Explorer Announcement of Opportunity (AO) Concept Study Report (CSR) Evaluation Plan

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January 8, 2013

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Approval Signatures
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Astrophysics Explorer

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Introduction

- The goal of NASA's Explorer Program is to provide frequent flight opportunities for high quality, high value, focused heliophysics and astrophysics science investigations that can be accomplished under a not-to-exceed cost cap and that can be developed relatively quickly, generally in 36 months or less, and executed on-orbit in less than 3 years.
- The purpose of this evaluation plan is to define the ground rules, processes, organizations, and schedules to be used in evaluating the Heliophysics Explorer and Astrophysics Explorer Concept Study Reports (CSRs).
- 5 Full Missions and 5 Missions of Opportunity were selected for concept studies, which constitute each investigation's Concept and Technology Development Phase (Phase A) of the Formulation process as outlined in NPR 7120.5D NID (NASA Interim Directive) (NM 7120-81), NASA Spaceflight Program and Project Requirements.

Evaluation Plan Overview

- The Explorer Announcement of Opportunity (AO), under which the investigations to be evaluated were selected, is comprised of two solicitations: AO NNH11ZDA002O, entitled Explorer 2011, issued November 1, 2010, and Program Element Appendix (PEA) H7, entitled Explorer 2011 Science Missions of Opportunity, appended November 1, 2010, to the Stand Alone Missions of Opportunity Notice (SALMON) AO NNH08ZDA009O.
- The Science Office for Mission Assessments (SOMA) at NASA Langley Research Center (LaRC) developed this Explorer AO CSR Evaluation Plan for the Science Mission Directorate (SMD) at NASA Headquarters.
- This CSR Evaluation Plan has been cleared for public release by SMD, SOMA, and the Office of General Counsel (OGC).
- The Explorer Program Acquisition Scientist and Astrophysics Explorer Program Scientist are responsible for validating all evaluation processes, responsibility assignments, assumptions, and ground rules.

CSR Evaluation Structure

- The Explorer Program is made up of two separate program elements, which are the Heliophysics Explorer and Astrophysics Explorer managed by the Heliophysics Division and the Astrophysics Division, respectively. While the program elements share a common management structure and Explorers Program Office at Goddard Space Flight Center (GSFC), budget authority is separate.
- For CSRs submitted in response to the Explorer AO, selections will be within the area of Heliophysics or in the area of Astrophysics. Thus all Heliophysics Full Mission (EX) and Mission of Opportunity (MO) investigations are deemed to be in competition with each other, but not with Astrophysics investigations. Similarly, all Astrophysics EX and MO investigations are deemed to be in competition with each other, but not with Heliophysics investigations.
- The Explorer AO Step 2 downselection process will be run with separate but corresponding evaluation panels for Heliophysics and Astrophysics missions. This will encompass the entire evaluation process, including Criterion A, B,C, D, E, and F evaluations.
- The tailoring of coordinated but parallel Heliophysics and Astrophysics evaluations will provide significant time-savings for the Step 2 downselect process and enable earlier notifications for the competing teams.

Background
Heliophysics Explorer

- 3 Full Missions were selected for Phase A concept studies. $1M was provided for each Concept Study.
  - Ionospheric Connection Explorer (ICON) - Thomas Immel, Principal Investigator (PI), University of California, Berkeley - The mission would fly instruments to understand the extreme variability in our Earth's ionosphere, which can interfere with communications and geopositioning signals.
  - Observatory for Heteroscale Magnetosphere-Ionosphere Coupling (OHMIC) - James Burch, PI, Southwest Research Institute, San Antonio, Texas - The mission would use a pair of spacecraft flying in formation to study the processes that provide energy to power space weather storms. These storms create auroras and other electromagnetic activity that can impact orbiting spacecraft operations.
  - Atmosphere-Space Transition Region Explorer (ASTRE) - Robert Pfaff Jr., PI, NASA's Goddard Space Flight Center, Greenbelt, Md. - The mission would study the interaction between the Earth's atmosphere and the ionized gases of space. By flying excursions deep into the Earth's upper atmosphere, its measurements would improve satellite drag models and show how space-induced currents in electric power grids originate and evolve with time.

Background (continued)
Heliophysics Explorer

- 3 Missions of Opportunity were selected for Phase A concept studies. $250k was provided for each Concept Study.
  - Global-scale Observations of the Limb and Disk (GOLD) - Richard Eastes, PI, University of Central Florida, Orlando - This mission of opportunity would involve an imaging instrument that would fly on a commercial communications satellite in geostationary orbit to image the Earth's thermosphere and ionosphere.
  - Ion Mass Spectrum Analyzer for SCOPE (IMSA) - Lynn Kistler PI, University of New Hampshire, Durham - This partner mission of opportunity would provide a composition instrument to the Japanese cross-Scale Coupling in the Plasma universE (SCOPE) mission. SCOPE will study fundamental space plasma processes including particle acceleration, magnetic reconnection, and plasma turbulence.
  - Coronal Physics Investigator (CPI) - John Kohl, PI, Smithsonian Astrophysical Observatory, Cambridge, Mass. - A solar telescope would be mounted on the ISS to investigate the processes that produce the sun's fast and slow solar wind.

Background
Astrophysics Explorer

- 2 Full Missions were selected for Phase A concept studies. $1M was provided for each Concept Study.
  - Fast INfrared Exoplanet Spectroscopy Survey Explorer (FINESSE) - Mark Swain, PI, Jet Propulsion Laboratory, Pasadena, California - This proposal would use a space telescope to survey more than 200 planets around other stars. This would be the first mission dedicated to finding out what comprises exoplanet atmospheres, what conditions or processes are responsible for their composition, and how our solar system fits into the larger family of planets.
  - Transiting Exoplanet Survey Satellite (TESS) - George Ricker, PI, Massachusetts Institute of Technology, Cambridge, Mass. - Using an array of telescopes, TESS would perform an all-sky survey to discover transiting exoplanets, ranging from Earth-sized to gas giants, in orbit around the nearest and brightest stars in the sky. The mission's primary goal would be to identify terrestrial planets in the habitable zones of nearby stars.

Background (continued)
Astrophysics Explorer

- 2 Missions of Opportunity were selected for Phase A concept studies. $250k was provided for each Concept Study.
  - Neutron star Interior Composition ExploreR (NICER) - Keith Gendreau, PI, NASA's Goddard Space Flight Center, Greenbelt, Md. - This mission would place an X-ray timing instrument on the International Space Station (ISS) to explore the exotic states of matter within neutron stars and reveal their interior and surface compositions.
  - Gal/Xgal U/LDB Spectroscopic/Stratospheric THz Observatory (GUSSTO) - Christopher Walker, PI, University of Arizona, Tucson - This mission would launch a high altitude balloon with a one-meter telescope to provide a comprehensive understanding of the inner workings of our Milky Way galaxy and one of our galaxy's companion galaxies, the Large Magellanic Cloud.

Handling of Proprietary Data

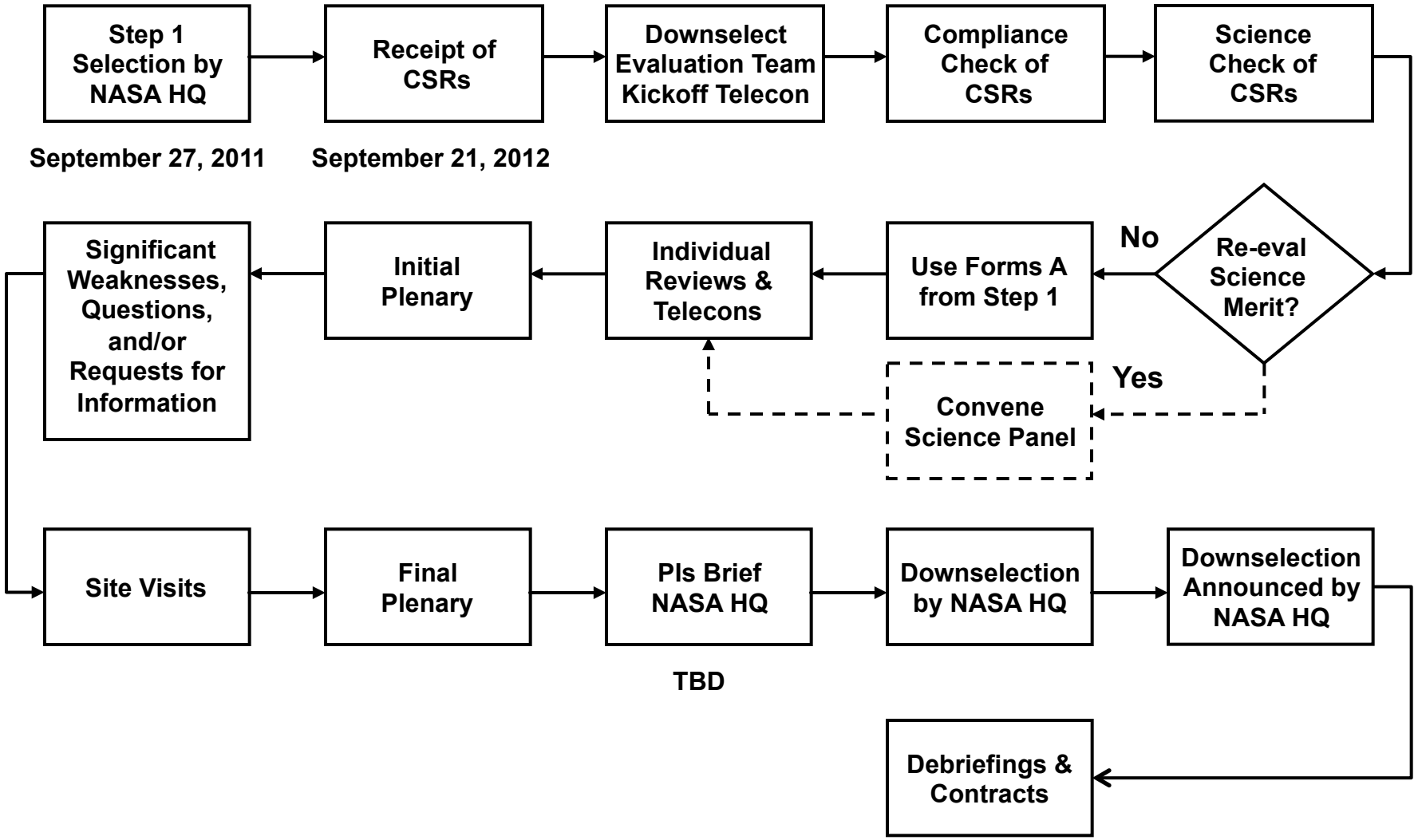
- All CSR related materials will be considered proprietary.
- Only those individuals with a need to know will be allowed to view CSR materials.
- Each non Civil Servant (CS) or non Intergovernmental Personnel Act (IPA) Assignee evaluator will sign a NASA Non-Disclosure Agreement (NDA) which must be on file with NASA Research and Education Support Services (NRESS) prior to any CSRs being distributed to that evaluator.
  - CS and IPA evaluators are not required to sign an NDA.
- All Report Materials will be numbered and controlled, with a record of who has what materials.
- Evaluators and Observers will be briefed at a Kickoff telecon on how to handle the CSR material. Evaluators will be briefed that they are not allowed to discuss CSRs with anyone outside the Evaluation Panels ever. Evaluators will be briefed to not contact anyone outside of their Evaluation Panel to gain insight on any CSR related matter without expressly getting authorization from the Explorer Program Acquisition Scientist (Dr. Jeffrey Newmark), the Astrophysics Explorer Program Scientist (Dr. Wilton Sanders), or a Technical, Management, and Cost (TMC) Panel Chair (Washito Sasamoto or Dr. Carlos Liceaga) in advance of making the contact.

Handling of Proprietary Data (continued)

- During the Evaluation, all proprietary information that needs to be exchanged between evaluators will be exchanged securely via the secure Remote Evaluation System (RES) web site maintained by SOMA, the secure Science Works System maintained by SMD, encrypted email, parcel post, fax, or regular mail. Proprietary information will not be sent via unencrypted email.
- Telecon line information is confidential. The phone numbers and pass codes are posted in a file on the Remote Evaluation Site (RES). Participants will be briefed to ensure they do not provide this information to anyone or distribute this information via email.
- When the evaluation process is complete, CSR materials will be collected. Some copies (for archival purposes) will be maintained in the NRESS and SOMA vaults. Also, some CSR material from the downselected mission(s) will be provided to the Explorers Program Office at GSFC. All other CSR materials will be destroyed.

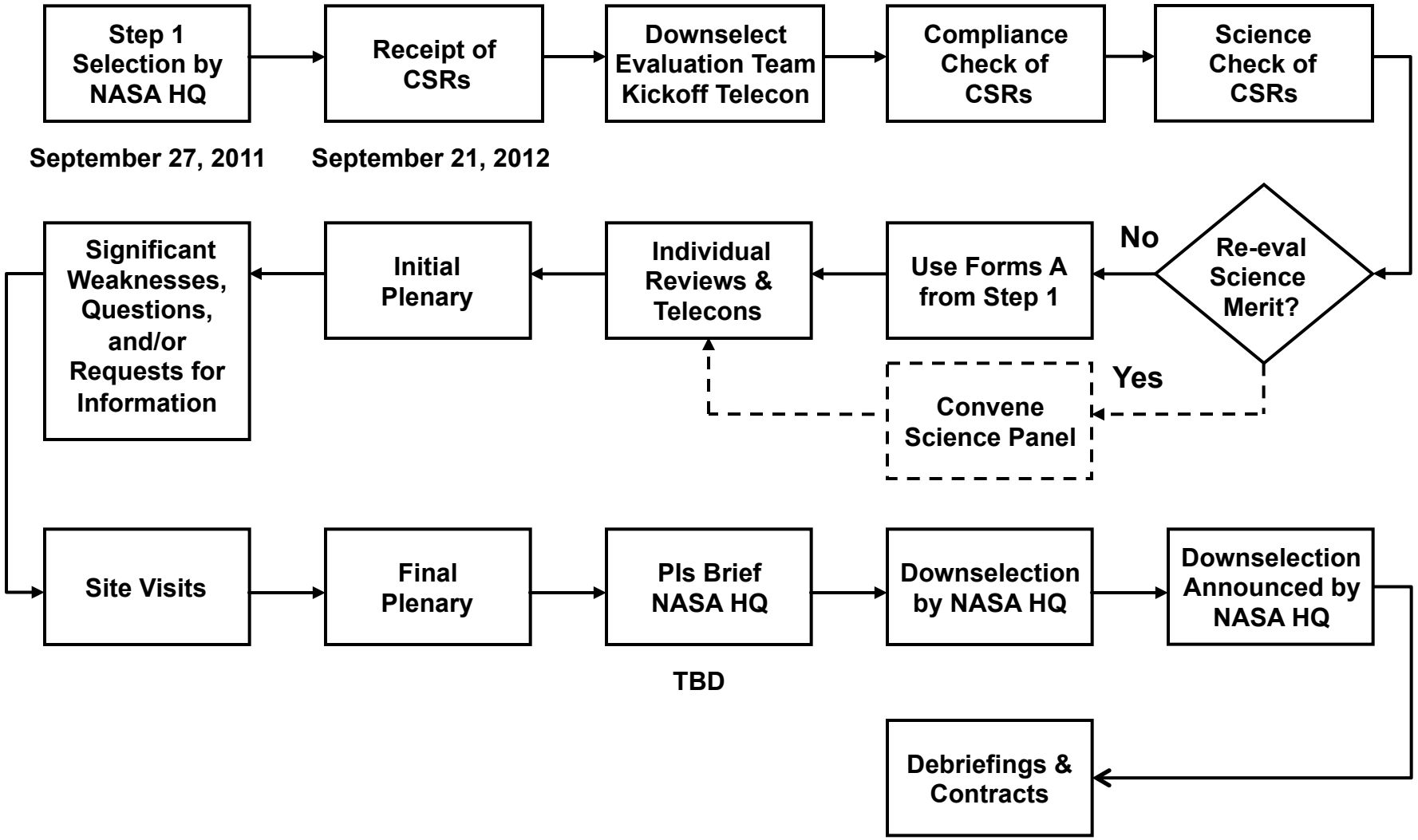
CSR Evaluation Flow
Heliophysics Explorer

Explorer AO
CSR Evaluation Plan

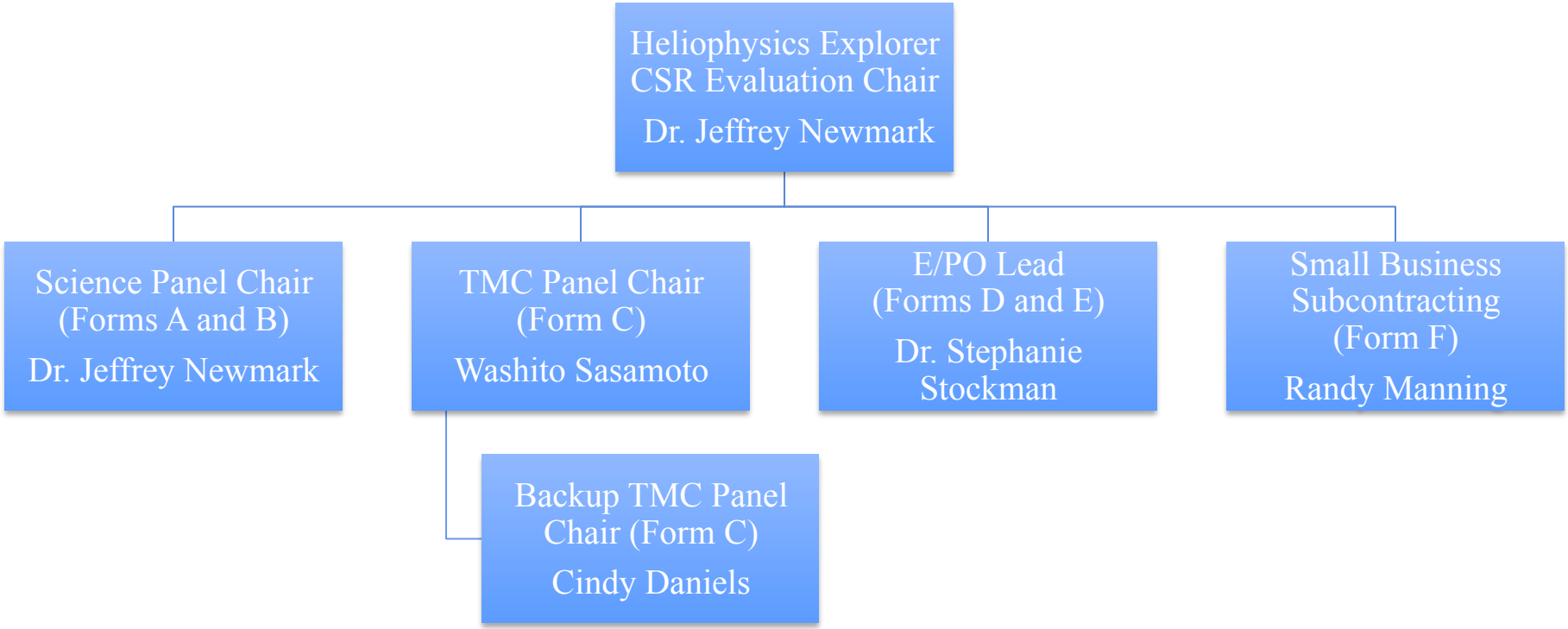


CSR Evaluation Flow
Astrophysics Explorer

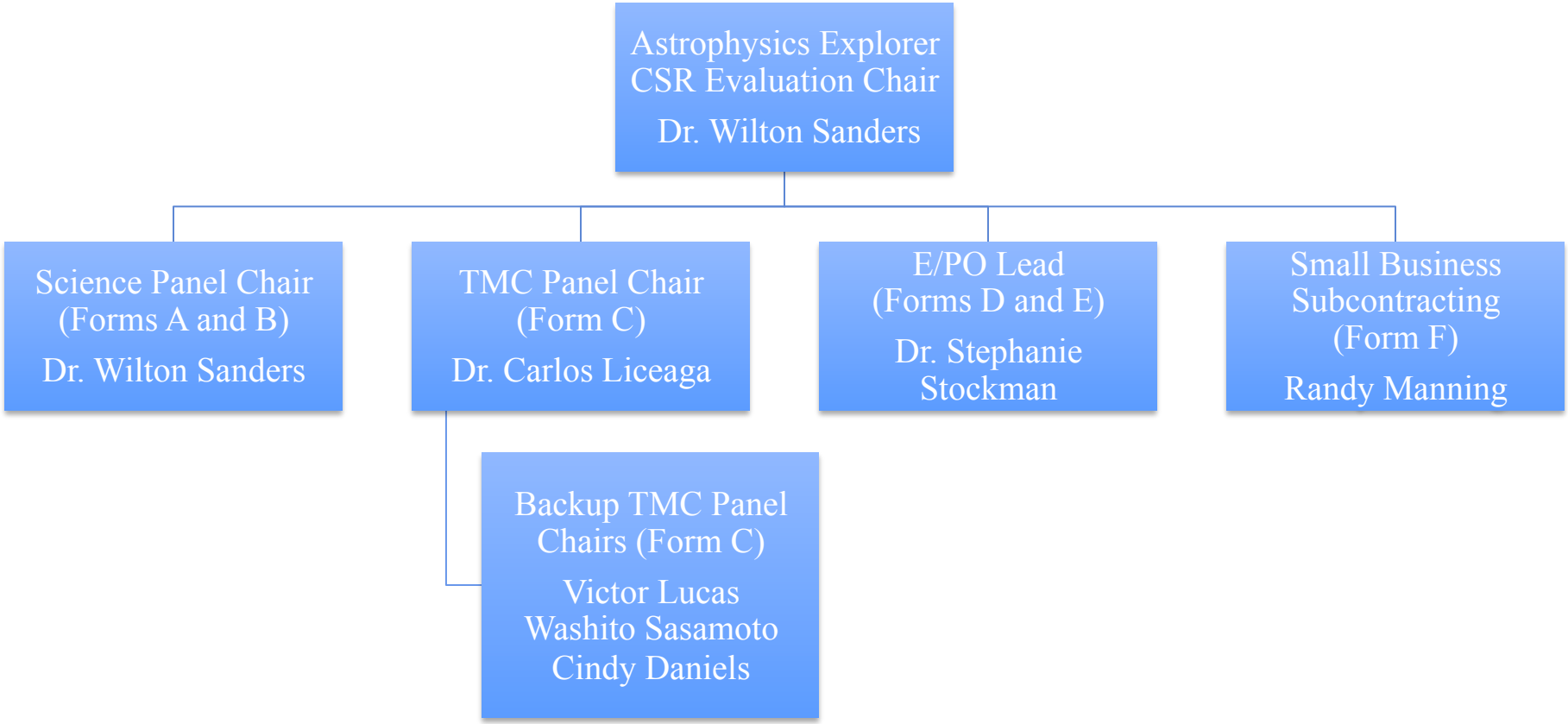
Explorer AO
CSR Evaluation Plan



Organization
Heliophysics Explorer



Organization
Astrophysics Explorer



Conflict of Interest (COI)

- Members of Evaluation Panels are cross checked against the list of organizations listed in the selected Step 1 proposals to ensure no individual or organizational COI exists with the planned evaluators. Evaluators are required to raise any potential COIs.
- After the Concept Study Reports (CSRs) are received, all members of the Evaluation Panels will again be cross checked against the lists of personnel on each CSR and organizations mentioned in each CSR to ensure no individual or organizational COI exists on the list of evaluators.
- In addition, all evaluators will review the final list of conflicted organizations and be required to divulge whether they have any financial, professional, or personal potential conflict of interest and whether they work for a profit making company that directly competes with any profit making proposing organization.
- Any potential COI issue is discussed with the Explorer Program Acquisition Scientist and/or the Astrophysics Program Scientist, and the SMD Deputy Associate Administrator for Research, and documented in the Heliophysics Explorer or Astrophysics Explorer Downselect COI Mitigation Plan.
- All Civil Service and IPA evaluators must file an OGE Form 450 or 278/278-T, which will be reviewed for conflicts of interest.
  - A list of all Civil Servants and IPAs involved in the evaluation will be provided to the SMD Deputy Associate Administrator for Research
- If any evaluators with potential organizational COI must be utilized, their respective organizations must submit a plan, as required by their contract or SMD waiver, addressing the Conflict of Interest and mitigation plan. This plan will outline how they will firewall the potentially conflicted evaluator(s) during the evaluation process from the conflicted part of their organization.

Plan to Avoid Conflicts of Interest

- If during the evaluation there is any actual conflict of interest noted, the conflicted member(s) will be notified to stop reviewing CSRs immediately, and the Explorer Program Acquisition Scientist and/or the Astrophysics Explorer Program Scientist will be notified. Steps will be expeditiously taken to remove any actual or potential bias imposed by the conflicted member(s).
- Community standards for conflicts of interest will be applied to all evaluators as directed in SMD Policy Document SPD-01A. Standards for financial conflicts on interest as specified in 18 USC 208 will be applied to civil servant evaluators. The HQ Office of General Counsel will be consulted as necessary. Conflicts involving contractors on NASA LaRC contracts will require consultation with the LaRC Office of Procurement.

Evaluation Criteria and Additional Selection Factors

- The Criteria to Evaluate the Concept Study Reports are documented in the EXPLORER 2011 GUIDELINES AND CRITERIA FOR THE PHASE A CONCEPT STUDY at http://explorers.larc.nasa.gov/EX/ex_Library.html.
- Evaluation criteria for Concept Study: approximate significance of each criterion is indicated by the percent weighting.
  - Form A: Scientific Merit of the Investigation (will not be reevaluated unless it is determined that the science has changed from that described in the Step 1 proposal) (approximately 25%)
  - Form B: Scientific Implementation Merit and Feasibility of the Investigation (approximately 20%)
  - Form C: Feasibility of Mission Implementation, Including Cost Risk (approximately 50%)
  - Forms D, E, and F: Quality of plans for core E/PO as applicable, optional Student Collaboration (SC) if proposed, and small business subcontracting plans (approximately 5%)
- Additional selection factors
  - NASA budget changes and/or other programmatic factors, including but not limited to changes in scientific mandates, national priorities, and budgetary forecasts that were not evident when the AO or the PEA were issued. The PI-managed Mission Cost, as well as other programmatic factors, may be additional selection factors.

Evaluation Criterion A

- **Scientific Merit of the Investigation** - The Heliophysics Explorer Program Scientist or the Astrophysics Explorer Program Scientist will determine whether any issues that may have emerged in the course of the concept study have effected significant changes to the science objectives or other aspects of the proposed Baseline and Threshold Science Missions (see Requirement CS-17 in Section II of [the EXPLORER 2011 GUIDELINES AND CRITERIA FOR THE PHASE A CONCEPT STUDY]) in such a manner as to have impacted the basis for the evaluation of the scientific merit of the investigation as determined by the peer review panel for the Step 1 proposal. If there are no significant changes to the proposed investigation that undermine the basis of this rating, the peer review panel rating for scientific merit of the Step 1 proposal will be the rating for scientific merit of the CSR. If there are significant changes, the Heliophysics Explorer Program Scientist or the Astrophysics Explorer Program Scientist will convene a peer review panel to reevaluate the scientific merit of the objectives in light of these changes. The factors for reevaluating this criterion will be the same as those used for the Step 1 proposal review (Section 7.2.2 of the AO or Section 7.2.1 of the PEA).

Evaluation Criterion B

- **Scientific Implementation Merit and Feasibility of the Investigation -** All of the factors defined in Section 7.2.3 of the AO or Section 7.2.2 of the PEA apply to the evaluation of the CSR. Note that details have been added to one of the subfactors of Factor B-1, Merit of the instruments and mission design. Also, an additional subfactor has been added to Factor B-2, Probability of technical success.
  - Factor B-1. Merit of the instruments and mission design for addressing the science goals and objectives. This factor includes the degree to which the proposed mission will address the goals and objectives; the appropriateness of the selected instruments and mission design for addressing the goals and objectives; the degree to which the proposed instruments and mission can provide the necessary data, including details on data collection strategy and plans (*n.b.*, details added for the evaluation of the CSR); and the sufficiency of the data gathered to complete the scientific investigation.

Evaluation Criterion B (continued)

- Factor B-2. Probability of technical success. This factor includes the maturity and technical readiness of the instruments; the adequacy of the plan to develop the instruments within the proposed cost and schedule; the robustness of those plans, including recognition of risks and mitigation plans for retiring those risks; the likelihood of success in developing any new technology that represents an untested advance in the state of the art; the ability of the development team - both institutions and individuals - to successfully implement those plans; and the likelihood of success for both the development and the operation of the instruments within the mission design. This factor includes assessment of technology readiness, heritage, environmental concerns, accommodation, and complexity of interfaces for the instrument design (*n.b.*, subfactor added for the evaluation of the CSR).
- Factor B-3. Merit of the data analysis, data availability, and data archiving plan. This factor includes the merit of plans for data analysis and data archiving to meet the goals and objectives; to result in the publication of science discoveries in the professional literature; and to preserve data and samples of value to the science community. Considerations in this factor include assessment of planning and budget adequacy and evidence of plans for well- documented, high-level data products and software usable to the entire science community; assessment of adequate resources for physical interpretation of data; reporting scientific results in refereed journals; and assessment of the proposed plan for the timely release of the data to the public domain for enlarging its science impact.

Evaluation Criterion B (continued)

- Factor B-4. Science resiliency. This factor includes both developmental and operational resiliency. Developmental resiliency includes the approach to descoping the Baseline Science Mission to the Threshold Science Mission in the event that development problems force reductions in scope. Operational resiliency includes the ability to withstand adverse circumstances, the capability to degrade gracefully, and the potential to recover from anomalies in flight.
- Factor B-5. Probability of science team success. This factor will be evaluated by assessing the experience, expertise, and organizational structure of the science team and the mission design in light of any proposed instruments. The role of each Co-Investigator will be evaluated for necessary contributions to the proposed investigation; the inclusion of Co-Is who do not have a well defined and appropriate role may be cause for downgrading of the CSR evaluation.
- Factor B-6. Merit of any science enhancement options (SEOs) or science/technology enhancement options (STEOs), if proposed. This factor includes assessing the appropriateness of activities selected to enlarge the science impact of the mission; the potential of the selected activities to enlarge the science impact of the mission; and the appropriate costing of the selected activities. The peer review panel will inform NASA whether the evaluation of the proposed SEO(s) or STEO(s) impacted the overall rating for scientific implementation merit and feasibility. Lack of an SEO or STEO will have no impact on the CSR's overall rating for scientific implementation merit and feasibility.

Evaluation Criterion B (continued)

- Factor A-3 of the AO or the PEA will be re-evaluated as a factor for Scientific Implementation Merit and Feasibility; it has been renumbered as Factor B-7.
  - Factor B-7. Likelihood of scientific success. This factor includes how well the anticipated measurements support the goals and objectives; the adequacy of the anticipated data to complete the investigation and meet the goals and objectives; and the appropriateness of the mission requirements for guiding development and ensuring scientific success.

Evaluation Criterion B (continued)

- A new evaluation factor that is not described in the AO or the PEA and was not evaluated for Step 1 proposals will also be included. This factor will be evaluated for the CSRs in addition to the factors specified in Section 7.2.3 of the AO or Section 7.2.2 of the PEA and updated above as Factors B-1 through B-7.
  - Factor B-8. Maturity of proposed Level 1 science requirements and Level 2 project requirements. This factor includes assessment of whether the Level 1 requirements are mature enough to guide the achievement the objectives of the Baseline Science Mission and the Threshold Science Mission, and whether the Level 2 requirements are consistent with the Level 1 requirements. The CSR will be evaluated for whether the requirements are stated in unambiguous, objective, quantifiable, and verifiable terms that do not conflict. The CSR will be evaluated for the adequacy, sufficiency, and completeness of the Level 1 and Level 2 requirements, including their utility for evaluating the capability of the instruments and other systems to achieve the mission objectives. The stability of the Level 1 science requirements and Level 2 project requirements will be assessed including whether the requirements are ready, upon initiation of phase B, to be placed under configuration control with little or no expected modifications for the lifecycle of the mission.

Evaluation Criterion C

- **Feasibility of the Mission Implementation, including Cost Risk** - All of the factors defined in Section 7.2.4 of the AO or Section 7.2.3 of the PEA apply to the evaluation of the CSR. All of these factors are interpreted as including an assessment as to whether technical, management, and cost feasibility are at least at a Phase A level of maturity.

  Note that the risk management aspects of Factor C-4, *Adequacy and robustness of the management approach and schedule, including the capability of the management team*, have been removed from Factor C-4 and included in a new evaluation factor, Factor C-6, *Adequacy of the risk management plan*.

  – Factor C-1. Adequacy and robustness of the instrument implementation plan. The maturity and technical readiness of the instrument complement will be assessed, as will the ability of the instruments to meet mission requirements. This factor includes an assessment of the instrument design, accommodation, interface, heritage, and technology readiness. This factor includes an assessment of the instrument hardware and software designs, heritage, and margins. This factor includes an assessment of the proposer's understanding of the processes, products, and activities required to accomplish development and integration of the instrument complement. This factor also includes adequacy of the plans for instrument systems engineering and for dealing with environmental concerns. This factor includes an assessment of plans for the development and use of new instrument technology and the adequacy of backup plans to mature systems within the proposed cost and schedule when technologies having a TRL less than 6 are proposed.

Evaluation Criterion C (continued)

- Factor C-2. Adequacy and robustness of the mission design and plan for mission operations. This factor includes an assessment of the overall mission design and mission architecture, the spacecraft design and design margins (including margins for launch mass, delta-V, and propellant), the concept for mission operations (including communication, navigation/tracking/trajectory analysis, and ground systems and facilities), and the plans for launch services. This factor includes mission resiliency – the flexibility to recover from problems during both development and operations – including the technical resource reserves and margins, system and subsystem redundancy, and reductions and other changes that can be implemented without impact to the Baseline Science Mission.
- Factor C-3. Adequacy and robustness of the flight systems. This factor includes an assessment of the flight hardware and software designs, heritage, and margins. This factor includes an assessment of the proposer's understanding of the processes, products, and activities required to accomplish development and integration of all elements (flight systems, ground and data systems, etc.). This factor includes an assessment of the adequacy of the plans for spacecraft systems engineering, qualification, verification, mission assurance, launch operations, and entry/descent/landing. This factor includes the plans for the development and use of new technology and the adequacy of backup plans to ensure success of the mission when technologies having a TRL less than 6 are proposed. The maturity and technical readiness of the spacecraft, subsystems, and operations systems will be assessed. The adequacy of the plan to mature systems within the proposed cost and schedule, the robustness of those plans, including recognition of risks and mitigation plans for retiring those risks, and the likelihood of success in developing any new technologies will be assessed.

Evaluation Criterion C (continued)

- Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team. This factor includes: the adequacy of the proposed organizational structure and WBS; the management approach including project level systems engineering; the roles, qualifications, and experience of the PI, PM, other named key management team members, and implementing organization, mission management team, and known partners; the commitment, spaceflight experience, and relevant performance of the PI, PM, other named key management team members, and implementing organization, mission management team, and known partners against the needs of the investigation; the commitments of partners and contributors; and the team's understanding of the scope of work covering all elements of the mission, including contributions. This factor also includes assessment of CSR elements such as the relationship of the work to the project schedule, the project element interdependencies, the associated schedule margins, and an assessment of the likelihood of launching by the proposed launch date. Also evaluated under this factor are the proposed project and schedule management tools to be used on the project along with the subcontracting plan including small and small disadvantaged businesses.

Evaluation Criterion C (continued)

- Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk. This factor includes CSR elements such as cost, cost risk, cost realism, and cost completeness including assessment of the basis of estimate, the adequacy of the approach, the methods and rationale used 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 (covering all elements of the mission, including contributions). CSRs will be evaluated for the adequacy of the cost reserves and whether CSRs with inadequate cost reserves demonstrate a thorough understanding of the cost risks. This factor also includes an assessment of the proposed cost relative to estimates generated using parametric models and analogies. Also evaluated under this factor are the proposed cost management tools to be used on the project.

Evaluation Criterion C (continued)

- The following evaluation factor has been removed as a subset of Factor C-4 described in the AO or the PEA and has been revised for the evaluation of the CSR.
  - Factor C-6. Adequacy of the risk management plan. The adequacy of the proposed risk management approach will be assessed, as will any risk mitigation plans for new technologies, any long-lead items, and the adequacy and availability of any required manufacturing, test, or other facilities. The approach to any proposed descoping of mission capabilities will be assessed against the proposed Baseline Science Mission. The plans for managing the risk of contributed critical goods and services will be assessed, including the commitment of partners and contributors as documented in Letters of Commitment and the adequacy of contingency plans for coping with the failure of a proposed cooperative arrangement or contribution; when no mitigation is possible, this should be explicitly acknowledged. The stability and reliability of proposed partners, and the appropriateness of any proposed contribution, is not assessed as a management risk but will be assessed by SMD as a programmatic risk element of the investigation.

Evaluation Criterion C (continued)

- The following are new evaluation factors that are not described in the AO or the PEA and were not evaluated for Step 1 proposals. These will be evaluated for the CSRs in addition to the factors given in Section 7.2.4 of the AO or Section 7.2.3 of the PEA and updated above as Factors C-1 through C-6.
  - Factor C-7. Ground Systems. This factor includes an assessment of the proposed mission operations plans, facilities, hardware and software, processes, and procedures.
  - Factor C-8. Approach and feasibility for completing Phase B. The completeness of Phase B plans and the adequacy of the Phase B approach will be assessed. This assessment will include evaluation of the activities/products, the organizations responsible for those activities/products, and the schedule to accomplish the activities/products.

Evaluation Criterion D

- **Quality and Merit of the Education and Public Outreach, Student Collaboration, and Small Business Contracting Plans**
  - Quality of Plans for Core E/PO Program. This factor will be evaluated against the criteria described in the document *Explanatory Guide to the NASA Science Mission Directorate Education and Public Outreach Evaluation Criteria* (April 2008*), which can be found in the Explorer Program Library. A discussion of these criteria is included in that document. See Section I in Part II of [the *EXPLORER 2011 GUIDELINES AND CRITERIA FOR THE PHASE A CONCEPT STUDY*] document for further details on E/PO requirements.
  - For full missions proposed against the AO, the minimum allowable core E/PO program cost is defined to be 1% of the PI-Managed Mission Cost Cap. Missions must designate at least the minimum allowable core E/PO program cost for implementation of the core E/PO program. There is no maximum allowable cost for the core E/PO program; however, the funding for the core E/PO program must be included in the PI-Managed Mission Cost.
  - E/PO programs are optional for MOs. Lack of an E/PO will have no impact on the CSR's overall rating for scientific implementation merit and feasibility. There is no minimum and no maximum allowable cost for the MO E/PO. NASA is providing an E/PO incentive that is defined to be 1% of the PI-Managed Mission Cost Cap. The proposed cost of the E/PO, up to the E/PO incentive, is outside of the PI-Managed Mission Cost. If the E/PO costs more than the E/PO incentive, then the rest of the cost of the E/PO must be within the PI-Managed Mission Cost.

* Note: The *Explanatory Guide to the NASA Science Mission Directorate Education and Public Outreach Evaluation Criteria* was updated from version 3.0 dated April 2008 to version 3.1 dated November 2010 per Q&A64.

Evaluation Criterion E

- **Quality and Merit of the Education and Public Outreach, Student Collaboration, and Small Business Contracting Plans**
  - Overall Merit of Student Collaboration (SC), if proposed. This factor will include an assessment of whether the scope of the SC follows the guidelines in section 5.5.3 of the AO or Section 4.4 of the PEA. The criteria to be used to evaluate the SC component and a discussion of those criteria are described in the document *Explanatory Guide to the NASA Science Mission Directorate Educational Merit Evaluation Factors for Student Collaboration Elements* (September 2007), which can be found in the Explorer Program Library.
  - For full missions proposed against the AO, there is no minimum and no maximum allowable cost for a SC. NASA is providing a student collaboration incentive that is defined to be 1% of the PI-Managed Mission Cost Cap. The proposed cost of the SC, up to the student collaboration incentive, may be outside of the PI-Managed Mission Cost. If the SC costs more than the student collaboration incentive, then the rest of the cost of the SC must be within the PI-Managed Mission Cost.

Evaluation Criterion F

- **Quality and Merit of the Education and Public Outreach, Student Collaboration, and Small Business Contracting Plans**
  - Merit of the Small Business Subcontracting Plans. This factor will be evaluated on the participation goals and quality and level of work performed by small business concerns overall, as well as that performed by the various categories of small business concerns listed in FAR 52.219-9, except for Small Disadvantaged Businesses (SDBs). Offerors will separately identify, and will be evaluated on participation targets of SDBs in North American Industry Classification System (NAICS) codes determined by the Department of Commerce to be underrepresented industry sectors.

CSR Evaluation Panel Products

- Form A if necessary
  - Grade range: Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, or Poor
- Form B for all CSRs
  - Grade range: Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, or Poor
- Form C for all CSRs
  - Grade range: LOW Risk, MEDIUM Risk, or HIGH Risk
  - Polling is held on 3 bins within each Risk category
  - The Risk Rating reflects the median grade
- Form D (Education and Public Outreach) as applicable
  - Grade range: Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, or Poor
- Form E (Student Collaboration) if proposed
  - Separable from the main mission: Yes or No
  - Grades: Meritorious, Meritorious with Reservations, or Not Meritorious.
- Form F (Small Business Subcontracting Plans) for all CSRs
  - Grades: Acceptable or Needs Work

Grade Definitions - Forms A, B, and D

- Form A, B, and D Grade Definitions
  - Excellent: A comprehensive, thorough, and compelling CSR of exceptional merit that fully responds to the objectives of the AO as documented by numerous and/or significant strengths and having no major weaknesses.
  - Very Good: A fully competent CSR of very high merit that fully responds to the objectives of the AO, whose strengths fully outbalance any weaknesses.
  - Good: A competent CSR that represents a credible response to the AO, having neither significant strengths nor weakness and/or whose strengths and weaknesses essentially balance.
  - Fair: A CSR that provides a nominal response to the AO, but whose weaknesses outweigh any perceived strengths.
  - Poor: A seriously flawed CSR having one or more major weaknesses (*e.g.*, an inadequate or flawed plan of research, or lack of focus on the objectives of the AO).

Form B Evaluation Factors and Sub-Factors

The degree to which the CSR addressed the following directly relates to the Science Implementation Merit and Feasibility of the Investigation Grade of Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, or Poor

- **Instrument and Mission Design**
  - Degree to which the proposed mission will address the goals & objectives
  - Appropriateness of the selected instruments & mission design for addressing the goals & objectives
  - Degree to which the proposed instruments & mission can provide the necessary data, including details on data collection strategy & plans
  - Sufficiency of the data gathered to complete the scientific investigation
- **Probability of Technical Success**
  - Maturity & technical readiness of the instruments
  - Adequacy of the plan to develop the instruments within cost & schedule
  - Robustness of development plans, including recognition of risks & mitigation plans for retiring those risks
  - Likelihood of success in developing any new technology
  - Ability of the development team to successfully implement those plans
  - Likelihood of success of development & operation of the instruments within the mission design
  - Technology readiness, heritage, environmental concerns, accommodation, & complexity of interfaces for the instrument design
- **Data Analysis, Data Availability, and Data Archiving Plan**
  - Planning & budget adequacy & evidence of plans for well-documented, usable, high-level data products, & software
  - Adequacy of resources for physical interpretation of data
  - Planning for reporting scientific results in refereed journals
  - Planning for the timely release of data
- **Science Resiliency**
  - Approach to descoping
  - Operational ability to withstand adverse circumstances, to degrade gracefully, & the potential to recover from anomalies
- **Probability of Science Team Success**
  - Experience, expertise, & organizational structure of the science team
  - Mission design in light of any proposed instruments
  - Co-Investigators make necessary contributions and have well defined and appropriate roles
- **Merit of any SEOs or STEOs**
  - Appropriateness of SEO or STEO activities
  - Potential of the SEO or STEO activities to enlarge the science impact of the mission
  - Appropriate costing of the selected activities
  - Peer review panel will inform NASA of impact to overall Form B rating
- **Likelihood of Scientific Success**
  - How well the anticipated measurements support the goals & objectives
  - Adequacy of the anticipated data to complete the investigation & meet goals & objectives
  - Appropriateness of the mission requirements for guiding development & ensuring scientific success
- **Maturity of Proposed Requirements**
  - Adequacy, sufficiency, & completeness of the Level 1 & Level 2 requirements, including their utility for evaluating the capability of the instruments & other systems to achieve the mission objectives
  - Stability of the Level 1 science requirements & Level 2 project requirements including whether the requirements are ready to be placed under configuration control with little or no expected future modifications
  - Whether the requirements are stated in unambiguous, objective, quantifiable, & verifiable terms that do not conflict

Definitions of Criterion B Findings

Major Strength: A facet of the response that is judged to be well above expectations and substantially contributes to the Science Implementation Merit and Feasibility of the Investigation.

Minor Strength: A strength that substantiates the Science Implementation Merit and Feasibility of the Investigation.

Major Weakness: A deficiency or set of deficiencies taken together that are judged to substantially detract from the Science Implementation Merit and Feasibility of the Investigation.

Minor Weakness: A weakness that detracts from the Science Implementation Merit and Feasibility of the Investigation.

Grade Definitions - Form C

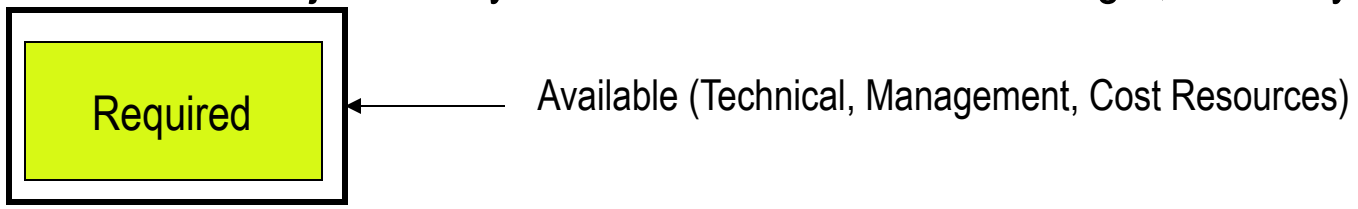
- The Criterion C evaluation serves to determine, for each proposed investigation, the level of risk of implementing the investigation, as proposed, on time and within cost.
- The Criterion C Risk Ratings of **LOW Risk, MEDIUM Risk, and HIGH Risk** will each be subdivided into 3 categories for a total of 9 Risk Rating categories. In general:
  - **LOW Risk:** There are no problems evident in the CSR that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the study team's capability to accomplish the investigation well within the available resources. "Envelope adequate". (low-LOW Risk, medium-LOW Risk, or high-LOW Risk)
  - **MEDIUM Risk:** Problems have been identified, but are considered within the study 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. "Envelope tight". (low-MEDIUM Risk, medium-MEDIUM Risk, or high-MEDIUM Risk).
  - **HIGH Risk:** One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources. "Does not fit within the Envelope". (low-HIGH Risk, medium-HIGH Risk, or high-HIGH Risk)

Risk Envelope Concept

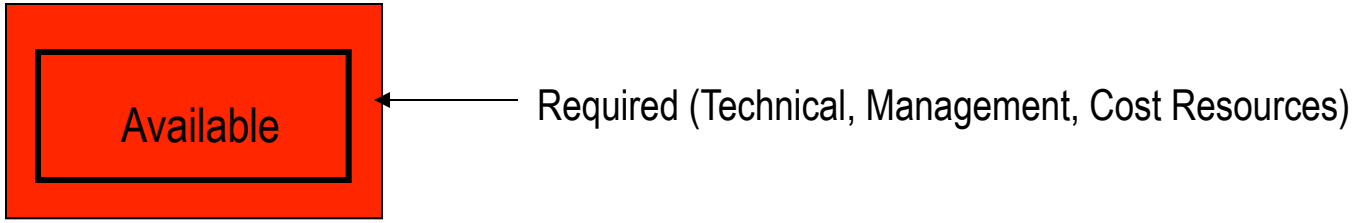
Envelope: All TMC Resources available to handle known and unknown development problems that occur. Includes schedule and funding reserves; reserves and margins on physical resources such as mass, power, and data; descope options; fallback plans; and personnel.

LOW Risk: Required resources fit well within available resources.

MEDIUM Risk: Required resources just barely inside available resources. Tight, but likely doable



HIGH Risk: Required resources DO NOT fit inside available resources. Expect project to fail



Form C Evaluation Factors and Sub-Factors

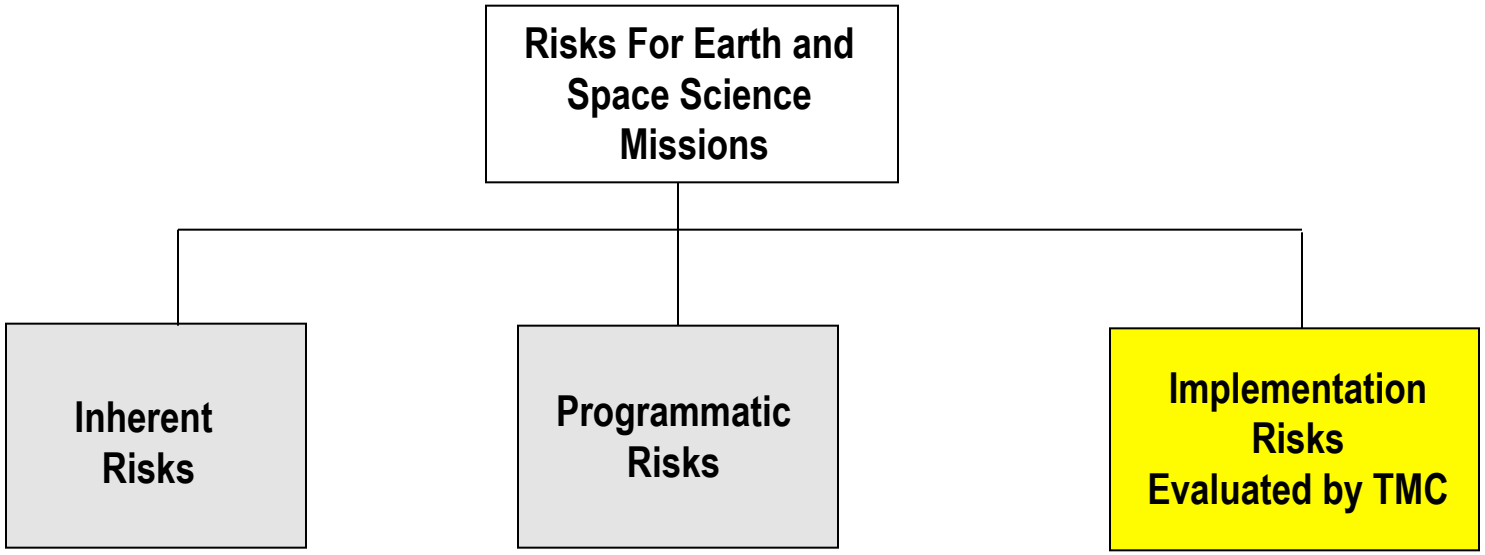
The degree to which the CSR addresses the following directly relates to the Feasibility of Mission Implementation, Including Cost Risk Grade of low-LOW, medium-LOW, high-LOW, low-MEDIUM, medium-MEDIUM, high-MEDIUM, low-HIGH, medium-HIGH, or high-HIGH

- **Instrument**
  - Maturity and technical readiness
  - Ability to meet mission requirements
  - Design, accommodation, interface, and heritage
  - Hardware and software designs, heritage, and margins
  - Development and integration processes, products and activities
  - Instrument systems engineering
  - Environmental concerns
  - New technology and backup plans
- **Mission Design and Operations**
  - Spacecraft design margins
  - Concept for mission operations
  - Launch services
  - Mission resiliency
- **Flight Systems**
  - Hardware and software designs, heritage and margins
  - Development and integration processes, products and activities
  - Spacecraft systems engineering, qualification, verification, mission assurance, launch operations, and entry/descent/landing
  - New technology and backup plans
  - Maturity and technical readiness of the spacecraft, subsystems, and operations systems
- **Management and Schedule**
  - Organizational structure and WBS
  - Project level systems engineering
  - Commitment, education, spaceflight experience and past performance of key team members and implementing organizations, partners and contributors
  - Schedule interdependencies and margins
  - Project and schedule management tools
- **Cost**
  - Risk, realism and completeness
  - Basis of estimate (BOE)
  - Reserves by phase
  - Comparison with TMC estimates
- **Risk Management**
  - Recognition of risks and mitigation plans for retiring those risks
  - Descope plan and decision milestones
- **Ground Systems**
  - Operations plans, facilities, hardware and software, processes and procedures
- **Phase-B**
  - Activities and products, organizations and schedule
- **Comments to Selection Official**
  - International participation/ITAR
  - SC, is it separable from the main mission?

For MOs, NASA will evaluate only the portions of the investigation that are funded by NASA including interface to the Sponsoring Mission. Not all Factors or Sub-Factors are applicable to MOs.

Earth and Space Science Mission Risks

Explorer AO
CSR Evaluation Plan



Risks that are unavoidable to do the mission:
- Launch environments
- Space environments
- Mission durations

Risks that are uncertainties due to matters beyond project control:
- Environmental Assessment approvals
- Budgetary uncertainties
- Political impacts
- Late/non-delivery of NASA provided project elements
- Stability and reliability of proposed partners and their contributions

Risks that are associated with implementing the mission:
- Adequacy of planning
- Adequacy of management
- Adequacy of development approach
- Adequacy of schedule
- Adequacy of funding
- Adequacy of Risk Management (planning for the known and unknown)

Criterion C Panel Evaluation Principles for Explorer AO Downselect

- Basic Assumptions for Step 1: Proposing team is the expert on their proposal.
  - Criterion C Panel: Task is to try to validate proposing team's assertion of LOW Risk.
  - Proposing team: Task is to provide evidence that the project is LOW Risk.
  - Proposing team given the benefit of the doubt.
- CSR Risk Assessment:
  - The tasks are the same as for Step 1, but expectations are higher.
  - The Criterion C Panel's task is to try to validate study team's assertion of LOW Risk.
  - The study team's task is to provide evidence that the project is LOW Risk.
  - The study team is not given the benefit of the doubt in the downselect.
- All CSRs will be reviewed to identical standards.
  - All CSRs receive same evaluation treatment in all areas.
- The Criterion C Panel is made up of evaluators who are experts in the areas of the CSRs that they evaluate.
- The Criterion C Panel develops findings for each CSR that are based on individual comments and reflect the general agreement of the entire panel.
  - Findings: Comments that are as expected are not included as findings. Comments that are above expectations result in strengths, and those that are below expectations result in weaknesses.

Definitions of Criterion C Findings

Major Strength: A facet of the response that is judged to be well above expectations and can substantially contribute to the ability to meet technical commitments on schedule and within cost.

Major Weakness: A deficiency or set of deficiencies taken together that are judged to substantially affect the ability to meet the proposed technical objectives within the proposed cost and schedule.

Minor Strength: A strength that is substantial enough to be worthy of note and brought to the attention of study team in debriefings.

Minor Weakness: A weakness that is substantial enough to be worthy of note and brought to the attention of study team in debriefings.

Note: Unlike Step 1, minor findings can influence risk ratings.

Cost Evaluation

- Missions will be evaluated using three cost models.
- Cost Realism will be reported as a Cost Risk in one of 5 categories: 1) LOW Risk, 2) LOW/MEDIUM Risk, 3) MEDIUM Risk, 4) MEDIUM/HIGH Risk, and 5) HIGH Risk.
- The Evaluation of Cost Realism will be based on all CSR-provided cost data, the application of TMC models and analogies, and heritage.
- Cost threats, risks, and risk mitigations will be identified and analyzed.
- Draft Forms C and Cost Evaluation Summaries (CESs) will be completed on all CSRs prior to the Initial Form C Plenary.
- Probability curves on the expected cost or “S curves” will not be considered in the Cost Risk Analysis.
- During the Form C Plenaries, the entire panel will participate in Cost deliberations:
  - All information from the entire evaluation process will be considered in the final cost assessment.
  - All significant Cost Findings will be included on the Form C.

Cost Risk Definitions

Cost Risk	Definition
LOW	***Cost Envelope is adequate – expect success.*** - The proposer's estimate *(with reserves)* agrees closely with the work, staffing, and schedule proposed, fits within the program cap and any other budget constraints, and is verified by TMC independent analysis. - The proposed cost reserve is adequate to address cost threats identified by TMC, and to fund unexpected needs. - The resource management plan indicates strong, active management of resources throughout implementation.
LOW/ MEDIUM	***Cost Envelope is somewhat tight, but project should succeed.*** - TMC identified one or more significant cost threats or weaknesses with regard to the proposer's estimate, cost reserves, and/or resource management. Overall impact of identified threats and weaknesses should be manageable. - TMC independent analysis verifies proposer's costs.
MEDIUM	***Cost Envelope is tight. Success requires diligent oversight of resources.*** - TMC identified one or more significant cost threats or weaknesses with regard to the proposer's estimate, cost reserves, and/or resource management. Cost impact of threats may be underestimated by proposer. Overall impact of identified threats and weaknesses should be manageable. - TMC independent analysis verifies some or most of proposer's costs.
MEDIUM /HIGH	***Cost Envelope is very tight. It is likely the project will require more funding.*** - TMC identified one or more major cost threats or weaknesses with regard to the proposer's estimate, cost reserves, and/or resource management. Cost impact of threats appears underestimated by proposer. Overall impact of identified threats and weaknesses will be challenging to manage within funding and/or schedule constraints. - TMC independent analysis could not verify significant elements of proposer's costs.
HIGH	***Project exceeds the Cost Envelope and is expected to require substantially more funding.*** - TMC identified one or more major cost threats or weaknesses in the proposer's estimate, cost reserves, and/or resource management. Overall impact of identified threats and weaknesses exceeds proposed resources and/or available resources to cover them. Threats are not acknowledged, or are underestimated by proposer. - TMC independent analysis could not verify proposer's costs.

Cost Assessment Process and Elements

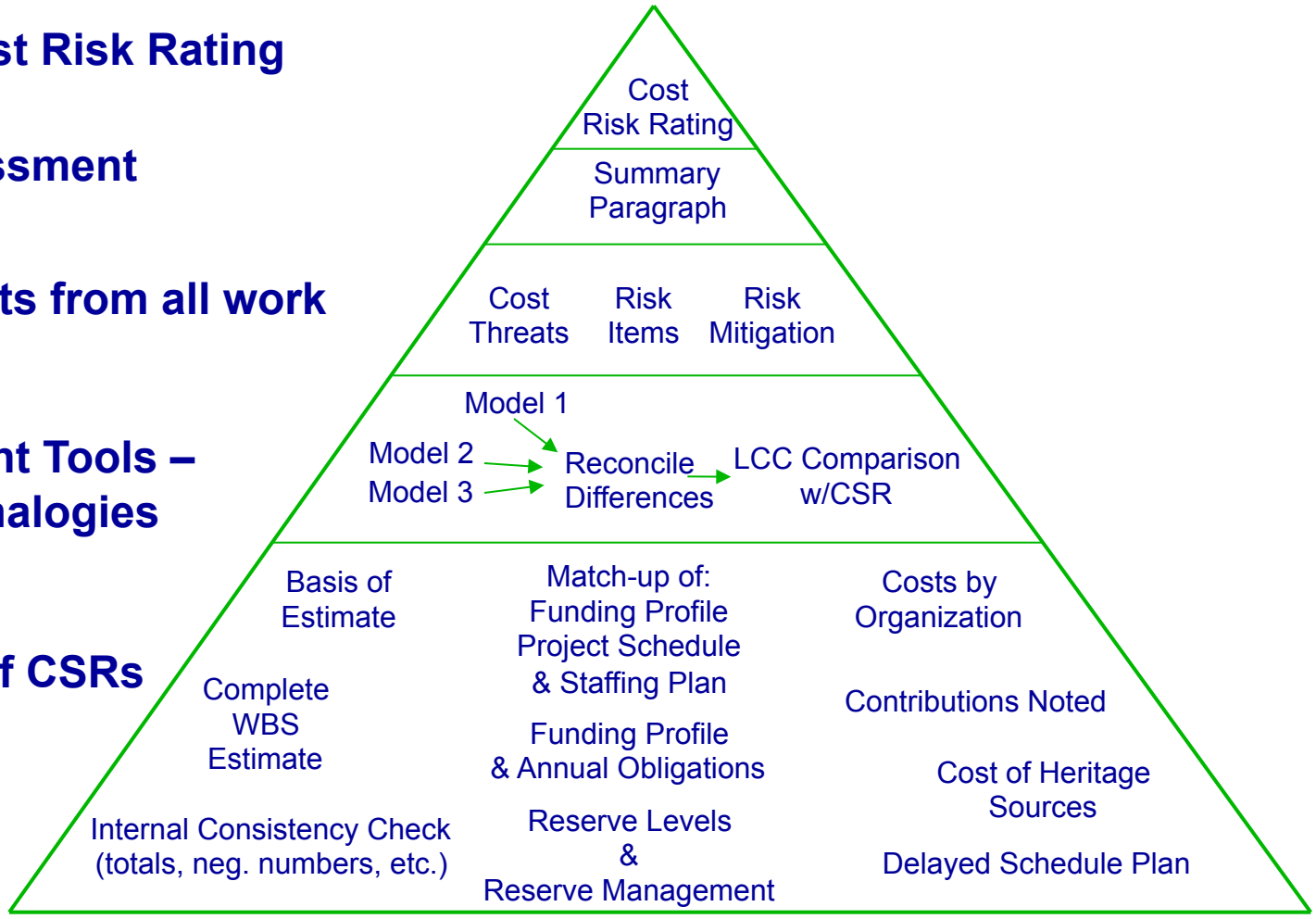
5. Overall Cost Risk Rating

4. Cost Assessment Summary

3. Cost Threats from all work below

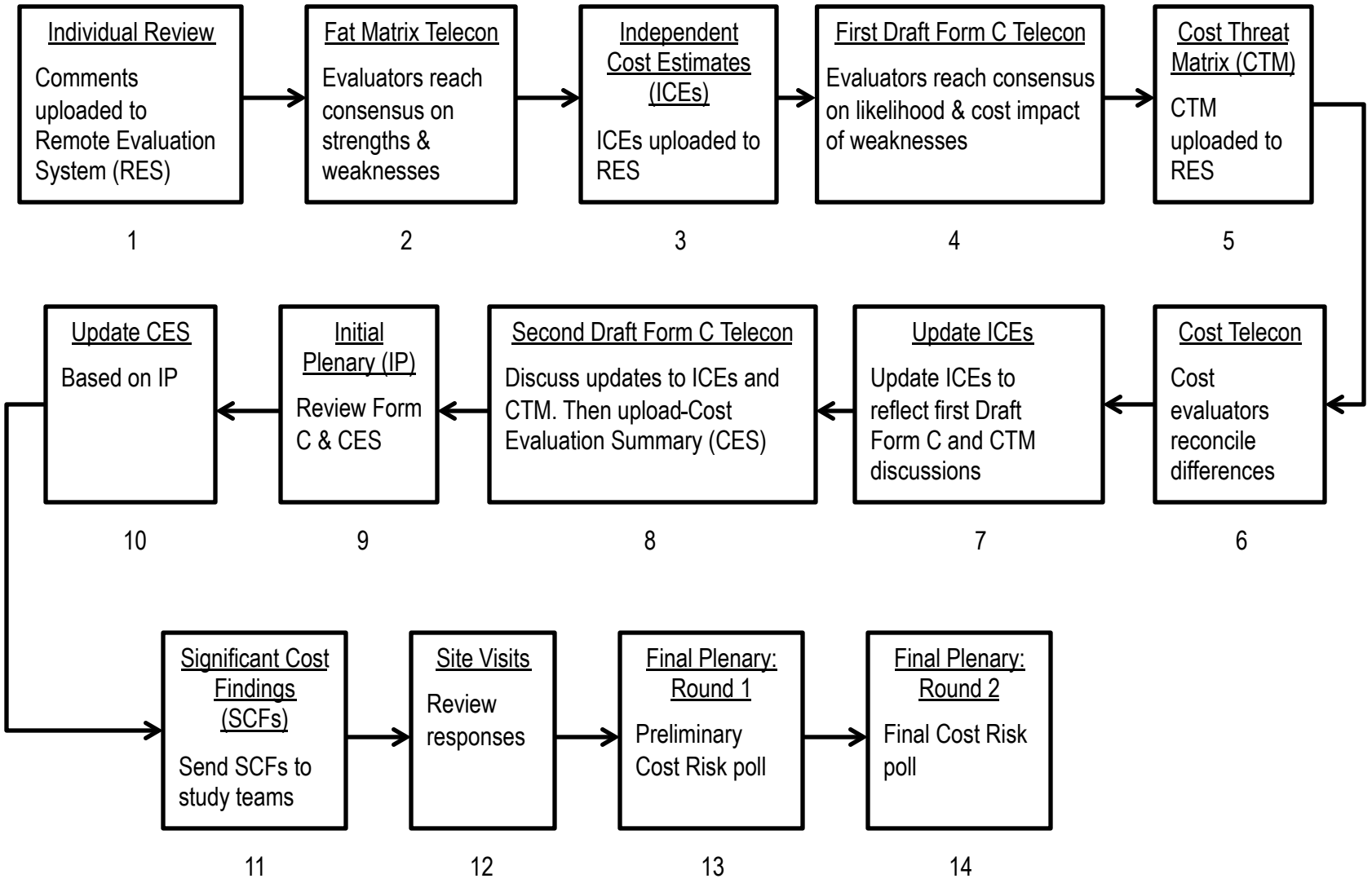
2. Independent Tools – Models, Analogies

1. Analysis of CSRs



CSR Cost Evaluation Process

Explorer AO
CSR Evaluation Plan



CSR Cost Evaluation Process (continued)

- A guiding principle for the TMC evaluation process is that individual reviews will occur first and individual evaluation comments will be entered into the Remote Evaluation System (RES) prior to multi evaluator discussions to the extent that this is feasible. This principle is being implemented as described below for cost related comments and products on the Explorer AO Downselect Evaluation.

1. Each Cost Analyst enters cost findings in the RES. Three cost evaluators read the CSRs and each uses a different cost model to generate a preliminary Independent Cost Estimate (ICE) and a set of cost findings.
2. Criterion C Panel review of individual comments. The cost evaluators and all other Criterion C evaluators participate in a Fat Matrix Telecon (FMT). In this telecon all individual comments entered in the RES are discussed for all evaluation Criterion C Factors. The preliminary ICEs are not discussed during the FMT.
3. Generate Version 1 of ICE based on Criterion C Panel discussion. After the FMT, each of the three cost evaluators will generate an ICE based only on the assumptions and discussion from the FMT. The ICE WBS elements as reported in the Cost Evaluation Summary will be rounded to the nearest $1M. These three estimates will be presented at the first Draft Form C telecons to all Criterion evaluators. No changes to the ICEs (generated based on the FMT) will be made until after listening to discussions with all evaluators at the first Draft Form C telecon.
4. Three ICEs presented at first Draft Form C Telecon. A Draft Form C telecon includes participation of all Criterion C evaluators where all major and minor strengths or weaknesses are discussed. The three Version 1 ICEs for each CSR will be presented. The likelihood and cost impact, if any, of each weakness is discussed.
5. Cost threat matrix. Subsequent to the first Draft Form C telecon, a cost threat matrix is developed for each CSR that reflects the discussion of the Criterion C Panel on the likelihood and impact of significant weaknesses. This is posted to the RES for all Criterion C evaluators to access.

CSR Cost Evaluation Process (continued)

6. Cost Telecon. A cost telecon among all three cost evaluators will occur after the first Draft Form C telecon to reconcile differences in detailed assumptions that may affect the ICEs.
7. Update ICEs based on first Draft Form C telecon. The cost analysts will update their ICEs to reflect the first Draft Form C discussions and the cost threat matrix discussions. If possible, cost threats with a likelihood > 80% will be included in the ICEs. The likely total cost impact of cost threats not included in the ICEs will be calculated by multiplying their mean likelihood by their mean impact and totaling those products.
8. Review of three ICEs and cost threat matrix at second Draft Form C Telecon. Discuss updates to ICEs and the cost threat matrix. After the telecon, upload Cost Evaluation Summary – which includes the cost threat matrix and the three ICEs for each CSR – to the RES for all Criterion C evaluators to access.
9. Initial Plenary. An Initial Plenary with all evaluators is held and findings on Criterion C are reviewed. Also the Cost Evaluation Summary is reviewed.
10. Plenary cost threat matrix and ICE update. Based on the review by the entire Criterion C Panel at the Initial Plenary, the cost threat matrix will be updated and each cost analyst will update their ICE.
11. Significant Cost Findings sent to Study Teams. Statements which represent the cost threat matrix will be included in the Significant Weaknesses sent to study teams prior to their respective Site Visits in order to provide each study team an opportunity to respond at their Site Visit. Statements describing significant cost findings based on the ICEs will be sent to study teams prior to their respective Site Visit in order to provide each study team an opportunity to respond at their Site Visit.
    - If the study team's estimate for any WBS element is below the average ICE, by more than the error range, as reported in the Cost Evaluation Summary, the study team will be sent a question or comment prior to the Site Visit stating that the study team's estimate for that WBS element could not be validated.
    - Cost related findings which may substantiate a weakness will be sent to the study team in advance of the Site Visit.
    - ICE related cost findings will be treated in a consistent manner across all CSRs.
12. Site Visits. Cost Analysts will participate in the Site Visits and listen to responses to Significant Cost Findings. All cost analysts will attend the post Site Visit meeting and participate in Criterion C discussions. After the Site Visit and the post Site Visit meeting, all cost analysts will update the cost threat matrix and their ICEs.
13. Final Plenary: Round 1. In Round 1, all major and minor strengths or weaknesses are discussed. Each CSR's cost threat matrix and the average ICE are reviewed, with a focus on any Site Visit and post Site Visit meeting based updates. A preliminary Cost Risk Poll for each CSR is held during Round 1. Each CSR's cost threat matrix and ICEs will be updated to reflect the Round 1 discussions.

CSR Cost Evaluation Process (continued)

14. Final Plenary: Round 2. In Round 2, all major and updated minor strengths or weaknesses are discussed. Each CSR's cost threat matrix and the consensus ICE are reviewed, with a focus on any Round 1 based updates. A Final Cost Risk Poll for each CSR is held during Round 2. Each CSR's cost threat and the ICEs will be updated to reflect the Round 2 discussions.

- The *likelihood* and *cost impact*, if any, of each weakness is stated as "This finding represents a cost threat assessed to have a Unlikely/Possible/Likely/Very Likely/Almost Certain likelihood of a Minimal/Limited/Moderate/Significant/Very Significant cost impact being realized during development and/or operations."
- 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 realized threat.
- The cost threat matrix below defines the adjectives used to describe the *likelihood* and *cost impact*.

		Cost Impact (CI, % of PI-Managed Investigation cost to complete Phases B/C/D)					**How cost threat was included in the ICEs**
		Minimal ($1M < CI ≤ 5%)	Limited (5% < CI ≤ 10%)	Moderate (10% < CI ≤ 15%)	Significant (15% < CI ≤ 20%)	Very Significant (CI > 20%)	
Likelihood (L, %)	Almost Certain (L > 80%)						
	Very Likely (60% < L ≤ 80%)						
	Likely (40% < L ≤ 60%)						
	Possible (20% < L ≤ 40%)						
	Unlikely (L ≤ 20%)						

Form D (Core E/PO) Evaluation Factors and Sub-Factors if Proposed

The degree to which the CSR addressed the following directly relates to the Quality of Plans for Education and Public Outreach Grade of Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, or Poor

- **Intrinsic Merit**
  - Quality, scope, realism, and appropriateness
  - Connections to other NASA E/PO activities
  - Partnerships/Sustainability
  - Evaluation
- **Relevance to NASA's Objectives**
  - Customer needs focus
  - Content
- **Cost**
  - Resource utilization
- **Program Balance Factors**
  - Pipeline
  - Diversity

Grade Definitions – Form E
Student Collaboration (SC)

- The merit of any Student Collaboration (SC) will be given a yes/no grade and one of three adjectives: Meritorious, Meritorious with Reservations, or Not Meritorious

  - **Is it separable from the main mission?** (Yes/No)

  - **Meritorious:** The student collaboration proposed has achievable education goals and objectives and an implementation/oversight/management approach that will provide students with a rich hands-on education experience.

  - **Not Meritorious:** The student collaboration proposed has not articulated achievable education goals and objectives and/or the implementation/oversight/management approach limits the likelihood of success for student's opportunities for hands-on experience.

Form E (SC) Evaluation Factors and Sub-Factors as Applicable

Generally, the degree to which the CSR addresses the following directly relates to the grade of Meritorious, Meritorious with Reservations, or Not Meritorious

- **SC Implementation Merit**
  - Maturity of requirements
  - SC design
  - SC performance
  - SC operations and data acquisition
  - SC data analysis and archiving
  - SC team
- **SC technical, management, and cost feasibility**
  - Instrumentation
  - Mission design and operations
  - Spacecraft/flight systems
  - Management and schedule
  - Cost
- **Educational Merit**
  - Quality, Scope, Realism, and Appropriateness
  - Continuity
  - Evaluation
  - Diversity

Grade Definitions – Form F Small Business Subcontracting

- The merit of the Small Business Subcontracting Plans will be rated as either Acceptable or Needs Work
  - **Acceptable**: The subcontracting plan adequately addresses all required elements of a subcontracting plan, and the proposed subcontracting percentage goals and the quality level of the work to be performed by small business concerns is sufficient.
  - **Needs Work**: The subcontracting plan does not address all required elements of a subcontracting plan, or the proposed subcontracting percentage goals and quality of work to be performed by small businesses is not sufficient, and further participation must be negotiated if this mission is selected.

Form F Evaluation Factors and Sub-Factors as Applicable

Generally, the degree to which the CSR addresses the following directly relates to the grade of Acceptable or Needs Work

- Participation goals and quality and level of work performed by:
  - Small business concerns overall
  - Various categories of small business concerns listed in FAR 52.219-9 except for Small Disadvantaged Businesses (SDBs)

- Participation targets of SDBs in North American Industry Classification System (NAICS) codes determined by the Department of Commerce to be underrepresented industry sectors

Evaluation Ground Rules

- All CSRs will be reviewed to identical standards and without comparison to other CSRs.
- All evaluators will be experts in the area that they evaluate.
- Specialist Evaluators (to provide special technical expertise to Criterion B/C/D/E/F Panels) and External/Mail-In Evaluators (to provide special science expertise to the Criterion B Panel) may be utilized, respectively, based on the specific technology and science that is proposed.

Panel Processes

- Evaluation panel members review assigned CSRs and perform an individual review before discussing findings with other members of the panel.
- The SOMA Remote Evaluation System (RES) will be used for:
  - Entering individual evaluation panel member's comments for Criterion B and Criterion C.
  - Developing draft and final Forms B and Forms C for each CSR.
  - A repository for all final Forms for the evaluation (Forms B, C, D, E, and F).
- Only Evaluators that have participated in the Form C Initial Plenary, and the Form C Final Plenary may participate in polling on Form C.
  - Participation is defined as in person or via telecon.
  - Specialist Evaluators are not polled.
- The Form B will be reviewed during approximately 1/3 of each plenary. Evaluation and polling on Form B will be restricted to Form B Evaluators, with the exception of Form C Instrument experts if designated by the Heliophysics Explorer Program Scientist or the Astrophysics Program Scientist as Form B Evaluators.
- Only Form B Evaluators that have participated in the Initial Plenary and the Final Plenary may participate in polling on Form B.
  - Participation is defined as in person or via telecon.

Panel Processes (continued)

- Consistency Review for Form C findings and Form B findings.
  - Form C consistency
    - A Form C Consistency Group will review all Form Cs and questions at the Initial Plenary and all Form Cs at the Final Plenary.
    - Form C Evaluators will review all CSRs for Full Missions, Missions of Opportunity, or both. Specialist Evaluators may review a subset of CSRs for Full Missions, Missions of Opportunity, or both.
  - Form B consistency
    - Form B Consistency Checker(s) will review all Form Bs and questions at the Initial Plenary and all Form Bs at the Final Plenary.
  - Form B and Form C consistency
    - At least one Form B Evaluator for each CSR will participate in the Form C discussions for each mission at the plenary meetings
    - Some Form C Instrument experts will participate in Form B discussions.
    - Consistency of findings between Form B and C will be reviewed at the Initial and Final Plenaries and adjudicated.

Initial Plenary

- The Initial Plenary is used to identify significant issues related to Criterion B and C based on the initial evaluation of the CSR. Initial Form Bs and Cs are reviewed.
- The Goal of the Initial Plenary is:
  1. Identify the Major Weakness, Minor Weaknesses, Major Strengths and Minor Strengths of each CSR.
  2. If necessary, develop questions and/or requests for information in addition to the Significant Weaknesses to give each study team an opportunity to clarify any misunderstanding.
- The main topic areas are the implementation issues in Criterion B and Criterion C.
- No polling on grades occurs at the Initial Plenary (Criterion B and Criterion C)
- The Significant Weaknesses (SWs), questions, and/or requests for information will be sent to each study team 6 days prior to its Site Visit.
- Criterion D (E/PO) and E (Student Collaboration) are reviewed as required by Criterion specific panels prior to the Initial Plenary. Site Visit questions are prepared and provided no later than the Initial Plenary to the Explorer Program Acquisition Scientist and/or the Astrophysics Explorer Program Scientist.

Significant Weaknesses and Questions

- Significant Weaknesses (SWs) and Questions for the Study Team
  - All SWs will be sent to the study team in advance of the Site Visit.
  - The SWs are preliminary and may change based on Site Visit information and further discussion by evaluation panels.
  - Questions may also be sent to the study team or verbalized during the Site Visit.
  - Questions must be of significance to a Form A, B, C, D, E, or F rating.
- The Heliophysics Explorer Program Scientist or the Astrophysics Explorer Program Scientist will approve all SWs and questions developed at the Initial Plenary. Three types of responses are planned for SWs and questions. These types may be combined for a given SW or question.
  - Written response prior to Site Visit: SWs or questions provided to the Study team that must be addressed in writing prior to the Site Visit. The nature of some SWs or questions require data that must be reviewed prior to the Site Visit.
  - Written response at Site Visit: SWs or questions that require documentation, but not extensive review.
  - Site Visit presentation: SWs or questions that must be addressed the day of the Site Visit by way of presentation.
- The evaluation team members may ask follow up questions during the Site Visit to ensure they understand the response to a SW or question, or to clarify any significant issues.

Site Visits

- Site Visits with Oral Briefings will be used to clarify implementation details and commitments. The study team may addresses weaknesses identified in the concept study and provide updates on the concept study since submission of the Concept Study Report.
- Site Visit locations and dates are TBD
- Briefings at each Site Visit will be limited to 7 hours with 1 additional hour for a site tour, 1 hour for lunch, and 15 minute breaks in the morning and afternoon. Suggest a schedule of 8:00 a.m. – 5:30 p.m..
- All Site Visit presentations/briefings should be in a plenary session with all Evaluation Team members attending - no splinter sessions – unless authorized by the Heliophysics Explorer Program Scientist, the Astrophysics Explorer Program Scientist, or a TMC Panel Chair.
- Written Significant Weaknesses, questions, and/or requests for information will be submitted to the PI 6 days before the Site Visit. All teams will have the same lead time.
- All information relevant to the evaluation, including information presented during the Site Visit; information provided in response to Significant Weaknesses, questions, and/or requests; and information contained in the CSR will be considered during the evaluation.
- Additional Significant Weaknesses, Questions, and/or Requests for Information:
  - In rare circumstances, NASA may send additional Significant Weaknesses, questions, and/or requests for information to study teams the day after their respective Site Visits and/or during a specific timeframe (February 20 to March 1, 2013 for Heliophysics and February 11 to 15, 2013 for Astrophysics), if necessary to resolve any issue or clear up potential misunderstandings. Responses will typically be due within 24 hours.

Final Plenary Products

- Finalize all evaluation Forms based on the information in the CSRs and clarifications.
- Both Major and Minor, Strengths and Weakness will be considered in the Grade for all Forms.
  - Form B
    - Polling will be held twice on the Form B grade. The final polling is recorded. For the final polling, the individual grades are recorded and the median grade is calculated and recorded as the final polling.
    - If there is a divergence of opinion, there may be additional rounds of discussion and polling.
    - SWs, questions, and/or requests for information generated during the Final Plenary may result in an additional rounds at or after the Final Plenary.
  - Form C
    - Form C will be reviewed three times. Polling will be held twice on the Form C risk rating. The final polling is recorded. For the final polling, the individual grades are recorded, the median calculated and the final grade recorded which reflects the Form C Risk rating of the median of the polling.
    - If there is a divergence of opinion, there may be additional rounds of discussion and polling.
    - SWs, questions, and/or requests for information generated during the Final Plenary may result in an additional rounds at or after the Final Plenary.
  - Form D E/PO (as applicable)
    - E/PO review results are updated based on the Site Visit.
  - Form E Student Collaboration (if necessary)
    - Representatives from the E/PO Panel will consider the Merit of any proposed Student Collaboration.
  - Form F Small Business Subcontracting
    - LaRC Small Business Office will evaluate this factor

Observers and Transition Briefing

- The SMD Deputy Associate Administrator for Research may invite Civil Servants, Intergovernmental Personnel Act Assignees, and Contractors with downstream implementation responsibilities to participate as observers to panel meetings and Site Visits.
  - Observers must comply with SMD Policy Document SPD-17, *Statement of Policy on Observers at Panel Reviews of Proposals*. This policy will be provided to all approved observers.
- After selection is announced, a Transition Briefing will be provided by the Evaluation Team to Civil Servants and Intergovernmental Personnel Act Assignees in the Explorers Program Office and at Headquarters who have implementation responsibilities.

Observer Status

- Invited Observers:
  - Heliophysics Explorer:
    - NASA Headquarters: Willis Jenkins and Voleak Roeum are invited due to their positions in which they will oversee implementation of the downselected mission(s). Their participation as Observers will provide early knowledge of any potential implementation challenges for the downselected mission(s).
    - Explorers Program Office: Nicholas Chrissotimos, Gregory Frazier, Christine Hinkle, Joe Burt, Beverly Thomas, and Tim Trenkle are invited due to their positions in the Explorers Program Office, which will oversee implementation of the selected mission(s). Their participation as Observers will provide early knowledge to the Program Office of any potential implementation challenges for the downselected mission(s).
    - SOMA personnel not identified as TMC Panel Chair or Backup TMC Panel Chair on slide 15 may be Observers.
  - Astrophysics Explorer:
    - NASA Headquarters: Douglas Hudgins, Louis Kaluzienski, Mark Sistilli, and Glenn Wahlgren are invited due to their positions in which they will oversee implementation of the downselected missions. Their participation as Observers will provide early knowledge of any potential implementation challenges for the downselected missions.
    - Explorers Program Office: Nicholas Chrissotimos, Mike Delmont, Christine Hinkle, Joe Burt, and Beverly Thomas are invited due to their positions in the Explorers Program Office, which will oversee implementation of the downselected missions. Their participation as Observers will provide early knowledge to the Program Office of any potential implementation challenges for the downselected missions.
    - SOMA personnel not identified as TMC Panel Chair or Backup TMC Panel Chairs on slide 16 may be Observers.

Updates

- This page will be used to document any updates to the evaluation plan that are made after the initial approval.
  - 1/8/2013: Last Updated date changed on slide 1; Backup TMC Panel Chairs added to slides 15 and 16; Observers added to slide 65