

Large Scale Tritium Recovery from Obsolete Illumination Devices at LLNL

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Since 2001, LLNL has supported a program to recover and recycle tritium from exit signs, telephone dials, gun sights and other military and commercial tritium-powered illumination devices. In addition to permitting tritium reuse, this effort also provides an environmentally safe disposal option. Recently, the startup of the Tritium Grinder System (TGS) in the LLNL Tritium Facility has added significantly to the program's capability and capacity.

The TGS liberates gaseous tritium from these various devices by mechanically grinding (or shredding) them in a modified industrial shredder under vacuum. Liberated tritium is collected in a storage tank and periodically removed by trapping on a commercially available hydrogen getter. Possible migration of tritiated particulate into the building ventilation system is precluded by HEPA filtration. Solid debris generated by the recovery process is safely collected in a lined 55-gallon drum using a "bagout" process similar to that developed for actinide gloveboxes and is later disposed of as low-level radioactive waste.

It is expected that the TGS will be capable of processing up to 70 standard exit signs or 2200 obsolete rotary phone dials per working day. Actual operating results, including costs, are presented along with a summary of the design features, construction process and regulatory and startup issues.

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