SPACE OPERATIONS SYMPOSIUM (B6)
New Operations Concepts (2)

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MULTIFACETED NATURE OF ATV OPERATIONS

Abstract

The European Automated Transfer Vehicle (ATV) successfully completed its first mission (Jules Verne) between March and September 2008. ATV 2 (Johannes Kepler) which is now being prepared will mark the beginning of the recurrent mission phase.

The ATV mission contains much more variation in its operational phases than more conventional missions, requiring corresponding variations in the organisation of the ATV Control Centre (ATV-CC) operational teams, in particular to deal with the differences between active and passive phases.

The multifaceted nature of the ATV mission can be seen in several areas. The 6 months ATV mission combines several classical spaceflight operations phases such as Launch and Early Operations Phase (positioning and stabilization in orbit), human spaceflight operations as for other ISS modules. However it also contains highly novel operations such as an automated rendezvous and docking, ISS-reboost, undocking and controlled re-entry phases.

On top of that, the preparation of the operations for the following mission has to begin while the current mission is in progress (due to there being only 5 months between the re-entry of one mission and the launch of the next).

The Interactions with many International Partners during critical joint phases (like the rendezvous) require the development of multilateral procedures such as Multi Element Procedures (MEP), Operations Interface Procedures (OIP) and Onboard Data Files (ODF) that are simultaneously used. This is especially true for the coordination between the 3 control centres and the crew and for the overall ISS planning process.

The ground segment uses a wide variety of communications infrastructure such as ARTEMIS and TDRS relay satellites, Ground Stations, the IGS network, and a link with the Kourou launch site. This results in complex but highly flexible ATV-CC ground infrastructure.

A unique feature was the combination of a demonstration flight and an actual operational flight that led to the Demo Days concept for the first mission.