

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

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WPA MK II: AN INNOVATIVE PUMP PACKAGE FOR THE INTERNATIONAL SPACE STATION

Abstract

WPA Mk II Project started in 2011 in response to the ESA spare procurement philosophy for ISS life extension up to 2020 (and possibly beyond 2020). The project involves TASI as responsible for the design, development, manufacturing, integration and testing of this new water pump package for the ISS Columbus module. This pump package is responsible for the circulation of water inside Columbus pipelines to ensure proper thermalcontrol not only for the Payloads (PL's), but also for the Cabin where astronauts work and live, and consequently represents the core of the Thermal Control System in Columbus. WPA Mk II is characterized by several innovations in comparison with the current WPA Mk I installed in Columbus, like New Functionalities (on board SW uploading capability), or New Technologies (Ultrasonic Flow Meter), up to a High level Modular design (characterized by several ORUs, on Orbit Removable Units, conceived to optimize RR operations and associated time and costs). A successful Critical Design Review has been achieved in July 2014, in Turin, with the support of the European Space Agency and Airbus. Now TASI is approaching MAIT phase: the first part of 2015 will be characterized by the integration and testing of the various ORUs while the second part and beginning of 2016, there will be the integration and testing of the two pump packages WPA Mk II to demonstrate system compliance to the environmental and functional requirements. The present article provides an overview of the Project, the main features, the mission scenarios, and a general overview about the associated Qualification plan at Component, ORUs and Assy level.