

National Aeronautics and
Space Administration



Headquarters
Washington, DC 20546-0001

Reply to Attn of: SMD/Planetary Science Division

SUBJECT: NASA Response to the 2019 Planetary Mission Senior Review of Operating Missions

Background

The NASA Science Mission Directorate (SMD) conducts comparative reviews of operating missions within each division to maximize the scientific return from these missions within finite resources. The Senior Review, held every three years, assists NASA in maximizing the scientific productivity from its operating missions within a constrained budget. This is consistent with Section 304(a) of the NASA Authorization Act of 2005 (P.L. 109-155), and the NASA Transition Authorization Act of 2017 (P.L. 115-10), which modifies Section 51 U.S.C. §30504 to read:

(a) Assessments. —

(1) In general. —

The Administrator shall carry out triennial reviews within each of the Science divisions to assess the cost and benefits of extending the date of the termination of data collection for those missions that exceed their planned missions' lifetime.

(2) Considerations. —

In conducting an assessment under paragraph (1), the Administrator shall consider whether and how extending missions impacts the start of future missions.

(b) Consultation and Consideration of Potential Benefits of Instruments on Missions. —

When deciding whether to extend a mission that has an operational component, the Administrator shall—

(1) consult with any affected Federal agency; and

(2) take into account the potential benefits of instruments on missions that are beyond their planned mission lifetime.

(c) *Reports.* —

The Administrator shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives, at the same time as the submission to Congress of the Administration's annual budget request for each fiscal year, a report detailing any assessment under subsection (a) that was carried out during the previous year.

These reviews of operating missions are NASA's highest form of peer review, as the subject is not a single science investigation, or even a single space mission, but rather a portfolio of operating missions. The reviews of operating missions are referred to as Senior Reviews, in recognition of the high level of the peer review.

NASA uses the findings from the Senior Review to:

- Prioritize the operating missions and projects;
- Define an implementation approach to achieve planetary science strategic objectives;
- Provide programmatic direction to the missions and projects concerned for FY20, FY21 and FY22; and
- Issue initial funding guidelines for FY23 and FY24 (to be revisited in the 2022 Senior Review).

Missions in the 2019 Planetary Mission Senior Review (PMSR) for Planetary Science include strategic missions, Principal Investigator-led missions, and foreign-led missions in which the U.S. is a minor partner (the NASA Senior Review assesses only U.S. funding for foreign-led missions). The 2019 PMSR included the following planetary science missions (in alphabetical order):

- Lunar Reconnaissance Orbiter (LRO);
- Mars Atmosphere and Volatile Evolution (MAVEN);
- Mars Odyssey (ODY);
- Mars Express (MEX);
- Mars Reconnaissance Orbiter (MRO), and
- Mars Science Laboratory (MSL/Curiosity).

There are four operating missions that were not subject to the 2019 PMSR. In alphabetical order, these missions (and the end of their prime mission) are:

- InSight – Prime mission extends to December 2020. A special Senior Review will be conducted in spring/summer of 2020 to align InSight with the 2022 PMSR;
- Juno – New prime mission approved in April 2018 ends in July 2021. Juno will participate in the special Senior Review conducted in spring/summer of 2020 to align with the 2022 PMSR;

- New Horizons – Extended Mission – 1 ends in 2021, but maintenance of the Deep Space Network (DSN) Canberra 70m station will delay completion of data downlink until late 2022. New Horizons will be given a 9-month extension through September 2022 and will be subject to the 2022 PMSR, and
- OSIRIS-REx –Prime mission ends late 2023 with sample return to Earth.

The 2019 Planetary Mission Senior Review adopted a multi-level review structure, in which six panels (one for each mission) reported to a Senior Review Subcommittee, which was established as a subordinate group to the Planetary Advisory Committee, consistent with the Charter of the Planetary Advisory Committee and compliant with the Federal Advisory Committee Act (FACA) of 1972 (P.L. 92-463). The Report of the 2019 Senior Review Subcommittee, along with supporting documentation from the review, may be accessed at <https://www.lpi.usra.edu/NASA-academies-resources/Senior-Review-Subcommittee-Report-Proposals-Mission-Extensions-2019.pdf>.

NASA Response

The report of the Senior Review Subcommittee contains recommendations that NASA continue to operate and support components of all six missions.

NASA used the ratings and individual recommendations of the 2019 Senior Review report to make the following decisions for each of the missions in the Senior Review. The missions are presented in alphabetical order.

Summary of NASA decisions

- Lunar Reconnaissance Orbiter (LRO): extension is approved.
- Mars Atmosphere and Volatile Evolution (MAVEN): extension is approved.
- Mars Odyssey (ODY): extension is approved.
- Mars Express (MEX): significantly, de-scoped extension is approved.
- Mars Reconnaissance Orbiter (MRO): extension is approved.
- Mars Science Laboratory (MSL/Curiosity): extension is approved.

For all missions, the extension is for FY20-FY22. Although planning guidance and budgets are provided for FY23 and beyond, as part of NASA's annual budget formulation process, decisions on extensions beyond FY22 will be informed by the 2022 PMSR.

These decisions are contingent on the Planetary Science Division receiving the approval of the requested FY 2020 Operating Plan.

Detailed NASA decisions for each mission

Lunar Reconnaissance Orbiter

LRO is directed to implement the project proposed plan for the budget assigned.

Mars Atmosphere and Volatile Evolution (MAVEN)

MAVEN is directed to maintain the safety of mission operation (both for scientific and programmatic reasons) while supporting communication relay support. The project should de-scope other areas consistent with maintaining mission safety within the budget assigned.

Mars Odyssey (ODY)

Mars Odyssey is directed to implement the project proposed plan for the budget assigned. The ODY over-guide budget request is not approved.

Mars Express (MEX)

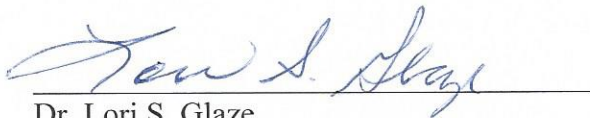
The US science participation in Mars Express was not highly rated by the review panel and the budget is hereby reduced. Mars Express is directed to support the Mars Advanced Radar for Subsurface and Ionosphere Sounding (MARSIS) instrument for both the subsurface soundings and upper atmosphere/ionosphere observations. High Resolution Stereo Camera (HRSC) imaging of the "back-side" of Phobos is worthwhile, if feasible under the reduced budget. Remaining funds should be used for closeout of the other US Mars Express activities, in which the collected data is calibrated and placed into the Planetary Data System. Other Project activities should plan to complete closeout by the end of Quarter 2, FY20.

Mars Reconnaissance Orbiter (MRO)

MRO is directed to maintain the safety of mission operation (both for scientific and programmatic reasons) while supporting communication relay support is highest priority. The project should de-scope other areas consistent with maintaining mission safety within the budget assigned.

Mars Science Laboratory (MSL/Curiosity)

MSL is directed to establish the number of operation cycles to maximize science return while maintaining mission safety within the budget assigned.



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7 February 2020
(DATE)