

## Instrument Concept Study Report (CSR) Cost Requirements

Requirement CS-1. Using the Work Breakdown Structure (WBS) definitions from NPR 7120.5E, a WBS shall be provided and used to describe how all project costs are accounted in the cost proposal.

Requirement CS-2. This section shall detail the estimated cost of the proposed investigation. The estimated cost shall encompass all proposed activities, including all applicable investigation phases, investigation unique or special services, flight systems, ground systems, ground network fees, contributions, and all cost reserves. Cost for ground network fees, data archive, and other investigation-unique elements shall be clearly described.

Requirement CS-3. This section shall describe the methodologies used to develop the cost estimate and provide an overview of the cost estimate development process. Any additional cost estimates or other validation efforts shall be described, the results presented, and any significant discrepancies discussed. The rationale for the proposed cost reserve levels shall be presented. Additional Basis of Estimate data shall be provided to assist the validation of the costs estimates. Examples of useful Basis of Estimate data include cost comparisons to analogous items/investigations, vendor quotes, and parametric model results.

Requirement CS-4. This section shall discuss cost risks and mitigation strategies.

Requirement CS-5. Using the investigation phases definitions from NPR 7120.5E, the CSR cost proposal shall provide information on the anticipated costs for all investigation phases. A discussion of the basis of estimate shall be provided, with a discussion of heritage and commonality with other programs. Quantify and explain any cost savings that result from heritage. All costs, including all contributions made to the investigation, shall be included. Specific information that would better enable NASA to validate costs (e.g., WBS level 3 data) may be provided. This will include cost by fiscal year to the lowest level of detail the project is working with.

Requirement CS-6. All contributions provided by NASA Centers, including Civil Servant services, as well as the cost for the use of Government facilities and equipment on a full-cost accounting basis, shall be included. All direct and indirect costs associated with the work performed at NASA Centers shall be fully costed and accounted for in the CSR and summarized in one page using the template provided using the template of Cost Table Template 5. The purpose of this data is twofold: 1) to determine those costs that are included in the NASA SMD cost but are not funded out of the SOFIA program, and 2) to determine civil service contributions that are not included in the NASA SMD cost. Teams should work with their respective NASA Centers to develop estimates for these costs. Contributions by NASA Centers should be documented by a Letter of Commitment.

Requirement CS-7. The NASA FY15 New Start Inflation Index shall be used to calculate all real-year dollar amounts, if an industry forward pricing rate is not available.

If something other than the NASA inflation index is used, the rates used must be documented.

Requirement CS-8. All costs shall include all burdens and profit/fee in real-year dollars by fiscal year, assuming the inflation rates used by NASA or specifically documented industry forward pricing rates.

Requirement CS-9. This section shall provide a detailed cost proposal. The cost proposal should correlate with the plans set forth in the Science and Science Implementation sections of the concept study. This cost proposal shall include the following elements:

- Workforce Staffing Plan. A workforce staffing plan (including civil service) that is consistent with the WBS shall be provided. This plan shall include all team member organizations and must cover all management, technical (scientific and engineering), and support staff. The workforce staffing plan shall be phased by month. Time commitments for the PI, PM, Co-Is, and other key personnel must be clearly shown.
- Proposal Pricing Technique. The process and techniques used to develop the cost proposal shall be described. For portions of the cost proposal developed with a grass-roots methodology, the bases from which the estimates were derived and details on how the estimates were extrapolated from the bases shall be provided. For portions of the cost proposal derived from vendor quotes/historical actuals/catalogue prices/etc., information sufficient to understand the fidelity of the values shall be provided. For portions of cost the proposal derived from analogies, the value of and the methodology for extrapolating the analogy shall be described. For portions of the cost proposal derived parametrically, the cost-estimating model(s) and techniques used in the cost estimate shall be described. The heritage of the models and/or techniques applied to this estimate, including any differences between investigations contained in the model's data base and key attributes of the proposed investigation shall be described. Assumptions used as the basis for the cost for Phase B shall be included, and those that are critical to cost sensitivity in the investigation shall be identified. If any "discounts" were assumed in the cost estimates for business practice initiatives or streamlined technical approaches, a description of how these have been incorporated in the cost estimate and will be managed by the investigation team shall be provided.
- Elements of Cost Breakdown. Cost or pricing data as defined in FAR 15.401 and supporting evidence stating the basis for the estimated costs by the WBS levels used shall be provided. The cost proposal shall include, but is not limited to, the following cost elements:
  - (a) Direct Labor. (i) The basis of labor-hour estimates for each of the labor classifications; (ii) the number of productive work-hours per month; (iii) a schedule of the direct labor rates used in the proposal, with a discussion of the basis for developing the proposed direct labor rates for the team member organizations involved; the forward-pricing method (including midpoint, escalation factors, anticipated impact of future union contracts, etc.); and elements included in the rates, such as overtime, shift differential, incentives, and allowances; (iv) if available, evidence of Government approval of direct labor rates for proposal purposes for each labor classification for the proposed

- performance period; and (v) if Civil Servant labor is to be used, but is not to be charged directly to the investigation, this labor shall be considered as a contribution by a domestic partner, and a discussion of the source of funding for the Civil Servant contributions shall be provided.
- (b) Direct Material. A summary of material and parts costs for each element of the WBS shall be provided.
- (c) Subcontracts. Each effort (task, item, etc., by WBS element) to be subcontracted, and list the selected or potential subcontractors, locations, amount budgeted/proposed, and types of contracts shall be identified. Explain the adjustments, if any, and the indirect rates (or burdens) applied to the subcontractors' proposed or anticipated amounts. Describe fully the cost analysis or price analysis and the negotiations conducted regarding the proposed subcontracts.
- (d) Other Direct Costs: (i) A summary of travel and relocation costs, including the number of trips, their durations, and their purposes; (ii) a summary of all unique computer related costs; (iii) specific task areas of problems that require consultant services, including the quoted daily rate, the estimated number of days, associated costs (e.g. travel) if any, and a statement of whether the consultant has been compensated at the quoted rate for similar services performed with Government contracts; and (iv) any other direct costs included in the proposal for Phase B, provided in a manner similar to that described above.
- (e) Indirect Costs. (i) all indirect expense rates for the team member organizations (indirect expense rates include labor overhead, material overhead, general and administrative [G&A] expenses, and any other cost proposed as an allocation to the proposed direct costs); (ii) a schedule of off-site burden rates, including a copy of the company policy regarding off-site vs. on-site effort, if applicable; (iii) evidence of Government approval of any/all projected indirect rates for the proposed period of performance, including the status of rate negotiations with the cognizant Government agency, and a comparative listing of approved bidding rates and negotiated actual rates for the past five fiscal years; and (iv) fee arrangements for the major team partners.

Requirement CS-10. An electronic version of the cost table(s) and the Master Equipment List (MEL) in a Microsoft Excel format shall be delivered securely using NASA's Large File Transfer service to Carlos.A.Liceaga@nasa.gov.

#### Instrument CSR Schedule Requirements

Requirement CS-11. A project schedule foldout (or foldouts) covering all phases of the investigation shall be provided. This foldout will not be counted against the page limits. The schedule format shall indicate the month and year of each milestone, have a corresponding table of dates, and follow standard NASA WBS elements for task descriptions as prescribed in NPR 7120.5E. The schedule foldout and accompanying narrative shall address major milestones, including the following items:

- Instrument development and major review dates including instrument-to-telescope integration and test;

- Ground systems development and major review dates;
- Major deliverables;
- Long-lead item specifications, development paths, and their impacts to schedule;
- Schedule critical path identification, including any significant secondary critical paths; and
- Funded schedule reserve, with indications of appropriate reserves associated with major milestones and deliverables, including allocated critical path reserves.

Requirement CS-12. An electronic version of the schedule in a Microsoft Project format shall be delivered securely using NASA's Large File Transfer service to Carlos.A.Liceaga@nasa.gov. The tasks in the schedule must follow the standard WBS defined in NPR 7120.5E. The detail on the schedule is requested to go to at least level 4 for the payload (one level below the instrument) where the data are available.