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RP aspects of the BDF/SHiP prototype tests in 2018

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The Beam Dump Facility (BDF) is a proposed general-purpose fixed target facility at CERN. In the beginning, it will be exploited by the Search for Hidden Particles (SHiP) experiment, whose aim is to absorb the vast majority of the particle cascade produced by the high intensity 400 GeV/c SPS proton beam. Two BDF/SHiP target prototypes were tested in the SPS North Area at CERN in 2018. One test was performed to measure the flux of muons leaving the target, which forms the main background of the SHiP experiment. The second test had the objective to validate the target design in terms of thermal and mechanical stability. Due to the high beam load, density and Z-composition of the target, considerable prompt radiation and material activation was expected for both tests and was therefore assessed with the FLUKA Monte Carlo code. Furthermore, the second test allowed to irradiate different material samples, being located at the target's surface, with the purpose of conducting tritium out-diffusion experiments. The tritium out-diffusion is relevant for estimating its contribution to the total amount of tritium released from BDF. The effect of the obtained results on the environmental impact assessment of the BDF facility will be presented.

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