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

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Criteria and Guidelines for the Phase A Concept Study

- The Criteria and Guidelines for the Phase A Concept Study is posted in the Program Specific Documents section of the New Frontiers Program Library (https://newfrontiers.larc.nasa.gov/nfpl.html).
- The document contains instructions for preparation of the Concept Study Report (CSR).
  - Concept Study Requirements are designated as CS-1 to CS-104.
  - Note the following language from the document:
    - All program constraints, guidelines, definitions, and requirements specified in the AO are applicable to the CSR, except as noted herein.
    - In case of conflict between the AO 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.

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

- The format of CSR is specified in Guideline 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)
  - 98 pages + for Science Implementation, Mission Implementation, Management, Other Factors to be Evaluated (including SEOs and/or TDOs, if any), and Preliminary Design and Technology Completion (Phase B) Plan
  - No page limit for Cost Proposal (formats are specified).
  - 25 page limit each for Justification and Cost Proposal for optional SEO and/or TDO Activities.
  - No page limit for Section M, Appendices, on specific topics.
  - Appendices should not be renumbered.

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

- Two signed originals of the CSR and sixty (60) 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, 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, trajectory files, required references, and any optional cost files delivered NLT 4 p.m. ET, December xx, 2018.
- Materials identified as subject to U.S. export laws and regulations, in accordance with the New Frontiers 4 AO Section 5.8.2, must be marked and also redacted into separate versions of files that are collected in a Redacted folder.

Updated Criterion C Factors

- Factor C-2, “Adequacy and robustness of the mission design and plan for mission operations”.
  - Addition of subfactor for scientific measurements planning and decision-making processes, and the schedule and workforce allocated to these processes
- Factor C-4, Adequacy and robustness of the management approach and schedule, including the capability of the management team.
  - Addition of subfactor for small business subcontracting plan including small disadvantaged businesses.
  - Risk management aspects moved to new Factor C-6.

Additional Criterion C Factors

- 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.
- 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.
- Factor C-9, “Implementation feasibility and risk of any proposed use of NASA-developed technology”
  - Assessment of whether the plan for any proposed infusion of NASA-developed technology adequately interfaces with, integrates, and uses the NASA-developed technology

Heritage

- Heritage is not an evaluation criterion. However, it is an aspect of multiple evaluation criteria, factors, and subfactors.

- In considering the heritage of any aspect of the mission, the evaluation team will consider the design, manufacture, software, provider, use, operating environment, referenced mission, and other factors. The evaluation team will consider the degree of difference between the proposed use and the referenced (heritage) use. The evaluation team will assess whether the degree of modification is consistent with any risk mitigation claimed and whether the degree of modification is consistent with any cost savings claimed.

Guidelines: Step-1 Deferrals

- **Final** Planetary protection plans
- **Final** Curation plan elements
- Requirements associated with the detailed disposal plan that were deferred until Step 2 will be imposed.
- Science Enhancement Options may be added during CSRs.
- Technology Demonstration Options may be added during CSRs.
- Student Collaborations may be added during CSRs.
- In Step 2, teams are required to contact the Office of the Director at the NASA IV&V Program to gain a preliminary understanding of the potential level of safety and software risks.
- 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.

Guidelines: Part II, Required Quantities, Media, Format, and Content

- Requirement CS-8. Provide a list of the individuals who have participated in the concept study (including individuals who worked on the CSR, such as any CSR writer, Red Team member, reviewer, etc) and whom you are proposing to provide work should the mission be downselected. Additionally, provide a list of all institutions with interests in the mission, including contributors or vendors. Provide a draft list of the participants as a Microsoft Excel spreadsheet document to the point-of-contact listed below, 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-103) 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 New Frontiers AO by email no later than seven days after the CSRs are due.

Guidelines: Section H, Management

- 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 are to be included as encumbered cost reserves or explicitly identified in the basis of estimate, including cost validations.

Evaluation: Sections I and L, SEOs and TDOs

- Section I: For Step 2, SEOs and TDOs will be evaluated to the same standard as the baseline investigation and assigned a separate TMC Cost and Risk Rating.
- Section L “Justification and Cost Proposal for optional SEO and/or TDO Activities” is not page limited.
- SEOs and/or TDOs will be assigned Criterion B and Criterion C ratings independent of the baseline investigation.

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

- Once entering Phase B, New Frontiers 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.16 "Additional Cost Data to Assist Validation (Optional)"

- In addition to the specific cost table data requested in the Cost Proposal (Section J), 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. Benchmark cost model input and output files (AO Requirement 69 and AO Requirement B-53) are not required. However, analogous 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.20 “References List”

- Requirement CS-102. This section shall provide a list of any internal program and project management standards to be used in the proposed development (e.g., GEVS, “Golden Rules”). To the extent practicable, the documents shall be included on the CD/DVD.

Site Visits

- Site visits with oral briefings will be used to clarify implementation details and commitments.
- Site visits are anticipated during the March 2019 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 TBD days before the site visit. All teams will have the same lead time.
- 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.

Evaluation: Range of Cost and Schedule (RCS)

- Range of cost and schedule (RCS) estimates will be provided to the Selection Official. The information in the CSRs, responses to questions, and information provided at site visits will be considered in preparing the RCS estimates. Findings generated by the Evaluation panel will also be considered when generating the RCS estimates.
- Driven by NPR 7120.5E:

  2.4.3.1 Tightly coupled and single-project programs (regardless of life-cycle cost) and projects with an estimated life-cycle cost greater than $250 million shall provide a range of cost and a range for schedule at KDP 0/KDP B, each range (with confidence levels identified for the low and high values of the range) established by a probabilistic analysis and based on identified resources and associated uncertainties by fiscal year. Separate analyses of cost and schedule, each with associated confidence levels, meet the requirement. A joint cost and schedule confidence level (JCL) is not required but may be used at KDP 0 and KDP B.

Updated/New Criterion B Factors

- Factor B-1, 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 instrument design.
- Factor A-3 defined in Section 7.2.2 of the AO will be re-evaluated as a factor for Scientific Implementation Merit and Feasibility; it has been renumbered as Factor B-8, Likelihood of scientific success.
- Factor B-9, Maturity of proposed Level 1 science requirements and Level 2 project requirements.