

U.S. Department of Energy's Spallation Neutron Source's Integrated Sustainability Radioactive Low-level Liquid Waste Reduction Project

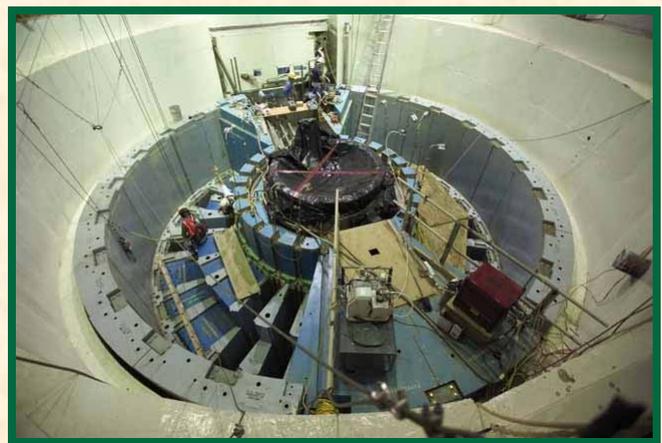
The U.S. Department of Energy (DOE)'s Spallation Neutron Source (SNS) currently under construction in Oak Ridge, Tennessee is the world's newest accelerator-based pulsed-neutron research facility. The design and construction of this \$1.4 billion facility is an ongoing collaborative effort among six DOE facilities, Argonne, Brookhaven, Lawrence Berkeley, Los Alamos, and Oak Ridge National Laboratories, and Thomas Jefferson National Accelerator Facility. Throughout design and construction of the SNS facility, concepts of sustainability including design, energy efficiency, and pollution prevention have been incorporated to minimize the facility's impact on the environment during construction as well as operation. These concepts go beyond mere regulatory requirements; they are both philosophical principles and pragmatic applications integral to design, construction, and ultimately operation of the facility.



Spallation Neutron Source Overview

Based on this team effort, SNS implemented design, construction, and operational changes which reduced the amount of process waste requiring treatment from an estimated 35,000 gallons per day to less than 375 gallons per day. This significant, sustainable achievement was possible by evaluating each potential point of contribution to the overall waste stream, and subsequently segregating clean process waste waters from potentially contaminated process waters, and then collecting and monitoring those waters prior to selecting a disposition pathway.

SNS recognized that its operation will generate numerous types of waste and created a working waste management plan to address the entire life cycle for all SNS waste streams prior to generation. The most significant waste stream documented was radioactive low-level liquid waste, specifically activated process water, which dwarfed all other streams and accounted for 93.3 percent of the total low-level waste, and 93.1 percent of the total low-level and mixed low-level waste. An intensive effort was initiated to re-evaluate and reduce the amount of process water destined for the process waste system.



SNS Target Monolith