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Abstract

The paper describes the end to end service provided by ALTEC, an Italian Public-Private Company, in the frame of the Integrated Logistics Support activities for Columbus Operations, with the aim to highlight the key functions, main points of interest and lessons learnt for the definition and development of supply chain and maintenance management strategy for manned exploration missions. Interplanetary and deep space exploration missions are a technological as well as a logistics and supply chain challenge, due to the distance from Earth and the reduced possibility of regular resupply for the outpost. Starting from the current logistics service scenario, managed by ALTEC in the frame of ESA contract for Columbus Training, Logistics and Operations Support within the International Space Station Programme, new operational approaches can be defined, learning how to balance the logistics resupply, with the potential benefits and challenges of using and recycling in-situ resources and improving logistics efficiency, increasing outpost autonomy and reducing crew time. The management of complete logistics support service is a key function for the definition of future logistics strategies for exploration. In the frame of the ESA Columbus Operations set-up, ALTEC is acting as European Logistics Center, being responsible of the overall support, encompassing planning, implementation and on orbit support for Logistics and Maintenance activities. The planning activities are focused on Maintenance Requirements Collection and Monitoring, Increment Operations and Stowage Planning, Launch Package Definition and Ground Logistics Planning. The planning phase is the first step for the logistics execution and is a key capability to be provided in support of ESA Mission Management. The implementation phase mainly relates to the On Orbit On Ground Inventory Monitoring, Launch Package Implementation, PHST Ground Logistics Processing, Warehousing and operating the Logistics Information System, with the main objective to deliver and make available the needed resources, spares and experiments to the integrator authority into the visiting vehicle, either US and Russian, meeting flight configuration, launch and ground transportation requirements in proper time per the integration schedule. In addition to that, ALTEC is in charge of on-console real-time and near-real-time activities performed in support of the Columbus Flight Control team by the COSMO function hosted in the Engineering Support Center.