



# Health Physics Neutron Generator

CNL's Health Physics Neutron Generator Facility (HPNGF) is equipped with two neutron generators which distribute controlled monoenergetic neutron beams over a wide range of neutron energies. This facility is used in instrument/dosimeter development, instrument/dosimeter calibration and evaluation, type-testing of new instruments, irradiation-physics studies and irradiation of biological samples.

The Model 150-1H Neutron Generator produces neutrons with nominal energies of 14 or 2.7 MeV, either by the D-T or D-D reactions, respectively. The designed maximum outputs are approximately  $5 \times 10^{10}$  n/s at 14 MeV and  $5 \times 10^8$  n/s at 2.7 MeV.

The ADELPHI DD109 Neutron Generator is currently being installed in the HPNGF and can be operated as continuous or pulsed beams. The designed maximum outputs are approximately  $2 \times 10^9$  n/s at 2.5 MeV.

In addition to the neutron generators mentioned above, the HPNGF has a variety of traceable sources including Californium-252 and alpha/beryllium sources, which can be used either bare or moderated, as well as, various instruments for neutron metrology and dosimetry, including:

- The Bonner Sphere Spectrometer - measures neutron energy spectra
- The Rotating Proton Recoil Spectrometer - measures neutron energy spectra
- The Tissue Equivalent Proportional Counter - measures dose deposition in tissue volumes
- The Long Counter - measures neutron fluences

Instruments have been calibrated at the National Physical Laboratory (UK).

The HPNGF is operated by members of CNL's Radiological Protection Research and Instrumentation Branch. In addition to the hands-on operation of the facility, CNL professionals have an extensive knowledge of dosimetry, and are able to leverage existing expertise in this field to enhance any project.

CNL offers numerous complementary facilities to further any proposed partnership, including the Cobalt-60 Gamma Beam Irradiator Facility and the Gamma Beam 150-C Irradiator.

