

## High-Yield D-T Neutron Generator

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A high-yield D-T neutron generator has been developed for neutron interrogation in homeland security applications such as cargo screening. The generator has been designed as a sealed tube with a performance goal of producing  $5 \cdot 10^{11}$  n/s over a long lifetime. Key components of this tube are a radio-frequency (RF) driven ion source, a beam-loaded neutron production target, and a gas pressure regulation system. An RF ion source has been developed that can operate in the low pressure range required for a sealed tube ( $< 4$  mTorr) and that can provide the necessary high  $D^+/T^+$  current ( $\sim 100$  mA) and a high fraction of ionized atomic species. A novel, beam-loaded neutron production target can handle the high beam power and offers the prospect of long lifetimes. The gas pressure in the tube is controlled by a regulator based on a titanium soot filled reservoir. The generator can be pulsed by pulsing the RF-driven ion source. Details of the neutron generator design and construction and initial test results are presented.

This work was supported by the U.S. Department of Energy under Contract No. DE-AC02-05CH11231 and by the Department of Defense under Contract No. N4175603G018403.