

# **ANSWERS TO FREQUENTLY ASKED QUESTIONS FOR OYSTER CREEK**

## **Advisory Panel**

### **1. What is the role of the Oyster Creek Safety Advisory Panel? How were its members chosen and when do they meet? Can the public be involved in the process?**

The Oyster Creek Safety Advisory Panel was created to assist the Department of Environmental Protection (DEP) with the evaluation of the continued safe operation, decommissioning planning, and cessation of operations at the Oyster Creek Nuclear Generating Station. New Jersey, as with all the other states with nuclear reactors, relies on the NRC as the regulatory authority to ensure the safety of Oyster Creek operations. The Panel and DEP will continue to work closely with NRC and Exelon to maintain the shared goal of safety.

The Panel was formed as additional oversight to further ensure the safety of operations at Oyster Creek and full compliance with the Administrative Consent Order. The Panel includes the Commissioner of the Department of Environmental Protection, the Director of the Office of Homeland Security and Preparedness and an independent consultant expert in nuclear safety. Access to Panel Members is provided through public meetings and progress updates. The Panel will continue to raise and discuss any credible issue or concern to both the NRC and Exelon.

The Panel has been actively meeting since December 2011. Those meetings have included participation from the NRC and Exelon. The Panel has provided the opportunity for public input at an open public meeting on January 7, 2013. Other opportunities for public involvement may be provided as necessary.

Based upon information provided by Exelon, NRC, and DEP, the Panel has verified the safe operation of Oyster Creek. In the future, the Panel will continue to appropriately address any and all credible information related to safety concerns at the site.

### **2. Does the Governor support closure of Oyster Creek?**

The Governor fully supports the closure of Oyster Creek in 2019 as it is a vital piece of his overall plan to help improve Barnegat Bay.

The Panel was created by Administrative Order to assist the DEP with the evaluation of the continued safe operation, decommissioning planning and cessation of operations at the Oyster Creek Nuclear Generating Station by December 31, 2019. Closure of the plant is part of Governor Christie's 10-Point Plan to address the health of Barnegat Bay.

## **NRC/Industry:**

- 1. Based on the issues Exelon identified during the past refueling outage with regard to pinhole leaks and corrosion, should the NRC have Exelon change or update its aging management program?**

The purpose of the aging management program is to identify and correct issues before they become a safety concern. In fact, it is this program and the routine inspections process for outages that identified these issues. If anything, this example demonstrates that the system is working as it should to identify and address issues during outage inspections.

- 2. Can Exelon delay capital improvements and maintenance over the next seven years in order to save money?**

The NRC has inspection programs in place to identify and correct any issues that arise. The Department, through agreement with the NRC, is permitted to be present during all inspection activities. That being said, the Panel provides one more mechanism to ensure that all appropriate actions are taken by Exelon going forward. In addition, DEP staff interacts with the NRC on a daily basis to discuss routine and emergent issues at Oyster Creek.

- 3. How does the NRC share information with the public and interested non-profit groups about safety issues at the plant?**

The NRC has a mature inspection program which provides the public access to all publicly available inspection data and reports. This transparency allows any party the ability to assess technical issues that may be of interest.

As an example, the NRC responded to a letter received from Senator Robert Menendez on February 22, 2013. In that response the NRC states the following related to this issue:

“The NRC verifies the licensee’s compliance with these requirements by performing a subsequent inspection. The NRC inspected the non-destructive testing and repair activities associated with indications identified on a specific weld on reactor vessel control rod drive injection nozzle (N9), as well as a small leak that was observed during the plant operational pressure test on a reactor head penetration flange (N7B). In both cases, the NRC inspector verified that the repair, the welding activities, and applicable non-destructive examination activities were completed successfully in accordance with American Society of Mechanical Engineers Code requirements. Based on our inspections, the NRC is confident that the flaws in the reactor coolant system have been identified and repaired successfully, and the reactor coolant system is not weakened or compromised. These conclusions are documented in our publicly available inspection report, which is attached for your reference. We trust that this publicly available inspection data and report address your concern about safety issues being addressed. Accordingly, we do not plan to ask Exelon to release their data regarding these issues.”

- 4. Is storing spent fuel onsite safe?**

The Department believes that adequate measures are in place to prevent spent fuel (whether in the fuel pool or dry cask) from posing any danger to the public. DEP has petitioned the NRC to

expedite the process to find a national repository. Unfortunately, until a national repository is available, storing spent fuel on-site is the only option at this time.

**5. Are there hazards associated with transporting new reactor fuel to the site?**

The transportation of new fuel to Oyster Creek does not pose a public health threat from a radiological perspective or any other. Fuel has been safely transported to the site for over 40 years with no issues or concerns. The precision-made fuel assemblies are transported in packages specially constructed to protect them from damage during transport. Uranium fuel assemblies have a low radioactivity level and radiation shielding is not necessary.

Fuel assemblies contain fissile material and criticality is prevented by the design of the package, (including the arrangement of the fuel assemblies within it, and limitations on the amount of material contained within the package), and on the number of packages carried in one shipment.

**6. What is New Jersey's position regarding Department of Energy's (DOE) failure to provide a long term high level radioactive waste repository as required under the law?**

New Jersey has been very vocal concerning the failure of the Department of Energy to provide a long term solution for the disposal of high level radioactive waste. The Panel will continue to be a strong advocate on this issue moving forward.

The Department of Energy released "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste", in January 2013. Within that document, the Department of energy proposed:

"With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;

Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and

Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048."

The Department of Energy Secretary Chu stated in the above referenced document that;

"For nearly two years, the Commission conducted a comprehensive review and ultimately made recommendations for addressing one of our nation's most intractable challenges. Its work provides a strong foundation for development of a new strategy to manage used nuclear fuel and high-level radioactive waste. We will work with Congress to build a new national program based on this foundation."

**7. Is it safe to build townhomes near Oyster Creek with the onsite Spent Fuel Storage Facility?**

There are no offsite safety impacts of the storage facility. The risks and exposures from the storage facility have been analyzed and assessed and the conclusions are that there is no additional offsite exposure from the facility. Local zoning is the responsibility of the municipality.

**8. The public has concerns that the effects of chlorides on plant systems and structures have gone beyond the issue found during the past outage. Is the Panel conducting further investigations?**

The Panel disagrees that the effect of chlorides is a plant wide concern. The Panel has consulted with NRC, Exelon, and DEP on this issue. There have been no reports issued or root cause analysis results that indicate that there needs to be a plant wide concern over chlorides. The NRC reviewed Exelon's root cause analysis. The results of the root cause and the NRC's conclusions are included in the Resident Inspectors' 2nd Quarter Inspection Report, No. 05000219/2013003 dated August 7, 2013.

## **Decommissioning: (also see NRC Decommissioning )**

### **1. Is there an opportunity for the public to comment on the decommissioning process?**

While DEP will remain fully engaged with Exelon and Oyster Creek throughout the decommissioning process, the NRC has sole regulatory authority. There will be opportunities for the public to engage the NRC with any questions or concerns as we move closer to December 2019. Comments and questions may be submitted in writing to the NRC Project Manager in-charge for the facility. Meetings are held in the vicinity of the facility.

### **2. Will decommissioning begin upon cessation of operations in 2019, including the immediate removal of spent fuel from the spent fuel pool to the dry cask storage facility? Who decides this?**

The decommissioning of a nuclear reactor is within the regulatory authority of the NRC. While the State can make recommendations regarding the process, it cannot require Oyster Creek to begin immediate decommissioning. With respect to spent nuclear fuel, there are certain restrictions and limitations for movement of the nuclear fuel to dry cask storage. For NUHOMS dry storage, the NRC requires a minimum of 5 years for fuel to cool in the spent fuel pool before moving it to dry cask storage. Lacey Township has imposed an additional 5 years before Oyster Creek can move fuel to dry cask storage. Therefore, 10 years after shutdown is the soonest that all of the fuel can be moved to dry cask storage by local agreements.

The Panel will continue discussions with all parties to further expedite the movement of spent fuel to dry cask storage in the most prudent timeframe possible.

### **3. The closure of Oyster Creek will result in a significant number of lost jobs to the community. When will the impact be seen?**

Staffing levels at Oyster Creek are expected to remain consistent with current levels through December 2019. At that point certain functions will gradually be unnecessary. However, the decommissioning work will result in additional skill sets being employed at the site.

### **4. Are there plans to construct a new power plant at the site once Oyster Creek is closed?**

Siting of a new plant is not within the purview of the Department but if that direction is chosen we would provide regulatory assistance to move the proposal forward.

### **5. Will Oyster Creek's NRC license be updated to indicate it will terminate in 2019?**

Exelon has already put in writing their intent to close the plant as of December 31, 2019. That commitment exists in a letter from Exelon to NRC and in the agreement signed with the State of New Jersey by the Administrative Consent Order. The letter fulfills NRC's regulatory requirement for notification of plant closure. There is no need to modify the NRC license.

### **6. Will site security remain after the plant is closed?**

Site security is under the jurisdiction of the NRC. Adequate security measures will be required to remain in place by the NRC until such time that the decommissioning is completed and all spent nuclear fuel is removed from the site.

## **Emergency Preparedness:**

- 1. How do residents of the Emergency Planning Zone (EPZ) get Potassium Iodide (KI) pills? What happens when the KI pills they have expire? Will they get new ones?**

KI is distributed by the State Department of Health in conjunction with county health departments. There is an annual program in place to make KI available to all residents of the EPZ. In addition, KI can be picked up directly at the county health department at any time by local residents. The state ensures that adequate supplies of KI are available for distribution to the public and new supplies are made available as supplies reach their expiration dates. Pre-distributed KI is tracked by the Health Department and citizens are notified when the expiration date is being approached.

With the distribution of KI, each resident is provided with FAQs on the administration and benefits of using KI. FAQs clearly states that KI only provides protection to the thyroid gland from exposure to radioactive iodine and does not provide protection from exposure to any other nuclides that may be released during an accident.

- 2. Since DEP staffing has been reduced over the years, will adequate staff be available in the Bureau of Nuclear Engineering to ensure oversight of Oyster Creek operations?**

The continued safe operation and closure of Oyster Creek is a priority of this administration. There is a dedicated funding source for the Bureau of Nuclear Engineering that provides for adequate staffing levels now and in the future.

- 3. What is DEP's role compared to the NRC's in oversight of New Jersey's nuclear power plants?**

The Nuclear Regulatory Commission has sole regulatory authority of nuclear power plants. DEP works cooperatively with the NRC on a daily basis to ensure the safety of our residents. DEP is the lead State agency for accident assessment, with knowledge and expertise of nuclear operations, radiation monitoring and analysis, and compliance with requirements issued by the NRC. OHSP is responsible for preparedness oversight for all hazards, including a radiological event.

- 4. Based on what occurred during Superstorm Sandy, can the public be safely evacuated if something happened at Oyster Creek?**

Yes. One of the key focus areas prior to restarting Oyster Creek was verification that offsite emergency preparedness was adequate. The State Police Office of Emergency Management and FEMA concluded that appropriate measures can be taken to protect the health and safety of the public in the event of an emergency at Oyster Creek.

The State re-evaluated the Evacuation plan to account for infrastructure changes within the EPZ that has been altered by the impacts of Superstorm Sandy. That analysis included but was not limited to sand blocked roadways, damaged shelters, displaced populations, etc.

Based on input from The State Police Office of Emergency Management and Ocean County, the Federal Emergency Management Agency (FEMA) concluded "the offsite radiological

emergency preparedness is adequate to provide “Reasonable Assurance” that appropriate measures can be taken to protect the health and safety of the public in the event of a radiological emergency at the Oyster Creek Nuclear Generating Station. A Comprehensive Disaster Initiated Review (DIR) was completed as required under federal regulations to provide NRC reasonable assurance that the state, county and local emergency response organizations can implement an immediate and comprehensive response to an emergency.

FEMA’s review further concluded:

“NJ OEM personnel have personally inspected all Oyster Creek-related response and support facilities; FEMA RII accompanied some of the inspections to verify that the emergency response facilities and infrastructure are intact and/or have been returned to service. We are continuing to work with New Jersey and the EPZ county to make sure they are able to maintain reasonable assurance and institute any necessary compensatory measures as they also deal with the needs of real world disaster response (44 CFR 350.13) in the aftermath of Hurricane Sandy and the subsequent Nor’easter. “

**5. The Panel has been asked for funding to build Volunteer Way in Waretown.**

Based on the assumption that building Volunteer Way was necessary for evacuation purposes, the Panel verified that the existing evacuation routes are sufficient to meet the needs of the population in the vicinity of Oyster Creek. However, the Panel is receptive to ongoing discussions on this issue if desired.



## **Environmental Impact:**

### **1. The impacts of a nuclear accident could have widespread impacts on drinking water within New Jersey. How would the public be protected?**

The DEP has comprehensive procedures and protocols for evaluating the effect of a radiation release on the drinking water supply. In the unlikely possibility of an accident at a nuclear facility, the public water supply is a priority for environmental sampling and analysis. Contingency plans for alternate water sources have been evaluated and plans are in place to ensure that the public is not exposed to unnecessary radiation from contamination of the public water supply.

The procedures for the radiological assessment of drinking water samples are found in the Department of Energy's Federal Radiological Monitoring Assessment Center (FRMAC) Manual, Volume 1. This document is available to the public at the following website address: <http://www.nv.energy.gov/nationalsecurity/homelandsecurity/frmac/manuals.aspx>. Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) sets standards for radionuclides in drinking water, applicable to community water systems. The current standards can be found at: <https://www.federalregister.gov/articles/2000/12/07/00-30421/national-primary-drinking-water-regulations-radionuclides-final-rule>.

In order to routinely assess any potential impacts on drinking water due to the operation of Oyster Creek, the licensee (Exelon) collects weekly well water samples from six locations, including all three of their onsite domestic water wells and the Lacey and Ocean Township Municipal Utility Authority (MUA) domestic water system wells. The DEP independently collects quarterly drinking water samples from two locations; one from an Oyster Creek onsite domestic water system well and one offsite location whose drinking water is supplied by the Lacey MUA (Forked River State Marina).

Historically, there has been no detectable radiological activity above background in any offsite drinking water or onsite domestic water well at Oyster Creek. Radiological analysis results from drinking water samples can be found at the following website addresses: NJDEP Environmental Surveillance and Monitoring Data, <http://www.state.nj.us/dep/rpp/bne/esmr.htm>. The Exelon Annual Environmental Monitoring Reports, <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/oc.html>

### **2. When Oyster Creek closes in 2019, will the environment continue to be monitored for contaminants such as tritium?**

Yes. The Department will continue its Environmental Surveillance and Monitoring Program (ESMP) throughout the entire decommissioning process, and beyond, to monitor the various pathways by which people and the environment could be exposed to radiation. The ESMP is the result of the legislative authority of the Radiation Accident Response Act (N.J.S.A. 26:2D-43g).

The current scope of the ESMP includes (1) the Radiological Environmental Monitoring Program (REMP); (2) the Thermoluminescent Dosimeter Program (TLD); and (3) the

Continuous Radiological Environmental Monitoring Program (CREST). The REMP consists of air, potable (drinking water), aquatic sediment, milk, fish/shellfish, surface, and vegetation samples. In addition, the Department analyzes samples from 38 groundwater monitoring wells at Oyster Creek for tritium. The Department operates an independent program to assess direct gamma radiation levels by deploying, collecting and analyzing TLD badges and through the operation of a real-time remote network of radiation detectors (CREST). Monitoring results can be found on the Department's website at <http://www.nj.gov/dep/rpp/bne/index.htm>,

During and after the decommissioning of Oyster Creek, the Department's ESMP will evolve to ensure that New Jersey's citizens and the environment are protected from any potential releases of radioactivity.

**3. Tritium leaks continue to be a concern for local government. The Panel has been asked to provide an update on the status of the tritium remediation at the site.**

In May of 2010, the DEP took action on the tritium leaks at Oyster Creek by issuing a directive requiring Exelon to take a series of steps to investigate the leak of radioactive tritium into aquifers below the plant and ensure that the tritium did not endanger public health or safety. Since November 17, 2010, Exelon has been pumping groundwater from an onsite remedial well, measuring the concentration of tritium in the extracted groundwater, and discharging it into the plant's cooling water intake structure in order to reduce the tritium concentration. Up through September 2013, 90.62 million gallons of groundwater have been extracted from the remedial well and discharged to the plant's intake structure. Since pumping of the remedial well began, tritium concentrations in the groundwater monitoring wells have decreased significantly, indicating that Exelon's remedial efforts are being successful. The Department continues to closely monitor and evaluate the groundwater sampling results. Results of the Department's split sample analyses are updated regularly and are available on the DEP's web page at <http://www.state.nj.us/dep/rpp/bne/bnedown/FinalOCH3.pdf>.

## **Post Fukushima/Superstorm Sandy:**

### **1. What is the State of New Jersey's role in the 2.206 petition submitted to the NRC on behalf of citizen organizations following Superstorm Sandy?**

The NRC has responded to all of the concerns raised in 2.206 petition. The Panel monitored Oyster Creek's response to Sandy and is in agreement with the statements made by NRC in response to the 2.206 petition. The State of New Jersey was actively involved in the recovery operations after the impacts of Superstorm Sandy. The Department of Environmental Protection (DEP), Office of Emergency Management (OEM), Counties and Local municipalities with FEMA evaluated the status of response assets, personnel and infrastructure and determined that the NJ RERP could be implemented should an accident occur at either Oyster Creek or the Salem/Hope Creek nuclear generating stations.

### **2. How is the NRC responding to concerns about the Mark 1 design that have surfaced as a result of the Fukushima Daiichi Plants in Japan?**

The NRC Near Term Task Force (NTTF) has identified a number of issues that need to be addressed by the nuclear industry. The NRC has provided deadlines to meet the requirements for the issues identified. The NRC continues to assess the impacts of Fukushima and the applicability of the lessons learned to all types of reactor designs in the United States. Most of the recommendations apply to the Mark 1 design. Both the industry and the NRC are working towards identifying and implementing required updates and changes. However, there are other additional issues being examined which are not unique to the Mark 1 design.

NRC information on this issue can be found at:

<http://www.nrc.gov/reactors/operating/ops-experience/japan-info.html>.

### **3. Did New Jersey participate in the NRC public meeting on the 2.206 petition?**

Five BNE staff members attended the NRC public meeting via webcast on the 2.206 petition. In addition, one member of the Oyster Creek Advisory Panel also attended the meeting via webcast. A detailed briefing on the public hearing discussion was developed by BNE staff and was submitted to senior DEP management for review prior the public meeting of the Advisory Panel.

### **4. Will NJPDES permit process be reopened in light of Executive Order 107?**

The Panel is confused on the relation of Executive Order 107 to the request. The purpose of Executive Order 107 was to protect Sandy impacted homeowners from higher insurance deductibles. Regardless, reopening the NJPDES permit process has the potential to further delay the closure of Oyster Creek beyond the agreed upon date of December 31, 2019.

### **5. Based on Executive Order 104, shouldn't Oyster Creek be shut down until further safety analysis can be performed?**

Executive Order 104 proclaimed a state of emergency in New Jersey due to the impending landfall of Superstorm Sandy. Based upon all of the information provided to the Panel by NRC, Exelon, and DEP, there is no evidence to support any outstanding safety concerns that would

warrant closing the plant. The ongoing NRC inspection program has found Oyster Creek is operating in a safe manner. The Panel is in agreement with that determination.

**6. Does the Interim Spent Fuel Storage Installation (ISFSI) need to be raised from its current level to an elevation that prevents flooding based on the impacts of Superstorm Sandy?**

There is a general misconception by the public that the Oyster Creek site was flooded with seawater as the level in the intake canal rose due to storm surge. In fact, while the water level did rise in the intake structure above historic levels, it never rose above the elevation of the plant site including the Interim Spent Fuel Storage Installation which is at 23 feet elevation. Therefore, there was no seawater on the site that could affect the Interim Spent Fuel Storage Installation.

**7. Will a new flood analysis for Oyster Creek be completed based on the impacts of Superstorm Sandy? Superstorm Sandy exceeded the historical flood information contained in the Final Safety Analysis Report (FSAR) and it needs to be updated to reflect the most current information.**

It is the responsibility of the NRC to ensure that the FSAR is updated to address the impacts of Sandy. The Panel's expectation is that there will be changes to the FSAR at a minimum and the Panel will evaluate those changes once they are available for review.

On March 12, 2012, the NRC issued a request for information to all nuclear power plant licensees (ML12053A340). Enclosure 2 to that letter directed the reevaluation of flooding hazards at operating reactor sites. A subsequent letter dated May 11, 2012 (ML12097A509) established a due date of March 12, 2015 for Oyster Creek to submit their flooding hazard reevaluation report to the NRC for review. The Panel's expectation is that there may be changes to the FSAR beyond those identified as a result of the new flood analysis. However, given the fact the plant will cease operation on or before December 31, 2019, this issue is not a critical factor for Oyster Creek.

**8. Public Justice, NJEF, and the GRAMMES filed an emergency petition in late November to stop Oyster Creek from restarting. Did DEP consider joining the petition to ensure the plant is safe?**

DEP ensures the safety of the plant every day. The decision on the petition is solely under the authority of the Nuclear Regulatory Commission. As you may be aware, DEP staff interacts with the NRC on a daily basis to discuss routine and emergent issues at Oyster Creek. After fully evaluating the Petition, the DEP agreed with the NRC determination that there was no immediate safety concern to Oyster Creek or to the health and safety of the public.

**9. Why didn't the Department require Oyster Creek to shut down immediately?**

The Administrative Consent Order (ACO) between Exelon and the Department requires Oyster Creek to close 10 years prior to their current operating license issued by the NRC. The ACO not only expedites the closing of Oyster Creek but also helps ensure the health and safety of the surrounding community during the next seven years through increased oversight.

**10. Since sirens failed due to electrical power outages and/or wind damage during Superstorm Sandy, backup power for the sirens needs to be installed to ensure operation during emergency events.**

The Panel, OEM, and DEP raised the issue of upgrading the sirens as a priority to Exelon. The Panel fully supported this initiative and carefully tracked progress. Exelon committed to upgrading the sirens at each of the sites within their fleet to include battery backup capabilities for power failures. At Oyster Creek, new sirens with battery backup are installed, tested and accepted for use by the Federal Emergency Management Agency.

In addition to the sirens for public notification, it should be noted that the New Jersey Radiological Emergency Response Plan (NJRERP) has contingency plans for back up notification in the event of siren failures. Back up route alerting and Reverse 911 capabilities are just two methods the State Police Office of Emergency Management can use in the event of siren failures for public notification.

**11. What were the impacts of Superstorm Sandy on Oyster Creek?**

There is no question that Sandy presented challenges to Oyster Creek, similar to the entire infrastructure in the area. Oyster Creek did declare an unusual event and alert; however, at no time was the plant placed in a position of high risk. (An “Unusual Event” is the lowest of 4 NRC action levels with the water at the intake reached 4.5 feet above sea level, as required by NRC. An “Alert” is the second lowest of 4 NRC action levels when water level at the intake reached over 6 feet above sea level, as required by NRC). The plant systems and personnel responded as designed and as expected to protect the public and the environment.

DEP was in constant communication directly with Exelon and the NRC before, during and after the storm to ensure proper safety precautions were put in place

Oyster Creek did have to issue an alert since the water level at the intake reached over 6 feet above sea level, as required by the NRC, but the plant was never in eminent danger.

They followed all appropriate protocol and operating procedures as expected to protect the public and the environment.

**12. Should Exelon be required to house its service water pumps in a sealed pump house to ensure that storm surge has no impact on emergency cooling?**

Oyster Creek has contingency plans in place to provide alternate water sources should the pumps at the intake structure need to be taken offline due to high water level. Based on the Panel’s evaluation of the existing compensatory measures, there are sufficient redundant systems in place to provide adequate core cooling and shutdown cooling in the event that there is a need to remove the service water pumps from service due to high water levels.

**13. Have the impacts of the storm surge on circulating water pumps, service water pumps, and emergency cooling water pumps been assessed and actions taken at the site to resolve any issues that have been identified?**

The impacts of the storm on the pumps at the intake structure have been inspected and analyzed at the site. There is a general misconception by the public that the Oyster Creek site was flooded with seawater as the level in the intake canal rose due to storm surge. In fact, while the water level did rise at the intake structure above historic levels, it never rose above the elevation of the site (23 feet). The Panel concurs with the findings of the NRC and Exelon that there were no impacts to the circulating water pumps, service water pumps, or emergency cooling water pumps, as a result of the storm surge.

**14. Has Exelon evaluated if any damage was done to the intake and discharge canal that would indicate that flood risk has been raised and design basis has changed?**

Oyster Creek staff, with NRC oversight, completed a site inspection post-hurricane that included an assessment of the intake canal structure. The Panel verified that the inspection concluded that there was no damage to the intake structure that would raise the vulnerability to flooding and no further action is required.

**15. Will the Panel investigate the impacts of seawater and flooding on underground cabling, the spent fuel storage facility structure and other electrical components that may have been subject to corrosion?**

There is a general misconception by the public that the Oyster Creek site was flooded with seawater as the level in the intake canal rose due to storm surge. In fact, while the water level did rise at the intake structure above historic levels, it never rose above the elevation of the site (23 feet). Therefore, there was no seawater on the site that could affect plant structures, cabling or vaults.

The Panel has confirmed with both the NRC and Exelon that there was no seawater on the site that could affect plant structures, cabling or vaults.

**16. Will the Panel require an independent review team inspect Oyster Creek to ensure that no new or existing safety concerns exist either as a result of Superstorm Sandy or gaps in the Aging Management program?**

The NRC evaluated, with DEP participation, the impacts of Sandy to the Oyster Creek site and previously the current Aging Management System. The Panel is satisfied based upon information provided by Exelon and NRC that no safety concerns exist as a result of Sandy and that the existing Aging Management Program is adequate. The Panel will continue to monitor the commitments of the site in the future to ensure all plant systems and structures are safe.

**17. Has the Panel read the Nuclear Review Task Force's report and considered the assumptions on which it is based?**

The Panel will review the report in light of any new information that is available and evaluate the assumptions to determine if any updates are required.

## **NRC Decommissioning**

The following answers were taken from the NRC Website. Below are direct links to the NRC for additional information:

<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/decommissioning.html>

<http://www.nrc.gov/about-nrc/regulatory/decommissioning/faq.html>

### **1. Why are power reactors decommissioned?**

When a power company decides to close its 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.

### **2. What alternatives are currently used for decommissioning?**

Licensees may choose from three alternative 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, it is dismantled and the property decontaminated.

Under ENTOMB, radioactive contaminants are permanently encased on site in structurally sound material such as concrete and appropriately 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.

### **3. Is there a limit on the number of years that it would take to decommission a plant?**

To be acceptable, decommissioning must be completed within 60 years of the plant ceasing operations. A time beyond that would be considered only when necessary to protect public health and safety in accordance with NRC regulations.

#### **4. How is decommissioning defined?**

The requirements for decommissioning a nuclear power plant are set out in NRC regulations (Title 10 of the Code of Federal Regulations, Part 20 Subpart E, and Parts 50.75, 50.82, 51.53, and 51.95). In August 1996, a revised rule went into effect that redefined the decommissioning process and required owners to provide the NRC with early notification of planned decommissioning activities. The rule allows no major decommissioning activities to be undertaken until after certain information has been provided to the NRC and the public.

#### **5. Who provides funding for decommissioning?**

Each nuclear power plant licensee must report to the NRC every two years the status of its decommissioning funding for each reactor or share of a reactor that it owns. The report must estimate the minimum amount needed for decommissioning by using the formulas found in 10 CFR 50.75(c). Licensees may alternatively determine a site-specific funding estimate, provided that amount is greater than the generic decommissioning estimate. Although there are many factors that affect reactor decommissioning costs, generally they range from \$300 million to \$400 million. Approximately 70 percent of licensees are authorized to accumulate decommissioning funds over the operating life of their plants. These owners – generally traditional, rate-regulated electric utilities or indirectly regulated generation companies – are not required today to have all of the funds needed for decommissioning. The remaining licensees must provide financial assurance through other methods such as prepaid decommissioning funds and/or a surety method or guarantee. The staff performs an independent analysis of each of these reports to determine whether licensees are providing reasonable “decommissioning funding assurance” for radiological decommissioning of the reactor at the permanent termination of operation.

Before a nuclear power plant begins operations, the licensee must establish or obtain a financial mechanism – such as a trust fund or a guarantee from its parent company – to ensure that there will be sufficient money to pay for the ultimate decommissioning of the facility.

#### **6. What meetings are planned to keep the public informed?**

Several opportunities are provided for public involvement during the decommissioning process. A public meeting is held in the vicinity of the facility after submittal of a post-shutdown decommissioning activities report (PSDAR) to the NRC. Another public meeting is held when NRC receives the license termination plan (LTP). An opportunity for a public hearing is provided prior to issuance of a license amendment approving the LTP or any other license amendment request. In addition, when NRC holds a meeting with the licensee, members of the public may observe the meeting (except when the discussion involves proprietary, sensitive, safeguards, or classified information).

#### **7. What improvements have been made as a result of previous decommissioning experience?**

Several nuclear power plants completed decommissioning in the 1990s without a viable option for disposing of their spent nuclear fuel, because the federal government did not construct a geologic repository as planned. Accordingly, the NRC implemented regulations allowing licensees to sell off part of their land once it meets NRC release criteria, while maintaining a small parcel under license for storing the spent fuel. These stand-alone facilities, called



“independent spent fuel storage installations” (ISFSIs), remain under license and NRC regulation. Licensees are responsible for security and for maintaining insurance and funding for eventual decommissioning.

As more facilities complete decommissioning, the NRC is implementing “lessons learned” in order to improve the program and focus on the prevention of future legacy sites. Applications for new reactors must now describe how design and operations will minimize contamination during the plant’s operating life and facilitate eventual decommissioning. New regulations published in 2010 require plant operators to be more vigilant in preventing contamination during operations and to clean up and monitor any contamination that does occur.

## **8. What are the different phases of decommissioning?**

The requirements for power reactor decommissioning activities may be divided into three phases: (1) initial activities; (2) major decommissioning and storage; and (3) license termination activities.

### **1) Initial Activities**

When a nuclear power plant licensee shuts down the plant permanently, it must submit a written certification of permanent cessation of operations to the NRC within 30 days. When radioactive nuclear fuel is permanently removed from the reactor vessel, the owner must submit another written certification to the NRC, surrendering its authority to operate the reactor or load fuel into the reactor vessel. This eliminates the obligation to adhere to certain requirements needed only during reactor operation.

Within two years after submitting the certification of permanent closure, the licensee must submit a post-shutdown decommissioning activities report (PSDAR) to the NRC. This report provides a description of the planned decommissioning activities, a schedule for accomplishing them, and an estimate of the expected costs. The PSDAR must discuss the reasons for concluding that environmental impacts associated with the site-specific decommissioning activities have already been addressed in previous environmental analyses. Otherwise, the licensee must request a license amendment for approval of the activities and submit to the NRC a report on the additional impacts of decommissioning on the environment.

After receiving a PSDAR, the NRC publishes a notice of receipt in the Federal Register, makes the report available for public review and comment, and holds a public meeting in the vicinity of the plant to discuss the licensee’s intentions.

### **2) Major Decommissioning Activities**

Ninety days after the NRC receives the PSDAR, the owner can begin major decommissioning activities without specific NRC approval. These include permanent removal of such major components as the reactor vessel, steam generators, large piping systems, pumps, and valves.

However, decommissioning activities conducted without specific prior NRC approval must not prevent release of the site for possible unrestricted use, result in there being no reasonable assurance that adequate funds will be available for decommissioning, or cause any significant environmental impact not previously reviewed. If any decommissioning activity does not meet

these terms, the licensee is required to submit a license amendment request, which would provide an opportunity for a public hearing.

Initially, the owner can use up to 3 percent of its set-aside funds for decommissioning planning. The remainder becomes available 90 days after submittal of the PSDAR unless the NRC staff has raised objections.

### 3) License Termination Activities

The owner is required to submit a LTP within two years of the expected license termination. The plan addresses each of the following: site characterization, identification of remaining site dismantlement activities, plans for site remediation, detailed plans for final radiation surveys for release of the site, method for demonstrating compliance with the radiological criteria for license termination, updated site-specific estimates of remaining decommissioning costs, and a supplement to the environmental report that describes any new information or significant environmental changes associated with the owner's proposed termination activities. Most plans envision releasing the site to the public for unrestricted use, meaning any residual radiation would be below NRC's limits of 25 millirem annual exposure and there would be no further regulatory controls by the NRC. Any plan proposing release of a site for restricted use must describe the site's end use, documentation on public consultation, institutional controls, and financial assurance needed to comply with the requirements for license termination for restricted release.

The LTP requires NRC approval of a license amendment. Before approval can be given, an opportunity for hearing is published and a public meeting is held near the plant site.

The NRC uses a standard review plan (NUREG-1700, "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans") to ensure high quality and uniformity of LTP reviews. The standard review plan is available to the public so that NRC's review process is understood clearly.

If the remaining dismantlement has been performed in accordance with the approved LTP and the termination survey demonstrates that the facility and site are suitable for release, the NRC issues a letter terminating the operating license.