



## **MEETING ISS CARGO AND CREW SUSTAINMENT NEEDS: An AIAA Information Paper**

### **ABSTRACT**

The American Institute of Aeronautics and Astronautics (AIAA) – the world’s forum for aerospace leadership – sees the American gap in servicing the International Space Station (ISS) with crew and cargo due to the retirement of the space shuttle as both a risk and an opportunity. The risk is a loss of national prestige in the ability to carry out such missions – especially manned missions – and the longer the gap, the more severe the loss in prestige and confidence in American leadership in space capabilities. The opportunity is for the new administration and congress to set clear space priorities with appropriate funding to promote and accelerate both government and commercial space endeavors, to honor our commitments to the ISS, and to boldly lead future space commercial and scientific development.

### **ISSUE**

NASA is in the process of updating its acquisition strategy for Cargo Resupply Services (CRS) and crew transportation services to continue logistics support of ISS following the currently planned Shuttle retirement in 2010. NASA is pursuing multiple avenues to ensure adequate support to continue robust ISS operations: CRS from the Commercial Orbital Transportation Services (COTS) contracts to Space-X and Orbital Sciences, Russian Progress and Soyuz vehicles, and Europe’s ATV and Japan’s HTV vehicles.

Due to the multi-year lead times required for ordering human flight and cargo service capabilities, and the fact that new American commercial capabilities are still in development, NASA was forced to ask for an extension to the Iran, North Korea, and Syria Nonproliferation Act (INKSNA) waiver beyond 2011, allowing continued purchase of Russian launch services to fill an anticipated ISS access gap. This was necessary to allow time for the American commercial systems to be developed to replace the Progress vehicle for cargo and to continue to use Soyuz for crew rotation and emergency return.

The issue is how to minimize the US launch capability gap following retirement of the Shuttle and to enable both American government (Ares/Orion) and commercial (Space-X’s Dragon and Orbital’s Cygnus) access to ISS for crew and cargo at the earliest possible opportunity.

### **BACKGROUND**

The retirement of the Shuttle in 2010 creates a gap in American ability to support its commitments to the ISS. By retiring the Shuttle, additional funds will be



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released to accelerate both the development of Ares/Orion – the government solution to ISS human access for American astronauts – and the commercial CRS efforts to supply the ISS.

The AIAA applauds the Obama Administration for the increase in the NASA GFY 2010 budget to \$18.7B from the \$17.8B in GFY2009 and the Congress for the additional \$1B as part of the American recovery and Reinvestment Act of 2009 – partially making up for budget shortfalls the last couple years. These visible signs of the importance of our commitment to the space program and our commitment to the ISS are very encouraging. The additional funding will help accelerate both Ares/Orion and provide an opportunity to accelerate the commercial CRS efforts.

Both new space launch capabilities are vital to continued American leadership in space. The Ares/Orion vehicle will pave the way to the Moon, Mars and beyond as we take our first tentative steps to be in space to stay. The CRS efforts at Space-X and Orbital Sciences are equally important. They represent the fledgling next generation of space endeavors and potentially the springboard to real material commerce in space.

## **RECOMMENDATIONS**

Sufficient funds should be appropriated for NASA to speed development of American government and commercial transportation options for ISS servicing (crew and cargo) in order to facilitate the maximum possible reduction of further reliance on foreign launch and transfer vehicle providers. Further, NASA should only exercise the extended INKSNA waiver for additional Progress cargo services if delays in the expected readiness dates of new US-supplied CRS capabilities are deemed likely to adversely impact sustained US crew presence on ISS after 2011.

Development to human-rate the commercial vehicles should be considered as a worthwhile extension of commercial space capabilities that could provide an additional hedge against issues with use of the other vehicles now planned for American ISS crew and cargo replenishment flights.

The AIAA also encourages the Congress to further increase the NASA exploration budget in 2010 and beyond to further accelerate the Ares I/Orion and Ares V programs to minimize the gap in the ability to perform full crew rotation capability for ISS and to provide a sound transportation basis to return to the Moon and beyond. We suggest this increase should come with some scrutiny to ensure efficiency in the overall program through streamlined requirements and emphasis on hardware build as part of the overall budget.