC, which is a high integrity pressure vessel designed and constructed to be **leak tight**. In other words, there are no seals or gaskets used on the fully welded MPC confinement system. As discussed in HI-STORM FSAR Chapters 7 and 11, there is no credible leakage from the confinement boundary during accident conditions and the vent and drain port cover plate welds are field leak tested to a “leak tight” acceptance criterion in accordance with ANSI N14.5. Therefore, there is no effluent dose contribution to the calculated normal, off normal, or accident offsite accident dose from the ISFSI.

Furthermore, the HI-STORM 100 is a completely passive system with appropriate margins of safety; therefore, it is not necessary to deploy any instrumentation to monitor the cask in the storage mode.

Finally, the HI-Storm AMP uses inspections for indication of deterioration that could affect the ability of the overpack to perform its important-to-safety functions. The following is assessed with the inspection of the HI-Storm:

- Lid studs and nuts or lid closure bolts, as accessible, and
- The accessible Overpack body and lid painted surfaces, and
- Vents, and
- ISFSI concrete portions adjacent to the HI-Storm shall be visually inspected for evidence of degradation (staining or rust). (Note: Independent of Aging Management, Operations Department personnel inspect each cask once per shift to ensure the vents on the bottom of each cask and the top of each cask are free of debris)

27. Are radioactive releases from the spent fuel casks monitored? If so how?

Yes, all nuclear power plants in the United States that are licensed by the Nuclear Regulatory Commission (NRC) are required to have an Offsite Dose Calculation Manual (ODCM). The ODCM is a document that describes the methodology and parameters used to calculate the doses of radiation that people living near the plant could receive from radioactive releases. The ODCM must be approved by the NRC before the plant can begin operating.

Indian Point Energy Center is subject to limits on radioactive waste releases that are set forth in the Offsite Dose Calculation Manual (ODCM), Parts I and II, as defined in the Technical Specifications. ODCM Part I, also known as the Radiological Effluent Controls (or RECS) contains the specific requirements and controls, while ODCM Part II (calculation methodologies) contains the details necessary to perform offsite dose calculations from the sampling and monitoring outlined in the RECS. The ODCM for IPEC specifies limits at and beyond the site boundary which includes the HI-STORMS on the ISFSI.

40CFR190 requires the reporting of total dose, including that of direct shine. Direct shine dose from sources other than dry cask are indistinguishable from background. Direct shine dose is determined from TLDs near the dry cask area and site boundary, compared with REMP TLDs and historical values, and corrected with occupancy factors to determine a bounding, worst-case assessment of direct shine dose to a real individual.

This information is documented in the Annual Radioactive Effluent Release Reports submitted by IPEC annually and is publicly available here:

<https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ip2-3.html>

28. **Specify, exactly what delays in decommissioning Indian point would occur, if any, in the event the radioactive tritium is stored onsite in storage tanks until the end of the decommissioning process?**

Holtec is currently evaluating.

29. **Is the crane at Indian Point #3 able to lift the casks with a water jacket? At San Onofre the pool crane could not handle the extra weight and the NRC allowed Holtec to lift fuel assemblies without it, even though that violates NRC safety regulations?**

Yes.

30. **Has a cost analysis been done regarding alternatives to managing nuclear tritiated waste effluent and nuclear by-products? If so please provide. If not, why not?**

No. The HDI DECON PSDAR that describes HDI's decommissioning plan and includes HDI's DECON Site Specific Decommissioning Cost Estimate was based on the ability to discharge effluents as allowed by the ODCM and SPDES permit. The PSDAR is publicly available here: <https://www.nrc.gov/docs/ML1935/ML19354A698.pdf>

31. **How much would onsite storage in approved storage tanks costs?**

This has not been estimated. In addition, it has been stated at DOB meetings that permits for installation of temporary water storage tanks at IPEC would not be approved.

32. **Has Holtec previously decommissioned a nuclear facility the size of Indian Point? If so where and how much did it cost?**

Holtec provides a number of nuclear services worldwide, all of which are noted on the company's website.

33. What special equipment for first responders for a radiological emergency has Holtec purchased and when?

Instrumentation was purchased by previous owners of IPEC for Hudson Valley and Phelps Hospitals. Gamma detectors and friskers are calibrated by HDI personnel and equipment is replaced by HDI as needed. HDI Radiation Protection technicians provide support as needed.

34. What are the dates and exercises of Indian Point Eight-Year Exercise Cycle Plan? When was the last “complete call out” of the ERO done as described in Section B of the Holtec Emergency Plan?

The current eight-year cycle ends in 2029, or when the site enters Fuel on Pad Protected (FOPP) which is currently scheduled to be at the end of 2023.

IPEC is scheduled for an emergency plan exercise with New York State on November 15, 2023.

The current HOLTEC emergency plan requires an off-hour call out drill to be performed quarterly. The last test was performed on June 6, 2023. The next test date is confidential.

The last off-hours response test (a.k.a. “touch the wall”) was completed on 11/18/2015 for the previous eight-year exercise cycle, which ended in 2021. If IPEC were still operating, the next test would need to be completed by 2029. We are not scheduled to have another “touch the wall” test prior to the implementation of the next EPLAN.

See question #38 for additional drill dates.

35. What is the date of the biennial emergency response that tests the plant’s emergency plan and activation of the major systems of outside agencies?

IPEC completed the biennial NRC/FEMA evaluated exercise on November 15, 2022. New York State, Westchester, Rockland, Orange and Putnam Counties all participated in the exercise.

The next exercise is tentatively scheduled for November 15, 2023 with the same Participants.

36. **What are the dates of the Combined Functional Drills and name what these are, the “scenario packages”?**

Scenario packages are defined as a way to complete a drill. These are not required drills but are training drills used to improve ERO performance in the past (Muster drills/ Turnover drills). In the current EPLAN, these types of drills (Muster/Turnover drills) are no longer required. Instead, Functional drills have been completed for personnel changing ERO roles, but “scenario packages” are no longer needed. It is important to note that based on the energy remaining in the Spent Fuel Pools, as of August 1, 2023, E-Plan guidance no longer requires evacuation or shelter in place.

37. **What are the dates in the past 1.5 years of the following tests:**

- **Monthly: Radiological Emergency Communication System (RECS) links between the Control Room, EOF/AEOF and the State and four county Warning Points?**

1/12/2022, 2/9/2022, 3/9/2022, 4/13/2022, 5/11/2022, 6/8/2022, 7/13/2022, 8/10/2022, 9/14/2022, 10/12/2022, 11/9/2022, 12/14/2022, 1/11/2023, 2/9/2023, 3/8/2023, 4/12/2023, 5/10/2023, 6/14/2023, 7/12/2023, 8/9/2023

- **Monthly: The Emergency Notification System**

1/25/2022, 2/21/2022, 3/14/2022, 4/25/22, 5/17/2022, 6/9/2022, 7/28/2022, 8/19/2022, 9/28/2022, 10/18/2022, 11/16/2022, 12/14/2022, 1/9/2023, 2/20/2023, 3/22/2023, 4/28/2023, 5/31/2023, 6/6/2023, 7/19/2023

- **Quarterly: The Department of Energy Radiological Assistance Program either by the state or federal program?**

The Radiological Assistance Program (RAP) is a first responder organization for assessing radiological incidents and providing aide if necessary.

- **Quarterly: The Radio Communication link between Emergency Operations Facility, the Control Rooms, and the off-site survey team vehicles?**

2/9/2022, 6/8/2022, 9/15/2022, 11/15/2022, 3/16/2023, 6/27/2023

38. **What are the dates of the drills/exercises in the last 1.5 years for:**

- **Indian Point Fire Brigade**

Fire Brigade Drills are completed annually for all Operations personnel. Dates of these drills are maintained by HDI and are business confidential. Note that the site Fire Protection Program is reviewed and assessed periodically by NYS.

- **Medical Emergency Personnel Drills**

9/12/2022, 9/21/2022, 10/5/2022

Scheduled for this year: 9/27/2023, 11/29/2023.

- **Radiological Monitoring Team**

5/18/2022, 11/15/2022

- **Radiation Protection Drills**

4/26/2022, 7/21/2022

Scheduled for this year: 9/27/2023, 11/29/2023.

- **Augmentation Drills**

6/14/2022, 9/21/2022, 12/13/2022, 3/15/2023, 6/6/2023

See question #34 about "Touch the wall drill".

39. **Is there documentation of the ERO and Site Manager meeting with First Responders in Buchanan, Verplanck, Cortlandt and Peekskill? Records of who attended and the date? Did this training include a full coordinated response of all first responder agencies: fire, ambulance, medical providers (with radiological precautions), law enforcement providers?**

There have been various meetings with various groups. Some of these meetings were tabletop exercises or training classes.

Records of attendance and meeting notes are kept by HDI.

40. **Nuclear Independent Oversight (NIOS) - would the NRC and Holtec be able to provide a record of the assessment (audit) of the emergency preparedness program?**

In accordance with applicable procedures and regulations, all emergency drills are critiqued with improvements captured in our CAP program. One would have to contact the NRC to review any potential records they have, however, they are actively involved in the critique process for those exercise drills they participate in. In addition, one can contact the leaders of the 4 counties who participate in exercise drills to provide assessment and audit records they may retain.

41. **What are the results of oversight from the Onsite Safety Review Committee of: Plan and procedure revisions; drill/exercise result; and audit inspection results?**

The OSRC reviewed License Based documents (EPLAN), meeting notes are kept by HDI. The OSRC has not reviewed the results of drill/exercise results, etc.

The NRC completed an inspection in November of 2022. No issues were identified during the inspection.

Drill report was completed by HDI.

42. **Can Holtec please outline that these positions are operative at the Decommissioning site: the Emergency Director, the Security Coordinator ICP with the NY State Police, the Emergency Plant Manager, the JIC Manager, the Radiological Assessment Coordinator, and the Radiation Protection Technician(s)?**

In the current EPLAN (22-01 Rev. 31), all positions are maintained as required.