



2018 Small Innovative Missions For Planetary Exploration (SIMPLEx) Mission of Opportunity (MO) Solicitation

Pre-Proposal Conference *Technical, Management, and Cost Evaluation*

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Outline

- Technical, Management, and Cost (TMC) Evaluation
- SIMPLEx Solicitation Highlights
- Other Supporting Documents Related to Technology Maturation
- References
- Questions



Glossary

AO	Announcement of Opportunity
SALMON-3 AO	Stand-ALone Mission of Opportunity Notice-3 Announcement of Opportunity
PEA	Program Element Appendix to SALMON-3
TMC	Technical Management and Cost
MO	Mission of Opportunity
SCMs	Small Complete Missions



TMC Evaluation



Evaluation criteria:

- Science Merit of the Proposed Investigation (Form A)
- Science Implementation Merit and Feasibility of the Mission or Investigation (Form B)
- **TMC Feasibility of the Mission or Investigation Implementation (Form C)**

Weighting: The first criterion is weighted approximately 40%; the second and **third criteria are weighted approximately 30% each.**

TMC Evaluation: The purpose of the TMC evaluation is to assess the likelihood that the submitted mission or investigation's technical and management approaches can be successfully implemented as proposed, including an assessment of the likelihood of completion within the proposed cost and schedule.



TMC Evaluation criteria

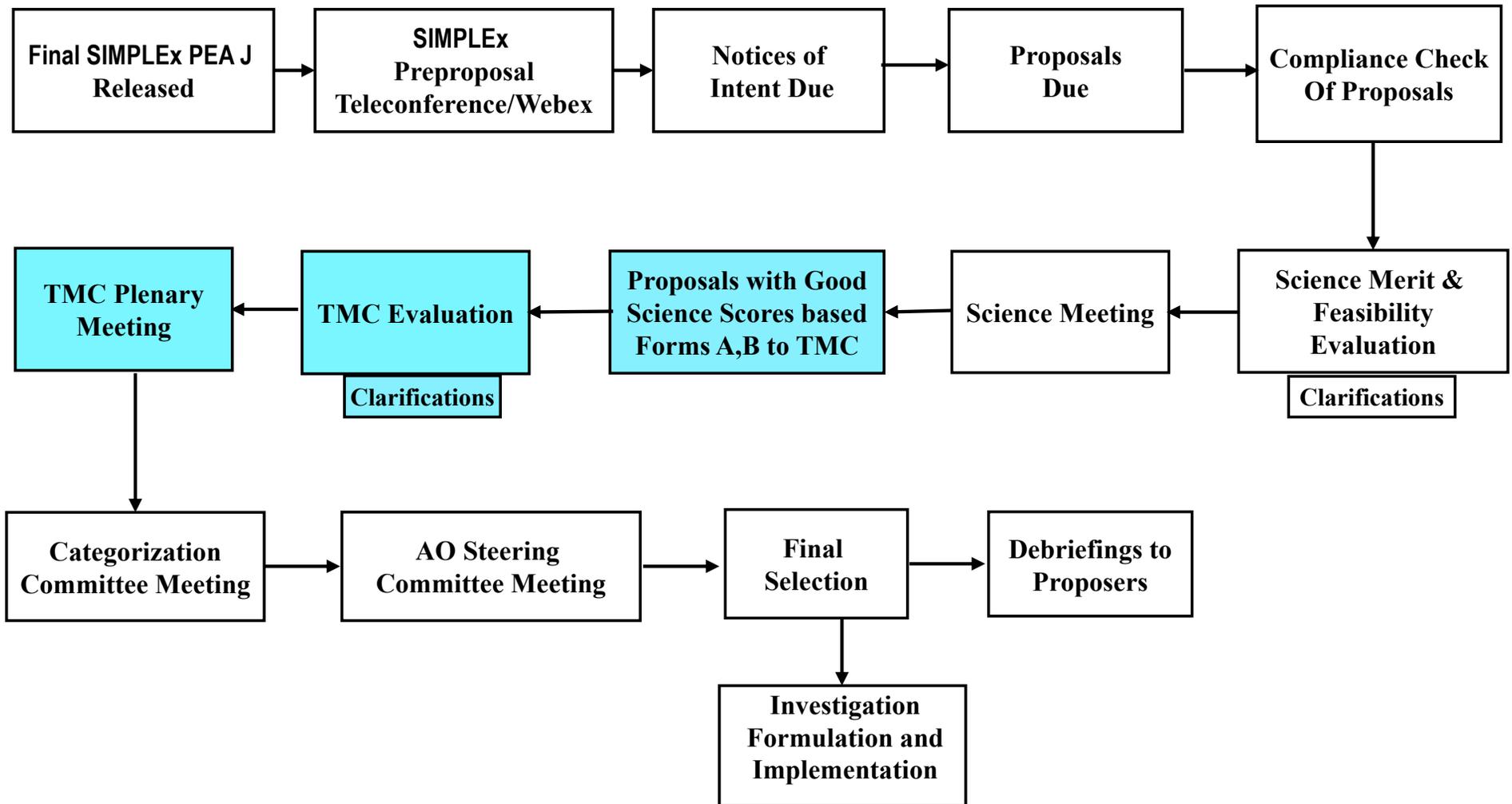
TMC evaluation criteria are stated in the sections titled “TMC Feasibility of the Investigation Implementation” (section 7.2.4) of the SALMON-3 AO

The 2018 SIMPLEx Mission of Opportunity (MO) solicitation is Program Element Appendix (PEA) J to the SALMON-3 AO.

Those proposing to the 2018 SIMPLEx MO must read the SALMON-3 AO and the SIMPLEx MO PEA J carefully, and proposals must comply with the requirements, constraints, and guidelines contained within these documents.



SIMPLEX PEA J Solicitation, Evaluation and Selection Flow





TMC Evaluation Factors

The following are highlights of the criteria listed in Section 7.2.4 of the SALMON-3 AO, “TMC Feasibility of the Mission or Investigation Implementation”

The technical and management approaches of all submitted investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule. The factors for feasibility of investigation implementation include the following, as applicable for the investigation being proposed:

Factor C-1. Adequacy and robustness of the instrument implementation plan.

Factor C-2. Adequacy and robustness of the investigation design and plan for operations.

Factor C-3. Adequacy and robustness of the flight systems.

Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team.

Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.



TMC Evaluation Principles

- **Basic Assumption: Proposer is the expert on his/her proposal.**
 - Proposer's task is to provide evidence that the investigation implementation risk is low.
 - TMC panel's task is to validate proposer's assertion of low risk.
- Merit is to be assessed on the basis of material in the proposal. All proposals are evaluated to identical standards and not compared to other proposals.
- TMC Panels consist of evaluators who are non-conflicted experts in the areas of the proposals that they evaluate.
- TMC Panels develop findings for each proposal - Findings: "As expected" (no finding), "above expectations" (strengths), "below expectations" (weaknesses).
 - The Cost Analysis is integrated into overall risk.
- Proposal Risk Assessment:
 - Proposals are based on Pre-Phase-A concepts; TMC Risk Assessments give appropriate benefit of the doubt to the Proposer.



TMC Risk Ratings: LOW, MEDIUM, HIGH

TMC Evaluation - The purpose of the TMC evaluation is to assess the likelihood that the submitted missions or investigations' technical and management approaches can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule. Ratings as defined in SALMON-3 section 7.2.1:

LOW Risk: There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the proposer's capability to accomplish the investigation well within the available resources.

MEDIUM Risk: Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Mission design may be complex and resources tight.

HIGH Risk: One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.



TMC Envelope Concept

Envelope: Contains all TMC Resources available to handle known and unknown development problems that occur. Includes schedule and funding reserves; reserves and margins on physical resources such as mass, power, and data; descope options; fallback plans; and personnel.

LOW Risk: Required resources fit well within available resources.



MEDIUM Risk: Required resources just barely inside available resources.



HIGH Risk: Required resources DO NOT fit inside available resources.





TMC Panel Evaluation Findings Definitions

Major and minor strengths and weaknesses are defined as follows:

- **Major Strength:** A facet of the implementation response that is judged to be well above expectations and can substantially contribute to the ability of the project to meet its technical requirements on schedule and within cost.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technical objectives on schedule and within cost.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.

Note: Findings that are considered “as expected” are not documented.



TMC Cost Analysis

- Initial cost analyses is accomplished on the basis of information provided in the proposals (consistency, completeness, proposed basis of estimate, contributions, use full cost accounting, maintenance of reserve levels, cost management, etc.).
- Cost is assessed with one or more models.
- Cost threats, risks, and risk mitigations are analyzed.
- The entire panel participates in Cost deliberations. All information from the entire evaluation process is considered in the final cost assessment.
- Cost realism (a.k.a. “cost risk”) is based on models, analogies, heritage, and grass roots information from proposals. There will not be a cost risk rating for SIMPLEx proposals.
- Significant findings are documented in the Cost Factor on Form C and considered in the TMC Risk Rating.



Potential Major Weaknesses Clarification Process

NASA requests clarifications of Potential Major Weaknesses (PMWs) identified by the evaluation panels in all three criteria; Intrinsic Science Merit of the Proposed Investigation, Experiment Science Implementation Merit and Feasibility of the Proposed Investigation, and TMC Feasibility of the Proposed Investigation Implementation.

- NASA requests such clarification uniformly, from all proposers.
- All requests for clarification from NASA and the proposers' responses are in writing.
- The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not intend to enter into discussions with proposers.
- PIs whose proposals have no PMWs are informed that no PMWs have been identified at that time.
- The form of the clarifications is strictly limited to a few types of responses:
 - Identification of the locations in the proposal (page(s), section(s), line(s)) where the PMW is addressed.
 - Noting that the PMW is not addressed in the proposal.
 - Stating that the PMW is invalidated by information that is common knowledge and is therefore not included in the proposal.
 - Stating that the analysis leading to the PMW is incorrect and identifying a place in the proposal where data supporting a correct analysis may be found.
 - Stating that a typographical error appears in the proposal and that the correct data is available elsewhere inside or outside of the proposal.

The PIs are given at least 24 hours to respond to the request for PMW clarification. Any response that goes beyond the five forms of clarification stated above will be deleted and not shown to the evaluation panel.



2018 SALMON-3 PEA-J (SIMPLEx MO) Highlights



SALMON-3 PEA-J Highlights

2018 SIMPLEx Mission
of Opportunity

Types of Mission of Opportunity solicited

- Selected Missions must be responsive to NASA Planetary Science Goals.
- SIMPLEx MO solicits proposals for Small Complete Mission (SCMs).
- The SCMs will be based on small satellite spacecraft (SmallSat), defined as ESPA-class or smaller, including CubeSats.
- Selected Missions will launch as secondary payloads on one of the specific flight opportunities (see PEA J Appendix A).
- Access to space will be provided by NASA; alternative access to space is not permitted.



Notice of Intent to Propose

- To assist the planning of the proposal evaluation process, NASA requires all prospective proposers to submit a Notice of Intent (NOI) to propose. Deadline for NOIs is 11:59 pm EDT, May 25th, 2018.
- NOIs are needed to help the evaluation teams plan and secure the services of well qualified unconflicted reviewers earlier in the evaluation cycle.
- Include the names of as many team members as possible (the project management team, partners, Co-Is, etc.)



Mission selection process

- Proposals submitted in response to this PEA will be selected for flight nominally through a **two-step competitive process**.
- As the outcome of the first step evaluation, NASA intends to fund one or more investigations to proceed to an 12 month Phase A/B study culminating in a preliminary design review (PDR).
- In the second step, NASA will conduct an evaluation of the Phase A/B PDR results. From this evaluation, NASA expects to select one or more SCMs to proceed into implementation.



SALMON-3 PEA-J Highlights

2018 SIMPLEx Mission
of Opportunity

New Technologies/Advanced Engineering Development

This PEA solicits science missions, not technology or advanced engineering development projects. Proposed investigations are generally expected to have mature technologies, with systems at a Technology Readiness Level (TRL) of 6 or higher. For the purpose of TRL assessment, systems are defined as level 3 WBS payload developments (i.e., individual instruments) and level 3 WBS spacecraft elements (e.g., electrical power system);

Proposals with a limited number of less mature technologies and/or advanced engineering developments are permitted as long as they contain a plan for maturing systems to TRL 6 by no later than PDR and adequate backup plans that will provide mitigation in the event that the systems cannot be matured as planned.

Proposals that use systems currently at less than TRL 6 shall include a plan for system maturation to TRL 6 by no later than PDR and a backup plan in the event that the proposed systems cannot be matured as planned.



SALMON-3 PEA-J Highlights

2018 SIMPLEx Mission
of Opportunity

Classified Proposal Appendix regarding Heritage

“In order to increase the capabilities of investigations proposed in response to this AO while minimizing the development and operations risks within the PI-Managed Mission Cost Cap, proposers may choose to leverage technology that was developed by other institutions and agencies as well as technology developed by NASA and NASA-funded partners. It is recognized that some technology relevant to proposed missions may have classified heritage.

Proposals that propose the use of hardware with classified heritage may provide a classified proposal appendix to NASA to allow validation of classified heritage claims. The classified appendix regarding heritage may include Letters of Validation for classified heritage claims from technology development sponsors. The proposer is responsible for determining what information is classified and what information is unclassified; any classified information provided to NASA must be handled appropriately.”

Note: Please let NASA know ASAP if you plan to submit a Classified Appendix regarding Heritage.



The following two documents have been posted to the Program Library to help proposers avoid weaknesses related to technology maturation.

- “Assessment of TRL in the AOs and Common Causes of Major TRL Weaknesses”
 - Background
 - Technology Readiness Level and the AO
 - Common TRL Major Weaknesses
 - Expected Compliance with AO

- “An Example for Demonstrating System Level TRL”
 - Define the Proposed Subsystem
 - Determine the Existing TRL
 - Assess the Subsystem TRL
 - Component Path to TRL 6
 - Subsystem Path to TRL 6



2018 SIMPLEx MO Acquisition Home Page

The 2018 SIMPLEx MO Acquisition Home Page, available at <https://soma.larc.nasa.gov/SIMPLEx/>, will provide updates and any addenda during the solicitation process. The contents of the acquisition page include the following:

- Links to the NSPIRES for access to the solicitation
- Program library
- Evaluation plan
- Q&A

2018 SIMPLEx MO Program Library

The Library provides additional regulations, policies, and background information. The Library is accessible at

<https://soma.larc.nasa.gov/SIMPLEx/programlibrary.html>



All further questions pertaining to the SALMON-3 PEA-J

**MUST
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Questions?