

**RF SOURCES FOR THE ITER ION CYCLOTRON HEATING AND CURRENT
DRIVE SYSTEM***

J. Hosea, C. Brunkhorst, E. Fredd, N. Greenough, J.R. Wilson
Princeton Plasma Physics Laboratory, PO Box 451, Princeton, NJ 08543
D.W. Swain, R.H. Goulding and D.A. Rasmussen
Oak Ridge National Laboratory, PO Box 2008, Oak Ridge, TN 37831
jhosea@pppl.gov

The RF source requirements for the ITER ion cyclotron (IC) heating and current drive system are very challenging — 20 MW CW power into an antenna load with a VSWR of up to 2 over the frequency range of 35 – 65 MHz. For the two present antenna designs under consideration, 8 sources providing 2.5 MW each are to be employed. For these sources, the outputs of two final power amplifiers (FPAs), using the high power CPI 4CM2500KG tube, are combined with a 180° hybrid combiner to easily meet the ITER IC source requirements — 2.5 MW is supplied at a VSWR of 2 at ~ 70% of the maximum tube power available in class B operation. The cylindrical cavity configuration for the FPAs is quite compact so that the 8 combined sources fit into the space allocated at the ITER site with room to spare. The source configuration will be described in detail and its projected operating power curves will be presented. Although the CPI tube has been shown to be stable under high power operating conditions on many facilities, a test of the combined FPA source arrangement is in preparation using existing high power 30 MHz amplifiers to assure that this configuration can be made robustly stable for all phases at a VSWR up to 2. The possibility of using 12 sources to feed a suitably modified antenna design will also be discussed in the context of providing flexibility for specifying the final IC antenna design.

*Work supported by U.S. DOE Contract No. DE-AC02-76CH03073.