

Discussion Session
ITER TBMs and Needed Blanket R&D
Beyond Toward DEMO

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TBM Program on ITER and TBM R&D

Integrated testing of whole blanket unit, DEMO relevant parameters (Temp, pressure, fluids, structure, etc.)

- Tritium breeding

- Heat removal

- Shielding

Integrated testing of TBS

- Breeder

- Coolant tritium extraction, T-accounting

- I&C

- Neutron activation

Connections of TBM to ancillary systems and long pipe runs to processing

- Tritium leakage

Will there be any confusion on tritium source from breeding or plasma?

Multiple TBMs aligned with ITER operation phases

Significant R&D infrastructure in each procuring member's country

Safety, licensing, qualification lessons to learn from ITER TBM

Challenges for Blanket R&D for DEMO Beyond Preparation for the ITER TBM

Plasma/neutron duration

Integrated testing platforms (nuclear and non-nuclear) and patching these together (CHIMERA, MPEX, A-FNS, IBTF,)

Neutron and plasma fluxes and fluence

Requirements of licensing, qualification

Tritium breeding and recovery

What is the nuclear testing acceptable before installation on DEMO/Next Steps

Blanket functional and structural materials database (irradiation)

Fuel Cycle pilot plants

Large system throughputs and back-end support (outside fusion core)

High magnetic fields, ferromagnetics

Li-6 and Be

Safety testing (in-box LOCA, beryllium and water, etc.)

FW HHF design

Down-selection to focus R&D, how many blankets to carry along?

Continuing R&D already in place at some level for the TBM (corrosion, cooling, etc.)

Large scale manufacturing, reliability, inspection and maintenance & diagnostics