



New Frontiers
Concept Study Report (CSR) Evaluation Plan

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**New Frontiers CSR
Evaluation Plan**

Approval

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- The New Frontiers Program is a science-driven program aimed at characterizing and understanding the bodies that constitute our solar system (excluding Earth and Sun). Its larger purpose is to illuminate the origin, evolution, and current state of the solar system.
- The purpose of this evaluation plan is to define the ground rules, process, organization and schedule to be used in evaluating the Concept Study Reports (CSRs) for the 3 Missions that were selected for a Phase A study.



Evaluation Plan Overview

- The Science Office for Mission Assessment (SOMA) at Langley Research Center developed this New Frontiers CSR Evaluation Plan for NASA Headquarters. This plan focuses on the Evaluation of the New Frontiers Concept Study Reports (CSRs).
- This CSR Evaluation Plan has been cleared for public release by SMD, SOMA, and OGC.
- The Lead Downselect Program Scientist is responsible for validating all evaluation processes, responsibility assignments, assumptions and ground rules.
- This CSR evaluation plan will be completed and approved in advance of the beginning the evaluation of the CSR's.



Background

- 3 Full Missions selected for a Phase A study. The Concept Study Reports for the full missions are due January 28, 2011. \$3.3M was provided for each Phase A study.
 - Surface and Atmosphere Geochemical Explorer (SAGE)
 - Origins Spectral Interpretation Resource Identification Security Regolith Explorer (OSIRIS REx)
 - MoonRise



Selected Missions

- **Surface and Atmosphere Geochemical Explorer (SAGE), Principal Investigator Larry Esposito, Laboratory for Atmospheric and Space Physics (LASP) University of Colorado, Boulder, CO.** - SAGE is a mission to Venus which will release a probe to descend through the planet's atmosphere. During descent, instruments will conduct extensive measurements of the atmosphere's composition and obtain meteorological data. The probe then will land on the surface of Venus, where its abrading tool will expose both a weathered and a pristine surface area to measure its composition and mineralogy.
- **Origins Spectral Interpretation Resource Identification Security Regolith Explorer (OSIRIS REx), Principal Investigator Michael Drake, University of Arizona in Tucson, AZ.** – The spacecraft will rendezvous and orbit a primitive asteroid. After extensive measurements, instruments will collect more than two ounces of material from the asteroid's surface for return to Earth. The returned samples will help scientists better understand and answer long-held questions about the formation of our solar system and the origin of complex molecules necessary for life.



Selected Missions (continued)

- **MoonRise, Principal Investigator Bradley Jolliff, of Washington University in St. Louis** – This is a Lunar South Pole-Aitken Basin Sample Return Mission which will place a lander in a broad basin near the moon's south pole and return approximately two pounds of lunar materials for study. This region of the lunar surface is believed to harbor rocks excavated from the moon's mantle. The samples will provide new insight into the early history of the Earth-moon system



Handling of Proprietary Data

- All Report Materials will be considered Proprietary.
- Only those individuals with a need to know will be allowed to view CSR materials.
- Each Evaluator (non Civil Servant) will sign a NASA Non-Disclosure Agreement (NDA) which must be on file at NRESS prior to any CSRs being distributed to that Evaluator.
 - Civil Servants (including IPAs) are not required to sign the NDA.
- All Report Materials will be numbered and controlled and a record will be maintained as to who has what materials.
- Evaluators will be briefed at a Kickoff meeting on how to handle the CSR material. They will be briefed that they are not allowed to discuss CSRs with anyone outside the Evaluation Panel ever. Evaluators will be briefed to not contact anyone outside of the Evaluation Panel to discuss CSRs or to gain insight on any CSR related matter without getting the Lead Downselect Program Scientist (Dr. Paul Hertz) and/or the Technical Management and Cost (TMC) Lead's (Cindy Daniels) express permission in advance of making the contact.

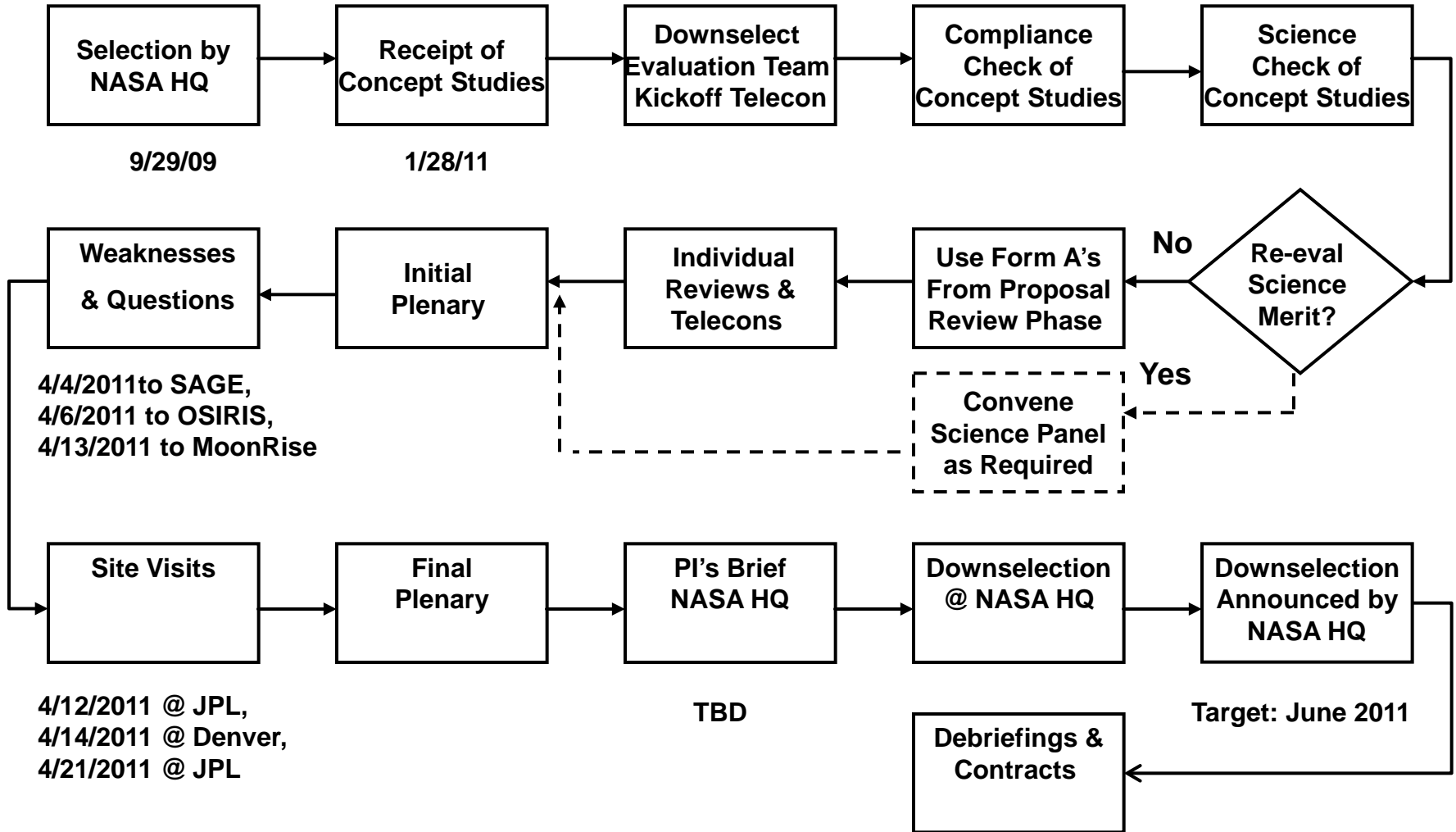


Handling of Proprietary Data

- 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 NASA Langley, the secure Science Works System maintained by SMD, encrypted email, FedEx, 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). Evaluators 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 from everyone. Some copies (for archival purposes) will be maintained in the NRESS and SOMA vault. Also, some CSR material from the downselected mission will be provided to the New Frontiers Program Office at MSFC. All other CSR materials will be destroyed.



New Frontiers CSR Evaluation Flow





Conflict of Interest (COI)

- Evaluation panel members are cross checked against the list of organizations listed in the selected step one proposals to ensure no individual or organizational COI exists with the planned evaluators. Evaluators asked to raise any potential COI.
- Any potential COI issue is discussed with the Lead Downselect Program Scientist and the Chief Scientist (these two positions are filled by the same person for this evaluation) for SMD and documented in the attached New Frontiers Downselect COI Mitigation Plan.
- After the Concept Study Reports (CSRs) are received, all members of the evaluation panel 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 be asked to review the final list of conflicted organizations and asked to divulge whether they have any other 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.
- All Civil Service evaluators (including IPAs) must file a Form OGE 450 or SF278 and be reviewed for conflicts of interest.
 - A list of all Civil Servants and IPAs involved in the evaluation will be provided to Chief Scientist of SMD
- If any Evaluators with potential organizational COI must be utilized, their respective organizations must submit a plan, as required by their contract, 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

- As potential conflicts of interest arise, they will be forwarded to the Lead Downselect Program Scientist and the Chief Scientist, SMD (these two positions are filled by the same person for this evaluation) for resolution. The resolution of potential COI issues will be documented in an updated New Frontiers COI Mitigation Log.
- If during the evaluation there is any conflict of interest noted, the conflicted member(s) will be notified to stop reviewing CSRs immediately, and the Lead Downselect Program Scientist will be notified immediately. 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 a necessary. Conflicts involving contractors on the SOMA NASA Langley contract will require consultation with NASA Langley Procurement Office.



Evaluation Criteria and Selection Factors

- Evaluation Criterion for Concept Study: The approximate significance of each criteria is indicated by the percent weighting.
 - Scientific merit of the investigation (will not be reevaluated unless it is determined that the science has changed from that described in the proposal) (approximately 25%)
 - Scientific implementation merit and feasibility of the investigation (approximately 20%)
 - Feasibility of mission implementation, including cost risk, of the proposed investigation (approximately 50%)
 - Quality of plans for core E/PO, SDB sub-contracting, and for an optional Student Collaboration (SC), if proposed. (approximately 5%)
- Additional Selection factors
 - The PI-managed Mission cost
 - A variety of programmatic factors
 - NASA budget changes
 - Changes in scientific mandates, national priorities, and budgetary forecasts
 - Other programmatic factors



Evaluation Criteria Details

- The Criteria to Evaluate the Concept Study Reports is documented in the Criteria and Guidelines for the Phase A Study document.
- **Scientific Merit of the Investigation (Criterion A)** - The *Lead Downselect Program Scientist** will determine whether implementation and/or cost issues that may have emerged in the course of the concept study have effected significant changes to the science objectives of the Baseline and Threshold Science Missions (see requirement CS-14 in Section II of Guidelines and Criteria for the Phase A Study). If there are no significant changes to the science objectives, 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 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).

* This title is a slight change from the Guidelines document



Evaluation Criteria Details

- **Scientific Implementation Merit and Feasibility of the Investigation (Criterion B)** - All of the factors defined in Section 7.2.3 of the AO apply to the CSR and will be re-evaluated from the data supplied in the CSR and at the site visit. The merit of scientific implementation will be based on the feasibility of the investigation's technical approach, instrumentation provided to acquire the data, plans for science operations and data acquisition, plans for science descope, technical capabilities of the investigation team, and the plans for data analysis and archiving.

The following are new evaluation factors that are not described in the AO and were not evaluated for Step 1 proposals. These will be evaluated in addition to the factors specified in AO Section 7.2.3 for the CSRs:

- Maturity of proposed Level 1 science requirements. This factor includes assessment of how the Level 1 requirements will achieve the objectives of the Baseline Science Mission and the Threshold Science Mission.
- Instrument design. This factor includes assessment of technology readiness, heritage, environmental concerns, accommodation, and complexity of interfaces.



Evaluation Criteria Details

- **Feasibility of the Mission Implementation, including Cost Risk, of the Proposed Investigation (Form C)** - All of the factors defined in Section 7.2.4 of the AO apply to the CSR. These may be augmented, as noted below, to assess whether technical, management, and cost feasibility are at least at a Phase A level of maturity.
 - Adequacy and robustness of the technical plan. This factor includes assessment of implementation elements such as: the overall mission design and mission architecture; the plan for communication and navigation/tracking; and the study team's understanding of the processes, products, and activities required to accomplish development and integration of all elements (flight systems, ground and data systems, etc.). Preliminary flight hardware and software designs; design heritage and all technical contingencies and margins; qualification and verification plans; assembly, test, and launch operations (ATLO) plans; and mission assurance plans will be evaluated. This factor includes mission resiliency – the flexibility to recover from problems – including technical contingencies and margins, system and subsystem redundancy, and changes which can be implemented without impact to the Baseline Science Mission. Mission resiliency also includes descopes that can be implemented without affecting the Threshold Science Mission.



Evaluation Criteria Details

- **Feasibility of the Mission Implementation, including Cost Risk, of the Proposed Investigation (Form C) - (continued)**
 - Adequacy and robustness of the cost plan and schedule. This factor includes assessment of concept study elements such as cost and cost risk, the adequacy of the approach, the methods and rationale used to develop the estimated cost, the discussion of cost risks, the subcontracting plan, and the team's understanding of the scope of work (covering all elements of the mission, including contributions). Concept studies will be evaluated for the adequacy of the cost reserves and whether concept studies with inadequate cost reserves demonstrate a thorough understanding of the cost risks. This factor also includes assessment of concept study 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 cost and schedule management tools to be used on the project.
 - Adequacy of the management approach, including the capability of the management team. This factor includes: the adequacy of the proposed organizational structure; the management approach; the roles, qualifications, and experience of the PI, PM, PSE and other named key management team members, and implementing organization, mission management team, and partners; the commitment, spaceflight experience, and relevant performance of the PI, PM, PSE and other named key management team members, and implementing organization, mission management team, and 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.



Evaluation Criteria Details

- **Feasibility of the Mission Implementation, including Cost Risk, of the Proposed Investigation (Form C) (continued)**
 - 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.
 - Technical readiness. 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 instrument complement, spacecraft, 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. This factor includes, additionally, assessment of risk reduction that has been accomplished during Phase A



Evaluation Criteria Details

- **Feasibility of the Mission Implementation, including Cost Risk, of the Proposed Investigation (Form C) (continued)**

The following are new evaluation factors that are not described in the AO and were not evaluated for Step 1 proposals. These will be evaluated in addition to the factors in AO Section 7.2.4 for the CSRs:

- Ground Systems. This factor includes the proposed mission operations plans, facilities, hardware and software, processes, and procedures.
- Approach and feasibility for completing Phase-B. This factor will be evaluated on the completeness of Phase B plans, to determine the adequacy of the Phase B approach. 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 Criteria Details

- **Quality of Plans for Education and Public Outreach (E/PO) (Form D)**
 - 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 *New Frontiers Program Library*. A discussion of these criteria is included in that document. See Section I in Part II of *New Frontiers Guidelines and Criteria for the Phase A Concept Study* document for further details on E/PO requirements.



Evaluation Criteria Details

- **Overall Merit of Student Collaboration (SC) (if proposed) (Form E)**
 - This factor will include an assessment of whether the scope of the SC follows the guidelines in section 5.5.3 of the AO. 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 New Frontiers Program Library.



Evaluation Criteria Details

- **Small Business Subcontracting Plans (Form F)**
 - 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, Poor
- Form B For all CSRs
 - Grade range: Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, Poor
- Form C For all CSRs
 - Grade range: Low Risk, Medium Risk, High Risk
 - Polling is held on 3 bins within each Risk category
 - The Risk Rating reflects the median grade.
- Form D For all CSRs
 - Grade range: Excellent, Excellent/Very Good, Very Good, Very Good/Good, Good, Good/Fair, Fair, Fair/Poor, Poor
- Form E - The merit of any Student Collaboration (SC) if proposed.
 - Is it separable from the main mission? (Yes/No)
 - Grade: Meritorious, Not Meritorious.
- Form F For all CSRs -The merit of the Small Business Subcontracting Plans
 - Grade range: Acceptable or Needs Work



Grade Definitions - Form 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, 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 factors directly relates to the Science Implementation Merit Grade of Excellent, Excellent/Very Good, Very Good, Very Good/Good,

Good, Good/Fair, Fair, Fair/Poor, Poor

- **Maturity of Level 1 Requirements**
 - Enable baseline mission
 - Requirements flow down to instrument performance
 - Adequacy of data to complete investigation and meet goals and objectives
- **Instrument Design**
 - Technology readiness
 - Environmental concerns
 - Accommodation
 - Complexity of interfaces
- **Instrument Performance**
 - Data quality, resolution
 - Meet requirements
- **Science Operations and Data Acquisition (including sample acquisition)**
 - Planned operation of instrument
 - Mission design sufficient for data acquisition
- **Data Analysis and Archiving (including sample analysis and curation)**
 - Data analysis and archiving plan
 - Adequate resources to implement plan
 - Timely release of data
- **Science Team**
 - Technical capabilities
 - Availability of key science team members
- **Science Descope Plan**
 - Baseline and Minimum Mission defined
 - Minimum Mission implementation meets major science objectives
 - Descope plan clearly defines items to descope, timing of decisions, and cost and schedule savings.
- **Student Collaboration (SC)**
 - If SC is not separable, then review as part of baseline mission and evaluate Form B factors as appropriate.
 - If SC is separable, then evaluate Form B factors as appropriate and provide comments for Form E.
- **Comments to Criterion C Panel**



Form D Factors and Sub-Factors as Applicable

The degree to which the CSR addressed the following factors 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, 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 C

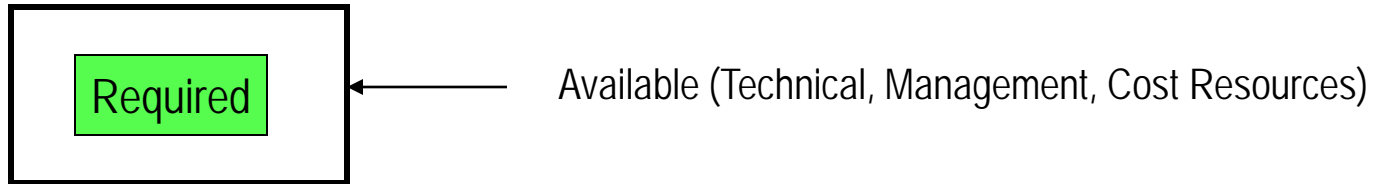
- The Criterion C evaluation is to determine, for each proposed investigation, the level of risk of implementing the investigation, as proposed, on time and within cost.
- The Criterion C Risk Ratings of **Low Risk, Medium Risk, and High Risk** will each be split into 3 categories for a total of 9 Risk Rating categories. In general:
 - **Low Risk:** No problems exist that cannot be normally overcome within the time and cost proposed. “Envelope adequate”. (Low-Low Risk, Medium-Low Risk, or High-Low Risk)
 - **Medium Risk:** Problems exist, but are not sufficiently bad such that they cannot be overcome with good management and engineering. “Envelope tight”. (Low-Medium Risk, Medium-Medium Risk, or High-Medium Risk).
 - **High Risk:** Major problems and insufficient resources exist to overcome the problems. “Does not fit within the Envelope”. (Low-High Risk, Medium-High Risk, or High-High Risk)
- **Envelope:** Resources available to handle known and unknown development problems that occur. Includes resource, schedule and funding reserves; descope options; and fallback plans.



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 Factors and Sub-Factors

Generally, the degree to which the CSR addresses the following factors directly relates to the grade of Low, Medium, or High Risk

- **Instrumentation**
 - Instrument Design, Accommodation, & Interface
 - Design Heritage
 - Environment Concerns
 - Technology Readiness
 - Instrument Systems Engineering
- **Mission Design and Operations**
 - Launch Mass Margins
 - Delta-V and Propellant Margins
 - Trajectory Analysis
 - Launch Services
 - Concept of Mission Operations
 - Ground Facilities – New/Existing
 - Telecom
 - Planetary Protection
- **Spacecraft/Flight Systems**
 - Hardware/Software Design
 - Design Heritage
 - Spacecraft Systems Design
 - Design Margins (Excluding mass)
 - Qualification and Verification
 - Assembly, Test, and Launch Operations
 - Mission Assurance
 - Development of New Technology
 - Entry/Descent/Landing
- **Management and Schedule**
 - Roles and Responsibilities
 - Team Experience and Key Individuals Qualification
 - Project Management and Systems Engineering
 - Organizational Structure and Work Breakdown Schedule (WBS)
 - International Participation
 - Risk Management, Including Descope Plan and Decision Milestones
 - Project-Level Schedule
- **Cost**
 - Basis of Estimate (BOE)
 - Cost Realism and Completeness
 - Cost Reserves by Phase
 - Comparison with TMC Estimates (Including Parametric Models/Analogies)
- **Student Collaboration**
 - Determine if SC is separable.



Cost Evaluation

- Full Missions will be evaluated using three cost models.
- Cost Realism will be reported as a Cost Risk in one of the following 5 categories: 1) Low Risk, 2) Medium-Low 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 and the application of TMC Models and Analogies, and heritage.
- Cost threats, risks, and risk mitigation issues will be identified and analyzed.
- Draft Form C and S will be completed on all CSR's prior to the Initial Plenary.
- Probability curves on the expected cost or "S curves" will not be provided or considered in the Cost Risk Analysis.
- During the TMC plenary, 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.

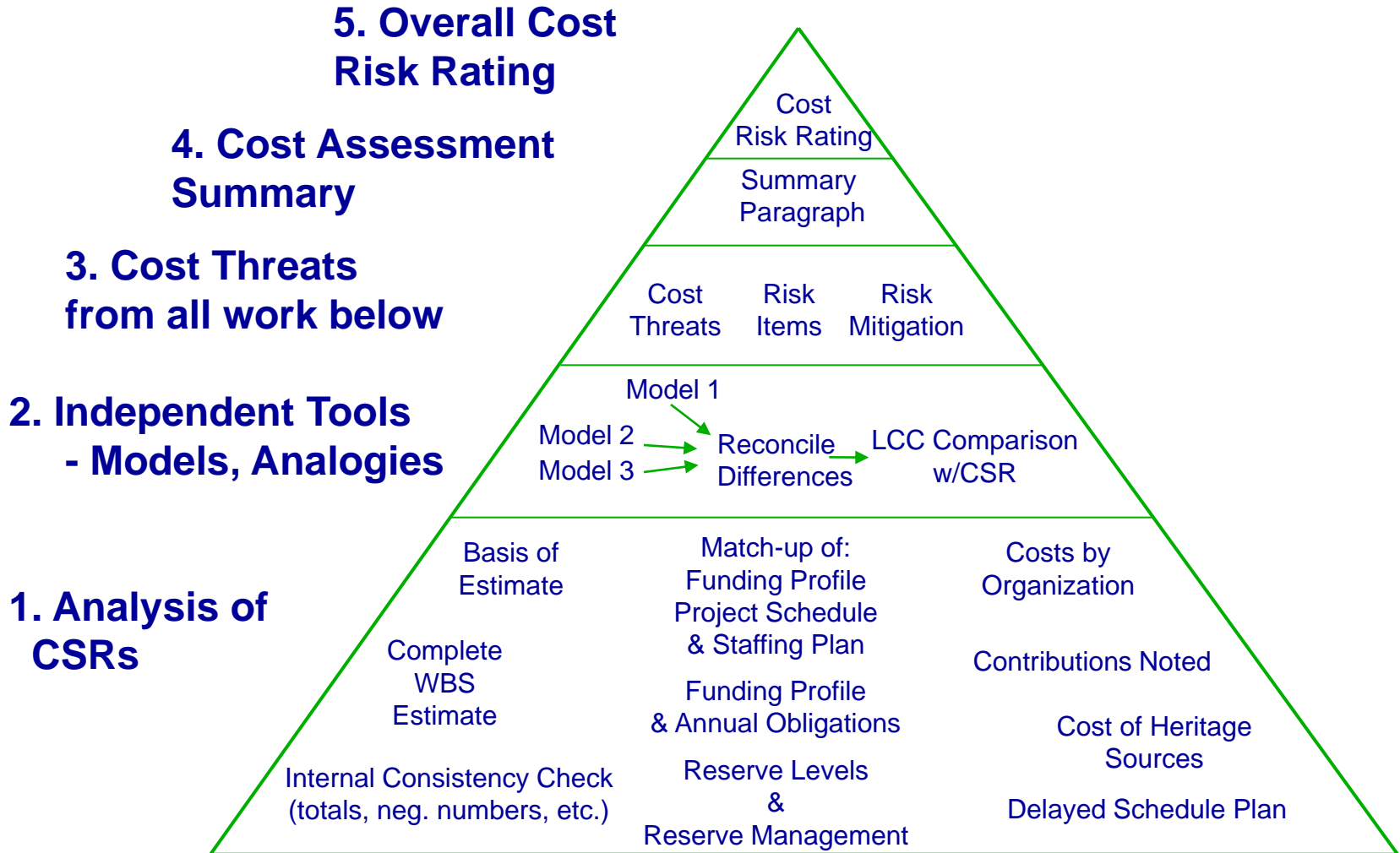


Cost Risk Definitions (Form S)

Cost Risk	Definition
LOW	<p><i>Cost Envelope is adequate – expect success.</i></p> <ul style="list-style-type: none"> - The proposer's estimate (<i>with reserves</i>) 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.
MEDIUM-Low	<p><i>Cost Envelope is somewhat tight, but project should succeed.</i></p> <ul style="list-style-type: none"> - 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	<p><i>Cost Envelope is tight. Success requires diligent oversight of resources.</i></p> <ul style="list-style-type: none"> - 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	<p><i>Cost Envelope is very tight. It is likely the project will require more funding.</i></p> <ul style="list-style-type: none"> - 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	<p><i>Project exceeds the Cost Envelope and is expected to require substantially more funding.</i></p> <ul style="list-style-type: none"> - 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





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, 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 proposal 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) Factors and Sub-Factors as Applicable

Generally, the degree to which the CSR addresses the following factors directly relates to the grade of Meritorious, Meritorious with Reservations, 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.



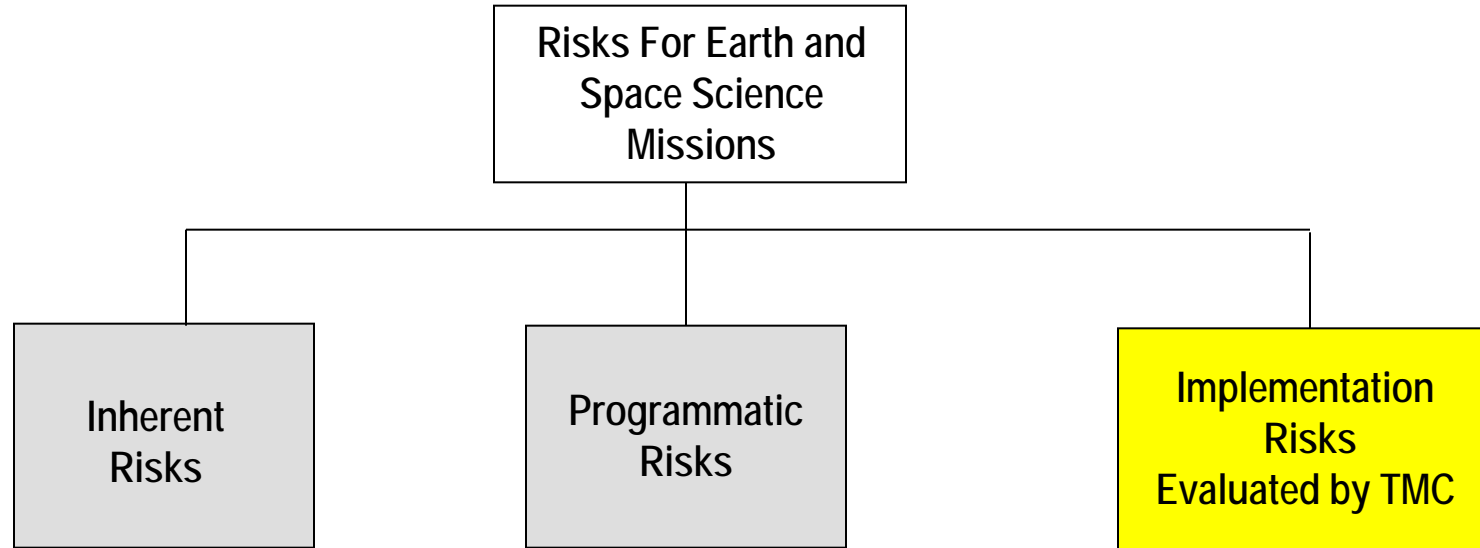
Form F Factors and Sub-Factors as Applicable

Generally, the degree to which the CSR addresses the following factors 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



Earth and Space Science Mission Risks



Risks that are unavoidable to do the mission:

- Launch environments
- Space environments
- Mission durations
- etc.

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
- etc.

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)



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 Reviewers (to provide special technical expertise to the Criterion B/C/D/E/F Panel) and External/Mail-In Reviewers (to provide special science expertise to the Criterion B Panel) may be utilized, respectively, based on the specific technology and science that is proposed.



Criterion C Panel Evaluation Principles for New Frontiers Downselect

- Basic Assumption on first step: Study team is the expert on his/her concept study.
 - TMC: Task is to try to validate study team's assertion of Low Risk.
 - Study team: Task is to provide evidence that the project is Low Risk.
 - Proposer given the benefit of the doubt in step one.
- Selection (downselect) CSR Risk Assessment:
 - The task is the same, 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 that are experts in the areas of the CSRs that they evaluate.
- The Criterion C Panel develops findings for each CSR that reflect the general agreement of the entire panel.
 - Findings: As expected (no finding), above expectations (strengths), below expectations (weaknesses).



Definitions of the 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: Minor points can influence risk ratings (unlike step 1).

Note: Normally, "as expected" findings should not be noted. However, findings that confirm analyses or comments to the Study Team or Selecting Official should be entered as "as expected".



Panel Processes

- All evaluation panel members review the assigned CSR and write an individual review before discussing findings with other members of the evaluation team.
- The NASA Langley Remote Evaluation System (RES) will be used for:
 - Entering individual evaluation team members comments for Criterion B and Criterion C comments.
 - Developing draft and final Form B and Form C for each CSR.
 - As a repository for all Final Forms for the evaluation (Form B, C, D, E, F).
- Evaluators may only participate in polling on CSRs that they have reviewed.
- Only evaluators that have participated in the Form C Initial Plenary, and the Form C Final Plenary may participate in polling on the Form C.
 - Participation is defined as in person or via telecon.
- The Form B will be reviewed during the first day and a half of each plenary and only Form B evaluators will be polled on the Form B. Instrument experts on Form C may also participate in the Form B evaluation and participate in polling on Form B if designated by the Lead Downselect 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 the Form B.
 - Participation is defined as in person or via telecon.



Panel Processes

- Consistency Review for Form B findings and Form C findings.
 - Form C consistency
 - A Form C Consistency Group will review all Draft Form Cs and questions at the Initial Plenary and all Criterion C findings at the Final Plenary.
 - All Form C evaluators will review all CSRs. Exceptions are specialist reviewers.
 - Form B consistency
 - A NASA Form B Consistency Group will review all Draft Form Bs and questions at the Initial Plenary and all Criterion B findings 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 attend the Form B panel.
 - Consistency of finding between Form B and C will be reviewed at the final plenary and adjudicated.
- Weaknesses and Questions to study teams:
 - NASA may send weaknesses and ask questions of study teams during the Final Plenary week if necessary to resolve any issue or clear up a potential misunderstanding.



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. Draft Form B 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, questions will be developed in addition to the weaknesses to give the study team an opportunity to clarify any misunderstanding.
- The main topic areas are the implementation issues in Criterion B, Criterion C and Criterion D (E/PO) and Criterion E (Student Collaboration).
- No polling on grades occurs at the Initial Plenary (Criterion B and Criterion C)
- The significant Weaknesses and questions will be sent to the study team in advance of the site visit. Weaknesses and questions will be sent to each team 8 days prior to the site visit.
- Criterion D (E/PO) and E (Student Collaboration) is reviewed by a Criterion D and E panel prior to the Initial Plenary. Site visit E/PO and Student Collaboration questions are prepared and provided no later than the Initial Plenary to the Lead Downselect Program Scientist.



Weaknesses & Questions to Study Teams

- Weaknesses and Questions for the Study Team
 - All significant weaknesses will be sent to the study team in advance of the site visit
 - These weaknesses are preliminary and may change based on site visit information and further discussion by evaluation panels.
 - Question may also be sent to the study team.
 - Questions must be of significance to a Form B, C, D, E rating.
- The Lead Downselect Program Scientist will approve all questions developed at the Initial Plenary. Three types of questions are planned:
 - Written questions provided to the Study team that must be addressed prior to the site visit. These are questions that require data that must be reviewed prior to the site visit. (Written Question - response required prior to site visit)
 - Written question provided to the Study team that must be addressed during the day of the site visit in the site visit presentation or by material provided during the site visit day. (Written Question - response at site visit)
 - Verbal questions which are not provided in advance of the site visit. These are questions generated at the Initial Plenary that will be asked verbally at the site visit.
- The evaluation team members at the site visit may ask follow up questions during the site visit to ensure they understand the answer to a question or clarify any significant issues.



Site Visits

- Site Visits with Oral Briefings will be used to clarify implementation details and commitments. The study team may address weaknesses identified in the concept study and provide updates on the concept study since submission of the Concept Study Report.
- Site Visits are SAGE - April 12 at JPL, OSIRIS-Rex - April 14 in Littleton CO (Denver area) , MoonRise - April 21 at JPL.
- Briefings at each Site Visit will be limited to 7 hours for full mission investigations with 1 additional hour for a site tour. (Suggest a schedule of 8:00 a.m. – 5:30 p.m. including 1 hour lunch).
- All Site Visit presentations/briefings should be in a plenary session with all Evaluation Team members attending - no splinter sessions – unless authorized by Lead Downselect Program Scientist or Criterion C Chair.
- Written weaknesses & questions and/or requests for information will be submitted to the PI 8 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 weaknesses and questions, and information contained in the CSR will be considered during the evaluation.

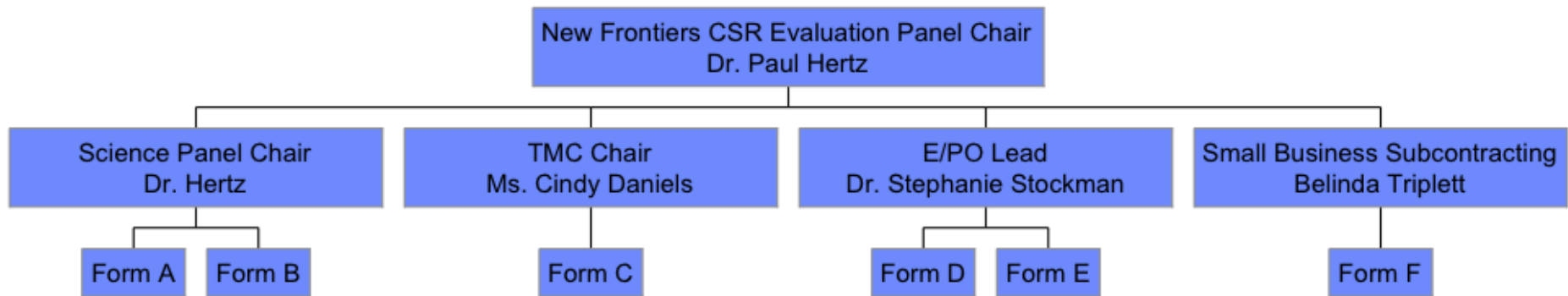


Final Plenary Products

- Finalize all evaluation Forms based on the information and clarifications provided at the site visit and the information in the CSRs.
- 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.
 - 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.
 - Form D
 - E/PO review results are updated based on the site visit and documented in Form D.
 - 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
 - MSFC Procurement will evaluate this factor



Organization





Observers

- The SMD Chief Scientist, who is also the Program Officer for this evaluation, Dr. Paul Hertz, may invite Civil Servants 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.
 - Current Status on Invited Observers:
 - Randy Baggett and Bill Kahle from MSFC, New Frontiers Program Office are invited by the SMD Chief Scientist, who is also the Lead Downselect Program Officer for this evaluation. Mr. Baggett and Mr. Kahle are invited due to their positions in the New Frontiers Program Office which will oversee implementation of the selected mission. Mr. Baggett's and Mr. Kahle's participation as observers will provide early knowledge to the Program Office of any potential implementation challenges for the selected mission.
 - Gordon Johnston, NASA HQ, Program Executive for selected New Frontiers mission. Mr. Johnston is invited due to his position as the Program Executive for the selected mission. He will oversee implementation of this mission and his participation as an observer will provide early knowledge of any potential issues for the selected mission.
 - After selection is announced, a Transition Briefing will be provided by the Evaluation Team to Civil Servants in the Program Office and at Headquarters who have implementation responsibilities.



Updates

- This page will be used to document any updates to the evaluation plan that are made after the initial concurrence.
- Changes Feb 10, 2011
 - On page 26, Form B Factors has been updated to reflect an additional subfactor. The third subfactor under "Maturity of Level 1 Requirements", i.e. "Adequacy of data to complete investigation and meet goals and objectives", was not stated explicitly in the CSR Guidelines. However the CSR Guidelines state that scientific merit will be re-evaluated if there are "significant changes to the science objectives." One of the factors for scientific merit ("Likelihood of Scientific Success") is independent of the goals and objectives. This factor will therefore be re-evaluated as part of scientific implementation merit during the downselect evaluation. Most of this factor is already included in the Form B Factors; the added factor is the non-redundant factor from "Likelihood of Scientific Success."
 - On pages 24 and 34, the Student Collaboration (SC) grade ranges and definitions have been added.
 - On page 36, the definitions for the Form F grades have been added.
 - On page 50, a second observer, Mr. Kahle has been added.



Updates (continued)

- Changes Feb 11, 2011
 - The following changes were made to clear this evaluation plan for public release
 - Markings that the document is “sensitive” were removed.
 - Throughout “proposal” changed to concept study and “proposer” changed to “study team.”
 - On page 10, the first bullet was rephrased for clarity.
 - On page 11, non-public dates were removed.
 - On page 31, deleted details on cost models.
 - On page 43, the consistency review was relabeled for clarity.
 - On page 46, updated first bullet to clarify purpose of site visit.
 - On chart 49, clarified role of Program Office observers and purpose of transition briefing.
- Changes Feb 21, 2011
 - Page 5, removed “procurement sensitive” marking.
 - Page 50, further elaborated on change to Form B subfactors.