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## **The Review of U. S. Human Space Flight Plans Committee**

### **Statement by EADS Astrium, represented by Dr. Mark Kinnersley**

Director of Business Development  
Orbital System and Exploration Division  
EADS ASTRIUM Space Transportation

Mr. Chairman and Members of the Committee,

On behalf of EADS Astrium, I would like to express our appreciation for the opportunity to contribute to the work of the Committee as it reviews the future of U.S. Human Spaceflight.

EADS Astrium is encouraged by the serious interest shown by this Committee, and by the Obama Administration, in expanding U.S. - European cooperative partnerships within the field of human spaceflight. As your charter alludes, the ability to develop and sustain a robust U.S. human spaceflight program requires leveraging all available alternatives capable of providing efficiencies toward affordability, risk and schedule.

We at EADS Astrium are confident that we can provide a great benefit to NASA and the U.S. taxpayer thanks to our expertise in the following three areas:

- **Automatic Transfer Vehicle (ATV):** EADS Astrium can offer additional ATV mission services to supply the International Space Station in cooperation with U.S. industry. In particular, ATVs can be used to plug the potential logistics gap to the ISS after Shuttle retirement.
- **Industrialization:** EADS Astrium's expertise gained over many years as the Industrial Operator for Europe's ISS activities could further enable international operational programs to achieve reliable, yet cost-efficient, industrial services.
- **Future Exploration Programs:** EADS Astrium could provide significant key building blocks in a joint international human and robotic space exploration.

EADS Astrium is a multinational company that lives and breathes international programs. Our experience and history serve as evidence that international cooperation can work, does work and can provide a way forward for both the U.S. and Europe to realize their respective goals in a sustainable and affordable manner. We have been a reliable partner to the United States for over thirty years and have no reason to doubt the continuation of this successful partnership over the next thirty years and beyond.



## **Proven Assets**

EADS Astrium would like to briefly present its proven assets & capabilities and future developments in the domain of human spaceflight and robotic exploration.

- **Columbus Orbital Laboratory**
- **Ariane 5**, a reliable and robust launcher
- the operational **Automated Transfer Vehicle (ATV)**
- Management of the European Contribution to the ISS as the **industrial operator**, including payload provision and operation
- Entry Descent and Landing, including ESA's Atmospheric re-entry Demonstrator (ARD)
- Robotic Exploration (Rosetta, Mars Express, Venus Express)
- Evolution of the ATV, providing download capability (**Advanced Re-entry Vehicle**)
- Development work on soft and precision landing on planetary bodies and the Moon.

With regard to the last two bullets, EADS Astrium is currently leading ESA-sponsored studies in these two areas.

## **Building on a Successful Cooperation**

Astrium is exceptionally experienced in partnering with NASA and U.S. industry, as can be witnessed by our over thirty-year history in this area. EADS Astrium can be counted on as a reliable and trustworthy partner to the United States.

Europe's involvement within the ISS program, specifically the Columbus Orbital Laboratory, has its roots in the development of Spacelab in the late 1970s. Spacelab flew a total of twenty-two missions, which continued into the late 1990s. This solid cooperation continues today, as the available internal payload capacity of the Columbus module is currently shared equally between the U.S. and Europe.

Europe's now operational Automatic Transfer Vehicle is a major provider of logistics to the ISS with regular flights planned for the future. The ATV supplies the ISS, as well as contributes to ESA's portion of the common space operation costs. The first flight of ATV-Jules Verne was performed successfully in 2008. Further ATVs are in production under contract to ESA (with a current lead time of thirty-six months).

## **Reap the Benefits of ISS Investment**

Now that the ISS is nearly complete, it is time to realize the fruits of our joint labors and reap the benefits of this unique laboratory asset.

In 2008, European theory became reality with both the launch and successful commissioning of the Columbus Orbital Laboratory and the triumphant maiden voyage and docking of the



Automated Transfer Vehicle (ATV). Success of the ATV serves as a substantial achievement. The ATV is the size of a London Double Decker bus, and it successfully flew and docked, inch perfect, with a platform travelling at over 17,000 miles per hour! This event effectively demonstrated that Europe has come of age in human spaceflight. Beyond the technical achievement, this success has built confidence among our prospective partners.

EADS Astrium believes that the ATV, now a fully flight proven and capable vehicle with a payload over 7 tons of cargo, will play an increasingly important role in the future. Once the Shuttle transitions out of service, the ATV will become one of only a handful of operational vehicles available for logistics support to ISS. In addition, the ATV could potentially be launched with U.S. launchers, such as Delta IV or Atlas V, and preliminary feasibility has been established.

In the future, an evolution of the ATV towards a download capability with the development of ESA's Advanced Re-entry Vehicle (ARV) could ease the strain on download logistics. Increased download capability from the ISS will encourage increased utilization of both the ISS and the Columbus module as a test bed for demonstrating space exploration technologies and to further facilitate top class research.

Finally, EADS Astrium fully supports efforts to extend the operational lifetime of the ISS to 2020 and beyond; the Columbus module, with a design lifetime of 15 years, is compatible with this goal.

### **Leverage European Capabilities**

It is EADS Astrium's opinion that the United States should also consider leveraging European capabilities in its space exploration goals; international space exploration will only become more robust and vigorous through contributions of the partners.

Work performed by EADS Astrium within an ESA-sponsored project to land soft and precisely on the Moon could lead, for example, to a European Automated Cargo Lander, again spreading the burden of logistics among all partners, thus sharing the costs and responsibilities.

EADS Astrium could provide significant key building blocks in a joint international human and robotic space exploration program, based on current assets and capabilities (e.g. ATV). Such capabilities include automatic rendezvous techniques and approaching Near Earth Objects, to name just two.

EADS Astrium's unique, multi-year experience as "Industrial Operator" - leading a European Industrial Team to manage the European contribution of the ISS - could become a model for further operations on the U.S. side beyond 2015 and lead to more cost-efficient usage of the station. This model could also be applied to other joint areas of an international exploration.



## Conclusions

In conclusion, there are three key areas where EADS Astrium believes it could contribute and be of significant benefit to future U.S. human spaceflight plans.

- **ATV:** EADS Astrium can offer additional ATV mission services to supply ISS in cooperation with U.S. industry.
- **Industrialization:** EADS Astrium's expertise gained as **Industrial Operator** for Europe's ISS activities could further enable international operational programs to achieve **reliable, yet cost-efficient, industrial services.**
- **Future Exploration Programs:** EADS Astrium could provide significant **key building blocks** in a joint **international space exploration scenario.**

EADS Astrium would like to thank the Committee its valuable time and attention.