LANSCE

Los Alamos Neutron Science Center

Isotope Production Facility

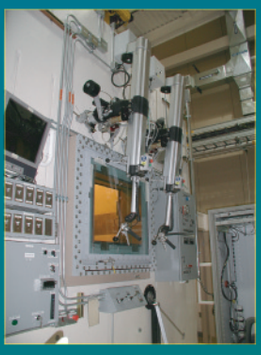
Providing essential isotopes for medicine, industry, and research

The red lines and arrows above show the international collaborations that complement Los Alamos National Laboratory's isotope-production capability.

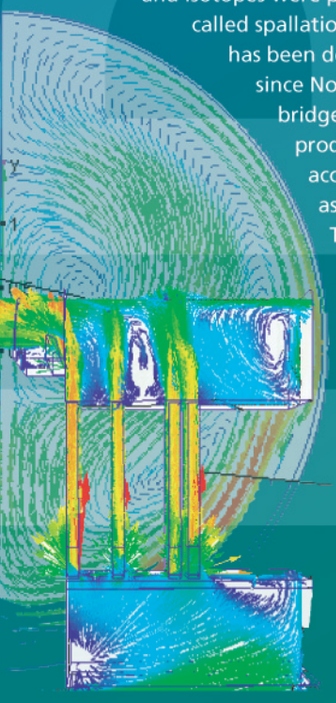
The new Isotope Production Facility (IPF), dedicated in January 2004 at LANSCE, will use 100-million-electron-volt (MeV) protons to cause nuclear reactions producing a reliable supply of medical, industrial, and research radioisotopes.

The IPF is the first dedicated isotope facility completed in more than 20 years. Its construction took five years. The facility houses a new beam line and equipment needed to direct part of the proton beam from the LANSCE accelerator to a new target station designed exclusively for the production of isotopes. The IPF will allow the production of more than 30 different types of isotopes including some used in the treatment of cancer and one used in the calibration of medical imaging equipment. It will also provide the flexibility to insert and retrieve targets while the LANSCE accelerator continues to operate.

LANSCE has produced radioisotopes for 30 years. In the past, targets were irradiated in front of the beam stop, and isotopes were produced by a nuclear process called spallation. However, no proton beam has been delivered to the beam stop since November 1998. The Laboratory bridged the gap in isotope production by collaborating with accelerator facilities as far away as Troitsk, Russia, and Cape Town, South Africa. For six years, targets irradiated at these facilities were transported to Los Alamos, where isotopes were isolated and shipped to industrial and research customers. Completion of the IPF and continued international collaborations will make all isotopes, except those with the very shortest half-lives, available year round.



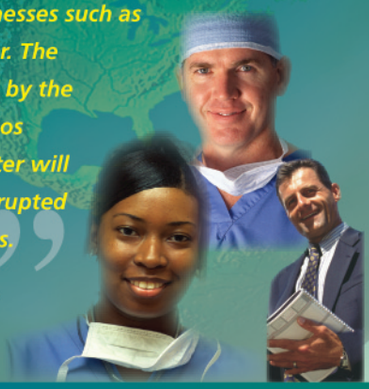
The photos above provide an insider's view of the new IPF. The top photo shows robotic arms and the window of the target transfer tube, critical components for safe transfer of irradiated targets from Technical Area (TA) 53 to TA-48, where separation chemistry is done. The photo immediately above shows "Gloria," a unique magnet developed at LANSCE that is a key component in redirecting the LANSCE beam to the new IPF.



Isotope production at 100 MeV presents challenges in cooling the target because of energy deposition in the solid materials. The photo above shows the system developed at LANSCE to provide water to cool the targets. Above the photo is a computational flow analysis of the water going through the cooling channels between the targets.

"The short-lived isotopes produced by this facility and other accelerators in the DOE complex provide vital isotopes required to diagnose, treat, and research serious illnesses such as heart disease and cancer. The radioisotopes produced by the new beam spur at the Los Alamos accelerator center will help assure the uninterrupted supply of these isotopes."

Department of Energy Secretary Spencer Abraham (remarks January 12, 2004, on the dedication of the IPF).



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