HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Commercial Human Spaceflight Programs (2)

Author: Mr. David Murrow
Lockheed Martin (Space Systems Company), United States, david.1.murrow@lmco.com

Ms. Carol Rapp
Lockheed Martin (Space Systems Company), United States, carol.j.rapp@lmco.com
Ms. Gaylene Langley
Lockheed Martin (Space Systems Company), United States, gaylene.l.langley@lmco.com
Dr. Todd Mosher
Sierra Space, United States, tmosher@microsatsystems.com
Dr. Olson John
Sierra Space, United States, john.olson@sncorp.com

MUTUAL BENEFITS FROM NASA'S EXPLORATION AND COMMERCIAL CREW PROGRAMS

Abstract

Since 2005, NASA has funded parallel paths to develop commercial, Low Earth orbit (LEO) spaceflight capabilities along with deep space exploration, government led, human space flight (HSF) activities. Previously established space flight providers have been funded by the government to develop large systems with cutting edge capabilities in order to extend human presence beyond LEO. New market entrants have been subsidized and cultivated in order to experiment with new business models, perform more routine spaceflight tasks, and to provide an economical test bed for key technologies and operational scenarios. This has included cargo and payload delivery to the International Space Station, and is being extended to ISS crew transportation. While competitive with each other at first glance, these two industry groups can both enjoy benefit through shared technology, processes, facilities, and staff, and through mutually advantageous business models. Lockheed Martin and the Orion program have streamlined the hardware and software certification process for ensuring the safety of the astronaut crew. By applying these streamlined processes to a commercial vehicle like the Sierra Nevada Dream Chaser, the training and learning in developing the process is being amortized over multiple programs, while still ensuring crew safety. This approach provides the ultimate customer, NASA, with more benefit for the investment made. A similar benefit is shown in the Dream Chaser use of test and operations facilities previously developed and certified by Lockheed Martin, such as the Space Operations and Support Center, Environmental Test facilities, and spacecraft production facilities. The benefits are extended further through the use of common support equipment, operations scheduling systems, and training programs. These common elements mean that each integration and test team can time-share people, processes, and procedures. Design activities can also benefit from reach back into an established program's technical capabilities. A key example being applied to Dream Chaser is the use of manufacturing technologies developed for Orion as well as for Lockheed's military aircraft and being used at the Michoud Assembly facility to build the DreamChaser airframe primary structure. Although sometimes seen as competitors, emerging HSF market entrants and the established HSF providers can achieve significant synergies if the companies choose to work cooperatively as Lockheed Martin and Sierra Nevada have. In 2014, Human Spaceflight now includes continued presence in Low Earth Orbit as well as continual exploration of our solar system. By focusing on our common goals, Lockheed Martin and Sierra Nevada are embracing a partnership which is increasingly important to NASA's future vision.