

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programs (Overview) (1)

Author: Dr. Michele Gates
NASA Headquarters, United States, michele.m.gates@nasa.gov

Mr. Michael Barrett
NASA Glenn Research Center, United States, michael.j.barrett@nasa.gov

Mr. Ronald Ticker
National Aeronautics and Space Administration (NASA), United States, Ronald.L.Ticker@nasa.gov

Ms. Vicki Crable
NASA Glenn Research Center, United States, crable@nasa.gov

Mr. David Irimies
NASA Glenn Research Center, United States, david.p.irimies@nasa.gov

Dr. David Manzella
NASA Glenn Research Center, United States, david.manzella@nasa.gov

Mr. Caram Joe
National Aeronautics and Space Administration (NASA), Johnson Space Center, United States,
joe.m.caram@nasa.gov

Ms. Debra Ludban
National Aeronautics and Space Administration (NASA), Johnson Space Center, United States,
debra.e.ludban@nasa.gov

THE GATEWAY POWER AND PROPULSION ELEMENT DEVELOPMENT STATUS

Abstract

The Power Propulsion Element (PPE) is to be the first element of the Lunar Orbiting Platform - Gateway (LOP-G) to arrive in cislunar space. PPE will soon be joined by other elements to create a human-tended outpost for exploration capabilities development in cislunar space and support human and robotic exploration of the lunar surface, Mars, and other destinations. The LOP-G will accommodate and support future human and robotic research missions, not only for NASA, but for international and commercial partners alike. PPE will demonstrate advanced 50 kilowatt class solar electric propulsion extensible for future deep space human exploration. It will provide LOP-G orbit maintenance and control, and transfer the LOP-G stack between cis-lunar orbits. PPE will also provide power for other LOP-G elements and external research sites as well as communications with Earth, visiting vehicles, relay for spacewalking crew members and lunar surface elements. Work on PPE is progressing rapidly toward a planned 2022 launch. In November 2017, NASA awarded five Power Propulsion Element Studies contracts solicited under the Next Space Technologies for Exploration Partnerships (NextSTEP) Broad Agency Announcement (BAA) Appendix C. These studies address key drivers for PPE development and support for the LOP-G concept formulation. The five commercial vendors selected for these studies focused on performance trades and assessing strategic capabilities leveraging their existing and planned capabilities for PPE development. The results from the four-month vendor studies will be completed middle to late March 2018. Additionally, PPE draft reference Levels 3, 4, and 5 requirements have recently completed review and received approval. This paper will provide an update on PPE development, including context in sustained human exploration in lunar orbit.