2023 Earth System Explorers (ESE) Solicitation

Announcement of Opportunity NNH23ZDA016O

Pre-Proposal Conference
Technical, Management, and Cost Evaluation

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Outline

- Introduction
- ESE Announcement of Opportunity (AO) Highlights
- Technical, Management, and Cost (TMC) Evaluation
- References
- Questions

Introduction

Purpose of this Presentation

1. Discuss some ESE AO highlights
2. Present a short overview of the Technical, Management and Cost (TMC) Evaluation of proposals submitted as a result of the 2023 Earth System Explorers (ESE) Announcement of Opportunity (AO).
3. Point to reference documents
4. Answer questions

Important Note: Proposers must read the AO carefully, and all proposals must comply with the requirements and constraints contained in the AO.

2023 ESE AO Highlights

ESE AO Highlights

- ESE is soliciting PI-led missions; naming of PM and PSE are deferred to Step 2.
- This is Step 1 of a 2 Step Process. Phase A is funded at $5M (FY2024$) for missions that are selected.
- Missions selected from this AO are Category 2 projects (per NPR 7120.5E) with Class C payloads (per NPR 8705.4A).
- Propose to an LRD of NLT April CY2030. Proposals should discuss the impacts (both positive and negative) of switching to an LRD of NLT April 2032 in Appendix J.4.
- Appendix J.13, Diversity and Inclusion Plan, is limited to 5 pages.
- Project risk and potential mitigation strategies in the form of a table only.

ESE AO Highlights

5.6 Cost Requirements and Constraints

- The PI-Managed Mission Cost is defined in Section 4.3.1 of the AO.
- The AO cost cap for an ESE mission is $310 million in Fiscal Year (FY) 2024 dollars, not including the cost of standard launch vehicle and launch services, or any contributions.
- Any launch services beyond the standard launch services offered must be funded out of the PI-Managed Mission Cost.
- The cost of SCaN services including costs for development must be represented as a reduction to the adjusted AO cost cap

5.9.2 AO-Provided Access to Space

- An ESE investigation will be launched as the primary payload on a single launch vehicle. See *Launch Vehicle Program Information Summary* document in the Program Library for enveloping launch vehicle characteristics and capabilities.

ESE AO Highlights

6.1.2 Notice of Intent to Propose

- To facilitate planning of the proposal evaluation process, NASA requires all prospective proposers to submit a Notice of Intent (NOI) to propose. (Due May 31, 2023)
- NOIs will help the evaluation teams to plan and secure the services of well qualified evaluators who do not have conflicts of interest earlier in the evaluation cycle.
- Include the names of as many team members as possible
- SMD requests that proposers communicate any changes to the investigation team or intent to propose, between NOI and proposal submission, to the Earth System Explorers Program Scientist identified in Section 6.1.5 of this AO.
- Submitting an NOI does not commit the team to submitting a proposal.

TMC Evaluation

TMC Evaluation

Evaluation criteria

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

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 investigations' technical and management approaches can be successfully implemented as proposed, including an assessment of the likelihood of the completion within the proposed cost and schedule.

TMC Evaluation

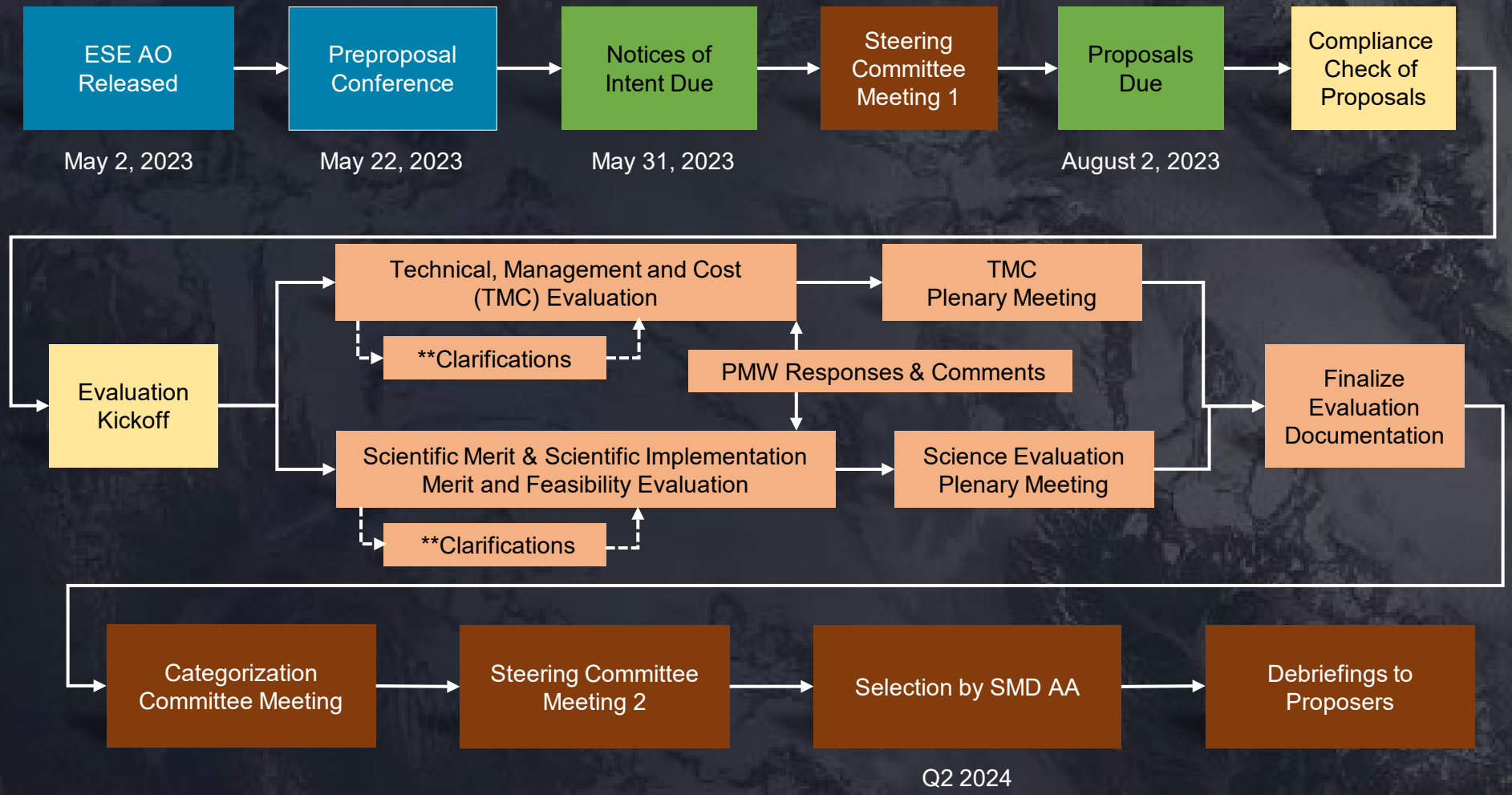
TMC Evaluation criteria

TMC evaluation criteria are stated in the ESE AO, Section 7.2.4, “TMC Feasibility of the Proposed Mission Implementation”

- The following are highlights of the criteria listed
  - Factor C-1. Adequacy and robustness of the instrument implementation plan.
  - Factor C-2. Adequacy and robustness of the mission design and plan for mission 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.

Evaluation, Categorization, and Selection Process

Proposal Evaluation Flow



TMC Evaluation

Principles of Evaluation

- All proposals are to be treated fairly and equally.
- Merit is to be assessed on the basis of material in the proposal and clarification responses (if applicable).
- Evaluation Ratings reflect the written strengths and weaknesses.
- Everyone involved in the evaluation process is expected to act in an unbiased objective manner; advocacy for particular proposals is not appropriate.

General Evaluation Ground Rules

- All proposals are evaluated to uniform standards established in the solicitation, and without comparison to other proposals.
- All evaluators are experts in the areas that they evaluate.
- Non-panel specialist evaluators (to provide special technical expertise to the TMC Panel) may be utilized, respectively, based on need for expertise in a specific science or technology/engineering area that is proposed.

TMC Evaluation

TMC Evaluation Findings

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 on the From C.

TMC Evaluation

There are three possible 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.

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 Evaluation Cost Analysis

The evaluation assesses the cost realism, and cost completeness including the basis of estimate, the adequacy of the approach to develop the estimated cost, the discussion of cost risks, the allocation of cost reserves by phase, and the team's understanding of the scope of work.

- An independent cost verification of the proposed cost for Phases A-D is performed using at least two independent cost models.
- An independent cost verification of the proposed cost for Phase E is performed using at least two cost models.
- The likelihood and cost impact of major weaknesses is assessed.
- Cost threat impacts to the proposed unencumbered cost reserves is assessed.
- The adequacy of the remaining unencumbered cost reserves is assessed.
- The entire panel participates in the Cost deliberations.
- All information from the entire evaluation process is considered in the final cost assessment.
- All cost findings are included on the Form C and considered in the TMC Risk Rating.

Cost Threat Matrix

- The ***likelihood*** and cost ***impact***, if any, of each weakness is stated as "This finding represents a cost threat assessed to have an Unlikely/Possible/Likely/Very Likely/Almost Certain likelihood of a Very Minimal/Minimal/Limited/ Moderate/Significant/Very Significant cost impact being realized during development and/or operations, which results in a reduction from the proposed unencumbered reserves."
- The ***likelihood*** is the probability range that the cost impact will materialize.
- The cost ***impact*** is the current best estimate of the range of costs to mitigate the threat.
- The cost threat matrix defines the adjectives that describe the ***likelihood*** and cost ***impact***.
- The minimum cost threat threshold is $1M(TBC) for Phases A-D, and 2.5%(TBC) for Phase E.

			Cost Impact (CI) % of PI-Managed Mission Cost to complete Phases A/B/C/D or % of Phase E not including unencumbered cost reserves or contributions					
	Likelihood of Occurrence	Weakness	Very Minimal	Minimal	Limited	Moderate	Significant	Very Significant
			0.5% < CI ≤ 2.5%	2.5% < CI ≤ 5%	5% < CI ≤ 10%	10% < CI ≤ 15%	15% < CI ≤ 20%	CI > 20%
				2.5% < CI ≤ 5%	5% < CI ≤ 10%	10% < CI ≤ 15%	15% < CI ≤ 20%	CI > 20%
Likelihood (L, %)	Almost Certain (L > 80%)							
	Very Likely (60% < L ≤ 80%)							
	Likely (40% < L ≤ 60%)							
	Possible (20% < L ≤ 40%)							
	Unlikely (L ≤ 20%)							

Clarification Process

PMW Clarification Process Requirements (1 of 4)

Clarifications Responses must conform to the following requirements:

Requirement Clar-1: Proposers shall submit only two Clarification Response Documents; i.e., one for the A and B Factors; and one for the C Factors.

Requirement Clar-2: The Clarification Response Document shall be a single unlocked (e.g., without digital signatures) searchable Adobe Portable Document Format (PDF) file, composed of the response text, figures, and/or tables. Images (e.g., figures and scans) shall be converted into machine-encoded text using optical character recognition. Animations shall not be included. Links to materials outside of the response are not permitted. Do not insert any comment fields.

Clarification Process

PMW Clarification Process Requirements (2 of 4)

Requirement Clar-3: The Clarification Response Document shall be presented in 8.5 x 11 inch paper (or A4). Text shall not exceed 5.5 lines per vertical inch and page numbers shall be specified. Margins at the top, both sides, and bottom of each page shall be no less than 1 inch if formatted for 8.5 x 11 inch paper; no less than 2.5 cm at the top and both sides, and 4 cm at the bottom if formatted for A4 paper. Type fonts for text, tables, and figure captions shall be no smaller than 12-point (i.e., no more than 15 characters per horizontal inch; six characters per horizontal centimeter). Fonts used within figures shall be no smaller than 8-point.

Requirement Clar-4: For the combined responses to A- and B-factor PMWs, the Clarification Response Documents shall not exceed eight pages. For the TMC Feasibility of the Proposed Investigation Implementation PMWs, the Clarification Response Documents shall not exceed six pages. Text, table(s) and figure(s) are permitted, however all material shall be within the page limits specified above and limitations in Requirement Clar-3.

Clarification Process

PMW Clarification Process Requirements (3 of 4)

Requirement Clar-5: The Clarification Response Document shall not contain International Traffic in Arms Regulations (ITAR), Export Administration Regulations (EAR), or classified material.

Requirement Clar-6: Each PMW shall be addressed and each clarification response labelled with the PMW number provided. Each PMW clarification response shall only contain information relevant to the PMW. Although your clarification response may point back to references in your proposal, please note that there are already references to locations on your proposal with the PMWs, which indicates that the evaluation team is familiar with and has already evaluated that data, therefore they are not obliged to re-consider them. When making references to the material in your proposal in your clarification responses, refer to the proposal page number on the bottom of the page, as opposed to the electronic PDF file page number.

Requirement Clar-7: The proposers are free to provide any additional information on any criteria or requirements relevant to the proposed investigation, e.g., for TMC Feasibility of the Proposed Investigation Implementation, advances in proposed technologies since proposal submission. However, this response together with the PMW clarification responses shall fulfill requirements above and not exceed the total page limitation per Clarification Response Document.

Clarification Process

PMW Clarification Process Requirements (4 of 4)

Requirement Clar-8: In support of each PMW clarification response, proposers shall not provide more than two references; references are restricted to peer reviewed literature. In support of any additional information response, proposers shall not provide more than three additional references; **references are restricted to peer reviewed literature**. Proposers shall not provide URLs with any of the responses.

Requirement Clar-9: Proposers may append to the page-limited response complete versions of a modified Science Traceability Matrix (STM; Table B1), Mission Traceability Matrix (MTM; Table B2), Total Mission Cost Profile table (Table B3b), Master Equipment List (MEL; Table B5), and/or schedule foldout. These modified foldout(s)/table(s) shall have modifications clearly marked by the use of a different color font or by a colored bordered box (labeled “PMW Clarification”). Proposers shall provide the description of the updates and changes to the modified fold-out(s)/table(s) as text in the page limited document. The complete versions of the modified STM, MTM, Total Mission Cost Profile table, MEL and schedule will not count against the page limit. Any new or other fold-out(s) will count as two pages against the response page limit.

References

Reference Material

2023 Earth System Explorers Acquisition Page

The 2023 Earth System Explorers (ESE) acquisition home page is available at https://explorers.larc.nasa.gov/2023ESE/

The contents of the web site include the following:

- 2023 Earth System Explorers news
- Community announcements
- Links to the NSPIRES for access to the solicitation
- Program Library
- Evaluation Plan
- Q&A
- betaSAM
- Teaming interest
- Preproposal conference

Reference Material

- **2023 Earth System Explorers Program Library**
- The Library provides additional regulations, policies, and background information. The Library is accessible at https://explorers.larc.nasa.gov/2023ESE/programlibrary.html
- Use Table B3b template in the program library to develop cost funding profile.

All questions pertaining to the ESE AO
Must be addressed by email to:

Dr Thorsten Markus
Earth Science Program Scientist
Science Mission Directorate
NASA Headquarters
Washington, DC 20546
thorsten.markus@nasa.gov
(subject line to read “Earth System Explorers AO")

Questions