

## **Rotation of a Neutral Beamline to Obtain Counter-Injection on the DIII-D Tokamak**

J.T. Scoville

*General Atomics, San Diego, California, Scoville@fusion.gat.com*

Until the recent experimental campaign in 2006, all the neutral beam systems on the DIII-D tokamak injected power with the momentum in the same direction as the usual plasma current (“co-injection”). A major modification made during the April 2005 – March 2006 shutdown period rotated one of the two-source beamlines to allow injecting power with the momentum opposite that of the plasma current (“counter-injection”). This modification provides the capability of injecting up to 10 MW of neutral beam power with zero momentum input to the plasma. Decoupling the injected momentum and power opens a previously inaccessible parameter space for experiments that study the effect of rotation on various plasma instabilities.

Rotating the 5 MW neutral beamline presented significant technical challenges. The beamline and several major subsystems required extensive dismantling and rebuilding, and a careful alignment of the ion sources was required to document the new injection paths. We present a summary of the tasks required for the beamline rotation, describe major technical issues addressed, and discuss the advantages of the new configuration.

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