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## Overview of DEMO Activities of IFERC Project in BA Activities

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In order to complement ITER and contribute to an early realization of the DEMO reactor, International Fusion Energy Research Centre (IFERC) implements DEMO Design and Research and Development activities. The design basis for DEMO and the sensitivity to underlying physics and technology assumptions has been reviewed through a 3-year collaboration. At this point, the plasma major radius and net electricity have been found to vary in a range of 8-9 m and 0.3-0.5 GWe, respectively. The tentative target is to set the start points of DEMO1 (pulsed) and DEMO2 (steady state) with low fusion power ( $\leq 2$  GW) for compatibility with divertor power handling. So far, DEMO1 with a major radius ( $R_p$ ) of 9 m, net electricity ( $P_{e,net}$ ) of 0.5 GWe and pulse length of about 2 hours, and DEMO2 with  $R_p \sim 8$  m and  $P_{e,net} = 0.3-0.5$  GWe have been proposed. Comparative studies on the remote maintenance methods are on going, and the modeling and event selection for the safety analysis of upper bounding sequences is in progress. Research and Development of common components for DEMO blanket have been performed in 5 task areas; 1) a long-term exposure test of organic compounds into tritium water for up to 2 years have been carried by JA without serious effects, and analysis of JET tile will be implemented under EU/JA collaboration in 2014, 2) the impact of heat treatment conditions on RAFM (Reduced Martensite Ferric Material) [F84H] steel properties and assessment of irradiation correlation are examined by JA, and the fabrication technology of RAFM [Eurofer] has been studied by EU, 3) using rotating electrode method apparatus, a series of trial tests for pebbles of beryllide for advanced neutron multiplier is carried out by JA to optimize the fabrication conditions, and EU proceeds with the fabrication of Be-Ti rods by hot extrusion of milled material in steel jackets and the characterization of the beryllides, 4) fabrication and the test of advanced tritium breeder pebbles, such as  $Li_2TiO_3$  with excess Li are implemented by JA, and EU proceeds with production and characterization of Lithium orthosilicate pebbles with secondary phase of 20, 25 and 30 mol% lithium metatitanate, and 5) EU/JA collaboration activities have progressed in the studies of characterization of electrical resistivity, He and H permeability and radiation damage effects of  $SiC_f/SiC$  composites progress.

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