

Radiation Effects Related to the Dismantling of the SUR Reactor Vessel from the INPE Neutron Physics Laboratory

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Abstract. The Institute of Nuclear and Physical Engineering of FEI STU in Bratislava (INPE) has been engaged in research activities involving various neutron sources, their applications, and shielding. These neutron sources are also used for educational purposes, industry cooperation, and online training. Since multiple experiments are conducted at the Laboratory of Neutron Applications, optimization is necessary to minimize neutron reflection during experiments and to reduce radiation doses to personnel. The dismantling of the old SUR reactor vessel, originally transported from Germany, and located at the center of the laboratory, was considered a reasonable approach to increase available laboratory space and minimize room effects. This paper investigates the radiation effects related to its dismantling using neutron transport simulations. It compares the effective dose rate of neutrons calculated using the MAVRIC sequence of the SCALE6 system in specific locations in the laboratory across different scenarios, including the complete removal of the equipment. The impact of different modeling approaches is also quantified. The results are presented using point detectors and meshtallie.

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