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Overview of power and diagnostic upgrades for HIT-SI3 and HIT-SIU experiments[1] A.C. HOSSACK, K.D. MORGAN, C.J. HANSEN, University of Washington, D.A. SUTHERLAND, CTFusion, Inc. — The HIT-SI3 device has been upgraded with new switching power amplifiers (SPAs) and capacitors for a 70% increase in nameplate power and a 35% increase in stored energy. The additional power injection enables optimized j/n and longer duration sustainment of high current (˜100 kA) and high current amplification (>3) spheromaks. A new, multi-chord, two-color interferometer has been constructed to measure plasma density in the toroidal midplane. The new system is able to operate in HIT-SI3's high density regime (n_e >5 x 10^{19} m^{-3}) where the previous far-infrared interferometer could not. Additionally, an overview of HIT-SI-Upgrade (HIT-SIU), presently under construction, will be given. The three, discrete helicity injectors will be replaced with a manifold which has four connections to the spheromak flux conserver and an RF preionization system will inject plasma into the manifold. The new injector manifold will test lower density startup, improved plasma-facing insulating coatings, applied perturbation spectra predicted to improve performance, and a geometry compatible with larger, future devices.

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