

Atlas Railcar

The U.S. Department of Energy (DOE) is developing special railcars for future large-scale DOE transport of spent nuclear fuel (SNF) from nuclear power plants. Designs include new buffer railcars, the Atlas railcar (to transport SNF containers), and a new escort railcar for security personnel that was developed in collaboration with the U.S. Navy. All railcars are expected to complete testing and meet North American freight safety standards in 2023.

Railcar Design Process

The Atlas railcar is designed to carry 17 different SNF containers (also known as “casks”) weighing between 82 tons and 210 tons. The railcar design process included extensive dynamic computer modeling to simulate how the railcar design would perform with different railcar components, different container attachment mechanisms, and different container weights.

Safety Standards and Testing

The Association of American Railroads (AAR) is the standard-setting organization for all of North America’s freight railroads. AAR’s S-2043 standard is specific to railcars used to transport high-level radioactive material, like SNF.

To gain AAR approval under the rigorous S-2043 standard, railcars must undergo individual testing, and testing as part of a full train with other S-2043 railcars (multi-railcar testing).

DOE estimates it will take about 8 years of railcar development and testing to verify that all of the new railcars meet the S-2043 standard, and receive approval from the AAR.



Atlas SNF railcar with test weights on test track.

Transporting SNF by Rail

Trains carrying SNF for DOE programs will look similar to the graphic below. The buffer railcar was designed by DOE and is undergoing testing with Atlas. DOE is working with the U.S. Navy to develop the escort railcar to meet the AAR’s S-2043 standard. DOE and the Navy will use identical escort railcars for their SNF shipments.

