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## **C2Po3A-07: Cryogenic Performance in Factory Acceptance Testing of the Material Plasma Exposure eXperiment (MPEX) Magnet System**

*Tuesday 20 May 2025 14:00 (2 hours)*

To achieve the desired field profile to facilitate rf source and heating for the Material Plasma Exposure eXperiment (MPEX), a series of seven magnet subsystems have been designed and manufactured by Tesla Engineering. A crucial step in the manufacturing process especially for the six superconducting magnet subsystems is successful completion of the factory acceptance testing that involves validation of each subsystem performance with respect to the MPEX requirements. For these magnet subsystems, which have individual helium recondensing refrigeration cryocoolers, factory acceptance testing with respect to cryogenic requirements involve verifying the cooldown performance with respect to time and amount of liquid nitrogen and helium consumed before steady state operation is reached and the margins in the heat loads to available cryocooler cooling capacity. Initial results from factory acceptance testing for the Upstream and Downstream Helicon and Helicon Source subsystems including integrated testing will be presented and compared to the design values and the MPEX requirements. The factory acceptance testing results provide the baseline that will be utilized when site acceptance testing is completed at Oak Ridge National Laboratory in mid to late 2025 prior to installation on final MPEX assembly.

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