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Comparison of Reported and Inferred Neutral Beam Performance by Neutron and Spectroscopic Measurements on DIII-D[1] R.N. ROZANSKY, Brown U., B.A. GRIERSON, PPPL, W.W. HEIDBRINK, UC Irvine — The DIII-D tokamak is equipped with eight sources for neutral beam injection (NBI). Recent studies of neutron rates indicate that the power injected by each source can differ from the values derived from NBI transmission calculations. During experimental operation, the first discharge of each day is a "reference shot" that provides information on wall conditions and neutral beam performance. During this reference shot all NBI sources are injected into steady plasma conditions enabling qualitative comparison between sources, and absolute comparison with fusion neutron counters. Spectroscopic diagnostics measure the neutral beam emission from up to six of the eight sources, as well as the circulating fast-ion content injected from all sources by the fast-ion D-alpha (FIDA) technique. Comparison of the neutron rate, beam emission, and fast-ion emission will be made with theoretical models of these processes in order to determine qualitative and quantitative agreement with expectations derived from reported NBI powers.

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