Contribution ID: **531** Type: **Invited Oral**

Failure Impact of crucial components on DEMO maintenance performance and mitigation attempts

Thursday 8 June 2017 15:00 (20 minutes)

EU-DEMO should demonstrate the technical as well as the economic viability of future fusion power plants. To reach the implemented goal of a sound availability also remote maintenance has to be performed fast and highly reliable.

During regular maintenance of the DEMO tokamak fusion reactor, all blanket segments, cooling and breeder pipes, divertor cassettes and other vessel inventory have to be replaced. Even with high technical reliability of equipment and components, failures possibly occur. Some of these failures do have a minor influence on the overall maintenance progress whilst others severely impact or even prevent the further maintenance of a complete port.

There are e.g. 18 upper ports and through each of them –as crucial components - 6 bundles of cooling and breeder pipes, and 5 blanket segments have to be extracted and inserted. Before getting access to the blanket segments, all port inventory e.g. the pipes have to be removed completely. Being placed at a key position in terms of access to the in-vessel components, failures with e.g. disjoining of the pipe connections may lead to a long-term compulsory break which will reduce the availability drastically. This is of high importance, as maintenance operations like extraction/insertion of blanket segments can exclusively take place through the dedicated port.

This contribution will emphasize the consideration of logistics aspects in terms of impact of failure on maintenance performance as well as attempts and strategies to mitigate or minimize the additional downtime caused by the failure.

To keep the downtime as short as possible, logistics as well as design aspects have to be carefully investigated and brought to an optimum. Furthermore, the design and the logistics processes have to be robust against failures. Recovery and rescue operations should be easily possible with short as possible interruptions of the maintenance process.

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.

Eligible for student paper award?

No

Authors: MITTWOLLEN, Martin (Karlsruhe Institute of Technology (KIT)); MADZHAROV, Vladimir (Karlsruhe Institute of Technology (KIT)); MILUSHEV, Viktor (Karlsruhe Institute of Technology (KIT)); PAGANI, Paolo (Karlsruhe Institute of Technology (KIT))

Presenter: MITTWOLLEN, Martin (Karlsruhe Institute of Technology (KIT))

Session Classification: R.OP6: Safety, Operations, and Maintenance

Track Classification: Operations and maintenance