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Cryostat and Subsystems Development at ITER

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ITER is a large experimental TOKAMAK being built to research fusion power. Cryostat is a multifunctional system which provides vacuum insulation for the superconducting magnets operating at 4.5K and for the thermal shield operating at 80K, also serves as a structural support for the TOKAMAK and provides access ways and corridors to the vacuum vessel for diagnostic lines of sight, additional heating beams and the deployment of remote handling equipment. Cryostat has feed-through penetrations for all the equipment connecting elements of systems outside the cryostat to the corresponding elements inside the cryostat.

Cryostat is a vacuum containment vessel having a very large volume of ~16000m³ designed to be evacuated to a base pressure of 10⁻⁴ Pa. Cryostat is a fully welded stainless steel cylindrical chamber with top dome shaped lid and bottom flat head. Cryostat is designed to transfer all the loads like gravity, seismic etc. that derive from the TOKAMAK vacuum vessel, magnets and from the cryostat itself, to the floor of the TOKAMAK pit through sliding bearings to the concrete crown ring structure.

Design details of the cryostat and associated systems, including Torus Cryo-Pump Housing (TCPH), are discussed. Status report of the cryostat developments is presented.

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