HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
How Can We Best Apply Our Experience to Future Human Missions? (2)

Author: Ms. Michele Brekke
National Aeronautics and Space Administration (NASA), Johnson Space Center, United States

LESSONS LEARNED FROM SPACE SHUTTLE MISSION INTEGRATION AND OPERATIONS

Abstract

As a chapter of NASA's history comes to a close with the retiring of the Space Shuttle, the legacy of this remarkable and successful program is the profound impacts it has had on human kind. In addition, the success of the Space Shuttle serves as a foundation for human space flight upon which new flight programs, government and commercial, can build. The Space Shuttle success can be attributed to a myriad of factors including leadership, technology, people and budget. For future human space programs, budget remains a critical factor. Cutting cost is a necessity.

This paper focuses on a specific element of the space shuttle mission, namely, mission integration and operations, and discusses several methods established over the years that resulted in lowering costs. The sub elements to be discussed include functions such as requirements development, flight planning and production, payload safety, mission and cargo integration and crew training.

Keys to lowering costs included reducing the time needed to perform program functions, scrutinizing requirements, minimizing repeat errors and empowering the workforce. Throughout the course of the 30 years of shuttle flight, significant cost savings were achieved by the continuing optimization of mission integration and operations functions. By definition, mission integration begins with the baselining of the mission requirements and the payload manifest (Launch minus 13 months). In the early days of the shuttle, this occurred at Launch minus 24 months. Over the course of the program, through experience, continual improvements and people, the mission integration template was cut in half. Time is money.

This paper focuses on the valuable lessons learned from the people of the Space Shuttle Program, the people who are responsible for the success of this legendary icon of human space flight. This paper compiles inputs from several personnel representing the technical disciplines of mission integration and operations as well as payload developers and experimenters. In addition, the author has over 25 years of experience in several different roles in shuttle mission integration and operations.

It is paramount to the success, performance and financial, of future space flight programs, commercial and government, to learn from the Space Shuttle successes and mistakes. This will be its legacy.