

Current status of the WEST Project

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The WEST project, which consists in modifying the Tore Supra tokamak into a D-shape diverted device in view of testing ITER tungsten divertor technology, has entered its phase of assembly in October 2014. The aim of the WEST tokamak platform is to significantly contribute to the reduction of the risks associated to the manufacture and operation of the ITER full tungsten divertor Plasma Facing Units (PFUs).

WEST will fill not only the gap of long pulse tokamak operation in the European fusion program but also will provide a relevant tokamak platform in a timely manner to ITER partners for preparing steady-state diverted plasma scenarios. Its operation phase is currently planned to begin mid-year 2016.

Some of main components (ICRH antennas, Divertor power Supply, Data acquisition Units, Diagnostics) are developed and procured in-kind by domestic and international partners in the framework of a large scale collaboration which is intended to continue through the implementation of a research plan that is being validated.

Besides high heat flux tungsten divertor PFUs, a set of actively cooled Plasma Facing Components (PFCs) has been designed with various heat exhaust capabilities, ranging from 8MW/m² for the upper divertor target elements featuring CuCrZr monoblock heatsink with W coating (15-20µm) down to 0.5MW/m² for the stainless steel vacuum vessel protection panels.

The instrumentation of PFCs being crucial for producing data not only to the scientific program but also to the control system for the machine protection, a new infrared thermography system has been developed with the objective to have a full coverage of the lower divertor target and the 5 RF (3 ICRH + 2 LHCD) antennas. The availability of such diagnostic being essential for safe high power long pulse operation, a RAMI approach has been applied for optimizing its design and reducing as much as possible its downtime.

This paper will give an overview of the current status of the WEST project with a particular emphasis on the new components and systems essential to a safe long pulse steady-state operation, and the main headlines which have been defined to structure the WEST experimental program will be presented.