

# **Mars Program Planning Group 2012**

## **Terms of Reference**

### **19 March 2012**

#### **Background**

The President's FY2013 Budget Request contains reductions in the Mars future program line necessitating reformulation of the current Mars Exploration Program (MEP), and discontinuing development of 2016 and 2018 missions with the European Space Agency. The realities of the fiscal environment, new priorities, and the most recent inputs from the science, human exploration, and technology communities, provide an opportunity to set new directions and a revised vision aimed at revising and renewing the program. This opportunity will also serve to exploit synergies between NASA programs to take advantage of the strengths of the NASA robotic and human exploration efforts for the long-term future (2025 and beyond).

#### **Charter**

The NASA Administrator has directed the Associate Administrator for the Science Mission Directorate (AA/SMD) to lead Mars program reformulation activities working with the Associate Administrator for Human Exploration and Operations Directorate (HEOMD), the NASA Chief Technologist (OCT), and the NASA Chief Scientist (OCS). In support of this reformulation, this Charter establishes a Mars Program Planning Group (MPPG). The purpose of the MPPG is to develop foundations for a program-level architecture for robotic exploration of Mars that is consistent with the President's challenge\* of sending humans to Mars in the decade of the 2030s, yet remain responsive to the primary scientific goals of the 2011 NRC Decadal Survey for Planetary Science. Program architecture is defined as a sequence of strategically selected and interconnected spaceflight and ground-based investigations that increase scientific knowledge, advance key technologies, and inform and enable long-term human exploration goals. The MPPG shall delineate potential investigations, including several possible options, in sufficient detail for NASA to be able to select and initiate high pay-off mission(s) beginning with the 2018 launch opportunity, to communicate with customers and stakeholders, and to facilitate the ultimate decision-making process for a reformulated Mars Exploration Program. These potential investigations will inform NASA's development of its FY2014 budget submission.

The MPPG is intended to serve as a limited-term study group responsible for delivering specific products to aid NASA in the decision-making process on the future direction of the reformulated MEP. In the process of developing such products, the MPPG shall work with NASA Centers, community subject-matter experts and stakeholders, as needed. The MPPG has no decision-making authority beyond the delivery of the products defined within this Terms of Reference (TOR).

(\* ) "Remarks by President Obama on Space Exploration in the 21st Century", John F. Kennedy Space Center, Merritt Island, Florida, April 15, 2010.

The MPPG will use non-consensus, individual inputs of both NASA civil servant and contractor employees, with resulting decisions being the exclusive responsibility of NASA.

The immediate focus of the MPPG is on the collection of multiple mission concept options for the 2018/2020 Mars launch opportunities. Fidelity and timeliness of these studies are the MPPG's priority so as to affect Agency decisions in the upcoming FY14 budget planning process and ensure a 2018 mission is viable. To maintain the successful strategic structure of the MEP, and ensure relevancy of the possible 2018/2020 mission(s) to longer-term science and exploration priorities, notional architectures/pathways spanning to the 2030s will be required. Concepts and pathways must be realistic based on the President's FY13 proposed budget profile and projected notional run-out for the Mars Exploration Program, must pose cost and technical risk commensurate with available mission budgets, should identify potential international partnership opportunities with a focus on "clean" interfaces, and must be responsive to the current Decadal Survey including traceability to Mars Sample Return requirements. Top-level science and exploration requirements must be identified for proposed concepts. Contributions and commitments from the HEOMD and OCT will be identified and incorporated in proposed mission sequence options, with clear identification of their value to the advancement of science and human exploration.

### **Relation to the Current Mars Program**

The highest priority for the Mars Exploration Program is the safe and successful Mars Science Laboratory (MSL) entry, descent, and landing, followed by the start of MSL science operations. As support elements for the MSL mission, the operation of the orbiting missions—Mars Reconnaissance Orbiter and Odyssey—is considered a high priority as well. MPPG is established to ensure the MEP can maintain adequate focus on these immediate priorities while future mission studies are being conducted concurrently. There should be no ambiguity that resources in support of MSL and its support elements take precedence over the activities of the MPPG. Any conflicts or issues will be brought to the Mars Program Director and Planetary Science Division Director by the MPPG Chair for resolution.

## Membership

The core membership of the MPPG is listed in the Table below. Membership of the core MPPG team has been carefully comprised of NASA civil servant and contractor employees to optimize relevant subject-matter expertise and provide individual inputs that collectively reflect a cross-section of the key stakeholders of a sustainable Mars Exploration program.

| Name  | Affiliation        |
|---|--------------------|
| Mr. Orlando Figueroa (Chair)                                      | OLE, LLC           |
| Dr. Michele Gates   | NASA HEOMD         |
| Dr. Jim Garvin  | NASA SMD/GSFC      |
| Dr. Michael Gazarik   | NASA OCT           |
| Mr. John Shannon  | NASA HEOMD         |
| Dr. Dan McCleese  | JPL                |
| Dr. John Mustard  | Brown University   |
| Dr. Firouz Naderi   | JPL                |
| Dr. Lisa Pratt  | Indiana University |
| Mr. George Tahu (Exec Secretary)                                  | NASA SMD           |
| Dr. Ramon DePaula (Ex Officio for International Coordination, HQ) | NASA SMD           |
| Dr. Mike Wargo (Ex Officio for science)                           | NASA HEOMD         |

## Deliverables and Key Milestones

The period of performance for the overall MPPG effort shall be from issuance of this ToR through August 23, 2012.

| Date      | Key Deliverables   |
|-----------|--|
| March 21  | Study plan, including milestones for community input. Preliminary collection of multiple concept options for the 2018 mission opportunity, including preliminary technical performance and programmatic requirements. Trade between 2018 options and possible 2020 mission possibilities (at high level).  |
| April 15  | Preliminary Program architecture (mission sequence), including options, and enabling systems and technology requirements. Mission level 0 requirements traceable to defining documents such as NRC Planetary Decadal Survey.   |
| June 15   | Updated Program architecture (mission sequence), including options, enabling systems and technology requirements, and including inputs from the external science, technology, and human exploration communities. Includes iteration with external community and adjustments as necessary.  |
| August 23 | Final study report defining mission sequence, their objectives, relationship to the NRC Planetary Decadal Survey and the human exploration of Mars challenge; as well as performance and programmatic requirements for each of the missions and the program as a whole. Includes demonstration of budget and schedule viability consistent with President's FY2013 Budget. |

## Review and Reporting

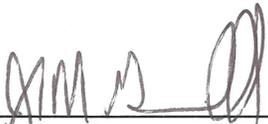
The Chair shall report to the Associate Administrator for the Science Mission Directorate at the key milestone dates. Regular progress reporting intervals will be established between the MPPG Chair and the AA/SMD. The final report will consist of the Chair's synthesis or summary of the individual, non-consensus views of the individual team members, an oral presentation, and supporting analysis including community inputs and other documentation, as required. The AA/SMD will be responsible for coordination of commitments with other Associate Administrators and senior NASA officials, as required.

## Meeting Logistics

The Chair and overall team shall define the schedule and location of MPPG meetings. It is expected that the large majority of meetings will be via telecon and/or other remote audio-visual means, except as necessary for key milestone reporting, community interaction, or as requested by the AA/SMD. Optimal use of new tools for collaborative interaction will be utilized to minimize travel expenses where possible.

## Resources

Resource requirements for the overall effort will be defined separately in coordination with the AA/SMD.



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Dr. John Grunsfeld  
Associate Administrator  
Science Mission Directorate



27 Mar  
2012

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Mr. William Gerstenmaier  
Associate Administrator  
Human Exploration and Operations



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Dr. Waleed Abdalati  
NASA Chief Scientist



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Dr. Mason Peck  
NASA Chief Technologist