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**Development of the ITER ICH Transmission Line and Matching System** D.A. RASMUSSEN, R.H. GOULDING, P.V. PESAVENTO, B. PETERS, D.W. SWAIN, Oak Ridge National Laboratory, E.H. FREDD, J. HOSEA, N. GREENOUGH, Princeton Plasma Physics Laboratory — The ITER Ion Cyclotron Heating (ICH) System is designed to couple 20 MW of heating power for ion and electron heating. Prototype components for the ITER Ion Cyclotron Heating (ICH) transmission line and matching system are being designed and tested. The ICH transmission lines are pressurized 300 mm diameter coaxial lines with water-cooled aluminum outer conductor and gas-cooled and water-cooled copper inner conductor. Each ICH transmission line is designed to handle 40- 55 MHz power at up to 6 MW/line. A total of 8 lines split to 16 antenna inputs on two ICH antennas. Industrial suppliers have designed coaxial transmission line and matching components and prototypes will be manufactured. The prototype components will be qualified on a test stand operating at the full power and pulse length needed for ITER. The matching system must accommodate dynamic changes in the plasma loading due to ELMS and the L to H-mode transition. Passive ELM tolerance will be performed using hybrid couplers and loads, which can absorb the transient reflected power. The system is also designed to compensate for the mutual inductances of the antenna current straps to limit the peak voltages on the antenna array elements.

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