Lessons Learned from Space Shuttle Integration of ISS Payloads

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Abstract

This paper presents examples of operational and technical issues encountered by the Shuttle Program at the Kennedy Space Center (KSC) during the Mir Program and the first International Space Station (ISS) assembly flights. A variety of topics will be discussed, including; Program interfaces, hardware design, operations and scheduling, access and handling, and anomaly resolution.

The intent of the author is to assist future payload and experiment customers of the Space Shuttle Program in design, development and integration of their hardware. The United Space Alliance Shuttle/Payload team has integrated the ground operations and flight hardware for hundreds of payloads and experiments over the last 20 years. The author polled key individuals to compile “lessons learned” that are of value to customers.

These examples are ordered by the phase of integration, and are presented from a unique and often over-looked perspective, that of the launch vehicle. It shows that during the early period in the life cycle of a payload, where priorities are on obtaining funding, science selection, and hardware design, the constraints and opportunities induced by the launch site process are often overlooked. Suggestions are made to allow payload customers to leverage their precious resources to optimize their ground processing flow and enhance their science return.