

Demonstration of Evaporator Technology for Radioactive Liquid Wastes

PARTNERS



WOW ("Wonderful Water") Technology SRL



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Large-scale WOW demonstration units installed at Saluggia Nuclear Repository (Italy)

Technical Summary

This project is focused on demonstrating the capability of an innovative evaporator design recently developed by Wonderful Water (WOW) Nuclear SRL that offers a small footprint and very high decontamination of the evaporator condensate. Tests conducted previously at the Applied Nuclear Energy Laboratory (LENA) of the University of Pavia indicate very high removal of the radioactivity in the evaporator condensate (e.g., >99.9998% removal of ¹³⁷Cs). The small footprint of the system makes it very attractive for deployment in new and existing facilities.



Demonstration unit planned for testing at LENA (Pavia, Italy)

If successful, this technology will address a key challenge in the DOE complex, especially at SRS and Hanford, related to effective water management associated with the storage, retrieval, pretreatment, stabilization and disposal of liquid radioactive wastes.

Path Forward

- Procure chemicals and radioisotopes to prepare two radioactive surrogates representing liquid wastes at DOE-EM facilities.
- Perform demonstrations using the WOW equipment at LENA (Pavia, Italy)
- Issue summary technical report detailing the findings from the two radioactive evaporation tests.

Funding FY16 - \$160K | FY17 - \$160K (carryover)

Key Accomplishments

- Selected two solution compositions for the technology demonstration.
 - SRS Effluent Treatment Facility Evaporator Feed Solution
 - Hanford Technetium Eluate Evaporator Feed Solution
- Awarded subcontract for the demonstration.
- Fabricated unit for radioactive testing at LENA in Pavia, Italy.

Key Benefits

- Proprietary technology offers an equipment design that exhibits high decontamination, high volume reduction, small operating footprint, no secondary waste, and the capability of treating a variety of liquids including acids and salts.
- Successful treatment of the radioactive solutions in the planned testing will increase the technical maturity of the technology.
- Deployment of the technology will assist in safely managing liquids that require evaporation and minimize releases of radioactivity to groundwater sources.