APPROVED AT 11/15/17 MEETING

NUCLEAR DECOMMISSIONING CITIZENS ADVISORY PANEL ("NDCAP")
Wednesday, October 18, 2017
Plymouth Community Intermediate School ("PCIS"), Little Theatre, 117 Long Pond Road, Plymouth, MA
Meeting Minutes

Meeting called to order at 6:30 p.m. by NDCAP Co-Chair Kurt Schwartz.

NDCAP MEMBERS PRESENT:

- Pat Ciaramella, Representative of Old Colony Planning Council
- H. Joseph Coughlin, Member from Plymouth Nuclear Matters Committee
- Pine duBois, Speaker of the House Appointee
- John G. Flores, Appointee of Governor Baker
- David Johnston[1], Department of Environmental Protection
- Richard Grassie, Minority Leader of the House Appointee
- Robert Hayden[2], Department of Public Utilities
- Robert Jones[3], Executive Office of Health and Human Services
- Heather Lightner, Representative of the Town of Plymouth
- John T. Mahoney, Representative of the Town of Plymouth
- Elysse Magnotto[4], President of the Senate Appointee
- David C. Nichols, Governor Baker Appointee
- John Ohrenberger, Representative of Pilgrim Nuclear Power Station
- Jack Priest, Department of Public Health, Radiological Control Program
- Kurt Schwartz, Massachusetts Emergency Management Agency (Co-Chair)
- Paul D. Smith[5], Representative of UWUA Local 369

NDCAP MEMBERS NOT PRESENT:

- Jessica Casey, President of the Senate Appointee
- John Chapman[6], Executive Office of Housing and Economic Development
- Sean Mullin, Minority Leader of the Senate Appointee (Co-Chair)
- Kevin O'Reilly, Speaker of the House Appointee
- Michael Twomey, Representative of Pilgrim Nuclear Power Station

REVIEW AND APPROVAL OF SEPTEMBER 27, 2017 MEETING MINUTES:

Co-Chair Schwartz called for a motion to adopt the September 27, 2017 meeting minutes as submitted. It was moved and seconded to adopt the September 27th meeting minutes as submitted without correction. The motion passed by a unanimous vote of the panel members present.

ADMINISTRATIVE/WORKING GROUP UPDATE:

Co-Chair Schwartz noted that the Safety and Security and PSDAR and Decommissioning working groups

[1] Designee of Secretary Beaton (EEA).
[2] Designee of Angela O'Connor (DPU)
[3] Designee of Secretary Sudders (Executive Office of Health and Human Services).
[4] Designee of Senator Dan Wolf, (President of the Senate Appointee)
[5] Designee of Richard Sherman (Representative of UWUA Local 369).
[6] Designee of Secretary Ash (Executive Office of Housing and Economic Development).

had already had their initial meeting. He stated that the Open Records Law requires that minutes be provided for the working group meeting, that it is not a requirement that the minutes attribute quotes to speakers by name, but that formal votes must be recorded by name. He asked that the working groups prepare and approve their minutes before sending them to the co-chairs. Co-Chair Schwartz stated that agendas for upcoming meetings should be sent to the co-chairs preferably two weeks in advance so that room accommodations can be made. Regarding meeting frequency, Co-Chair Schwartz noted that it had already been determined that there is no formal requirement regarding number of annual meetings, but that the co-chairs recommend meeting twice this calendar year. Co-Chair Schwartz stated that the most important subject for the first meeting is to set the scope of the working group.

Ms. duBois asked whether a panelist who is not a member of a particular working group could sit in for a specific meeting of that working group and participate in any votes taken at that meeting. Co-Chair Schwartz replied in the negative, and stated that the working groups have formal memberships. He stated that if a panelist would like to formally join a working group, that panelist should notify the co-chairs so that they can make the appropriate changes to membership. Mr. Coughlin noted that there have been changes to working group membership, and requested a current list of working group membership. Co-Chair Schwartz stated that he would circulate an update membership list.

NUCLEAR REGULATORY COMMISSION PRESENTATION:

Co-Chair Schwartz introduced Mr. Bruce Watson as Chief of the Reactor Decommissioning Branch of the Nuclear Regulatory Commission ("NRC"). Co-Chair Schwartz stated that Mr. Watson had a presentation which would be followed questions first from panel members, and next from members of the public. Mr. Watson stated that with him were Diane Screnci, Senior Public Affairs Officer, and Jon Greives, State Liaison Officer, and that Ted Smith, Project Manager, was unable to attend.

Mr. Watson stated that his goal was to provide an overview of reactor decommissioning, a subject with which the NRC has been particularly busy over the past ten years. Mr. Watson stated that he NRC's mission is nuclear and radiation safety, and that it performs this mission throughout plant operations and during decommissioning. Mr. Watson stated that the NRC is present throughout the decommissioning process, performing inspections and maintaining safety standards until the license is terminated. Once the license is terminated, Mr. Watson noted that the NRC no longer has a say in the former plant site's usage. He reiterated that the NRC's Congressional mandate is to regulate nuclear material and radiation at the plant site, and that after decommissioning, there will be a newly licensed facility to store the plant's spent nuclear fuel ("SNF"). Mr. Watson stated that the NRC will continue to inspect that facility until a permanent repository is found and the SNF is removed from the site.

Mr. Watson stated that, nationwide, there are six plants in active decommissioning, of which he anticipates four completing the decommissioning process by 2020. He stated that eight plants have announced that they plan to shut down, but that, at this stage, that decision is not binding and that they could reconsider and choose to remain open. He stated that Pilgrim Station is one of these eight.

Mr. Watson stated that NRC's current regulations took effect in 1997, that they are performance based, which allows for flexibility by a licensee, and that they are risk-informed, or dose-based. Mr. Watson stated that license termination is based on a radiation levels. Mr. Watson noted that since 1997, ten power plants have completed decommissioning and had their licenses terminated, all for unrestricted

use. Mr. Watson explained that unrestricted use allows the site owner to use the site for future use without any restrictions.

Mr. Watson stated that the regulations are available at 10 C.F.R. § 50.82, and that the NRC has Regulatory Guidebook 1.184 available on its website that describes the process in more detail.

Mr. Watson explained that the first step in the decommissioning process is applicant notification to the NRC of its intent to permanently shut down, a step which has already been taken for Pilgrim Station. The licensee next submits two certifications to NRC: one at the end of plant operations; and the second when fuel is permanently removed from the reactor. Mr. Watson explained that at this point, the licensee is not authorized to run the plant or put the fuel back in the reactor, and that it must remain in a spent fuel pool. He explained that the licensee must next submit a post-shutdown decommissioning activity report ("PSDAR"). He stated that when the NRC receives a PSDAR, the NRC holds a public hearing to receive comments on it. Mr. Watson explained that a key regulation holds that decommissioning must be completed within 60 years from the cessation of plant operations. He explained that this does not mean that it necessarily takes 60 years to decommission a plant. By contrast, he explained that the ten fully decommissioned plants needed between seven and ten years to decommission. The timing of the decommissioning process is up to the licensee. Mr. Watson explained that the regulations allow a plant to go through 50 years of radioactive decay, which reduces radiation dose rates in the plant.

Mr. Watson explained that the next major step in the decommissioning process is the submission of a license termination plan ("LTP"). The LTP must be submitted two years before a licensee requests license termination, and decommissioning activities can take place between the submission of the PSDAR and the LTP. Mr. Watson explained that the LTP explains how a licensee will meet the radiological release criteria needed to terminate the license.

Mr. Watson stated that the next step is for a licensee to submit final status survey reports, and if the NRC agrees with those reports, the NRC will terminate the license by letter. He explained that the NRC will be on site inspecting the plant through license termination and that the NRC uses an independent contractor to verify that the licensee is taking the correct measurements to meet license criteria.

Mr. Watson next described steps in the decommissioning process in greater detail. He stated that during Phase 1, the reactor is shut down and the nuclear fuel is transferred to the spent fuel pool. Also, the plant is prepared for decommissioning, which includes an independent spent fuel cooling system and certain security changes. He further stated that the PSDAR will describe a licensee's plan to go into active decommissioning, or DECON, or SAFSTOR, which he described as a mothballed state. He stated that plants can switch back and forth between DECON and SAFSTOR, as long as decommissioning is complete with in 60 years. He stated that Phase 1 includes a site decommissioning status report and an affirmation of environmental review to show that the licensee will remain in compliance with environmental requirements. He stated that the NRC holds a public meeting to receive comments on the PSDAR, and, because it is a report, there is no approval process for it.

Mr. Watson stated that Phase 2 is the decommissioning phase, where a plant will either go into DECON or SAFSTOR. He stated that the licensee has 60 years to complete the decommissioning, which consists of 50 years for radioactive decay and ten years to dismantle the plant. Mr. Watson stated that Phase 3 is the license termination phase, includes the submission of the LTP, and that a public meeting is held to receive comments on the LTP.

Mr. Watson explained that the Reactor Decommissioning Inspection Program continues until the license is terminated, that there is an inspection manual describing the program, and that there are roughly 40 inspection procedures. He stated that there is a minimum of one inspection per year for a project that is in SAFSTOR, but that the frequency of inspections changes depending on the specifics of each decommissioning. He stated that a resident inspector will remain on site for one year following plant shutdown to provide oversight, and this period can be extended as needed. He stated that inspection reports are publicly available.

Next, Mr. Watson showed pictures of various decommissioned for unrestricted release nuclear power plants. Mr. Watson explained that these sites all met the NRC's criteria for unrestricted release, which requires a site to release below 25 millirem or less per year. He explained that this means that a site can have residual radioactivity, but at these levels it is safe according to the ALARA principle. He stated that unrestricted release allows a site owner to use the site at its discretion. He stated that these sites typically do have independent spent fuel storage installations ("ISFSI") near them that have separate licenses.

The decommissioned sites Mr. Watson showed included: (1) Rancho Seco, whose license was terminated in 2009, but whose structures have not been fully demolished; (2) Big Rock Point, whose license was terminated in 2007 and whose site contained artifacts of importance to certain Native American tribes, and has been greenfielded; (3) Maine Yankee, whose license was terminated in 2005, and which was required by the state to greenfield the site and to decommission to below 10 millirem per year; and (4) Connecticut Yankee, whose license was terminated in 2007, and which had groundwater contamination requiring soil removal and additional groundwater monitoring.

Next, Mr. Watson described the concerns typically heard by the NRC at public hearings. These include economic losses, a desire for community involvement, concerns regarding the future use of the site, issues involving SNF storage, complaints about the length of the 60-year time limit, complaints about reductions in emergency response plans, decommissioning fund adequacy, and decommissioning license transfers, such as the ongoing proposed sale of Vermont Yankee.

Mr. Watson next described the decommissioning of Yankee Rowe, whose license was terminated in 2007 and which was the only nuclear power plant in Massachusetts other than Pilgrim Station. Mr. Watson used a photograph to show that the plant has been demolished and returned to a greenfield state with the exception of a dry fuel storage facility. In addition, Worcester Polytechnic Institute operated a research reactor whose license was terminated in 2013.

Mr. Watson then summarized the main points of his presentation. He stated that the NRC is expecting future plant shutdowns, and that certain states have provided rate relief to allow plants to continue operating when they might have otherwise shut down.

PANELIST QUESTION AND ANSWER:

Mr. Coughlin noted that although the NRC does not approve PSDARs, it reserves the right to comment on them if they do not meet requirements. Mr. Coughlin also asked how the NRC determines reasonableness when considering whether there are reasonable funds in a decommissioning trust. Mr. Watson responded that if a PSDAR is inadequate, the NRC will request that the licensee bring it into

compliance with regulations. Mr. Watson stated that the regulations include a formula for determining the required level of funds, and that a trustee oversees the fund.

Mr. Grassie asked how the money in the trust fund is allocated to the licensee and what role the NRC has in verifying that decommissioning is conducted according to the PSDAR. Mr. Watson replied that the NRC has no oversight over how the money is allocated, because that matter is between the licensee and the trustee, but that the NRC does have oversight over the trust's minimum fund level. He also stated that the NRC confirms that decommissioning is conducted appropriately through site inspections. Mr. Watson noted that if a licensee is spending money but not making progress, the NRC can urge the Department of Justice to investigate. Mr. Watson explained that the NRC is evaluating North Star's proposal to buy Vermont Yankee's license, and that the NRC will only evaluate North Star's PSDAR for Vermont Yankee if the NRC approves the sale. At that time the NRC will also evaluate whether the trust fund contains sufficient funds to cover the decommissioning as proposed in the North Star PSDAR.

Ms. duBois asked whether funds from the decommissioning trust fund may be used to transfer fuel from the spent fuel pools to the dry cask storage. Mr. Watson responded that this is a normal plant operation that takes place prior to decommissioning, and costs associated with this activity would therefore come from the operating fund. Mr. Watson stated that decommissioning funds cannot be used until submission of the PSDAR. Ms. duBois followed up by asking about the dry fuel storage facility's license, and why that license is issued by the NRC and not the Department of Energy ("DOE"). Mr. Watson replied that the NRC regulates the storage of SNF until DOE takes title to it, and DOE has not taken title to it because it has not determined where to store it. Ms. duBois asked in what ways a licensee is restricted in its use of the decommissioning trust's funds. Mr. Watson replied that the fund cannot be spent on the management of the SNF. Ms. duBois stated that she has concerns about the location of dry fuel storage, an Mr. Watson responded that changes to the location of dry fuel storage facilities require NRC approval.

Mr. Mahoney asked about the financial assumptions that result in certain sites choosing to fully decommission, when others are in SAFSTOR. Mr. Mahoney also asked whether the examples Mr. Watson offered of fully decommissioned sites experienced any shortfalls in the decommissioning funds. Mr. Watson responded that they had sufficient funding, although that they may have required assistance from the state. Mr. Mahoney followed up by asking whether any of the decommissioning funds retained a surplus when decommissioning was complete, and, if so, what happened to that money. Mr. Watson replied that the use of surplus funds would be a state's decision. Mr. Smith noted that in a state with deregulated energy markets, such as Massachusetts, there may not be the same type of additional funds that were available in the regulated states. Mr. Mahoney asked what would happen if inflation outpaces the fund's growth over time. Mr. Watson replied that NRC regulations require that the fund has a two percent rate of return over inflation.

Mr. Priest asked Mr. Watson to explain the site characterization process, and at what point during the decommissioning process it occurs. Mr. Watson replied that the NRC requires an environmental monitoring program and files important to decommissioning, and that these contain information that results in a licensee's site historical assessment. The site historical assessment lists the locations of prior leaks and areas on-site that may be contaminated. Mr. Watson stated that the next step is a scoping survey, and next is a detailed characterization survey. Mr. Watson stated that licensees may conduct these surveys at any time, but that they usually occur after a plant has shut down. Mr. Priest followed up by asking whether the information obtained by the surveys inform the PSDAR's price estimates, to which Mr. Watson replied that it could. Mr. Watson stated that Connecticut Yankee's issues with

groundwater contamination took place before the current regulations were effective, and that the current regulations require groundwater monitoring such that any contamination at Pilgrim would be identified now, and not during decommissioning.

Ms. duBois followed up by noting that the tritium present at Pilgrim Station is near Cape Cod Bay, which is a moving environment, and she asked how the NRC is protecting the Bay. Mr. Watson responded by noting that NRC regulations require water monitoring.

Mr. Priest asked about unrestricted release, and whether states can require that radiation release levels be stricter than those that the NRC requires. Mr. Watson responded that states may impose stricter requirements than the NRC, but not less strict than the NRC's 25 millirem per year limit. Mr. Watson stated that Yankee Rowe had stricter radiation level requirements than the NRC's. Mr. Priest asked about deferred dismantlement, and whether searching for hard-to-detect radionuclides could actually result in unanticipated cost increases, as occurred at Connecticut Yankee. Mr. Watson responded that it could add to the cost.

Mr. Smith asked whether Mr. Watson anticipates differences between the decommissioning of Yankee Rowe and of Plymouth Station. Mr. Watson responded that because Plymouth is a larger site, there will likely be a larger amount of radioactive material removed from the site, which could result in an increase in traffic. Mr. Watson stated that he anticipates a safe decommissioning process, similar to Yankee Rowe.

Mr. Nichols asked whether a licensee could place a long-term dry cask storage facility farther from the shore than 150 feet if it so chose. Mr. Watson replied that the location of the facility is at the discretion of the licensee, and that it must meet certain NRC minimum requirements. Mr. Watson noted that these decisions are often driven by security concerns and site size. Mr. Nichols followed up by asking about the long-term viability of the storage casks and how the NRC views them. Mr. Watson responded that the NRC is developing monitoring programs to ensure cask integrity, and that this is driven by a realization that the casks will likely remain in storage longer than originally expected due to the lack of a permanent repository. Mr. Nichols noted that an in-depth discussion of dry-fuel storage would be a useful topic for a future panel meeting.

Mr. Johnston asked about the advantages and disadvantages of DECON and SAFSTOR, and whether states can encourage a licensee to choose one approach rather than the other. He noted that Yankee Rowe was motivated by achieving unrestricted release. Mr. Watson responded that the NRC cannot require either approach, but that plants decommissioning during the 1990s were motivated to decommission quickly so that they could move their SNF to a storage site in South Carolina that would close soon thereafter. Mr. Watson stated that certain licensees consider a clean site that is available for reuse as an asset because it is free from the liability potentially caused by the presence of radioactive matter. He stated that it is a business decision, but if there is a safety issue, the NRC will take action. Mr. Johnston asked whether states can encourage a licensee to DECON rather than SAFSTOR. Mr. Watson stated that he was uncertain whether states could do this.

Ms. duBois noted an ongoing NRC decommissioning rulemaking process scheduled to conclude in 2019, and asked whether these new rules would apply to Pilgrim Station. Mr. Watson stated that the rulemaking will incorporate the lessons learned in recent history, but noted that the rulemaking may not be complete in time for it to apply to Pilgrim. Ms. duBois followed up by asking the status of the rulemaking and where to find information in order to assess whether or not to participate. Mr. Watson

stated that there have been two comment periods thus far, that the NRC is producing a regulatory analysis which will be available soon, and that information is available at regulations.gov, and also on the NRC's website.

Mr. Grassie noted a proposal at Vermont Yankee to decrease the size of the secure area to that immediately surrounding the ISFSI. Mr. Watson concurred, and stated that security concerns can change depending on where fuel is stored. Mr. Grassie followed up by asking whether decommissioned sites that currently house only ISFSIs have security beyond double fences, and whether there is a point where security is no longer needed. Mr. Watson responded that security will remain on site 24 hours per day as long as fuel is stored on-site. Mr. Grassie asked whether the planned second ISFSI at Pilgrim would result in two ISFSIs on-site, or whether they would consolidate the contents of the first ISFSI into the new facility. Mr. Watson responded that licensees typically consolidate into one ISFSI, and that he is not aware of a site that has more than one ISFSI.

PUBLIC QUESTION AND ANSWER:

Co-Chair Schwartz announced that the Panel would first receive questions from members of the public, answer them, and then receive comments.

Mr. Jim Lampert asked to what extent the NRC critically analyzes the information it receives from a licensee. Mr. Lampert stated that this includes information pertaining to finances, site condition, the presence of radiation, and the accuracy of decommissioning reports. Mr. Watson stated that the presence of resident inspectors ensures that what a licensee reports is accurate, and that operations are conducted in compliance with the site's license. He stated that NRC oversight is comprehensive.

Ms. Diane Turco of the Cape Downwinders asked what the boundaries of the unrestricted release use areas will be at Pilgrim, and asked whether a school could be built at Pilgrim. Mr. Watson replied that all but the boundaries of the ISFSI would be available for unrestricted use, and that the site may be used however the site owner deems appropriate. Mr. Watson stated that such decisions are outside the NRC's purview after license termination. He stated that decommissioned power plant sites are often locally zoned for industrial use, but that unrestricted release sites are safe from the NRC's perspective. Ms. Turco also asked what impact public comment would have on the PSDAR. Mr. Watson responded that the NRC is interested in learning whether there is a safety issue of which the NRC was unaware. He stated that it is also important for the licensee to hear the public's concerns. He related that citizen concern about increased traffic during the decommissioning of Connecticut Yankee resulted in increased policing of the streets near the site.

Mr. Richard Rothstein asked what the most contentious issues have been during the DRC's ongoing decommissioning regulations update. Mr. Watson responded that, in his opinion, the 60-year requirement is controversial because many believe that decommissioning should take place more quickly. He stated that financial aspects of decommissioning can also be controversial. Mr. Rothstein also mentioned that, in 2015, NRC concluded that if the current location of the dry cask storage posed any problems, the NRC could require Entergy to relocate it.

Ms. Mary Lampert asked Mr. Watson to explain why the NRC has stated both that fuel can safely be stored in either a pool or a cask for 60 years, and that after 100 years a licensee would need to change the cask, and that the NRC has also stated that casks can develop cracks within 30 years. Ms. Lampert noted that Holtec has stated that casks cannot be inspected because inspectors cannot see through

concrete, and that if a cask develops a crack, that cask cannot be repaired. Ms. Lampert also noted that Holtec has stated that storing casks in a pool is dangerous and that pools will eventually be removed. She noted that the NRC has asked licensees to propose inspection programs in five years, and to subsequently inspect one canister every 25 years. Ms. Lampert asked Mr. Watson to explain these inconsistencies. Ms. Lampert also asked why the Vermont Yankee PSDAR includes calculations assuming that its SNF will be removed in the 2040s, and would like to know the basis for the NRC's approval of this. Mr. Watson responded that the Electric Power Research Institute and the NRC have been testing approaches to innovative cask inspections and monitoring. Mr. Watson also explained that the dates quoted in the Vermont Yankee PSDAR are based on dates that DOE has advertised as its expected date for taking title to the SNF, based on when DOE expects to have a repository available, and that this matter is not handled by the NRC but rather by policymakers.

Mr. Lampert stated that the NRC seems to be narrowly compartmentalized, and that the panel will be challenged to obtain information from each of these compartments. Mr. Lampert also stated that the NRC has financial inconsistencies. Specifically Mr. Lampert noted that the NRC requires a two percent increase in the decommissioning trust fund, while other NRC papers have described a five to nine percent annual increase in costs. Mr. Lampert noted that industry panels stated that the increase in costs over a five-year period were 60 percent. He stated that he would provide his information to the panel.

Ms. Turco stated that the NRC may be underestimating the danger of SNF. She also stated that if the decommissioning fund in insufficient to cover the costs of decommissioning and additional funds are required, those who fund the decommissioning should have a say in the process. Ms. Turco stated that the panel should persuade the NRC to listen to the public and to prioritize public safety over business.

Ms. Lampert noted that the NRC stated at a meeting in Vermont Entergy would assure additional funding if Vermont Yankee's decommissioning fund lacks funding. Ms. Lampert noted that in the Department of Public Utilities' ("DPU") approval of the sale of Pilgrim Station from Boston Edison to Entergy, the DPU rejected the Attorney General's argument that any shortfall of funds would be provided by Entergy. Ms. Lampert suggested that the NRC should be liable for and funding shortfall.

WRAP UP AND ADJOURN:

Mr. Mahoney noted that Chairman Tavares requested that, at an upcoming meeting, the group discuss imposing a more restrictive millirem output requirement than that required by the NRC. Mr. Mahoney requested that this subject be added as an agenda item at an upcoming NDCAP meeting, so that he could subsequently present the Panel's input at a Board of Selectmen meeting. Co-Chair Schwartz stated he and Co-Chair Mullin would discuss the request and that the panel should discuss the available options for imposing stricter millirem standards under state law and regulations. Co-Chair Schwartz stated that Co-Chair Mullin had spoken with Entergy representatives about speaking at the next NDCAP meeting to discuss its plans.

Mr. Priest noted that the Site Restoration and Cleanup panel would be meeting on October 25, and that this could be a topic for that working group.

Co-Chair Schwartz adjourned the meeting.

Meeting adjourned at approximately 8:30 p.m.

DOCUMENTS USED AT MEETING:

- NRC presentation on the nuclear power plant decommissioning process