Integrated Waste Treatment Unit

The Integrated Waste Treatment Unit (IWTU), a first-of-a-kind, 53,000-square-foot facility, will treat 900,000 gallons of liquid radioactive and hazardous waste that has been stored in underground storage tanks.

The waste that will be treated – called sodium-bearing waste – was generated from operations at Idaho Nuclear Technology and Engineering Center (INTEC). The liquid is stored in three stainless steel 300,000-gallon storage tanks that are part of a tank farm of 15 tanks.

IWTU, located east of INTEC, will use a steam-reforming technology to convert the liquid to a solid, granular material; packaging it in stainless steel canisters; and storing the containers in concrete vaults at the site.

Any emissions generated during the treatment campaign will be filtered through high-efficiency particulate air (HEPA) and Granulated Activated Charcoal filters and sampled to ensure regulatory requirements are met. Steam reforming is used successfully in a variety of chemical and petrochemical applications. It is currently being used at a facility in Erwin, Tenn., to primarily treat radioactive resin wastes from commercial nuclear facilities.

Treatment of sodium-bearing waste supports the regulatory agreements between the DOE and state of Idaho.

Once the three underground storage tanks containing the waste have been emptied, they – like the previous tanks – will be thoroughly washed and filled with a concrete grout mixture. The entire tank farm will eventually be capped.

IWTU process system flow diagram on reverse.

Fluor
IDAHO

PROJECT STATUS

Following a successful 50-day demonstration of the IWTU in 2019 where more than 63,000 gallons of liquid simulant were converted to a granular solid, Fluor Idaho is completing final modifications to the facility in advance of initiating a confirmatory run in late 2020.

Testing is continuing at Hazen Research in Colorado on new ceramic filters that have undergone more than 50 days of successful tests using a liquid simulant. Ceramic media has proven much more effective at withstanding high temperatures and a corrosive operating environment than previous IWTU filters.

Crews at the IWTU are continuing to make progress on a wet decontamination system that is being installed to allow operators to drain the primary reaction vessel during actual waste treatment operations and transfer the liquid waste to a holding tank. A robotic arm is also being added to the IWTU's canister fill cell to decontaminate the stainless steel product canisters before they are placed remotely in concrete vaults for storage.

The upcoming confirmatory run will test the new equipment and demonstrate that the facility can maintain stable operations for 60 days. Following a successful run, the IWTU will undergo an outage and readiness assessment in advance of beginning actual waste treatment operations.

IWTU TREATMENT PROCESS OVERVIEW