



**pennsylvania**

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Radiation Protection

# Nuclear Power Plant Decommissioning

Low-Level Waste Advisory Committee  
Annual Meeting

September 27, 2024

Josh Shapiro, Governor

Jessica Shirley, Acting Secretary

# What is Decommissioning?

- Removal of a facility from service and reduction of residual radioactivity to a level that permits termination of the NRC license
- NRC requires the licensees to decommission the nuclear plant within 60 years after it ceases operations
- NRC regulates and provides oversight of the decommissioning process

# Decommissioning Methods

- **DECON** (immediate dismantling) - The equipment, structures and portions of the facility containing radioactive contaminants are removed and decontaminated to a level that permits release of property and termination of the NRC license.
- **SAFSTOR** (deferred dismantling) – The facility is maintained and monitored in a condition that allows the radioactivity to decay; afterwards the plant is dismantled and property decontaminated.
- **ENTOMB** – Radioactive contaminants are permanently encased on site in structurally sound material such as concrete and the facility is maintained and monitored until radioactivity decays to a level that permits termination of the license.

# Decommissioning Funds

- The licensee must establish or obtain a financial mechanism to ensure there will be sufficient funds for ultimate decommissioning of the facility
- Licensee accumulates funds over the life of operating reactor
- NRC Minimum Funding Amount (MFA) is adjusted for changes in labor, energy, and low-level radioactive waste burial cost
- MFA covers radiological decommissioning only
- Licensee must report to the NRC every 2 years the status of its decommissioning funding, annually within 5 years of the plant shutdown, and annually once the plant ceases operation

# Phases of Decommissioning

## ➤ **Phase 1. Transition from Operation to Decommissioning**

- Certificate of permanent cessation of operations
- Certificate of permanent removal of fuel from reactor
- Post shutdown decommissioning activity report

## ➤ **Phase 2. Major Decommissioning Activities**

- Permanent removal of major components
- Owner can use up to 3 percent of funds for decommissioning planning

## ➤ **Phase 3. License Termination Activities**

- Submit a license termination plan for final radiation surveys and updated estimates of remaining decommissioning costs
- Requires NRC approval of a license amendment and a public meeting
- NRC issues a letter terminating the operating license

# U.S. Reactor Decommissioning Business Model

- Licensee carries out decommissioning activities
- Licensee manages a decommissioning contractor
- Temporary license transfer to a decommissioning company and return the land and spent nuclear fuel to the utility
- Asset sale and license transfer to a non-utility

# ➤ Reactor Decommissioning Public Involvement

- Post Shutdown Decommissioning Activities Report (PSDAR) meeting
- License Termination Plan (LTP) meeting
- Opportunity to provide written comments whenever the licensee submits a PSDAR, LTP and LAR (license amendment request)
- Opportunity to form a Citizens Advisory Panel for decommissioning activities

# Status of Nuclear Power Plant Decommissioning

- 14 commercial nuclear power plants have been decommissioned in the U.S.
- 16 nuclear power plants are in active decommissioning
- 7 nuclear power plants are in SAFSTOR

**Source:** Nuclear Regulatory Commission (as of 1/1/2024)



# Estimated LLRW Associated with TMI-1 & 2 Decommissioning

<u>Waste Type</u>	<u>TMI-1</u>	<u>TMI-2*</u>
Class B & C	1,770 ft <sup>3</sup>	17,000 ft <sup>3</sup>
Class A	347,776 ft <sup>3</sup>	4,200,000 ft <sup>3</sup>

**Source:** Post Shutdown Decommissioning Activity Report

\*TMI-2 experienced the worst commercial nuclear power plant accident in the U.S.



# Questions?

**Rich Janati, M.S.  
Bureau of Radiation Protection**

**Phone: 717-787-2163  
rjanati@pa.gov**

Federal and State law prohibit discrimination on the basis of age, color, creed, mental and/or physical disability, gender identity, national origin, pregnancy, race, religion, sex, or sexual orientation. If you believe you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please contact DEP's Non-Discrimination Coordinator at [repondiscrim@pa.gov](mailto:repondiscrim@pa.gov)