Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Developing the Science and Technology for the Material Plasma Exposure eXperiment (MPEX) JUERGEN RAPP, THEODORE BIEWER, TIMOTHY BIGELOW, JOHN CAUGHMAN, RICHARD GOULDING, ARNOLD LUMSDAINE, Oak Ridge National Laboratory, MPEX TEAM TEAM — The Material Plasma Exposure eXperiment (MPEX) is a device planned to address scientific and technological gaps for the development of viable plasma facing components for fusion reactor conditions (FNSF, DEMO). MPEX is designed to deliver those plasma conditions with a novel Radio Frequency plasma source able to produce high density plasmas and heat electron and ions separately with Electron Bernstein Wave (EBW) heating and Ion Cyclotron Resonance Heating (ICRH) with a total installed power of 800 kW. The science and technology for this source system is currently being tested on Proto-MPEX. This is a linear device utilizing 12 water-cooled copper coils able to achieve peak magnetic fields of 1.6T. The currently total installed heating power (for helicon, EBW and ICRH) is 330kW. An overview of the status of this development program is given with an outlook to the next steps.

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Date submitted: 20 Jul 2016 Electronic form version 1.4