

## A collaborative Global CAD Platform for ITER Project

W. Werner <sup>a</sup>, E. Martin <sup>a</sup>, H. Heidl <sup>a</sup>, G. Dalle Carbonare <sup>a</sup>, F. Lassueur <sup>a</sup>, F. Autogue <sup>a</sup>, J. Mann <sup>a</sup>, S. Murray <sup>a</sup>, E. Storath <sup>a</sup>, E. Thomas <sup>a</sup>, F. Redon <sup>a</sup>, S. Chiocchio <sup>a</sup>, E. Alexandrov <sup>b</sup>, P-Y. Chaffard <sup>c</sup>, GH. Kim <sup>d</sup>, K. Koizumi <sup>e</sup>, M. Mills <sup>c</sup>, V. Muratov <sup>b</sup>, B. Nelson <sup>f</sup>, S. Padasalagi <sup>g</sup>, R. Prakash <sup>g</sup>, K. Sato <sup>e</sup>, I. Semenov <sup>b</sup>, Y. Song <sup>h</sup>, M. Sugimoto <sup>e</sup>, D. Williamson <sup>f</sup>, S. Wu <sup>h</sup>

<sup>a</sup>ITER Organization, CS 90 046, 13067 St Paul Lez Durance Cedex, France

<sup>b</sup> Russian Federation Domestic Agency

<sup>c</sup> European Domestic Agency, (Fusion 4-For Energy)

<sup>d</sup> Korean Domestic Agency

<sup>e</sup> Japan Domestic Agency

<sup>f</sup> United States Domestic Agency

<sup>g</sup> ITER India

<sup>h</sup> Chinese ITER Domestic Agency

One of the key challenges of the ITER Project is the development of the design in a collaborative manner world-wide, involving numerous contributors and large number of interfaces between complex systems. As a consequence, the development of an efficient and high quality Computer Aided Design (CAD) Platform for the ITER Project is a pre-requisite for the success of the project. This platform must provide design, integration, analysis and simulation of mechanical and plant geometry in an integrated way with a minimum of interfaces between tools. This development performed in close collaboration with representatives of the 7 Domestic Agencies (DA) at the ITER CAD Working Group, has reached a level of maturity such that about 120 Designers at the IO and almost as many at the DA are currently using the ITER CAD Platform.

The ITER CAD infrastructure has been developed to allow all contributors to perform the design along the entire life-cycle. It is based on the following main ITER project requirements: production of 3D models, drawings, diagrams, simulations, searches, analysis, bill-of-materials, ..., complex 3D geometry, a large range of mechanical & plant disciplines, concurrent design involving CAD Designers located world-wide, management of a very large number of equipment and parts, contribution to the geometrical interface management in highly populated zones, and compliance with Safety, QA and engineering processes.

The present paper reviews the key ITER CAD design requirements and highlights the development of the ITER CAD platform. This includes first a description of the involved CAD & data-base software, the associated development or customization that have been required to implement the specific & demanding ITER needs that commercially available tools could not provide off-the shelf and finally the development of dedicated CAD methodologies. The required quality is supported by the Design Office (DO) Quality Assurance processes and procedures. Then the CAD collaboration strategy and infrastructure is presented and finally a short outlook to the planned enhancements and developments is given.

Keywords: ITER, CAD, Collaboration, mechanical design, plant design, data management