R&D FOR MAJOR DEVICES OF ITER BLANKET REMOTE HANDLING SYSTEM TO FINALIZE DESIGN FOR PROCUREMENT

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The ITER requires remote handling equipment because of its high gamma ray circumstance during maintenance operations. The blanket is one of major in-vessel components and needs a dedicated remote handling system. The blanket remote handling system will be procured by Japan and therefore the Japan Atomic Energy Agency (JAEA) has been launched several R&Ds for the ITER blanket remote handling system as a procuring agency[1-4]. The results obtained by these R&Ds have supported to develop the newest design[5]. The design is almost finalized and a procurement agreement is planned to be signed in this year. This report summarizes the newest results and describes about the procurement plan. The blanket remote handling system is composed of three major devices: a manipulator, a rail deployment system and a cable handling device. The R&D result of the manipulator will be mentioned in the separated report. This report concentrates on the other two.

A function of rail connection is a new function for the rail deployment system and thus a full scale mock-up shown in Fig. 1 was fabricated and has been tested. Through the test, it was found that the system can accept the misalignment of 1.5-2 mm[4]. However, the limitation of misalignment has not been investigated. In order to finalize the design for procurement, the maximum misalignment should be defined. The test is still on-going and the result will be shown in the presentation

A mock-up of the cable handling system shown in Fig. 2 had been fabricated also to confirm feasibility of the reel type, which is newly introduced instead of the accumulator type. The previous report suggested that the cable handling system could feed the cable stably by controlling the rotation torque and that the initial slack of the cable could be reduced[4]. However, the torque has not been optimized. A result of a parametric study will be shown in the presentation.

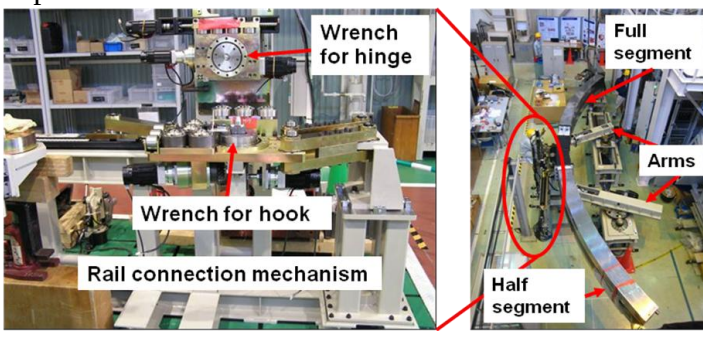

Figure 1: Mock-up of rail connection device

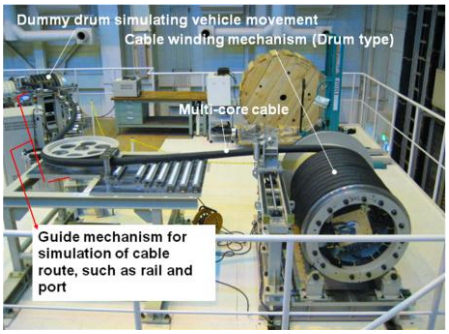

Figure 2: Mock-up of cable handling device

[1] N. Takeda et al., Plasma Fusion Res. 2 (2007) 052.
[2] N. Takeda et al., Fusion Eng. Des. 83 (2008) pp. 1837-1840.
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[4] N. Takeda et al., Fusion Eng. Des. 84 (2009) pp. 1813-1817.
[5] M. Nakahira et al., Fusion Eng. Des. 84 (2009) pp. 1394-1398.