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Neutral Beam Injection Systems on the MST S.P. OLIVA, J.K. ANDERSON, S. KUMAR, R.M. MAGEE, J. WAKSMAN, Univ Wisconsin-Madison, G. FIKSEL, Univ Rochester, G.F. ABDRASHITOV, V.I. DAVYDENKO, P.P. DEICHULI, A.A. IVANOV, V.V. KOLMOGOROV, N.V. STUPISHIN, Budker Inst of Nucl Physics, Russia — Recent upgrades to a 50kV diagnostic neutral beam (DNB) and the addition of a 1 MW 20 ms neutral beam injector (NBI) on MST posed many technical challenges in design, installation and commissioning. The DNB upgrades improved beam divergence and energy distribution and reduced temporal fluctuations in beam energy. The addition of the 1 MW NBI required many novel engineering solutions, such as a narrowly focused (10cm) beam and an ultra-high pumping-speed titanium-arc getter pump, to allow the injection of the beam into the MST plasma with minimal perturbations to the thick conductive shell and neutral pressure. An innovative snubber circuit mitigates the effects of parasitic stored energy in the long transmission lines separating the beam sources and power supplies, which are required due to space constraints. Both systems are largely self-contained with independent vacuum and control systems; the NBI is fully automated with a computer interface allowing remote control and data acquisition. Work supported by USDoE and NSF.

John Sarff
Univ Wisconsin

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