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The ITER cryogenic system overview

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The ITER (International Thermonuclear Experimental Reactor) cryogenic system is in its final design phase to be constructed at Cadarache, South of France. With a refrigeration capacity equivalent to 65 kW at 4.5 K distributed via complex and compact cryogenic distribution system it will represent the next large scale cryogenic installation to go into operation in the next decade.

The refrigeration capacity equivalent to 65 kW at 4.5 K is distributed for the cooling of superconducting magnets, their HTS current leads and small users. It includes also the cooling and regeneration in sequence of the cryogenic pumps. A 1300 kW nitrogen plant cools the 80 K thermal shields. The key design requirement is the capability to cope with large pulsed heat loads deposited in the magnets due to magnetic field variations and neutron production from the fusion reaction.

ITER is designed to be operated 365 days per year in order to optimize the available time of the Tokamak. It is foreseen to operate continuously for up to two weeks with short maintenance periods of few days. Major shutdown will take place only every 16 months for routine maintenance of Tokamak and plant system installations.

After recalling the basic features we will present the expected performances and requirements for operation and maintenance of the cryogenic installations.

Proposed for workshop session (see call for abstracts): 1- Operation 2- Maintenance 3 - Safety 4 - Control

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