

Additional Closed-loop Chiller System Implementation Reduces Once-Through Cooling Water Usage in the Chemical Sciences Division

The Oak Ridge National Laboratory (ORNL) UT-Battelle Chemical Sciences Division (CSD) created a fiscal year (FY) 2006 plan to reduce environmental impact caused by CSD research activities including the use of once-through cooling water. CSD used more than 2 million gallons per year of process water for once-through cooling purposes. In FY 2006, by implementing closed-loop chillers, CSD successfully met its objectives/ targets by reducing this usage by approximately 188,000 gallons per year resulting in about an 8 percent reduction in once-through cooling water usage.



New Closed-loop Chilled Water Systems

In FY 2007, CSD established a new objective and target to reduce its once-through water usage by an additional 100,000 gallons per year resulting in about a 5 percent reduction in once-through cooling water usage. CSD built upon its FY 2006 success and purchased and installed additional closed-loop chilled water systems to replace once-through cooling water used in 3 laboratories. The implementation of the additional closed-loop chilled water systems in 2 of these laboratories eliminated 102,000 gallons of once-through cooling water uses and the associated discharged water. The third system was installed on an operation that was being re-established. In this case, the chiller saved an estimated 2.6 million gallons of water annually. This initiative reduced the cost of the water and reduced waste water generation, resulting in more efficient operations and cost savings. This initiative also has a downstream benefit of reducing the amount of waste water requiring treatment at ORNL. The one-time equipment and installation cost for these 3 chilled water systems was approximately \$30,000.

Consequently, in FY 2007, this implemented CSD source reduction initiative:

- improved operational efficiency – reduced water usage and costs
- reduced waste water generation (approximately 2.7 million gallons per year)
- avoided costs of approximately \$27,000 from reduced water usage and management of waste water
- eliminated piping that reduced the opportunity for leaks.



Example of Laboratory Equipment Using Chilled Water