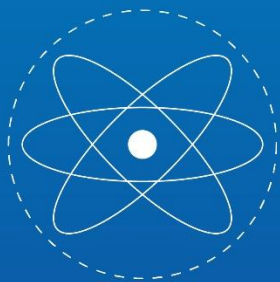




Transportation of Radwaste

September 25th, 2026

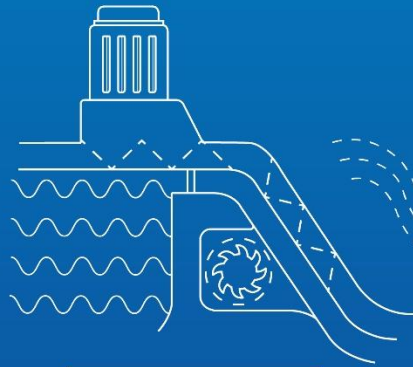
Constellation's Carbon-Free Generation



Nuclear

21 reactors in IL and the Mid-Atlantic

20,895 MW



Hydroelectric

2 plants along the Susquehanna River in MD and PA

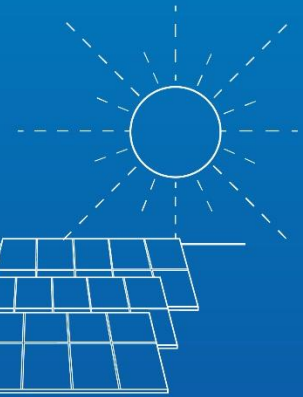
1,642 MW



Wind

27 projects across 10 states

738 MW



Solar

5 sites, including Antelope Valley Solar Ranch in CA

268 MW

[constellationenergy.com/csr](https://www.constellationenergy.com/csr)

Limerick Clean Energy Center



Peach Bottom Clean Energy Center



Calvert Cliffs Clean Energy Center



US Regulations

- 49 CFR 173 Subpart I – Class 7 Radioactive Material
 - Establishes the requirements for Class 7 shipping classifications.
 - White I, Yellow II and Yellow III
 - Empty, DOT Exempt, Limited Quantity
 - Radioactive – LSA, Radioactive – SCO
 - Governs the packaging requirements for Type A, Industrial Packages and general design packages.
 - Establishes the training requirements for Shippers and Transporters
 - Establishes the requirements for transportation security programs
- 10 CFR 71 – Packaging and Transportation of Radioactive Material
 - Governs the control, design and use of Type B packaging
 - Establishes the Quality Assurance requirements for Type B packages
- 10 CFR 37 – Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material
 - Security requirements during transient for high radioactivity shipments

Common Waste Streams at Commercial Nuclear Plants

- Dry Active Waste (DAW)
 - Commonly packaged into plastic bags, metal boxes/drums or loaded as is.
 - Waste with higher dose rates are loaded in shielded containers.
- Oil and Liquid Waste
 - Commonly packaged into drums or loaded directly into container.
- Demineralizer Resins
 - Commonly packaged into High Integrity Containers (HICs) or steel liners
 - Secondary resin in PWRs are commonly packaged into metal boxes or drums if radioactive.
- Filters
 - Commonly loaded into HICs, steel liners or shielded containers
- Irradiated Components
 - Packaged into steel containers

Transportation DAW

- Most common shipment
- Standard ISO metal shipping container
- 20' or 40' models are used depending on the plant configuration.
- Typically loaded with poly bags, drums or metal boxes which is based upon the waste being loaded.
- Shipped to vendor for inspection, volume reduction and repackaging.
- Transportation to burial in large quantities via rail.



Transportation of Oil and Liquid Wastes

- **Prevent spills and leaks**
 - Absorbents or secondary containments must be able to control twice the volume being shipped.
- **Package Integrity**
 - Still driven by radioactivity of the liquid and must meet the structural requirements.
- **Unique Considerations**
 - Settling times after filling.
 - Control of drains and vents.
 - Gross Weight



Transportation of Demineralizer Resin and Filters

- Requires the use of a DOT Type A or an NRC licensed Type B shielded transport cask.
- Loaded remotely using cranes.
- DOT Type A casks:
 - 120 ft³ to 210 ft³ capacity
 - 30,000 – 50,000 empty weight
 - 2" – 3.65" Pb equivalent shielding
 - Typical package shipped have dose rates that are <10 R/hr
- NRC Type B casks:
 - 120 ft³ to 160 ft³ capacity
 - 50,000 lbs – 76,000 empty weight
 - 4.5" – 5.1" Pb equivalent shielding
 - Requires a leak test prior to shipment
 - Can safely ship packages up to 500 R/hr



Transportation of Irradiated Components

- Common components shipped are control rod blades and nuclear instrumentation.
- NRC Type B casks:
 - 60 ft³ to 154 ft³ capacity
 - 70,500 lbs – 150,135 empty weight
 - ~7" – ~8" Pb equivalent shielding
 - Loaded underwater which requires draining, drying and decontamination upon removal.
 - Requires a leak test prior to shipment
 - Can safely ship packages greater than 2,000 R/hr.





Constellation Energy Generation, LLC
Marc Pawlowski
Corporate Functional Area Manager – Radwaste
marc.Pawlowski@constellation.com
267.533.5264