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# Evaluation of Radiation Shield Integrity of DD Neutron Generator Facilities by Monte Carlo and Experimental Methods

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A new deuterium-deuterium (D-D) neutron generator has been installed for a wide range of applications. The generator is an excellent fast, epithermal and thermal neutron sources for laboratories and industrial applications that require neutrons with safe operation, small footprint, low cost and small regulatory burden. The generator has three major components: a Radio Frequency Induction Ion Source, a Secondary Electron Shroud, and a Diode Accelerator Structure and Target. Monoenergetic neutrons (2.5MeV) are produced with a maximum yield of 1010 n/s using 25-50 mA of deuterium ion beam current and a 125 kV of acceleration voltage. Detailed knowledge of the radiation dose rates around the neutron generator are essential for ensuring radiological protection of the personnel involved with the operation. This work describes the Monte Carlo and experimental studies carried out in the Neutron Generator facility of the National Center of Nuclear Sciences and Technologies (NCNST). Verification and validation of the shielding adequacy was carried out by measuring the neutron and gamma dose-rates at various locations inside and outside the neutron generator hall during the operational conditions and comparing with theoretical simulations. A successful operation of this generator will provide a convenient neutron source for basic and applied research at NCNST.

## Country/Organization invited to participate

Tunisia

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