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**Title:** Nuclear Data Activities of the EUROfusion Consortium

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### Abstract

Within the Power Plant Physics and Technology (PPPT) programme of EUROfusion, extensive development works are conducted on a fusion power demonstration plant (DEMO) and the high intense neutron source IFMIF-DONES (International Fusion Material Irradiation Facility- DEMO Oriented NEutron Source) for the material qualification. Neutronics simulations play a fundamental role for the design and optimisation of these facilities including the evaluation and verification of their nuclear performances. Accurate data need to be provided to predict the tritium breeding capability, assess the shielding efficiency, estimate the nuclear power generated in the system, and produce activation and radiation damage data for the irradiated materials/components. Likewise this applies for the radiation dose fields to be provided after shut-down or during maintenance periods. The availability of high quality nuclear data is thus a pre-requisite for reliable design calculations affecting the nuclear design and performance of the facilities, as well as safety, licensing, waste management and decommissioning issues.

Accordingly, the EUROfusion consortium has implemented a dedicated activity on the development of high quality nuclear data to support neutronics in the PPPT programme. This includes the evaluation of general purpose neutron cross-section data as required for design calculations using particle transport codes, the generation of new activation and displacement damage cross-section data libraries, and evaluation of deuteron cross-sections as required for the IFMIF-DONES accelerator. This work is complemented by extensive benchmark, sensitivity and uncertainty analyses to check the performance of the evaluated cross-section data and libraries against integral experiments.

The paper provides an overview of the related nuclear data activities conducted in the PPPT programme since 2017. The focus is on the achievements obtained in the area of nuclear data evaluations, benchmarking and validation, activation and radiation damage, nuclear model and method improvements, and sensitivity/uncertainty assessments.