



Contribution ID: 1

Type: **not specified**

Path planning and space occupation for remote maintenance operations of transportation in DEMO

Monday, 17 September 2018 11:00 (2 hours)

The ex-vessel Remote Maintenance Systems in the DEMOnstration Power Station (DEMO) are responsible for the replacement and transportation of the plasma facing components. The ex-vessel operations of transportation are performed by overhead systems or ground vehicles. The time duration of the transportation operations has to be taken into account for the reactor shutdown. The space required to perform these operations has also an impact in the economics of the power plant.

A total of 87 trajectories of transportation were evaluated, with a total length of approximately 3 km. The total occupancy volume is, comparatively, between 21 and 45 Olympic swimming pools, depending mainly to the type of transportation adopted in the upper level of the reactor building. Taking into account the recovery and rescue operations in case of failure, the volume may increase up to, between 43 and 64 Olympic swimming pools. The estimation of the total time duration of all expected transportation missions in the reactor building are between 166 hours (7 days) and 388 hours (16 days). This time estimation does not include docking, accelerations or other operations that are not transportation. The travel speed is assumed constant with a maximum value of 20cm/s (the same value assumed for Cask and Plug Remote handling System in the International Thermonuclear Experimental Reactor - ITER).

The results achieved in this preliminary assessment will help the design process to optimize the time duration of the reactor shutdown and the layout of the DEMO power plant.

This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

Co-authors: Dr VALE, Alberto (Instituto de Plasmas e Fusao Nuclear, Instituto Superior Técnico); Dr DIAS, Jose (Instituto de Plasmas e Fusao Nuclear, Instituto Superior Técnico)

Presenter: Dr VALE, Alberto (Instituto de Plasmas e Fusao Nuclear, Instituto Superior Técnico)

Session Classification: P1

Track Classification: Vessel/In-Vessel Engineering and Remote Handling