



NJDEP OYSTER CREEK NUCLEAR REACTOR DECOMMISSIONING FAQs

The Oyster Creek Nuclear Generating Station in Lacey, Ocean County, owned and operated by Exelon, began service in 1969. The 625-megawatt boiling-water reactor is the nation's oldest operating commercial nuclear power plant. It is shutting down this year, 10 years ahead of the expiration of its U.S. Nuclear Regulatory Commission license. The following FAQs answer common questions about the New Jersey Department of Environmental Protection's role in the decommissioning process.



What role will the DEP have in the decommissioning of the Oyster Creek Generating Station? What presence will the DEP have while the decommissioning process takes place?

The DEP's Bureau of Nuclear Engineering is comprised of three sections: The Nuclear Engineering Section, the Nuclear Environmental Engineering Section and the Nuclear Emergency Preparedness and Response Section. The Bureau of Nuclear Engineering and all its sections will have a role after the shutdown of the Oyster Creek Generating Station and in the plant's decommissioning.

- **Nuclear Engineering Section**

An agreement between the DEP and Exelon Generating Company LLC provides for the continuance of unescorted access for authorized Bureau of Nuclear Engineering personnel to all Oyster Creek protected and owner-controlled areas. Exelon will continue to provide an on-site Bureau of Nuclear Engineering office and access to work activities, reports and plant data. The Bureau of Nuclear Engineering will continue to review decommissioning activities at Oyster Creek and make periodic visits on an as-needed basis to the Oyster Creek site. This will include being on-site during selected United States Nuclear Regulatory Commission inspections. During these periodic visits, Bureau of Nuclear Engineering personnel will observe the ongoing decommissioning activities and processes. Exelon will provide the Bureau of Nuclear Engineering with copies of all formal submittals related to decommissioning and decommissioning reports to outside agencies. The Bureau of Nuclear Engineering has and will continue to

review these submittals and reports and provide any comments to the appropriate organizations.

- **Nuclear Environmental Engineering Section**

The Nuclear Environmental Engineer Section will ensure that the Oyster Creek Site is decommissioned in a manner that is protective of the environment and the health and safety of the public and in accordance with all federal, state, and local environmental regulations. The DEP's Nuclear Environmental Engineering Section will ensure that Exelon's plans for environmental monitoring after shutdown are sufficient and provide feedback to both Exelon and the NRC as necessary. The Nuclear Environmental Engineering Section will continue its own environmental monitoring program associated with the Oyster Creek Station to provide independent verification of the results of Exelon's monitoring program.

The Nuclear Environmental Engineering Section also will participate in the environmental sampling that will be performed to ensure that any residual radioactive material found at the site is within federal and state limits. This will include reviews of Exelon's sampling results as well as independent analyses of samples by Bureau of Nuclear Engineering's contractor laboratories to verify Exelon's results. Nuclear Environmental Engineering Section engineers also will conduct site visits on a regular basis during the decommissioning process and will be observing selected inspections performed by the NRC.

- **Nuclear Emergency Preparedness Section**

New Jersey State Police Office of Emergency Management and the DEP's Bureau of Nuclear Engineering will continue to implement the state's Radiological Emergency Response Plan as required by the New Jersey Radiation Accident Response Act (*N.J.S.A. 26:2D-37, et seq.*) until all the spent fuel is transferred into dry-cask storage. Exelon will continue to support state efforts in implementing the Radiological Accident Response Act as outlined in its agreement with the DEP.

When will Oyster Creek officially stop generating power?

Exelon's Post Shutdown Decommissioning Activities Report states that Oyster Creek will cease permanent operations on Sept 17, 2018.

What are the primary safety concerns involved in decommissioning? Is there a danger of radioactive releases to the environment during the decommissioning process?

According to Exelon's Post Shutdown Decommissioning Activities Report, the reactor will be defueled by approximately Sept. 30, 2018, and all off-loaded spent fuel will be stored in the spent-fuel pool. After sufficient cooling, the spent fuel will be transferred to dry casks and stored on-site at the Independent Spent-Fuel Storage Installation. The process for defueling the reactor, storage of the spent fuel in the pool and transfer to the Independent Spent-Fuel Storage Installation is the same process that Oyster Creek has used while in operation and therefore provides no additional operational risk. The risk of a radioactive release is

significantly reduced after permanent shutdown of the reactor. This risk is further reduced as the fuel cools in the spent-fuel pool and even further reduced when the fuel is moved into dry-cask storage.

How long will it take for the spent-fuel rods in the spent-fuel pool to cool sufficiently to move them into dry-storage casks? How long will it take for all the fuel rods to be moved into dry storage casks?

Typically, spent fuel can be transferred after five years of cooling in the spent-fuel pool. Site specific conditions may allow for earlier transfer into dry casks. According to the schedule provided by Oyster Creek to the NRC, all spent fuel will be moved into the dry storage casks by March 2024.



How do you know the dry-cask cask systems are safe? Does the NRC inspect these casks?

The NRC is responsible for reviewing the cask designs to ensure that they will provide a confinement barrier to the fuel before they are licensed and certified for use. The NRC reviews the testing, manufacturing, and maintenance of casks used in dry storage. The NRC is also responsible for inspection of dry-cask storage systems. Before casks are loaded, the NRC inspectors observe a dry run at the site and the

initial cask loadings. After the casks are placed on the Independent Spent Fuel Storage Installation, the NRC performs periodic inspections of the casks. The licensee conducts their own periodic inspections according to its procedures.

How do you know the spent-fuel pools are safe? How long can you store the spent fuel in the pool?

The spent-fuel pools are robust, constructed of reinforced concrete several feet thick, with steel liners. The water in the pool is about 40 feet deep, which helps in both shielding and cooling of the spent-fuel rods. The spent-fuel pools are designed to withstand a design-basis seismic event. The spent fuel in the spent-fuel pools can be stored safely for at least 30 years.

Exelon is reducing staff and emergency preparedness personnel after decommissioning. Will the reduced staff be able to respond to onsite emergencies?

The risk of a large offsite radiological release at a decommissioning power reactor storing fuel in the spent-fuel pool is lower than from an operating power reactor. Because of the lower risk from a decommissioning power reactor, licensees typically make a case for an exemption from some emergency preparedness requirements to the NRC. Exelon has submitted Exemption Requests to reduce emergency preparedness staffing to the NRC. The NRC will review the submittal to ensure the reduced staff can perform their functions adequately and provide reasonable assurance that the health and safety of the public will not be affected by the reduced staffing.

How long will the NRC Resident Inspector be present at Oyster Creek during decommissioning?

The NRC Resident Inspector will be present for several months after the plant shutdown. Additional NRC staff will be present for specific inspections during shutdown, spent-fuel transfer to the spent-fuel pool and other decommissioning activities as required.

How long will the dry casks be stored on the Independent Spent Fuel Storage Installation pad? When will U.S. Department of Energy accept the fuel? Can the NRC expedite the Department of Energy's fuel move to either a permanent repository or a consolidated interim storage facility?

Currently all dry-cask designs are issued a Certificate of Compliance by the NRC that is valid for 20 years and may be extended in 20-year increments. The U.S. Department of Energy will accept the spent nuclear fuel as soon as either a permanent repository or a consolidated interim storage facility is approved. Currently, there are no licensed facilities that can accept spent nuclear fuel for either interim or long-term storage. The NRC has no legal or regulatory authority to expedite the process.

How does the NRC ensure that Exelon will have sufficient money in their decommissioning funds? What happens if they sell the plant to a third party?

The regulations require that all licensees submit a decommissioning trust fund report to the NRC at least once every two years. The NRC has placed regulations regarding the amount of money that can be used from the decommissioning trust fund at various stages of the decommissioning process. The NRC reviews the licensee's decommissioning trust fund report to ensure that the licensee has enough money to complete decommissioning. During the sale of the power plant, the potential owner will have to submit a License Transfer Application report to the NRC for review and approval. The License Transfer Application should provide financial assurance that the potential owner can complete the decommissioning process by the NRC regulations.

Are the current casks on the Independent Spent-Fuel Storage Installation safe to be transported to a final repository?

The current casks on the Independent Spent-Fuel Storage Installation can be transferred to a transportation cask specifically designed for transportation. The design, construction, use and maintenance of the transportation casks are also regulated and licensed by the NRC. The casks are designed to withstand a series of tests that simulate similar accidents during normal conditions of transportation, including drop, puncture, immersion and fire-accident tests.

Will there be continued environmental monitoring at the site during decommissioning process?

Yes. The radiological environmental monitoring program that was in place at the plant will continue after the plant is shut down. The program will be modified to appropriately monitor the types of releases that may occur during decommissioning and to monitor results at appropriate intervals. The DEP will continue to collect and analyze environmental samples

throughout the decommissioning process to ensure that there are no adverse impacts to public health and safety or the environment.

Will the Continuous Radiological Environmental Surveillance Telemetry System remain after Oyster Creek shuts down?

Yes. The 19 monitoring stations around Oyster Creek will remain and continue to read minute-by-minute radiation and meteorological conditions in the environment. The monitoring system will remain in place as it currently exists until all fuel is moved to dry casks at the Independent Spent-Fuel Storage Installation. At that point, a reduced network of monitors that provides continuous monitoring at the Independent Spent-Fuel Storage Installation would be appropriate until all spent-fuel casks are removed from the site.

Once Oyster Creek is shut down, will the Nuclear Regulatory Commission continue to conduct routine Radiological Environmental Monitoring Program Inspections?

The Radiological Environmental Monitoring Program will continue once the plant is shut down and enters decommissioning. The Radiological Environmental Monitoring Program can be modified by the licensee to appropriately monitor the types of releases that may occur during



decommissioning and to monitor results at appropriate levels. Under the NRC's inspection program for decommissioning nuclear power plants (*Inspection Manual 2561 and specifically Inspection Procedure 84750*), Radiological Environmental Monitoring Program inspections will be performed annually during decommissioning. The New Jersey Bureau of Nuclear Engineering will be observing these inspections.

Exelon has announced the sale of Oyster Creek to Holtec International, a company specializing in decommissioning nuclear reactors. Does the DEP

have any concerns with the sale? If so, is there anything preventing Exelon from doing so?

The DEP has no regulatory authority to preclude Exelon from selling the site. The NRC is the regulatory body that would evaluate the potential transfer of the license to Holtec for the purposes of decommissioning. Should the NRC find that Holtec is suitable and qualified to assume the site decommissioning license, the DEP would not object, providing Exelon requires and Holtec agrees to assume all the rights, obligations and liabilities contained in the agreement between the DEP and Exelon.

What is Holtec International?

Holtec International, based in Jupiter, Fla., is a diversified energy technology company that offers nuclear-energy decommissioning and nuclear-fuel and waste-management services. The firm recently built a 260-acre technology center in Camden, N.J. For more information, visit <https://holtecinternational.com/>

Who must review and approve the Exelon license transfer to Holtec?

The U.S. Nuclear Regulatory Commission must approve the indirect transfer of control over Oyster Creek and the transfer of the facility operating license to Holtec.

What benefits may result from an earlier decommissioning?

Accelerating the decommissioning schedule to achieve site restoration will allow the site to be released decades sooner for alternative development and create decommissioning-related jobs and economic activity many years sooner, with benefits for the local economy.

When will the ownership transaction be completed?

According to preliminary reports, Exelon is expecting to complete the sale of Oyster Creek to Holtec by the third quarter of 2019.

A tritium leak occurred at Oyster Creek a few years ago. How much tritium has traveled into Barnegat Bay from that leak?

Tritium is both naturally occurring and a byproduct of nuclear power generation. It emits a weak form of radiation. The NRC imposes strict limits on the amount of tritium and other radioactive material that nuclear power plants can release to the environment. Those release limits are designed to ensure the health and safety of the public and to protect the environment. The tritium leaked from Oyster Creek to the Barnegat Bay was a minute fraction of NRC release limits. Routine monitoring of the water in the discharge canal and Barnegat Bay have found no incidents of elevated tritium levels.

In the nearly 50 years Oyster Creek has been in operation, how much radiation has entered the environment?

The NRC imposes strict limits on the amount of radioactive material that nuclear power plants can release to the environment. Those release limits are designed to ensure the health and safety of the public and to protect the environment. To demonstrate compliance with those limits, all nuclear power plants are required to submit annual radioactive effluent release reports to the NRC. Those reports provide a very detailed accounting of the amounts of radioactive material released to the atmospheric and aquatic environments during the year. The annual radioactive effluent release reports for the Oyster Creek Nuclear Generating Station can be accessed on the NRC's website at www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/oc.html.

The DEP's Bureau of Nuclear Engineering maintains an independent radiological environmental monitoring program around the Oyster Creek Station. The program includes two types of continuous radiation monitors: thermoluminescent dosimeters and pressurized-ion chambers. These extremely sensitive radiation monitors are deployed in a ring around the immediate vicinity of the facility and as far away as several miles, providing continuous, real-time radiation monitoring. No radiation above normal background levels attributable to Oyster Creek operations has ever been detected by these monitors.

The Bureau of Nuclear Engineering also operates continuous air samplers and collects samples of well water, surface water, fish and shellfish, sediment, and vegetables from the environment around Oyster Creek. The results of the analyses of these samples demonstrate that people living in the area around Oyster Creek have not received measurable radiation exposures above normal background.

Has sea-level rise been taken into consideration in the decommissioning plans as it relates to the storage of dry casks and this dismantling of the nuclear plant?

The NRC requires each site to perform an analysis of the potential impacts of flooding at the site. Each site, including Oyster Creek, has completed this analysis.

ONLINE RESOURCES

- NRC DECOMMISSIONING INFORMATION: www.nrc.gov/waste/decommissioning/faq.html
- NJDEP BUREAU OF NUCLEAR ENGINEERING: www.state.nj.us/dep/rpp/bne/index.htm
- EXELON OYSTER CREEK HOME PAGE: www.exeloncorp.com/locations/power-plants/oyster-creek-generating-station
- NJ BOARD OF PUBLIC UTILITIES: www.state.nj.us/bpu/index.shtml