

**RF heating needs and plans for ITER**

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RF heating systems are required to deliver more than half of the total auxiliary power to operate ITER successfully through the different levels. To achieve this goal, systems in the range of ICRF, LHF and ECRF will be implemented for different tasks in different phases of operation. Power levels proposed to be used in different ranges will vary depending on the needs. Different mix of power will depend on the physics needs of the experimental programmes. Lower Hybrid power of 20 MW at 5.0 GHz is not planned for the startup phase and therefore no procurement scheme exists at the present time. 20 MW will be delivered into the plasma at 40 to 55 MHz as well as at 170 GHz with the help of Ion Cyclotron Heating (ICH) and Electron Cyclotron Heating (ECH) systems respectively. All the heating systems will have the capability to operate in continuous mode. A dedicated ECH 3.0 MW system at 127.6 GHz will be used for plasma breakdown and start up.

Three equatorial ports along with four upper ports will house all the required launchers for delivering the power into plasma from the RF systems mentioned above. Upper port launchers will deliver power at desired locations from the ECH system to suppress the NTMs. Each of the system will be procured under multi party procurement arrangement in kind from different Domestic Agencies (DA). Procurement packages are along functional specifications or detailed build to print drawings. Unsolved technical issues still prevail in the designs which need to be solved before the procurement packages (PP) are formalized.

The level of completion of PP is to some extent is indicated by the unresolved issue cards that exist for a system. Working Group (WG) for Heating and Current drive system has been formed under the Design Review activity of ITER Design. It is reviewing the existing design in the light of the issue cards submitted for the systems. The WG then will give a design report for relevant systems to IO. Based on all the inputs, it is planned to fix a 2007 base line design for ITER systems consistent with the boundaries defined in the international agreement signed by the seven parties.

Being multi party procurement activity, each of the system has numerous interfaces among the subsystems and with other systems at large. Many of the essential requirements have not been well defined. Therefore, the present activity of the central team is focused on such interface issues and identification of R & D activities required to mature the designs for implementation. R & D activities will also try to focus on issues which will have effects on the operation scenarios that are currently being discussed.

This present talk will discuss the existing designs, issues related to them and the immediate IO plans in the areas mentioned.