

Early definition of the maintenance plan is essential to achieve an economic EU DEMO

Friday 26 October 2018 08:30 (4 hours)

The development of fusion as a viable power source is moving from the science driven design of experimental devices to the engineering design considerations required to develop a feasible power plant. An effective maintenance plan is essential because the time in maintenance is potentially very large.

To be effective a maintenance plan must be outlined early in the plant design because it has two key requirements that must be embedded from the outset of the plant layout. First it requires the efficient transport of components and equipment around the plant through corridors, shield doors and contamination control systems using the most appropriate transport system. Second it requires maintenance-oriented strategies to reduce the maintenance burden and to achieve the maintenance in a shorter time, with lower risk of failure and with simpler recovery scenarios.

Work is therefore required at the pre-concept design stage to define the maintenance plan so that the design driving factors required to enable the plan can be embedded in the plant design from the outset.

This paper will describe this work, including the key transport system that has been proposed for the transfer of components and equipment to and from the tokamak using ceiling mounted cranes and dexterous manipulator systems. A qualitative comparison will be made between the proposed system and an alternative cask-based system will be made.

The paper will also briefly describe some of the proposed maintenance-oriented strategies and development and testing work that is being carried out to mitigate the technical risks associated with the proposed maintenance plan.

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 and from the RCUK Energy Programme [grant number EP/P012450/1]. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

Country or International Organization

United Kingdom

Paper Number

FIP/P7-33

Author: Mr CROFTS, Oliver (RACE UKAEA B1 Culham Science Centre, Abingdon, Oxon, UK)

Co-authors: Mr LOVING, Antony (RACE UKAEA B1 Culham Science Centre, Abingdon, Oxon, UK); Mr KEECH, Gregory (EUROfusion Consortium, PPP&T Department, Boltzmannstraße 2, 85748 Garching, Germany); Mr GOWLAND, Richard (RACE UKAEA B1 Culham Science Centre, Abingdon, Oxon, UK)

Presenter: Mr CROFTS, Oliver (RACE UKAEA B1 Culham Science Centre, Abingdon, Oxon, UK)

Session Classification: P7 Posters

Track Classification: FIP - Fusion Engineering, Integration and Power Plant Design