CONCEPT DESIGN OF THE CASSETTE TOROIDAL MOVER

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A full scale physical development and test facility, Divertor Test Platform 2 (DTP2), has been established in Finland for the purpose of demonstrating and developing the RH equipment designs for ITER using prototypes and virtual models. The major objective of the DTP2 environment is to verify ITER divertor RH devices and operations. In practice this means various test trials and measurements of performance characteristics.

This paper describes the design process of the Cassette Toroidal Mover (CTM). The main purpose of this design task was the development of the CTM concept. The goal of the design process was to achieve compatibility between CTM and the latest ITER divertor design. The design process was based on using a variety of tools i.e. Catia V5, Delmia, Ansys, Mathcad and project management tools. Applicable European Safety Regulations and Standards were applied to the concept design.

CTM is the RH device, which transports divertor cassettes on the toroidal rails inside the ITER Vacuum Vessel during RH maintenance. The operational environment is harsh and radiation level is high. The temperature during RH operations can be as high as 50°C. Clearances are very tight and the loads carried are heavy. These conditions pose demanding problems that require special solutions during the design process.

The design process consisted of defining and developing of the CTM operational sequence. This sequence includes the procedure of how the CTM – with it's onboard manipulator – prepares for and handles the divertor cassettes during RH operations. RH operations are essential part when defining CTM functions. High reliability is required in order to carry out RH tasks successfully. The recoverability of CTM is also an important design criteria.

This paper will also describe structure of the CTM concept, it's performance characteristics, operational sequence and rescue operations.

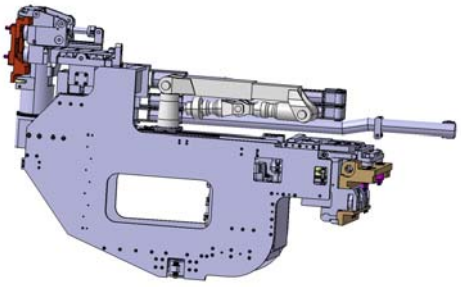

Figure 1: CTM concept