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**Design point and scenario development for a compact Spherical Tokamak with Double Null Divertor**[1] SIMON WOODRUFF, TOM CASPER, Woodruff Scientific Inc, PETER BUXTON, MIKHAIL GRYAZNEVICH, Tokamak Energy Ltd — We present the design point of a high field spherical tokamak (R=45cm, BT>2T, Ip=2MA, kappa=2.5) developed with the CORSICA equilibrium, stability and transport code. The tokamak equilibrium is determined as a series of fiducial states: after merging; limited; diverted and flat top with a transition to pedestal profiles and H-mode confinement. Vertical stability has been optimized by having two copper passive plates which unusually can be cooled to liquid nitrogen temperatures. Scenarios are developed for the compression, current ramp and flat-top phases. Cases where all of the heating energy goes to the: ions, electrons and a 50/50 split are examined, and power requirements are assessed to gain access to keV temperatures. We discuss implications for follow on devices including use of high temperature superconductors and a ST burning plasma experiment.

[1]Work performed under contract to Tokamak Energy Ltd

Simon Woodruff
Woodruff Scientific

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