



Before the House Environmental Committee:
Testimony of Three Mile Island Alert, Inc.
on Nuclear Waste Containment

The Problem: Rad Waste Is Not the New Green.

For decades High-Level Radioactive Waste has accumulated at reactor sites where it is made. There is no credible plan to permanently isolate it. (1) Storage pools have been re-racked to pack waste tightly, creating new problems. (2)

As of 2018 there were ~ 80,000 metric tons of uranium (“MTU”) commercial irradiated fuel in the US with ~2,000 more generated every year. The half-life of the waste is 10,000 years.

There are now about 7,560 metric tons of high-level radioactive waste fuel stored at Pennsylvania’s nuclear power plants excluding Peach Bottom-1 and Three Mile Island Unit-2.

With the exception of Three Mile Island-1, (3) Beaver Valley, Limerick, Peach Bottom and Susquehanna have transitioned to dry cask storage. Limerick has capacity in its shared pool for both units of less than 1,340 MTU. Peach Bottom 2 and 3 have the capacity of approximately 1,250 MTU in their combined spent fuel pools.

In the case of Limerick, 28% of the high-level radioactive waste (“HLRW”) is in dry cask storage while at both Peach Bottom 2 and 3 the amount is over 50%.

All of Three Mile Island spent fuel is stored in a pool that has been re-racked three times. Exelon does not plan to transition to dry cask storage until 2022. (3)

Reducing the amount of radioactive waste in fuel pools is a top priority. The waste would not be completely safe in dry storage, but independent engineers have testified that it would be safer. Hardened On-Site Storage (“HOSS”) would provide better security at reactor sites with robust dry storage and oversight, including real-time monitoring of heat and radiation.

Removing the waste from the pools is an important step. Unfortunately, the nuclear industry is now almost exclusively using dry casks that are far more vulnerable to failure and more difficult to inspect than those used in other countries.

Consolidated/Centralized “Interim” Storage: Bridge to Nowhere.

Consolidated/Centralized Interim Storage (“CIS”) Nuclear Waste dumps would be sites to which high level nuclear power waste would be moved before being shipped to a (currently nonexistent) permanent repository.

The current federal law, the Nuclear Waste Policy Act of 1982, and 1987 Amendments, state that consolidated “interim” storage is allowed only if a permanent repository is operating. Moreover, the provision of the law allowing for a “temporary” site expired, making any such facility illegal.

Despite the illegality, two private corporations applied to open such sites and the Nuclear Regulatory Commission (“NRC”) is proceeding with their applications - one in Texas and one in New Mexico. (4) These site pose significant safety challenges:

- 1) Consolidated waste sites are not designed to store irradiated nuclear fuel for the millions of years it remains radioactively dangerous.
- 2) There has been a failure to improve the existing vulnerability of nuclear waste storage technology.
- 3) It is likely that an “interim” site could become a de-facto permanent storage site if a morally and scientifically sound permanent system to isolate the waste is not developed.

These corporations want to change the law to allow them to make money while liability is borne by the public by:

- 1) Legalizing consolidated “interim” storage before there is a permanent repository.
- 2) Shifting liability for high-level waste from nuclear power companies to the US Department of Energy, i.e., taxpayers.
- 3) Raiding Nuclear Waste Fund money collected for permanent isolation to be redirected for so called “interim” storage.

Recommendations for Pennsylvania.

Spent fuel should be stored more securely in Hardened On-Site Storage in containers that can be monitored. Better storage containers and systems are needed no matter where the waste is located. (5)

Recommendation 1: Reporting.

Pennsylvania Licensees shall send the Pennsylvania Public Utility Commission, (PUC) any report provided to the NRC with respect to 10 C.F.R. 50.75 or 50.82(a)(8)(v) within ten days of the date upon which it was provided the NRC.

Recommendation 2: Department of Energy Recovery.

All spent fuel management costs recovered from DOE must be put into the Decommissioning Trust Fund and used only to pay for decommissioning costs. **This is not what Exelon proposed in their Request for An Exemption to the NRC, which would allow the Company to raid decommissioning funds. (6)**

Recommendation 3: Parent Company Guarantee.

The Licensee's parent Company (not a Limited Liability Cooperation's subsidiary) must provide a Parent Company Guarantee of not less than \$500 million, after the payment of all taxes.

Recommendation 4: Spent Fuel Monitoring.

Until all spent nuclear fuel has been moved into dry casks in the Independent Spent Fuel Installations("ISFSI"), the licensee shall make annual payments to the Pennsylvania Department of Environmental protection ("DEP") and the Pennsylvania Emergency Management Agency ("PEMA") to defray the costs incurred by the Bureau of Radiation Protection's ("BRP") radiation control program for offsite and onsite radiological monitoring and testing.

Recommendation 5: Emergency Planning.

Until the calendar year after all spent fuel has been moved into dry casks, the licensee shall make annual payments to the DEP and PEMA, and to each county, any portion of which is within ten miles of the a nuclear site, to defray the costs incurred with respect costs to provide emergency radiological planning. **Licensees will continue to make annual payments to DEP and PEMA, and to each county within ten miles of the reactor and the Commonwealth at an agreed upon reduced level until all spent nuclear fuel has been removed from the site.**

Recommendation 6: Monitoring fees and responsibilities.

Consistent with Act 31, initial payment shall be \$650,000. With respect to each subsequent calendar year, the payment shall be in an amount equal to the costs incurred in the prior calendar year by the department's radiation control program. **No decommissioning trust funds shall be used to make any of these payments.** Commonwealth personnel will accompany NRC personnel visiting the site in connection with any license termination plan, and to take and test samples. (7)

Recommendation 7: Site Restoration.

All activities conducted at this site shall comply with applicable federal, state and local environmental and human-health based laws, standards and regulations, to the extent such laws standards and regulations do not conflict with the standards identified in a MOU and should include the Delaware River Basin Commission or the Susquehanna River Basin Commission as signatories. All subsurface voids shall be filled, and the land shall be regraded and reseeded. All fill material must comply with the approved radiological and non-radiological remediation standards.

Hazardous (non-radiological) Waste: All hazardous waste shall be removed from the site to whatever level is required by federal, state, or local laws or regulations for unrestricted use of the site.

Recommendation 8: Radiation Monitoring.

The BRP must continue offsite and onsite radiological monitoring until all spent nuclear fuel has been removed from the site. Licensees shall underwrite all costs and work cooperatively with the DEP and PEMA to develop appropriate protocols related to non-radiological remediation and site restoration for information sharing, obtaining samples from onsite environmental media, conducting site visits and inspections, site characterization, remediation, site restoration, and notifications.

Recommendation 9: Offsite-Emergency Planning.

State and local communities within ten miles of the site shall be funded for radiological emergency planning at current levels until all spent fuel is removed from the pools and placed in hardened dry casks. Licensees shall pay the costs of such monitoring as set forth above.

Recommendation 10: Spent Fuel-Dry Cask and Pad Monitoring.

Licensees agrees to monitor in real-time each cask for heat, helium and radiation, and provide real-time monitoring data to the Bureau of Radiation Protection. The canisters and concrete outer packs are prone to cracking, exacerbated by corrosion.

The Commonwealth shall have the ability to inspect the pad and casks, and shall receive a copy of any report relating to any inspection of the pad or casks by the licensee or the NRC within ten days after the date of any such report.

Recommendation 11: ISFSI Security.

To reduce the potential of a line-of-site attack, either the casks shall be stored in a building for additional security and environmental protection or, at minimum, a barrier not less than five feet higher than the height of any cask in the ISFSI shall be constructed around the ISFSI. While fuel remains onsite, security shall include: a protected area around the ISFSI, concrete vehicle barriers; lighting; cameras and intrusion detection equipment, and cyber security measures. (8)

Reference notes

1 "The configuration of spent fuel pools is essentially the same for all nuclear power plants. The pools are rectangular in vertical and horizontal cross section. The spent fuel assemblies are stored in racks at the bottom of the pool. Insertion or removal of the fuel assemblies is accomplished vertically from above the storage racks. The 13.5 to 14.5 foot long fuel rods must remain submerged during fuel removal or insertion into the racks; thus, for this reason alone, the spent fuel pool must be at least 27 feet deep.

However, an additional eight to ten feet of water is required for shielding an irradiated fuel assembly just removed from the reactor. The spent fuel pool depth must therefore be approximately 40 feet. The direct radiation at the the pool surface from the fuel stored at the bottom is very low because of the water depth of about 25 feet above the top of the irradiated fuel assemblies is equivalent to about 10 to 11 feet of concrete shielding value." (David Lochbaum, Union of Concerned Scientists, "Nuclear Waste Disposal Crisis", Spent Fuel Pools, p. 52., 1996.)

2 The National Academy of Sciences issued a report that had been requested by Congress in March 2005. The report questioned the safety and security of highly crowded spent fuel pools currently storing the nation's nuclear inventory. The report concluded that the government does not fully understand the risks that a terrorist attack could pose to the pools and ought to expedite the removal of the fuel to dry cask storage casks that are more resilient to attack.

3 In 2005, TMI's owner said TMI-1, will lose off- load refueling capacity in 2018.

In 2008, Exelon was in the process expanding of a spent-fuel storage capacity. The project will last from 2002-2009 and re-rack "wet storage". AmerGen is increasing capacity through three phases:

- Phase 1 - Complete;
- Phase 2 - Completed in mid-2003. An additional 216 re-racked cells added were installed, or enough for three refueling cycles, were installed.

- Phase 3 - To be completed by mid-2009, and would add another 432 re-racked cells extending storage capacity through 2018. (4) Because of the additional capacity, and Three Mile Island-1 core size, (177) the Company will not lose full core off-load capability until 2018. In other words, lack of waste storage space will not force TMI to close prior to its license expiration.

Source: “AmerGen and Exelon Meeting with EFMR on January 23, 2003, at the Three Mile island Training Center, S 1-2: Peach Bottom-2 & -3 and Three Mile Island-1, Meeting & Action Items.”

4 **Application 1:** Waste Control Specialists (“WCS”) Orano USA and NAC International seek to store 40,000 metric tons on their Texas site bordering New Mexico.

Application 2: The Eddy Lea Energy Alliance in conjunction with Holtec International is applying for a license to “temporarily” store 100,000 metric tons (with potential for 120,000) of irradiated nuclear fuel in holes in the ground in southeast New Mexico, east of Carlsbad.

5 a. **Early Site Assessment:** The licensee will complete a thorough assessment of the site for the following impacts (including, but not limited to, flooding, severe storms coinciding with high tides and exceptional wave heavy precipitation, rising groundwater tables, and increased acidity contributing to corrosion of any underground structures), and an assessment of radiological materials and non-radioactive hazardous materials, not later than December 31 or 3 months after the license transfer, whichever comes first.

In advance of such assessment, licensee will provide the Commonwealth with the protocol for its reviews and will give the Commonwealth the opportunity to provide comments with respect the protocol.

b. The Commonwealth also shall be given access to the site and the opportunity to take and analyze samples. Within 30 days following completion of the assessment, the licensee will give the Commonwealth a detailed report of the results of the assessment, including all data and other information learned during or as a result of the assessment.

c. **Interim Inspection and Sampling:** Licensees will give the Commonwealth access to sites during decommissioning to take samples; accompany NRC in its inspections; and be given split samples of any samples taken by the licensee or NRC.

d. **Final Environmental Site Assessment:** The licensee will give the Commonwealth a copy of any license termination plan provided to the NRC within five days of the date on which any such plan was submitted to the NRC; and will give the Commonwealth the opportunity to provide comments to the NRC with respect to any such plan.

Rubblization: All structures, components and soil having any detectible level of radiation distinguishable from background radiation shall be removed from the site. No structure shall be rubblized and buried on site.

Rubblization is a process in which above-grade structures are demolished into rubble and buried in the structure's foundation below ground. The site surface is then covered, regarded, and landscaped for unrestricted use. It poses a threat to public health and decreases the long-term stability of the land. Instead, the demolished rubble should be shipped to a licensed disposal site.

6 Document Title: "Three Mile Island Nuclear Station, Unit 1 - Request for Exemption from 10 CFR 50.82(a)(8)(i)(A) and 10 CFR 50.75(h)(1)(iv)." Document Type: Exemption from NRC Requirements. Letter Document Date: 04/12/2019.

7 Commonwealth of Pennsylvania Radiation Protection Act Report to the General Assembly Pursuant to Act 31 of 2007, Annual Fee Payments, pp. 2-3. (November 6, 2017)

8 The Illinois legislature proposed impact fee legislation on January 9, 2019. Language in the bill states that an impact fee would be based on operation "immediately before the nuclear facility ceased to generate electricity." It provides that the annual amount of the fee can't exceed 25 percent of the average annual amount of property taxes paid to the municipality by the operator during the last five years that the nuclear facility was operational.

If enacted, the measure would permit Illinois communities to "establish and collect a nuclear storage impact fee from the entity that operated a nuclear facility within the boundaries of the municipality" if a plant ceased generating electricity on or before the act's effective date.

Synopsis As Introduced

Amends the Illinois Nuclear Facility Safety Act. Provides that any municipality may establish and collect a nuclear storage impact fee from the entity that operated a nuclear facility within the boundaries of the municipality. Provides that the nuclear storage impact fee shall only be imposed on nuclear facilities that ceased generating electricity on or before the effective date of this amendatory Act. Provides that the fee shall be charged to the entity that operated a nuclear facility within the boundaries of the municipality immediately before the nuclear facility ceased to generate electricity. Provides that the nuclear storage impact fee can only be applied prospectively. Provides that in any calendar year, the nuclear storage impact fee shall not exceed 25% of the average annual amount of property taxes paid to the municipality by the entity that operated the nuclear facility during the last 5 years that the nuclear facility was operational. Provides that the municipality shall conduct a public hearing before imposing the nuclear storage impact fees. Provides that the revenue collected from the fees shall be used to offset property taxes for owners of property within the boundaries of the municipality. Provides that no sale, assignment, lease, or decommissioning agreement that was executed after a nuclear facility ceased generating electricity and before the effective date of this amendatory Act shall assign or transfer the obligation to pay any nuclear storage impact fee imposed.