

SPACE OPERATIONS SYMPOSIUM (B6)
Human Spaceflight Operations Concept (1)

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DEVELOPMENT AND OPERATION STATUS OF 'KIBO'(JEM) EXPOSED FACILITIES

Abstract

This paper summarizes the characteristics of the Exposed Facility (EF) and the Experimental Logistic Module-Exposed Section (ELM-ES)). And the development and recent operation status of them are summarized. The Exposed Facility (EF) is a multipurpose platform where science experiments can be deployed and operated in the exposed environment. The Experimental Logistic Module-Exposed Section (ELM-ES) is the carrier, which is carried 3 payloads(EF experiments). The EF is the common facility to support the preparation of experiments, supply experimental environment(microgravity) and necessary resources, and process the experiment results. The EF provides the field of view for the zenith and nadir of payloads. The EF payloads could observe the earth and space environment using this field of view. The EF has the Equipment Exchange Units (EEU) for payload attachment. The EEU is composed of an active exposed facility unit (EFU), which is the capability to attach or detach the EF payloads positioned by JEM RMS (the JEM Remote Manipulator System), and a passive payload interface unit (PIU). The EF has 12 EFU's (10 EFU's for EF payload use, 1 EFU for ELM-ES or HTV Exposed Pallet (EP) and 1 EFU for the communication system). The ELM-ES or the HTV Exposed Pallet (EP) carries the EF payloads. The ELM-ES or the EP is attached to the EF by SSRMS (the Space Station Remote Manipulator System) or JEM RMS (the JEM Remote Manipulator System). The ELM-ES has PAM (Payload Attachment Mechanism), which is the mechanism for fastening the payload during launch and detaching its on orbit. The EF and ELM-ES with JEM payloads are launched on flight 2J/A by Space Shuttle, a joint flight with NASA payload. The basic JEM configuration is completely assembled. The EP with 2 payloads is launched by HTV(H-II Transfer Vehicle).