

3-9 Early Realization of Fusion Reactor

— International Fusion Energy Research Centre Project in the Broader Approach Activity —

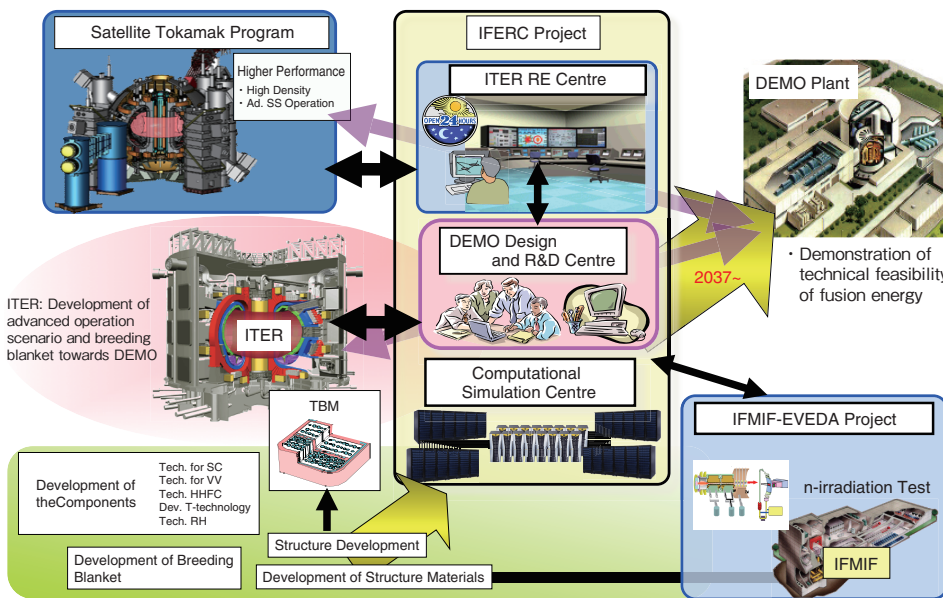


Fig.3-20 Outline of the IFERC project

The IFERC project shall perform activities on (1) DEMO Design and R&D Coordination Centre, (2) Computational Simulation Centre, and (3) ITER Remote Experimentation Centre in cooperation with the other BA projects in order to contribute to the ITER project and promote the early realization of the fusion reactor.

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
DEMO Design and R&D	Workshops/Meetings				Joint Work Phase						
CSC	Preparation/Procurement					Operation of CSC					Dismantling
REC							Preparation-1	Prep-2	Operation		
Buildings	Design	Construction	Adaptation		Maintenance						

For contributing to the International Thermonuclear Experimental Reactor (ITER) project and facilitating the early realization of DEMO, the International Fusion Energy Research Centre (IFERC) shall perform activities on (1) DEMO Design and R&D Coordination, (2) Computational Simulation Centre, and (3) ITER Remote Experimentation Centre (Fig.3-20). Activity (3) will be performed later since ITER is under construction.

The DEMO design activity is aimed at establishing a common basis for DEMO design, including the design features of DEMO and a possible common concept of DEMO to EU and Japan. Taking into account the present divergence in the DEMO concepts, the activity will be implemented on the basis of the appropriate phases. In the initial phase, the activity is carried out by holding workshops and/or meetings where “common elements” of the DEMO design are discussed for facilitating “joint work” in Phase Two. Recent design activities in Phase One have focused on discussions on the role of DEMO, design driver and constraints for the DEMO design, roadmap to DEMO, and DEMO design concepts.

On the basis of the common interests of the EU and Japan,

the DEMO R&D activities have been planned and carried out in the following five areas that are relevant to the blanket development: (1) SiC/SiC composites, (2) tritium technology, (3) materials engineering for the DEMO blanket, (4) advanced neutron multiplier for the DEMO blanket, and (5) advanced tritium breeders for the DEMO blanket. Considerable efforts have been focused on the design of experimental facilities and equipment to be developed/installed in the DEMO R&D Building at the Rokkasho Broader Approach (BA) site.

The objective of the activity relating to the Computational Simulation Centre is to provide and exploit a supercomputer for large-scale simulations to analyze experimental data on fusion plasmas, predict the performance of ITER, and contribute to the DEMO design. In the initial phase, high-level benchmark codes have been selected by a special working group and the procurement arrangement of the supercomputer has been concluded.

It is hoped that fruitful results toward the early realization of the fusion reactor will be obtained through the steady progress of the IFERC project.

Reference

Araki, M. et al., Progress of IFERC Project in the Broader Approach Activities, Fusion Engineering and Design, vol.85, issues 10-12, 2010, p.2196-2202.