

## ADVANCES IN THE OPERATION OF THE DIII-D NEUTRAL BEAM COMPUTER SYSTEMS\*

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The DIII-D neutral beam system routinely provides up to 20 MW of deuterium neutral beam heating in support of experiments on the DIII-D tokamak, and as such is a critical part of both the DIII-D experiment and physics experimental program.

The four computer systems previously used to control neutral beam operation and data acquisition were designed and implemented in the late 1970's and used on DIII and DIII-D from 1981 through the 1996. By comparison to modern standards, they had become expensive to maintain, slow and cumbersome machines making it difficult to implement improvements. Most critical of all, they were not networked computers.

Between the 1996 and 1997 experimental campaigns, the task was begun of replacing the computer hardware and software with new unix compliant hardware and, for the most part, commercially available software packages.

This paper describes operational experience with the new neutral beam computer systems, and more importantly, new advances made possible by using features not previously available. These include retention and access to historical data, an asynchronously fired "rules" base, and a relatively straightforward programming interface. Initial experience with the implementation of an experimental fuzzy-logic control for the neutral beam daily start-up process will also be presented.

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