

THE EUROPEAN CONTRIBUTION TO THE ITER CRYOPLANT

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In the ITER machine, the plasma is confined and controlled in shape and position by strong magnetic fields generated by superconducting magnets. Furthermore, the base pressures inside the vacuum vessel as well as the high gas throughputs during operation are achieved and accommodated with large cryopumps which need to pump helium and be regenerated regularly. The ITER cryogenic system consists of a cryoplant, generating the required cooling powers, and a cryodistribution network, processing and transferring the fluids to the magnets, cryopumps and other users. Half of the cryoplant is supplied by the European Union, through Fusion for Energy (F4E), and half by the ITER Organization, while the cryodistribution components are supplied by India.

This paper will focus on the European Contribution, made up of 80K helium loops, LN2 plants and auxiliaries, which will enter its procurement phase in 2011. The Procurement Package managed by F4E is based on functional specifications to be defined by the ITER Organization and agreed upon in the related Procurement Arrangement. F4E will then be responsible for the supply of all in-kind components of the European part including acceptance testing at the suppliers' premises, transport, installation and individual system commissioning at Cadarache. The paper will present the technical solutions adopted to cope with a wide range of operating conditions, to fulfil the stringent requirements of reliability, availability and maintainability as well as to optimize the performances. In particular, it will highlight the main challenges induced by the translation of the conceptual design to an industrial procurement file, with a view to minimizing risks and costs, and delivering the equipment on time and on quality.