

IFERC Newsletter



IFERC-N-2015-9, 13 Nov. 2015

International Fusion Energy Research Centre, Rokkasho, Aomori 039-3212, Japan

REC Activity

Progress on the ITER Remote Experimentation Centre (REC)

Based on intensive discussions at Technical Coordination Meetings (TCMs), Progress Report Meetings (PRMs) and Technical Meeting, EU and Japan are progressing in execution of eight tasks to construct the remote experimentation center and to test/demonstrate the functionality of the remote experiment. These tasks cover the provision of hardware and of software.

On the hardware side, construction of the REC room (Task 1) and the network system for REC (Task 2) is progressing. Interior finishing of the REC room, equipment of REC system, and the network for REC were discussed and preliminarily determined. Procurement of the hardware of REC starts in 2015 by JA and EU. Figure 1 shows how the REC room will look after completion.

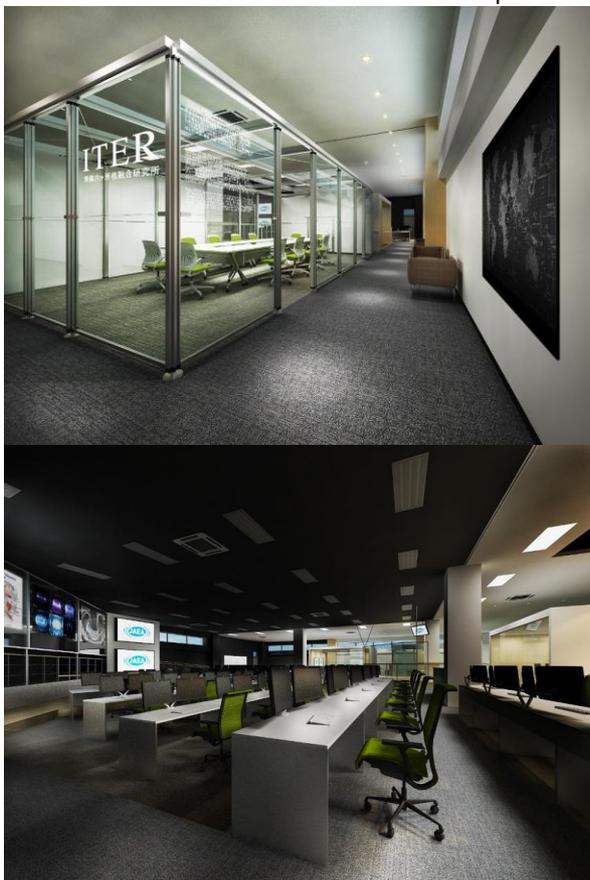


Fig. 1 Image of the remote experiment room made by computer graphics

Software of the remote experimentation centre is developed to test the functionality of remote experiment. The software to be developed addresses fundamental applications on remote experiments (Task 4 and 7) as follows:

- Remote experiment system (RES): this consists in software components needed to remotely prepare and validate a plasma discharge, and to monitor the status of operation and of plant systems in JT-60SA
- Remote experimental data analysis software (EDAS): this is the software developed for several fundamental applications for data analysis on remote experiments.
- Remote data access (RDA): this is a unified software infrastructure to access data stored both at the remotely participated experiment and at REC
- Documentation management system (DocMs): this is a software platform that will allow both local users (at the remotely participated experiment) and remote users (at the REC site, or elsewhere) to manage the documentation of the remotely participated experiment.

The development of the software for REC started in 2014 based on PAs, and this activity successfully continued in collaboration with the Satellite Tokamak program. Figure 2 shows an image of time sequence in a remote experiment (RES).

Software of plasma simulator (Task 8) is also provided to predict plasma discharges and to support inter-discharge decision process. Existing codes are adapted and customized.

Fast data transfer of experiment data between EU and Japan is a crucial issue, because reduction of the data transfer speed is caused by the long distance, i.e., the large latency. Development of the method of fast data transfer (Task 3) starts in collaboration with experts in informatics, such as National Institute of Informatics (NII) and National Institute for Fusion Science (NIFS).

Demonstration of remote experimentation using EU tokamaks is under definition (Task 5), and various proposals from EU tokamaks are under consideration. Data storage system (task 6) is also important to store the experiment data of the remote experiment. In case of ITER, a huge amount of data (of the order of 1 Petabyte) is expected. Here, adaptation to CSC tape storage system or usage of a part of the CSC tape library

system is investigated by F4E and CEA.

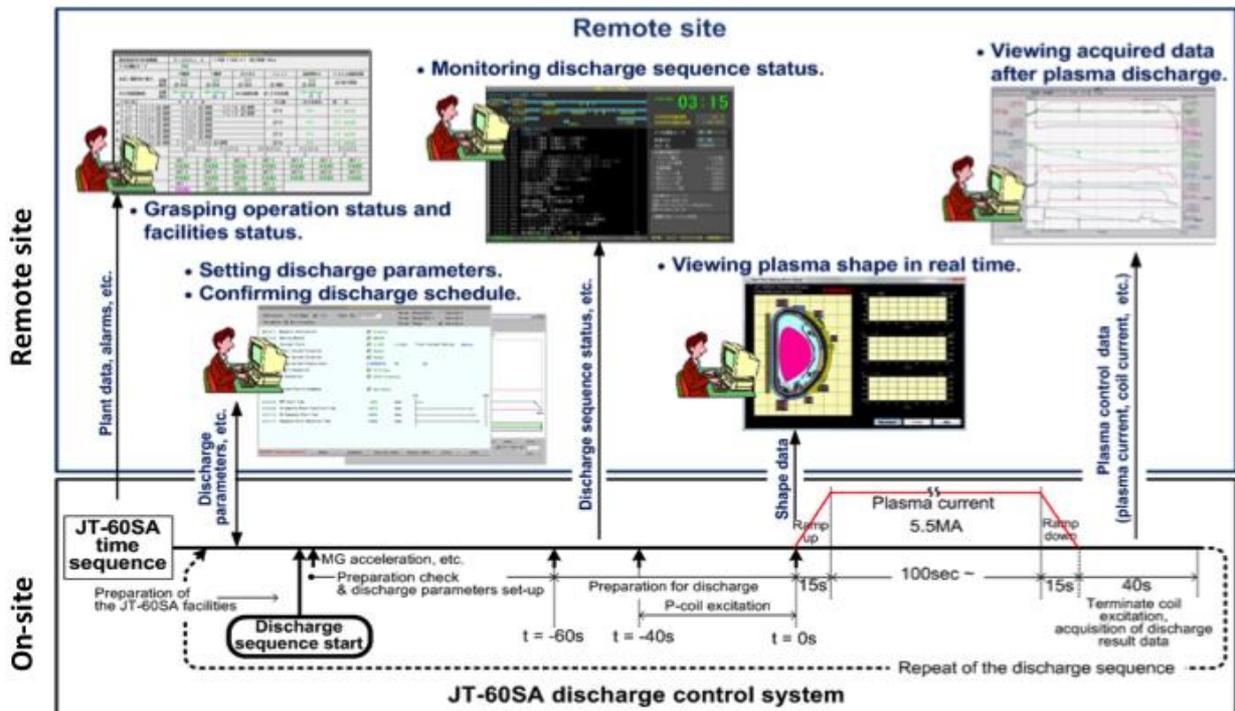


Fig. 2 Outline of Plasma Discharge Sequence including operational parameter setting and monitoring the experiment results.

(Takahisa Ozeki and Susana Lorenzo Clement)