



# **2018 Heliophysics Explorers Program (HEP) Missions of Opportunity (MO)**

## **Concept Study Guidelines and Criteria: Technical, Management, and Cost (TMC)**

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# Guidelines and Criteria for the Phase A Concept Study

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- The ***Guidelines and Criteria for the Phase A Concept Study*** document is posted in the Heliophysics MO Program Libraries.
    - <https://soma.larc.nasa.gov/2018HelioMO/programlibrary.html>
    - “Documents Referenced by PEA” section, item 19
      - This document contains instructions for preparation of the Concept Study Report (CSR). It combines the instructions for both the Heliophysics TechDemo Program Element Appendix (PEA) L and Heliophysics Science PEA M Step 2 evaluations.
      - Throughout this document, the term “Science/Technology” indicates that the text being addressed applies to both the Heliophysics Science (PEA M) and TechDemo (PEA L) solicitations, respectively.



# Guidelines and Criteria for the Phase A Concept Study (continued)

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- Requirements are designated as CS-1 to CS-109.
  - Note the following language from the document:
    - All program constraints, guidelines, definitions, and requirements specified in the PEA are applicable to the CSR, except as noted herein.
    - In case of conflict between the SALMON-3 AO, the PEA, and the CSR Guidelines, the CSR Guidelines take precedence.
    - Because members of this evaluation team may not have reviewed, nor be provided access to Step 1 proposals, each CSR must be a self-contained document.



# Guidelines and Criteria for the Phase A Concept Study (continued)

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- The format of the CSR is specified in Sections A through M.
  - The CSR Structure and Page Limits are specified on page 15.
    - 5 pages for Executive Summary.
    - 30 pages for Science Investigation (highlight changes from Step 1).
    - Sections F through J: 75 pages + 2 pages for each additional, separate, nonidentical instrument, or flight element + 5 pages for Student Collaboration.
    - No page limit for Cost Proposal (formats are specified).
    - No page limit for Justification and Cost Proposal for optional Science Enhancement Option Activities.
    - No page limit for Section M, Appendices, on specific topics.
      - Appendices should not be renumbered.



# Guidelines and Criteria for the Phase A Concept Study (continued)

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- Two signed originals of the CSR and five CD-ROMs (CDs) or single-layer DVD-ROMs (DVDs) containing unlocked, bookmarked, and searchable PDF file(s) of the CSR – limited to the main body of the CSR, all tables, all appendices (except for any classified one), and the MEL – as well as a separate PDF of the Fact Sheet, Microsoft Excel files of cost tables and the MEL, Microsoft Project schedule files, references not publicly available, and any optional cost files delivered **NLT 4 p.m. ET, August 7, 2020**.
  - Materials identified as subject to U.S. export laws and regulations, in accordance with PEA M Section 6.2.1 and SALMON-3 AO Section 5.9.3, must be marked and also redacted to create separate versions of the files that are collected in a Redacted folder.
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# Updated Criterion C Factors

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- Factor C-4, Adequacy and robustness of the management approach and schedule, including the capability of the management team.
    - Addition of named Project Systems Engineer (PSE) as Key Management Team member.
    - Change to meeting the proposed launch readiness date.
    - Addition of subfactor for small business subcontracting plan including small disadvantaged businesses.
    - Addition of career development opportunities to train the next generation engineering and management leaders.
    - Risk management aspects moved to new Factor C-6.



# Additional Criterion C Factors

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- Factor C-6, Adequacy of the risk management plan.
    - Includes risk management aspects of Factor C-4, Adequacy and robustness of the management approach and schedule, including the capability of the management team.
    - Adds non-NASA launch-related elements
    - Adds acknowledgement of no mitigation for a contribution and programmatic risk assessment for contributions.
  - Factor C-7, Ground systems.
    - Assessment of the proposed mission operations plans, facilities, hardware and software, etc.
  - Factor C-8, Approach and feasibility for completing Phase B.
    - Assessment of the completeness of plans.
    - Assessment of the adequacy of the approach.



# Guidelines: Items Deferred at Step-1

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- Requirements associated with the detailed disposal plan that were deferred until Step 2 will be imposed.
  - Science Enhancement Options may be added to the CSRs.
  - Student Collaborations are required for CSRs.
  - Category 3 missions are not required to do IV&V unless selected explicitly by the NASA Chief of the Office of Safety and Mission Assurance.
  - Regarding conjunction analysis risk assessment, any investigation to which NPR 8715.6A, Chapter 3 is applicable will have to budget costs in its PI-Managed Mission Cost to establish a working interface between the Flight Operations Team and the CARA or MADCAP team.
  - A full Data Plan will be required, in lieu of the Step-1 Data Analysis Plan. This will include the requirement for a schedule-based end-to-end data management plan.
  - Imposition of requirements for specification of costs in Real Year dollars.
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# Guidelines: Part II, Required Quantities, Media, Format, and Content

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- Requirement CS-8. Provide a list of the individuals who have participated in the concept study (*e.g.*, individuals who worked on the CSR, any CSR contributor, Red Team member, reviewer, *etc.*) and/or whom you are proposing to provide work should the mission be down-selected. Additionally, provide a list of all organizations named in the CSR, or providing developmental or research services, including the lead organization, subcontractors, vendors and contributing organizations who have an interest in the mission. Provide a draft list of the participants as a Microsoft Excel spreadsheet document to the point-of-contacts (PEA M Section 9) three months prior to the due date of the CSR. Use the Microsoft Excel spreadsheet template that has been posted to the Program Library. This list is to be updated and a final revision shall be included on the CD or DVD at the time of CSR submission.
  - Requirement CS-9. Create a separate document that contains a table with all of the requirements (Requirement CS-1 through Requirement CS-109) and the page, section, or table number that is the main place in the CSR where the requirement is addressed. Provide this table as a PDF document to the point-of-contact for the PEA by email no later than seven days after the CSRs are due.
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## Guidelines: Section H, Management

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- Provide quantitative risk assessments, where the probability and impact of occurrence are independently and numerically specified prior to mitigation; specification of probability and impact after mitigation is encouraged but not required. The products of pre-mitigation probabilities and impacts shall be included as encumbered cost reserves or explicitly identified in the basis of estimate, including cost validations.



# Guidelines: Section J, Preliminary Design and Technology Completion (Phase B) Plan

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- Once entering Phase B, Heliophysics projects will be subject to the same requirements as all other NASA missions. Note that the CSR only satisfies some of the KDP-B deliverable requirements, and that the balance will have to be developed early in Phase B (consistent with Section 2.2.7.1 in NPR 7120.5E: "In a two-step AO process, projects are down-selected following evaluation of concept study reports and the down-selection serves as KDP B. Following this selection, the process becomes conventional with the exception that products normally required at KDP B that require Mission Directorate input or approval will be finished as early in Phase B as feasible.").



# Guidelines: Appendix M.4, Phase B Contract Implementation Data

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- This appendix provides data necessary for the Program Office to modify the contract during the First Bridge Phase in order to add the balance of Phase B activities to the contract. Provision of Phase B contract implementation data may be deferred to the date of each concept study team's Site Visit.
  - From the Introduction section:
    - A First Bridge Phase proposal will be required with CSR submission. The Program Office will negotiate a priced option for a two-month First Bridge Phase into the Phase A contracts (where the First Bridge Phase is the first two months of Phase B, the balance of which will represent the Second Bridge Phase).
    - During the First Bridge Phase, NASA and the continued project will negotiate and sign contract modification necessary for the remaining portion of Phase B—the Second Bridge Phase—on the basis of information provided in the CSR.
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## Guidelines: Appendix M.16, Additional Cost Data to Assist Validation (Optional)

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- In addition to the specific cost table data requested in the Cost Proposal (Section K), investigation teams may also provide any additional costing information/data that they feel will assist NASA to validate the project's proposed costs. Vendor quotes, cost estimates, rationale for design heritage cost savings, are all examples of data that can be included here. Input and output files for any publicly available cost model may be included on each submitted CD/DVD, if accompanied by discussion in this appendix.



# Guidelines: Appendix M.19, Space Systems Protection

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- On February 1, 2019, the NASA Associate Administrator issued a letter directing that all newly started or newly solicited robotic spacecraft protect their command uplink through the use of encryption that is compliant with Level 1 of the Federal Information Processing Standard (FIPS) 140-2.
    - Requirement CS-104. Provide the detailed plans, as applicable, addressing the protection of uplink commands using approaches compliant with FIPS 140-2 Level 1.
    - Requirement CS-105. Provide the detailed plans addressing the ability of command uplink, position, navigation, and timing subsystems to recognize and survive interference.
    - Requirement CS-106. Provide the detailed plans addressing the protection of command uplink information at no less than the Sensitive But Unclassified level.
  - Exemptions
    - Hosted instrument payloads
    - Class C or D spacecraft lacking propulsion subsystems
    - Spacecraft that will operate more than two million kilometers (“deep space”) from the Earth
  - Additional costs associated with these new requirements are outside the PEA Cost Cap.
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## Guidelines: Appendix M.21, References List

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- Requirement CS-108. This section shall provide a list of any internal program and project management standards to be used in the proposed development (e.g., GEVS, “GOLD Rules”). To the extent practicable, the referenced documents shall be included on the CD/DVD.



## Site Visits

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- Site visits with oral briefings will be used to clarify implementation details and commitments.
  - Site visits are anticipated during the November 2020 timeframe at location sites to be coordinated between the PI/Proposal Team and NASA HQ/SOMA.
  - Briefings for each site visit will be limited to approximately eight hours.
  - All site visit presentations/briefings should be in a plenary session with all Evaluation Team members attending - no splinter sessions.
  - Written significant weaknesses, questions, and/or requests for information will be provided to the PI/Proposal Team 6 days before the site visit. All teams will have the same lead time.
  - Some questions will require an early response, 2 days before the site visit.
  - Any additional information provided to NASA by the investigation team at the site visit, in response to the NASA-identified weaknesses and questions, or in response to NASA requests for additional information, will be treated as updates and clarifications to the CSR.
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# Additional and Updated Program Library Documents

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## Updated:

- Guidelines and Criteria for the Phase A Concept Study
  - 2018 Heliophysics Technology Demonstration and Science Missions of Opportunity Guidelines and Criteria for the Phase A Concept Study
- NASA's Mission Specific Launch Vehicle Secondary Payload Adapter System Interface Specifications for Heliophysics Missions of Opportunity

## Additional:

- Program Level Requirements Appendix (PLRA) examples from NuSTAR and IBEX
- Mission Definition Requirements Agreement (MDRA) examples from IBEX and IRIS
- Sample International Agreements from Juno and MSL
- NPR 8000.4B, Agency Risk Management Procedural Requirements
- CSR Conflicted Party List
- Launch Service Interface Requirements Document (LSIRD)



# Updated/New Criterion B Factors

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- Factor B-1, PEA M: Merit of the instruments and mission design for addressing the science goals and objectives.
    - Includes details on data collection strategy and plans.
  - Factor B-2, Probability of technical success.
    - Includes assessment of technology readiness, heritage, environmental concerns, accommodation, and complexity of interfaces for the technology/instrument design.
  - Factor B-5, Probability of investigation team success.
    - Collaborator roles not evaluated for the CSR.
    - Addition of career development opportunities to train the next generation science/technology leaders.
  - Factor A-3 of the PEA will be re-evaluated as a factor for Experiment Science/Technology Implementation Merit and Feasibility; it has been renumbered as Factor B-7, Likelihood of scientific/technology success.
  - Factor B-8, Maturity of proposed Level 1 science/technology demonstration requirements and Level 2 project requirements.
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