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Radiation Shielding Analyses of A 10 MeV LINAC for Electron Beam and X-Ray at KACST

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The King AbdulAziz City for Science & Technology (KACST) in the Kingdom of Saudi Arabia plans to build a 10 MeV, 15kW LINAC for electron beam and X-ray applications. The design and construction of the accelerator building will be conducted in the cooperation with KACST and EB Tech Co., Ltd. This report presents the shielding analysis of the accelerator building using the MCNP Monte Carlo radiation transport code. In order to improve the accuracy in estimating deep radiation penetration and to reduce computation time, various variance reduction techniques, including the weight window (WW) method, DXTRAN spheres were considered. Radiation levels were estimated at selected locations in the shielding facility running MCNP6 for particle histories up to 1.0x10+8. The final results indicated that the calculated doses at all selected detector locations met the dose requirement of 50 mSv/yr, which is the US NRC requirement.

Country/Organization invited to participate

Korea, Republic of

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