EVOLVING THE JET VIRTUAL REALITY SYSTEM FOR DELIVERING THE JET EP2 SHUTDOWN REMOTE HANDLING TASKS

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The quality, functionality and performance of the Virtual Reality (VR) system used at JET for preparation and implementation of remote handling operations has been progressively enhanced since its first use in the original JET remote handling shutdown in 1998.

As preparation began for the JET EP2 (Enhanced Performance 2) shutdown it was recognised that the VR system being used was unable to cope with the increased functionality and the large number of 3D models needed to fully represent the JET in-vessel components and tooling planned for EP2.

A bespoke VR software application was developed in collaboration with the OEM and enhancements made to meet the requirements of JET remote handling in preparation for EP2, including:

- Model hierarchy of externally referenced parts
- Meta-data associated with component models
- Dynamic colouring of parts to indicate (installed) status
- Dynamic model re-configuration using behaviours
- Visualisation of planned robot trajectory

Performance improvements required to meet the challenges of EP2 could not be obtained from the development of the new VR software alone. New methodologies were required to prepare source, CATIA models for use in VR using a collection of 3D software packages. In collaboration with the JET Drawing Office, techniques were developed within CATIA using polygon reduction tools to reduce model size, while retaining surface detail at required user limits. This created models of a manageable size and complexity which could be imported into a 3D package called Deep Exploration. New methodologies were developed in this package to structure the model hierarchy, by attaching and grouping the model parts, in such a way as to maximise real-time performance and to create a model hierarchy which made sense to the engineers who were using the complex VR simulations for EP2 task development. This paper will discuss how these developments have played an essential part in facilitating EP2 remote handling task development and examine their impact during the EP2 shutdown.

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