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CONCEPT FOR A GATEWAY PHASE 2 ELEMENT

Abstract

The Gateway in high lunar orbit is a critical piece of infrastructure to enable the initial crewed lunar landing mission in 2024, as well as sustained lunar surface activity and assembly of eventual crewed Mars exploration vehicles. The Gateway will not just be a NASA project, but will be an international partnership. Sustainable exploration of the moon and Mars requires combining efforts across many countries, leveraging the capabilities of everyone to enable sustainable exploration systems. While Phase 1 of the Gateway consists of a Power and Propulsion Element and a habitation element to minimally support a 2024 landing mission, Phase 2 of the Gateway will add additional elements to support long-term exploration of the moon and Mars. Lockheed Martin has been studying concepts for the Gateway under contract to NASA through the NextSTEP-2 program. RSC Energia has also been studying concepts for the Cis-lunar transit station. In addition to these independent efforts, Lockheed Martin and RSC Energia have been studying together systems and elements for Phase 2 of the Gateway leveraging each companies unique skills and heritage. In particular, we have developed concepts together to leverage existing ISS-derived RSC Energia conceptual designs for an element to provide additional docking capability, a crew airlock, and a payload airlock to the Gateway. This element could be launched co-manifested with Orion on an SLS launch vehicle, and Orion would deliver the element and dock it to the Gateway. This concept will show an innovative way to move the Gateway from Phase 1 to Phase 2 in a sustainable way by leveraging critical long-term international partnerships.