The significant temperature differences between the finite element and computational fluid dynamics results can be attributed to flow differences. To reduce solution time (and in some cases, to allow for convergence to any solution), the first element thickness was not to polarity value of 5.3. Generally, this should be accurately capture flow behavior. The analysis assumed a single point manifold, which limited the fluid velocity in the channels. A train study will allow multiple manifolds. The CFD initial cases have a lower fluid velocity (5.78 m/s) than the finite element initial cases (8 m/s). The peak temperatures for the optimized cases are still above the desired design goal of 80°C. Of particular interest are those materials that are closest to the plasma. The combination of thermal loads and mechanical loads from the various magnetic fields (TF, PF, plasma currents), both steady and transient. The centerpost is a critical component of the spherical tokamak design, as it controls the size of the entire reactor. The centerpost is a critical component of the spherical tokamak design, as it controls the size of the entire reactor. The centerpost, managed by UT-Battelle, LLC for the U.S. Department of Energy.

REFERENCES