

**Mo-99 2015 TOPICAL MEETING ON
MOLYBDENUM-99 TECHNOLOGICAL DEVELOPMENT**

**AUGUST 31-SEPTEMBER 3, 2015
HILTON BOSTON BACK BAY
BOSTON, MASSACHUSETTS**

**Design of a Tritium Purification Process
for SHINE™ Mo-99 Production**

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ABSTRACT

SHINE™ Medical Technologies has developed a Subcritical Hybrid Intense Neutron emitter (SHINE) to create molybdenum-99 (Mo-99) via fission of uranium-235 (U-235) in a subcritical aqueous phase solution. An accelerator-based neutron generator, developed by Phoenix Nuclear Labs, creates D-T neutrons for irradiation of U-235 bearing solutions. As part of accelerator operations, the tritium used for neutron production will be recovered, undergo impurity removal and isotopic separation before being reused for accelerator operations.

This paper discusses the efforts of Savannah River National Laboratory (SRNL) to assist SHINE™ Medical Technologies in the design of a Tritium Purification System (TPS). In addition to supplying a process-critical technology for isotope separation (TCAP) SRNL aided in the design of the TPS, the glovebox confinement systems, and glovebox stripper system (GBSSs) for the TPS. The TPS is a novel, low inventory, continuously operating tritium process system.

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