

SPACE OPERATIONS SYMPOSIUM (B6)  
Human Spaceflight Operations Concepts (1)

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ATV-2 CARGO INTEGRATION

**Abstract**

In the frame of the ATV Operations program, the tasks for ATV2 Cargo Integration have been completed in the second week of February with the finalization of the related data packages. The ATV2 cargo integration was divided in 3 main phases. The first phase was related to the Analytical integration, in which the proposed cargo manifest was analyzed and a cargo layout generated with the support of dedicated tools (CARAT/CAST), in compliance with ATV mass properties and operational constraints. For ATV2 four analytical cycles were performed, with a last update in late January, to introduce, less than 1 month before launch, a last-minute change in the cargo. The ATV2 is configured with 6 ILR racks and 4 M-01 support hardware, for a total dry cargo mass of 1605,1 kg accommodated in 87 bags. The second phase was the Physical Integration, when the cargo was received in Turin, packed in accordance with dedicated drawings and prepared for shipment to the Kourou launch site. For ATV2, two Bench reviews were performed for the ESA and JAXA cargo items to be packed in Turin. The first one was held in July 2010 for the nominal cargo. Nine CTBs and 1 M-01 bags were prepared and shipped to Kourou for the nominal cargo integration in September 2010. The second Bench Review was performed in November 2010, with three bags prepared in Turin and one in Kourou as late cargo. The cargo integration has been completed in January, with the final support to the preparation of the late cargo, integrated in ICC through RDS hatch, after ATV mating with the launcher. The third phase was related to the PA and Safety process, that followed the overall cargo integration flow, supported the Integrated Cargo Safety Review, and was concluded with the closure of all safety verifications. The final closure of the Integrated Cargo Flight Safety Review has been successfully achieved in February 2011. The lessons learned are collected and will be implemented in ATV3 Cargo Integration process, started in February 2011.