ATLAS RAILCAR

The U.S. Department of Energy (DOE) has developed special railcars for future large-scale DOE transport of spent nuclear fuel (SNF) from nuclear power plants. The designs include the Atlas railcar (designed to transport SNF containers), new buffer railcars, and a new escort railcar for security personnel that was developed in collaboration with the U.S. Navy.

RAILCAR DESIGN PROCESS

Atlas is a 12-axle railcar designed to carry 23 different SNF transportation packages (also known as "casks") weighing between 82 tons and 210 tons. The design process included extensive dynamic computer modeling to simulate how the railcar would perform with various railcar components, attachment mechanisms, and container weights.

SAFETY STANDARDS AND TESTING

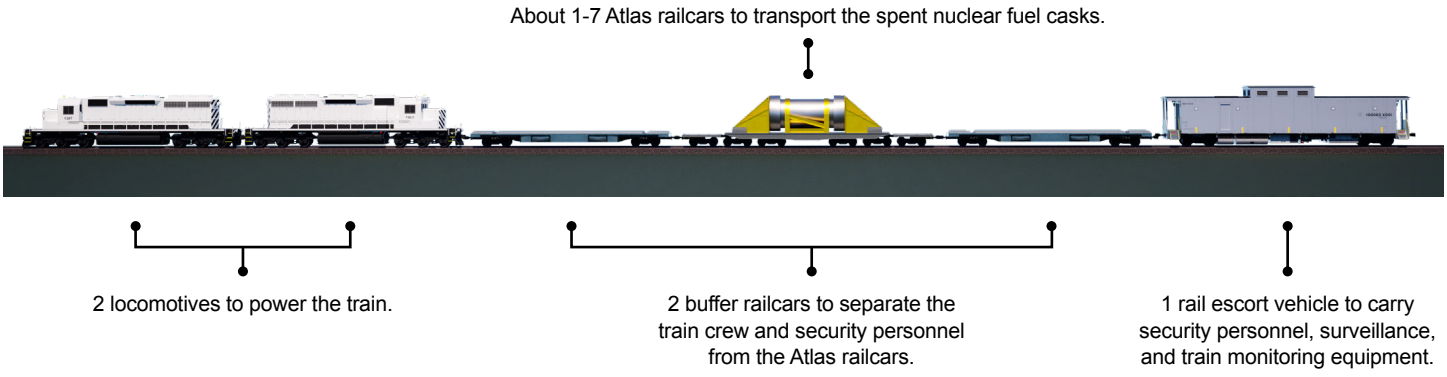
The Association of American Railroads (AAR) is the standard-setting organization for North America's freight railroads. In May 2024, DOE's three railcar designs were officially approved under AAR's S-2043 standard, which is specific to railcars used to transport high-level radioactive material such as SNF.

To gain AAR approval under the rigorous S-2043 standard, railcars must undergo individual testing and multiple-railcar testing as part of a full train with other S-2043 railcars. The Atlas railcar took 10 years of development and testing to meet AAR standards.

TRANSPORTING SNF BY RAIL

DOE transport of SNF by rail will look similar to the graphic below, with flat-deck buffer railcars providing physical separation from radioactive materials in the cask-carrying Atlas railcar(s). A rail escort vehicle (REV) will transport armed escorts along with security and safety monitoring equipment for each shipment. DOE and the U.S. Navy collaborated on the design and testing of the REV.

For more information, contact **AskSNF@nuclear.energy.gov**



U.S. DEPARTMENT of ENERGY | Office of Nuclear Energy
Spent Fuel and High-Level Waste Disposition

June 2025