



Contribution ID: 67

Type: **not specified**

EUROfusion Plasma EXhaust (PEX) strategy on upgrades to European tokamaks and PFC test facilities

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

The European fusion electricity roadmap sets out a strategy for a collaboration to achieve the goal of generating fusion electricity by 2050. It has been developed based on a goal-oriented approach with eight different missions including development of Heat-Exhaust systems which must be capable of withstanding the large heat/particle fluxes of a fusion power plant. This paper summarises the development of the strategy to achieve this mission, focussing on the programme of coordinated upgrades to European tokamaks and PFC facilities. The strategy pursues the conventional ITER divertor solution in a combination of radiative cooling and detachment, which is taken as the baseline for DEMO. Nevertheless, a significant risk remains that high-confinement regimes of operation are incompatible with the larger core radiation fraction required in DEMO. Therefore, an investment in assessment of the adequacy for DEMO and proof-of-principle tests of innovative geometries as well as the use of liquid metals (LM) is also required. The broad tasks and milestones for both the conventional and risk mitigation approaches for developing the solutions at the levels of Proof of Principle, Demonstration and Qualification, including implementation on DEMO will be summarised.

To enable implementation of this strategy a dedicated programme of PEX facilities upgrades and new devices was developed. The selection of projects in the strategy was based on the degree to which the projects enabled the physics and technology gaps to be addressed, prioritising of studies on conventional materials and divertor configurations. Currently the programme includes upgrades on the three MST tokamaks (AUG, TCV and MAST-U), WEST tokamak and a hot cell facility. The assessment PEX activities and the decision to down select alternatives for possible implementation on DTT are scheduled for 2023-2024. The results of this analysis and current status and progress of the PEX upgrades will be presented and discussed.

Primary author: Dr TURNYANSKIY, Mikhail (ITER Physics, EUROfusion PMU)

Presenter: Dr TURNYANSKIY, Mikhail (ITER Physics, EUROfusion PMU)

Session Classification: P1

Track Classification: Experimental Fusion Devices and Supporting Facilities