Abstract Submitted
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Fusion Nuclear Science Facility (FNSF) before Upgrade to Component Test Facility (CTF)[1] Y.K.M. PENG, ORNL, FNSF WORKING TEAM — The Fusion Nuclear Science Facility (FNSF) aims to address Fusion Energy Sciences research needs in "Materials in Fusion Environment". Such an environment can be provided initially in an ST device with the JET-level plasma conditions (Q=0.86 in Hot-Ion H-Mode) providing 0.25 MW/m**2 in outboard fusion neutron wall loading, and subsequently at twice the JET conditions (Q=1.7) to provide 1 MW/m**2. Conservative high-q and moderate-beta plasma conditions are calculated for the FNSF to minimize plasma-induced disruptions and allow the delivery of the required neutron fluence of 1 MW-yr/m**2 and duty factor of 10%. Fully modular designs for all the chamber components, including the single-turn toroidal field coil center-post, allow component installation and replacement via remote handling, which is required for the research operations of FNSF. Since the device support structures are hidden behind the chamber components, the FNSF provides a ready upgrade path to the Component Test Facility (CTF), which will require more stringent fusion nuclear and operational capabilities. Details of the physics, engineering, and research prerequisites assessments for the FNSF will be reported.

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