

ACCELERATOR PRODUCTION OF TRITIUM



[\[APT Home \]](#) | [About Tritium](#) | [The APT System](#) | [APT Advantages](#) | [APT Tour](#)]

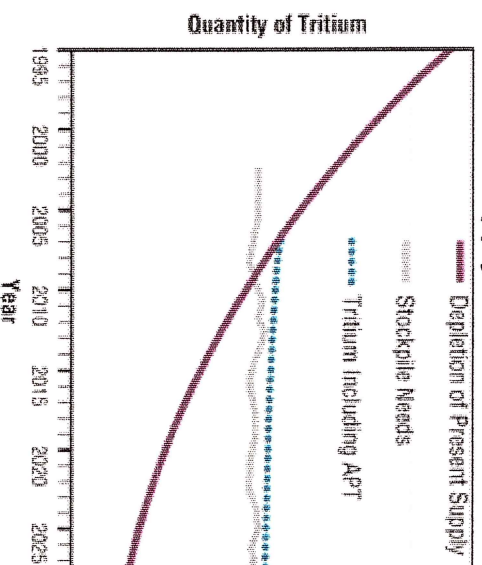
What does Tritium have to do with National Defense?

For 50 years, the existence of nuclear weapons has been an important component of the United States' strategy to deter major international war. Today, maintaining an adequate defense through both conventional and nuclear arms remains the best means to ensure continued peace.

Tritium is required to maintain the nuclear part of our defense structure. Tritium decays at the rate of 5.5% per year and must be continuously replenished. Therefore, the production of tritium is essential to sustain the nation's defense.

Currently, tritium requirements are being met through reuse of tritium recovered from dismantled nuclear weapons; however, this will not be sufficient for future needs. The Department of Defense (DOD) estimates that to maintain the strategic nuclear weapons remaining in the enduring stockpile, a tritium production capability must come on-line by 2007. However, depending on international negotiations, it could be needed as early as 2005.

Tritium Supply and Production



Tritium is lost to radioactive decay at the rate of 5.5% per year. In the time frame 2005 – 2011, new supplies of tritium must be produced to maintain the nation's nuclear stockpile.

What's the Source of Tritium?

Tritium is a radioisotope of hydrogen made in small quantities in nature by cosmic rays. Although it does exist naturally, it is rare. To obtain the quantities required for national defense needs, it must be man-made. Before 1988, tritium was produced in dedicated military-material production reactors until they were shut down because of safety concerns. Presently, there are only two systems that can produce tritium: one involves nuclear reactors, and the other, accelerators.

National Program to Produce Tritium

In March of 1995, the Department of Energy (DOE) released a Programmatic Environmental Impact Statement (PEIS) that considered several types of nuclear reactors (including the use or purchase of an existing commercial nuclear reactor) and an accelerator for the new source of tritium. In October 1995, the Secretary of Energy announced a decision to pursue a "dual-track" strategy, funding both reactor- and accelerator-based systems for a three-year period, after which the DOE will select the most promising method. This announcement was followed up with a formal Record of Decision signed by the DOE on December 5, 1995, that also named Savannah River as the site for construction of the APT plant.

On December 22, 1998, Secretary of Energy Bill Richardson announced that commercial light water reactors will be the primary tritium supply technology. The Secretary designated the APT as the "backup" technology for tritium supply. APT preliminary design will continue through 2001 to support the backup role, in addition to a reduced engineering development and demonstration program.

[APT](#) | [LANSCE](#) | [Phone Book](#) | [Search](#)

LOS ALAMOS NATIONAL LABORATORY

Operated by the [University of California](#) for the [US Department of Energy](#)

▶ [NOTICE TO USERS](#)

apt-www@lanl.gov - Copyright © 1998 UC - [Disclaimer](#) - 4 August 1998