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Overall assessment of the ESS linac shielding

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European Spallation Source (ESS) will consist of a proton linear accelerator that will accelerate protons up to 2 GeV, a target and a number of neutron instruments. An overall preliminary assessment of the linac shielding is completed. A simplified 3D model is constructed and used for necessary shielding evaluations using MARS Monte Carlo code. Model consists of a linac tunnel and an earth berm around it. Study about the amount of the berm shielding on top of the linac was completed as well as towards the klystron gallery. The klystron gallery building is also part of the model and a number of openings in the bulk shielding are included, such as penetrations for power waveguides, cable penetrations, emergency exits, smoke evacuations, alignment penetrations and a loading bay. Most of the penetrations were designed as chicanes/labyrinths to ensure that they don't contribute to elevated dose rates outside the shielding. A detailed shielding design study is planned at the next stage of the ESS project.

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