

## ITER ION CYCLOTRON HEATING SYSTEM

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The ITER ion cyclotron system offers significant technology challenges. The antenna must operate in a nuclear environment and withstand heat loads and disruption forces beyond present-day designs. It must operate for long pulse lengths and be highly reliable, delivering power to a plasma with edge and loading conditions that will change throughout the discharge. The 20 MW multi-strap antenna will be mounted in a horizontal midplane port, fed by multiple rf sources covering the 35-65 MHz frequency range.

A development and testing program is planned to evaluate proposed ITER antenna designs before the final procurements and fabrication begin. Low-power electrical mockups of potential antenna concepts will be used to validate and optimize the designs. A prototype of the tuning mechanism must be designed and tested. A high-power prototype antenna must be built and tested under vacuum at voltages similar to those expected for ITER operation. This prototype will likely be a 1/8 sector of the full antenna including the tuning mechanisms, vacuum transmission line and vacuum window.