

MSR Campaign Concept Review

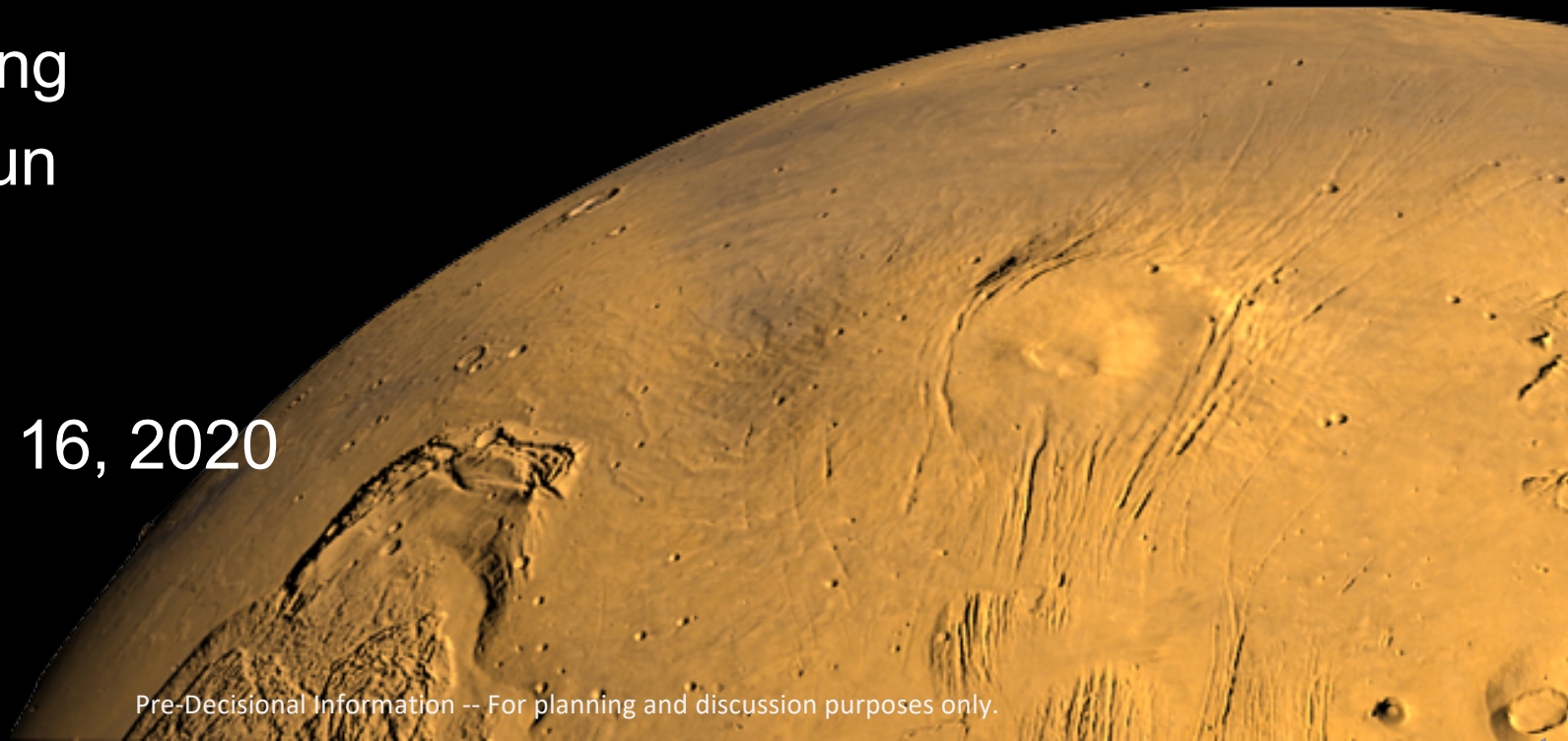


5.1 Management

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Pre-Decisional Information -- For planning and discussion purposes only.

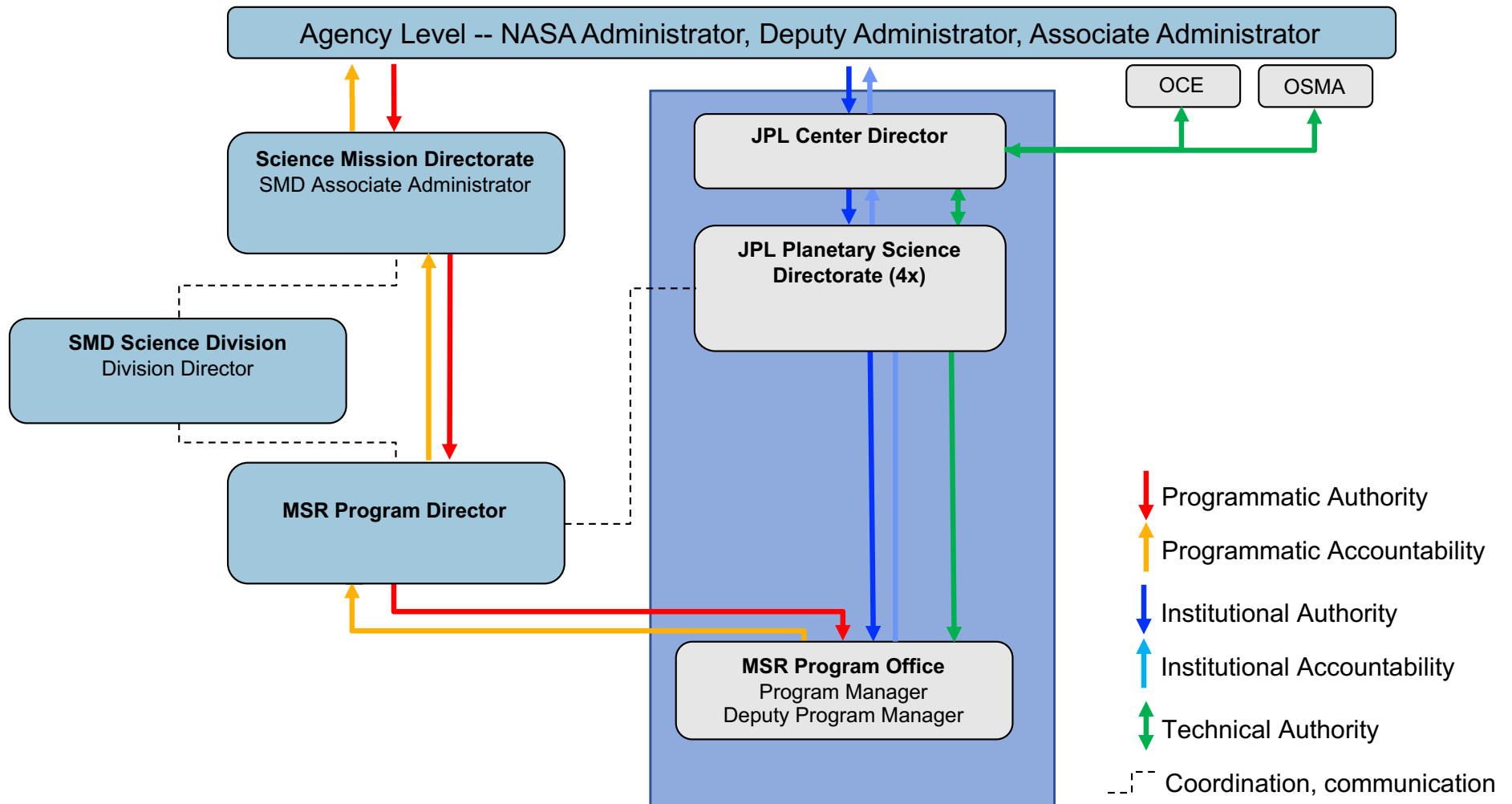


- MSR is a SMD “Agency Flagship” Program
- Category 1, Class A
 - Decision Authority is AA, Program reports to APMC
 - Convening Authorities for the Standing Review Board (SRB): AA, AA/SMD, JPL and GSFC Center Directors, with concurrence from the NASA CE and CFO per 7120.5E (Table 2-2)
- MSR Integrated Center Management Council (ICMC) (7120.5E Section 2.3.3.1)
 - JPL, GSFC, MSFC, LaRC, GRC, ARC, chaired by JPL CD
- Engineering Technical Authority and SMA Authority per 7120.5E and 7123.1C (i.e. ARC, LaRC, MSFC, GSFC, GRC, and JPL TA goes from respective executing centers to HQ)

NASA MSR Program Operating Model



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Lessons Learned/SMD Flagship Model



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- During Formulation, MSR team has reviewed and attempted to apply Agency Lessons Learned from past flagship missions
- MSL (subsequent presentation)
 - Perform independent cost assessments prior to MCR
 - *Aerospace and CTS performing independent cost assessments*
 - Conduct Non-Advocate review prior to MCR
 - *SMD commissioned MSR Independent Review Board*
- JWST & WFIRST
 - Streamlined lines of authority to SMD AA
 - MSR has dedicated Program Director in SMD reporting to AA/SMD and a dedicated MSR Program Office at JPL
- M2020 (subsequent presentation)
 - MSR will follow development of M2020 Lessons Learned
 - *Initial conversations complete. Will fully address in future lifecycle reviews*
- SMD “Agency Flagship” Mission Model Implementation
 - Program Director at HQ
 - *Augmented with staff to maintain understanding of program performance and status*
 - MCR will be conducted by an Agency SRB

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Program Management Approach Summary



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- The MA and ABC will be established at the system level (JPL Program Office)
- Program plans will be developed at the system level
- Lifecycle Reviews (LCRs) (KDP-A, B, C, D, E) conducted at the system-level
 - All aspects of MSR program will be reviewed at system-level LCRs
 - » Results of lower level LCRs will be presented at system-level LCRs
 - » No separate program office (numbered) KDPs
- The SRL and CCRS will:
 - Develop 7120.5E management plans to guide their implementation
 - » To achieve efficiencies, system-level plans will be used if appropriate
 - Execute against internal management agreements established prior to KDP-C
 - Status reported internally to agency at APMC and BPR
- Project UFE will be managed at the system level
 - At least 25% of the initial Phase B-D project UFE will be distributed and managed by the SRL and CCRS managers
 - Remainder will be held at the system level for distribution as needed

NASA-ESA Program Coordination



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- **MSR Program Management Level Discussions (ESA Program Office, JPL Program Office, NASA HQ):**
 - Frequency: every month or more often / ad-hoc if required for urgent/important issues
 - Purpose: to share knowledge, address specific issues, and make decisions that require program-level coordination.
 - In addition, Quarterly Face-to-Face Meetings (post-COVID) to review progress and resolve program wide issues
- **MSR Program Science Coordination:**
 - Weekly coordination including ESA MSR Scientist, NASA HQ MSR Lead Scientist, and JPL MSR Lead Scientist.
- **MSR Program System Engineering and Integration:**
 - Weekly ESA-NASA MSR System Engineering Coordination to address and track ongoing developments.
 - Organized by ESA and NASA/JPL MSR System Engineering team leaders with wide participation by the MSR projects managers and system engineers
- **MSR Program Planetary Protection/Back Planetary Protection Coordination:**
 - Twice a month coordination with ESA PP Scientist, NASA PPO, JPL MSR PP, NASA HQ PE, and MSR Lead Scientist.

- **MSR Program Director:**

- Weekly meeting with JPL Program Manager
- Monthly meeting with GSFC Director of Flight Projects
- Monthly meeting with JPL Director for Planetary Science (4x)
- Monthly Program Status Reviews
- Bi-Monthly Center Director Forum with AA/SMD

- **MSR Program Management:**

- Weekly MSR Program leadership meeting to address and track ongoing developments
- Monthly Management Reviews of CCRS and SRL Projects
- Weekly Coordination meeting with NASA HQ MSR Program Director
- Weekly QH with CCRS, SRL and SE&I teams
- Monthly meeting with GSFC Director of Flight Projects
- Bi-weekly meeting with JPL Director for Planetary Science (4x)
- Weekly Business meeting
- Monthly Risk Management meeting

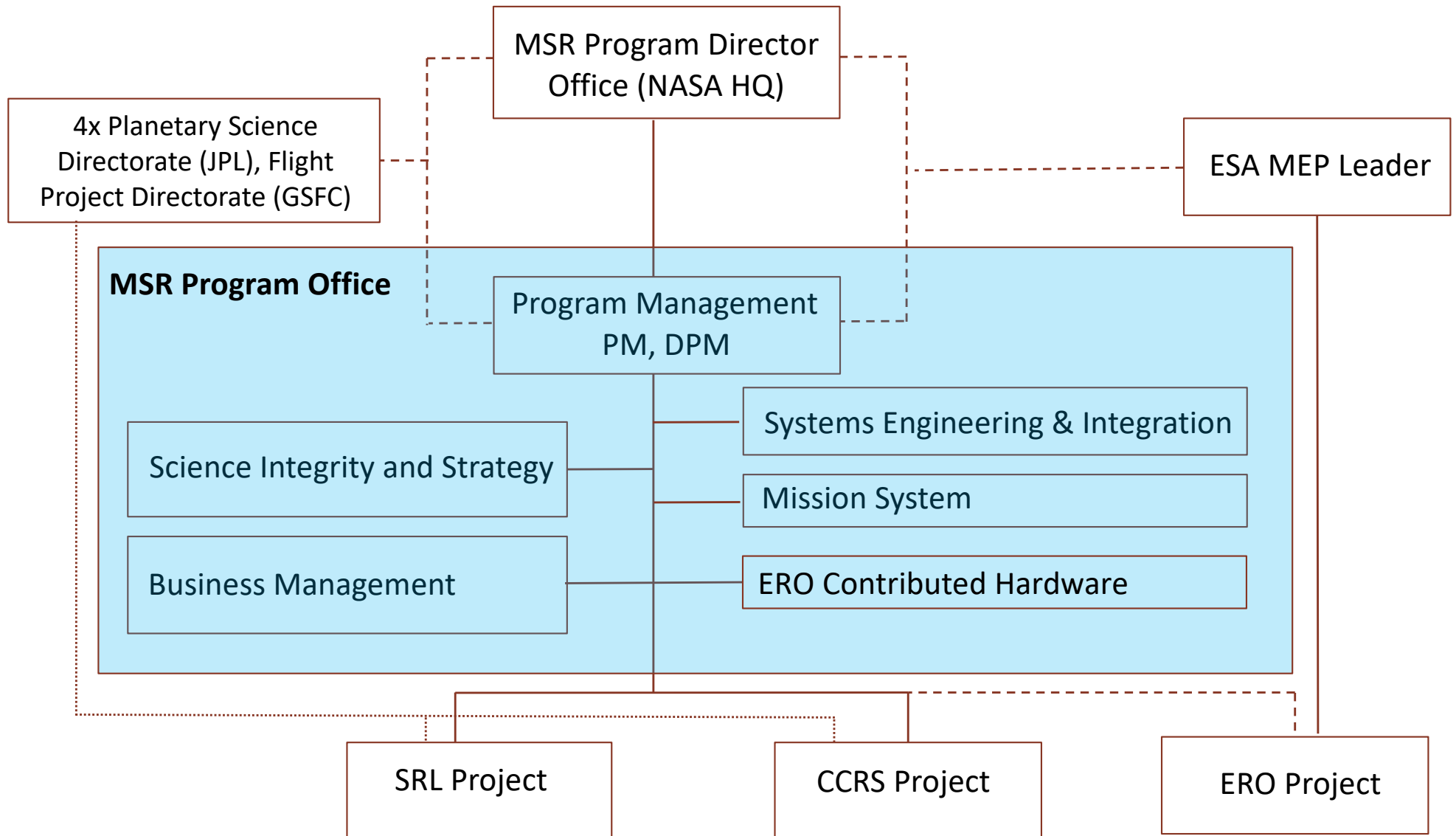
- **CCRS and SRL Project Management:**

- Weekly MSR Program leadership meeting to address and track ongoing developments
- Monthly Management Reviews of CCRS and SRL Projects with Program Office
- Weekly Coordination meeting with NASA HQ MSR Program Director
- Weekly QH with Program Office and elements
- Weekly meeting with GSFC Director of Flight Projects (CCRS) or JPL 4x Director (SRL)
- Weekly Business meeting
- Monthly Risk Management meeting

MSR Program Organization (Phase A)



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- Program accountability
- - - Program coordination
- Institutional accountability

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NASA/ESA MOU on MSR Flight Elements



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- Scope:
 - Agreement between NASA and ESA to jointly pursue the return of Mars samples to Earth for subsequent scientific investigations.
 - Establishes the overall objective of the collaboration and the individual and joint responsibilities of NASA and ESA in that endeavor.
 - Includes lower level details such as financial arrangements (no exchange of funds), intellectual property rights, release of data and public information, access to facilities, customs clearances.
 - Also establishes the agreement that each party will apply biological planetary protection measures based on their respective applicable policies and requirements.
- Status:
 - Has received extensive review among NASA and ESA teams at the Program and Directorate level.
 - Is presently in the NASA Administrator's Office for signature; will go to ESA for signature after that. Anticipate signatures by CCR.

- **Scope**
 - Defines the programmatic, management, and technical coordination processes to be used by NASA and ESA for the conduct of their respective components of the joint MSR Campaign as defined in the NASA/ESA Memorandum of Understanding
 - Includes detailed campaign objectives, program and projects roles and responsibilities, documentation, interfaces, joint management and engineering processes
- **Status**
 - Previous version reviewed by all parties
 - In revision, updating management and organizational changes at ESA and NASA
 - Expect to have signed by CCR

- **Scope:**
 - The FAD identifies a project's goals, objectives, constraints, participants, and resources.
 - Establishes the program structure within which to develop the project.
 - Formally authorizes a project to enter formulation.

- **Status:**
 - Draft has undergone extensive review at NASA HQ.
 - Will be delivered to the MSR Program team for review the week of September 14.
 - Anticipate signature-ready by CCR (typically signed after gate review as part of KDP-A process).

Formulation Agreement (FA)



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- **Scope:**
 - The FA expands upon the content of the FAD to establish the general plan for project formulation (Phase A and B).
 - Describes the technical and acquisition work which will be conducted during formulation, the products to be matured, and the schedule, funding and other resources required to accomplish that work.
- **Status:**
 - Draft has undergone extensive review in the MSR Program and at NASA HQ.
 - Will be updated consistent with the FAD following delivery of that document.
 - Anticipate signature and release by CCR.

Plan for Initiating NEPA Process



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- Scope
 - Addresses overall NEPA strategy, implications of PD/NSC-25 and restricted Earth return, compliance approach, key products and schedules
 - Proposes a MSR Programmatic EIS with lower-tiered documents for CCRS on ESA orbiter and for Sample Handling Facility
 - Includes risk communication strategy
- Status
 - DRAFT plan developed
 - DRAFT plan reviewed by MSR Program Manager and Program Director. Scheduling review discussion before proceeding with review by NASA NEPA implementation office
 - Plan to engage NASA NEPA implementation office prior to KDP-A

CRASPR Board Report Findings and Responses



Mars Sample Return Campaign Concept Review

- 1) Evaluate operations timeline robustness including rover lifetime and improved lander tolerance to dust storms, including radioisotopes.
 - More detailed basis of estimate for surface operations assumptions
 - Initiated green zone mission design studies that increase operations timeline margin
 - Studies of radioisotope heat/power for lander to be completed in first QTR FY'21
 - Assessed architecture options of delayed return (2033)
- 2) Develop a balanced view of cost, schedule and risk for 2026 launch.
 - Significant cost and schedule validation work over the past six months
 - Initiated ICEs and stood-up IRB and SRB in pre-phase A
 - Improved understanding (including cost and schedule) of alternate mission architectures
- 3) Present MSR architecture at a future MEPAG meeting to initiate broader discussion with the science community, include Science in future reviews, and adopt a minimum sample requirement of approximately 30.
 - Developed initial depot strategy concept; draft MOU with MEP/M2020 in work
 - Engagement with Mars science community through MEPAG and Science Steering Group
 - OS sized to return 30 samples

CRASPR Board Report Findings and Responses



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- 4) Develop MAV V&V program including a test program analogous to recent Mars EDL practices
 - Core test program of motors and system in place; key development with early funding
 - Continuing to evaluate possibility of flight test(s)
 - Tracking on Campaign risk list and included in cost range assessment
- 5) Develop a clear margin responsibility and release policy prior to CCR
 - Initial margin policy described in draft Management section of Program Plan; Phase B-D release plan in work
- 6) Staff Mission Manager role at Campaign level
 - Completed
 - Mission System roles/responsibilities to be finalized prior to CCR
- 7) Clear set of roles/responsibilities, lines of authority, ICDs and decision rules for presentation at CCR
 - Significant progress; documented in draft Management section of Program Plan
 - Will be presented at CCR; definition will be finalized in early Phase A

CRASPR Board Report Findings and Responses



Mars Sample Return Campaign Concept Review

- 8) Gather information and lessons learned from past Earth return missions
 - Restricted Earth return being managed as a Campaign responsibility
 - Held initial discussions with Genesis, Stardust and O-Rex teams and incorporated lessons learned in mission operations and NEPA planning
- 9) Assess the viability and potential performance improvement of DTE for SFR and Lander. Assess the viability of direct comm between surface assets
 - Evaluating X-band DTE for SRL, to be closed in first QTR FY21
 - DTE is not an option for SFR
 - Direct comm between SRL and SFR is not of sufficient benefit for added complexity
- 10) Develop mission strategy to minimize impact of solar conjunction in late cruise. Revisit the launch/arrival space to gain timeline margin between the end of solar conjunction and Mars arrival
 - Completed; 2.5 months for 2026 LRD between arrival and end of solar conjunction, more challenging for 2028 LRD
- 11) Improve CCRS return mass margin.
 - Working both return and launch mass margin prior to closing CCR baseline
 - Have allocated 50-kg of Campaign margin for return, continuing to work design options to improve launch margin