

6. Activities of Rokkasho Research Centre

At Rokkasho village in Aomori prefecture, the buildings and/or facilities have been constructed of 1) International Fusion Energy Research Centre (IFERC), consisting of three sub projects; DEMO Design and R&D Coordination Centre, Computer Simulation Centre (CSC), and ITER Remote Experimentation Centre (REC), and 2) International Fusion Materials Irradiation Facility–Engineering Validation Engineering Design Activities (IFMIF-EVEDA). The related activities are shifting from the preparatory research phase to the real research phase. The roles of the Rokkasho Research Centre of NIFS are to assist NIFS and universities to cooperate with those activities, and to prepare the environment for promoting various collaborative researches including technology between activities at Rokkasho and universities, in the real research phase like the start up of the operation of the super computer in CSC at the beginning of 2012. As one of the cooperation, the head of the Rokkasho Research Centre of NIFS is undertaking jobs as the IFERC project leader.

The mission of IFERC is to contribute to ITER and to an early realization of the DEMO reactor, and so IFERC implements the following 3 sub-projects; DEMO Design and R&D Coordination Centre, Computer Simulation Centre (CSC), and ITER Remote Experimentation Centre (REC). The mission of DEMO Design and R&D Coordination Centre is to coordinate scientific and technological DEMO activities required in DEMO Design, and the practical contents are to hold seminars and meetings, and to present or exchange scientific and technological information, and to perform activities on DEMO conceptual Design and on R&D of DEMO technology. The mission of CSC is to exploit high performance and large-scale fusion simulations, and the practical contents are to introduce the high performance computer and to exploit high performance and large-scale simulations on plasmas, fusion materials and technology, in order to analyse experimental results, to prepare ITER operational scenario, to predict ITER performance, to contribute to DEMO design physics and to BA activities. In the case of REC, the mission is to perform ITER remote experiments and verify the functions, and the practical contents are to prepare the ITER Remote Experiment Room and connection of network to verify the function by using JT-60SA and others from 2012.

IFERC project progresses on time; the recent activities of DEMO Design are to create Terms of Reference (ToR) of DDA for EU-JA joint work in the Phase-2 (from 2011/1 to 2017/6), and to make Procurement Arrangement (PA) ready to be concluded, and to establish structure of Integrated Project Team (IPT), consisting of DEMO Design unit of IFERC Project Team and JA-EU home teams, and meetings, and to promote joint activities. Those of DEMO R&D are to construct DEMO R&D Building and to install equipment and apparatuses composed of globe box, Tritium calorimeter, micro-

structure analysis, material test room (Small hot cell), material analysis room, and Beryllium handling room, and to hold workshops and to implement 5 tasks identified (T1: SiC_f/SiC composites, T2: Tritium technology, T3: Material engineering, T4: Advanced Neutron multiplier, T5: Advanced Tritium breeders). In the case of CSC, the recent activities are to construct CSC&REC Building, and to perform uniform test and review of PA by Special Working Group-1 (SWG-1), to conclude PAs for computer and interface, and to select the vendor (Bull company), and to create ToR of Standing Committee (StC) by SWG-2 for simulation projects. The processor of the supercomputer is Intel Xeon Sandy Bridge (8 cores with 18.4 GF/core and 4GB/core), the total performance is 1.3 PF at peak (1 PF in Linpack benchmark tests) and the main memory is around 282 TB. The system consists of 4410 nodes (70560 cores). The roles of StC are to call for simulation projects, select the projects through a peer review, to allocate the computer resources, and to evaluate the simulation project results. The StC will be created in 2011.

Critical issues in 2011- early 2012 are to create Work Breakdown Structure (WBS), and to start joint work between EU-JA home teams based on PA for DEMO Design, to start upgraded collaboration with universities by using R&D apparatuses for DEMO R&D, and to install computer system for CSC, and to start the operation.

From 2012 IFERC activity will enter a more real research phase, which might bring us a systematic unification of researches pursued in IFERC project, and lead to contribution to ITER and to an early realization of DEMO reactor.

In addition, the Rokkasho Research Centre performs communication works with the organization related to ITER-BA, Aomori prefectural office, and Rokkasho village office, and publicity works to have villagers understand the research of the nuclear fusion. The latter includes the regular exhibition on NIFS and the special exhibition on NIFS once per year.

(Nakajima, N.)

