

## PAYLOAD DOCUMENTATION ENHANCEMENT PROJECT

2/16

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### ABSTRACT

In late 1998, the Space Shuttle Program recognized a need to revitalize its payload accommodations documentation. As a result, a payload documentation enhancement project was initiated to review and update payload documentation and improve the accessibility to that documentation by the Space Shuttle user community.

### INTRODUCTION

The foundation of the Space Shuttle program design requirements are found in the NTS 07700 (Volume XIV, Payload Accommodations) series of documents. The cornerstone of the payload document community is found in Volume XIV, Payload Accommodations, of that series. Volume XIV describes the capabilities of the Space Shuttle system to accommodate payloads. It reflects the baseline Space Shuttle system as it is presently configured and is the official source of Space Shuttle vehicle capabilities to deliver payloads to orbit and return them to Earth, as well as the services that the Space Shuttle provides to payloads and the means by which payloads can avail themselves of these services. Volume XIV also contained the official set of standard interface provisions between the Orbiter and payloads. The original document contained an introductory document with 10 appendixes aligned along technical disciplines. Appendixes 1 through 10 contain system description and design data concerning accommodations and interface requirements. The appendixes are: Contamination Environment, Thermal, Electrical Power and Avionics, Structures and Mechanics, Ground Operations, Mission Planning and Flight Design, Extravehicular Activities, Payload Deployment and Retrieval System, Intravehicular Activities, and Integration Hardware.

Payload customers in search of information on flying on the Shuttle and the physical accommodations of the Shuttle were introduced to these documents which then referenced a small mountain of additional documents. Potential customers in search of the rudimentary requirements were often delivered a carton of documents to read. Although the documents have been in an electronic library for several years, this library was not accessible outside of the NASA community.

### PROJECT PLAN

In early 1999, the Manager of the Space Shuttle Program Integration authorized a team of NASA and United Space Alliance from JSC and KSC to review the technical data, update it, and determine a document architecture that would make it easier for the payload customer to access and search for information.

The team recommended an introductory document and set of user guides aligned by payload types; specifically, attached payloads, deployable/retrievable payloads, small payloads, and middeck payloads. These user guides, patterned after our own internal "Standard Integration Plan Blank Books" and some of the expendable launch vehicle user guides, will contain all information pertinent to a particular class of payload.

The second part of the plan is to have this information available on an Internet web site. The site will have a query and search system. If the user guides referenced other documents, that document would be hyperlinked to the site. The information will be characterized such that it is considered "public domain"; thus it will not be necessary for the potential customer to obtain permission to "surf" the web site. However, access to payload specific documentation will continue to be limited.

NSTS 07700, Volume XIV, Payload Accommodations, remains at the top of the official payload documentation tree. This document will be expanded to contain some of the policy and general requirements that were previously in the technical appendixes. By a query and hyperlink system, the web user will be able to access the information that is pertinent to them.

For example, a middeck payload customer would be routed to only the information relevant to a middeck user, e.g., thermal middeck accommodations. The engineer who is interested in all thermal payload data would be routed to all thermal data.

The web site will contain an overview of Shuttle capabilities, history, and payload accommodations. The Internet user will be introduced to the payload integration process with information beginning with how to make a request for a flight assignment and proceeding to the preparation for launch process. Engineering product definitions and typical schedules will be provided. Documents that are referenced will be hyperlinked to enable the web user to easily obtain the required data. Throughout the web site, there will be definitions, acronyms explained and personal contact information.

The third part of the plan is the development of a compact disk (CD) that takes advantage of today's multimedia capabilities. This CD will have high level introductory information for flying on the Shuttle. The CD will be a documentary-like overview of Shuttle processes and accommodations. It will contain background music, animation, and video clips of actual Shuttle events. The emphasis of the CD will be on the unique capabilities and dependability of the Shuttle. It can either be presented at first contact meetings or sent to potential customers. The CD can either standalone or work in conjunction with the web site.

The long-term goal is to have a web site query system that will allow the customer to build their unique payload integration documentation. The payload integration documentation would evolve from a narrative type document to a data-submittal type document that could be electronically maintained and updated. The integration plans that contain the requirements of the payload and Shuttle accommodations will be based on a "fill-in-the-blank" type scenario. The negotiation of requirements and accommodations can be initiated electronically and the agreement developed and potentially approved via electronic means.

## **SUMMARY**

The Space Shuttle Program has been on the cutting edge of technology development but in the area of documentation, the program has fallen into the government red tape trap and projects the image of a huge bureaucracy with unwieldy requirements. After flying for over 17 years and for over 95 missions, the Space Shuttle Program should be able to trim its documentation down to basic essential information and provide it in a concise manner without the lacy trim of "motherhood and policy". The responsibility should not be on the potential customer to ferret out information but on the Space Shuttle Program to present in a format that is accessible, succinct, and usable. This documentation enhancement plan is to alleviate the customer of the burden of searching pages of documents for bits of information. It is the Space Shuttle Program's intent to present payload accommodation information in a professional and crisp manner that projects a positive image of the Space Shuttle Program and NASA.