National Aeronautics and Space Administration

2023 Heliophysics Space Weather Vigil Focused Mission of Opportunity (FMO) Evaluation Plan

Announcement of Opportunity

NNH23ZDA020O

~~***December 19, 2023***~~ ***Amended February 5, 2024***

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Introduction

Introduction

- The goal of this Evaluation Plan is to define the ground rules, processes, organizations, and schedules to be used in evaluating the proposals received in response to the Vigil Focused Mission of Opportunity (FMO) Announcement of Opportunity (AO).
- This Evaluation Plan covers evaluation information from the AO and from the evaluation processes conducted by the Scientific and Vigil-Complementary (VC) Operational Panel and the Technical, Management, and Cost (TMC) Panel.
- This Evaluation Plan describes the single-step competitive process that entails the solicitation, submission, evaluation, and selection of proposals prepared in response to the Vigil FMO AO.
- The Science Office for Mission Assessments (SOMA) at NASA Langley Research Center (LaRC) developed this Vigil FMO Evaluation Plan for the Science Mission Directorate (SMD) at NASA Headquarters.
- This Evaluation Plan has been cleared for public release by SMD.
- The Vigil FMO Program Scientist is responsible for validating all evaluation processes, responsibility assignments, assumptions, and ground rules.

Vigil FMO Solicitation

- This solicitation is for a PI-led FMO science investigation that advances the research goals of the NASA Space Weather Program and that supports the European Space Agency (ESA) Vigil mission by providing observations of the solar atmosphere that complement the operational objectives of the Vigil mission. The investigations will be managed under the Living With a Star Program Office and implemented via a remote sensing and potentially other instrument(s) hosted on the Vigil spacecraft.
- All investigations proposed in response to this solicitation must support the objectives of the AO (AO Section 2.2.1), must also include support of the ESA Vigil mission by providing observations of the solar atmosphere that complement the operational objectives of the Vigil mission (AO Section 2.3.1), must be implemented by PI-led investigation teams (AO Section 5.3.1), and must be implemented through the provision of complete spaceflight missions (AO Section 5.2.1).

Evaluation Organization

Evaluation Panel

J. Daniel Moses, Program Scientist

James E. Favors, Program Executive

Ursula K. Rick, Deputy Program Executive [Amended February 5, 2024]

Heliophysics Division, SMD

Scientific and VC Operational Evaluation Panel

J. Daniel Moses, Program Scientist

James E. Favors, Program Executive

Ursula K. Rick, Deputy Program Executive [Amended February 5, 2024]

Heliophysics Division, SMD

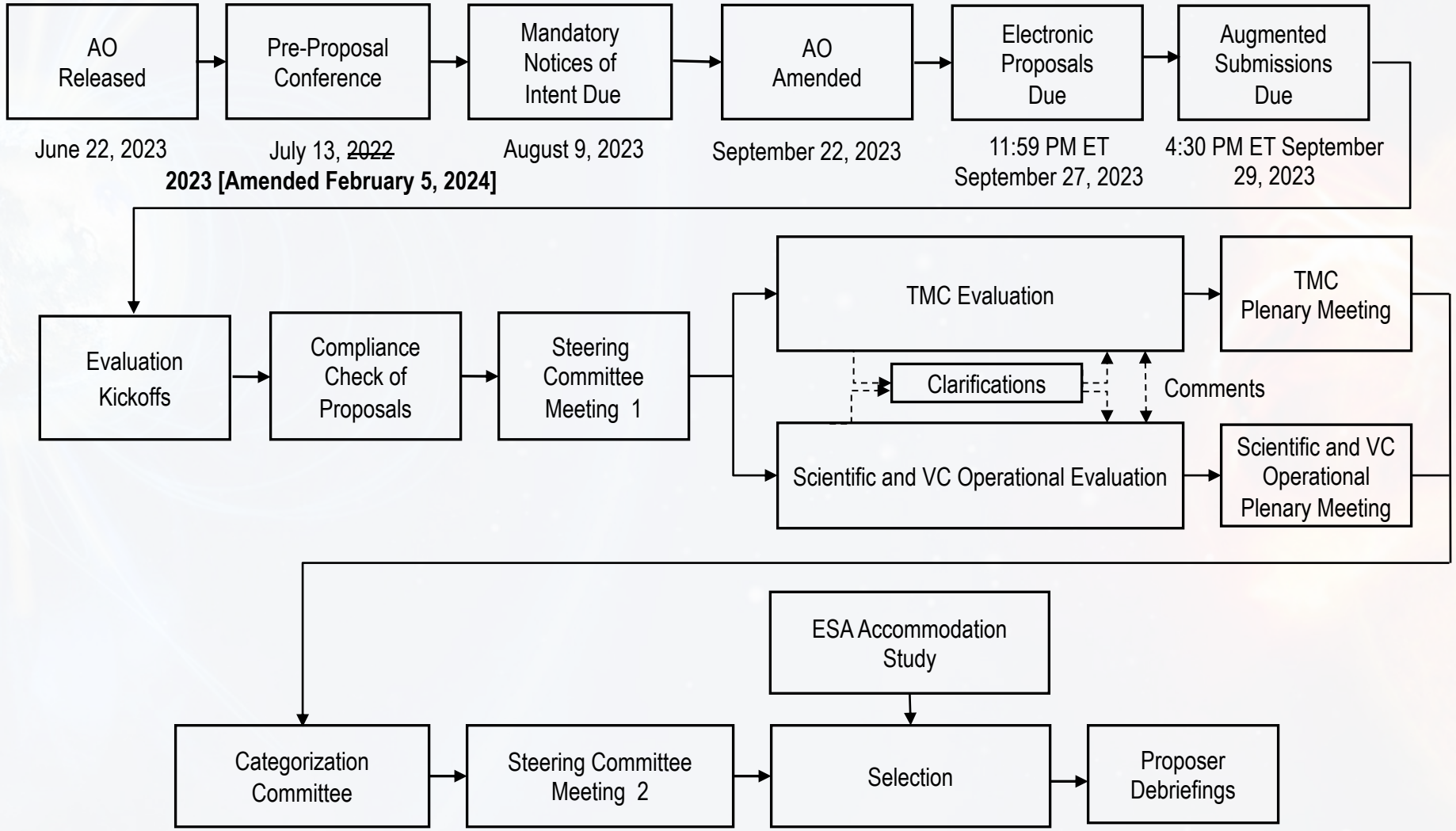
TMC Evaluation Panel

Washito A. Sasamoto, Acquisition Manager (AM)

Omar Torres, Backup AM

NASA SOMA

Proposal Evaluation Flow



Compliance Checklist, Vigil FMO AO Appendix F

Compliance Checklist

This is the list of items that NASA Checks for compliance before releasing a proposal for evaluation. All other requirements are checked during evaluation.

Administrative:

1. Mandatory NOI submitted on time
2. Electronic proposal received on time
3. Augmented submission via the NASA Box service made on time
4. Original signatures of PI and of authorizing official included
5. Meets page limits
6. Meets general requirements for format and completeness, including maximum 5.5 lines per vertical inch (6.5 lines per 3 vertical centimeters), maximum 15 characters per horizontal inch (6 characters per horizontal centimeter), and 12-pt font for text and figure captions.
7. Required appendices included; no additional appendices
8. Budgets are submitted in required formats
9. All individual team members who are named on the cover page indicate their commitment through NSPIRES
10. Export-controlled information has been identified
11. Restrictions involving China acknowledged on Electronic Cover Page

Compliance Checklist

Scientific:

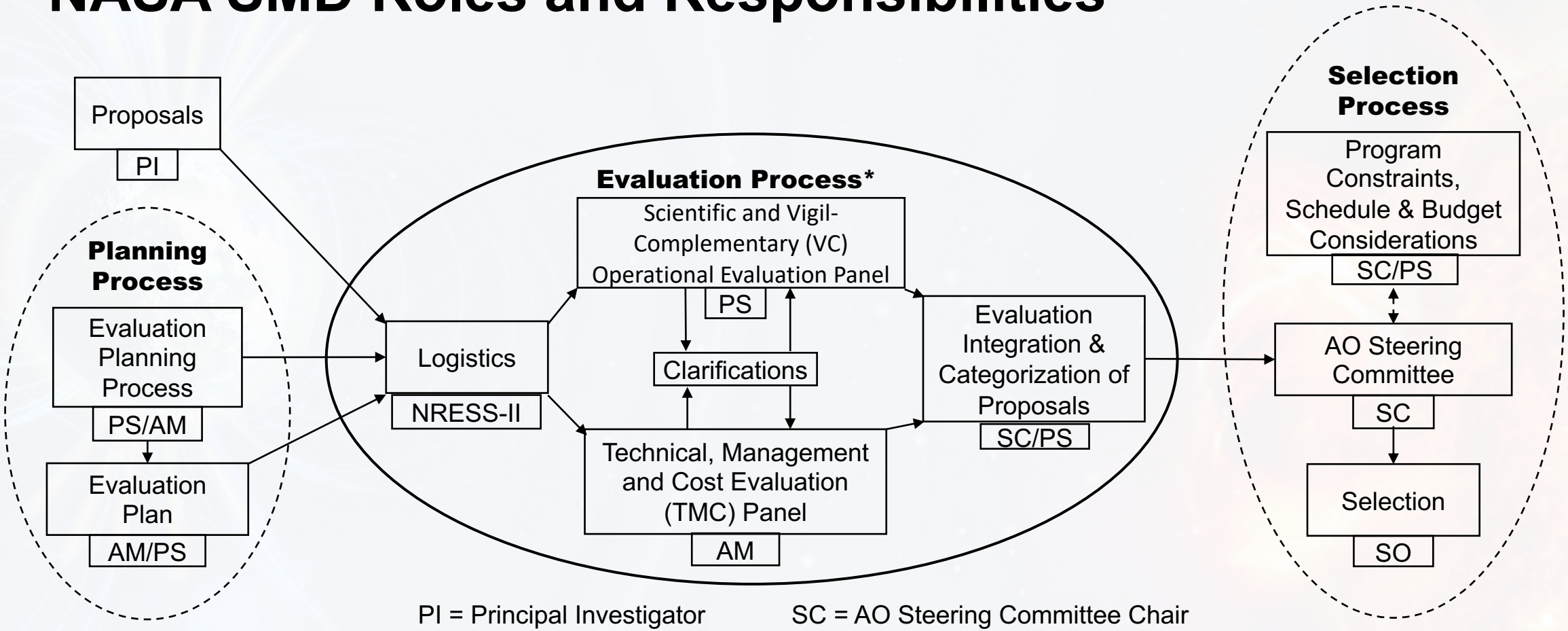
12. Addresses solicited science research programs
13. Requirements traceable from science and operational requirements to instrument to investigation
14. Appropriate Open Science/VC Operations and Data Management Plan (OS/VCO_DMP)
15. Baseline and threshold science investigations defined

Technical

16. Complete spaceflight mission (Phases A-F) proposed
17. Team led by a single PI
18. PI-Managed Mission Cost within AO Cost Cap
19. Contribution within contribution limit
20. Co-investigator costs in budget
21. Proposed delivery readiness dates prior to respective Engineering Model Delivery Readiness Date, Structural-Thermal Model Delivery Readiness Date, and AO-Required Instrument Delivery Readiness Date
22. Includes table describing non-U.S. participation
23. Includes letters of commitment from funding agencies for non-U.S. participating institutions
24. Includes letters of commitment from all U.S. organizations offering contributions
25. Includes letters of commitment from all major partners and non-U.S. institutions providing contribution of efforts of anyone on the Proposal Team

General Evaluation Requirements

NASA SMD Roles and Responsibilities



PI = Principal Investigator
PS = Program Scientist
AM = Acquisition Manager
SC = AO Steering Committee Chair
SO = Selecting Official
NRESS-II = NASA Research and Education Support Services-II

** The Evaluation Process is addressed in this document.*

Pre-Evaluation - Steering Committee Meeting 1

- As part of the Evaluation Planning Process, an AO Steering Committee will be convened. This Committee is composed of the SMD Deputy Associate Administrator for Research (DAAR) and a small number of SMD Program Scientists/Executives.
- The AO Steering Committee will conduct an independent assessment of the planned evaluation and associated processes regarding their compliance to established policies and practices, completeness, and self-consistency. They may provide recommendations to the Program Scientist and Acquisition Manager on potential adjustments to the evaluation team and the planned processes.

Conflicts of Interest (COI) Prevention and Mitigation Requirements

- The Scientific and VC Operational Panel members are on-boarded through the NASA Research and Education Support Services-II (NRESS-II) contractor, and the non-Civil Servants are provided an honorarium for their participation.
- The NRESS-II contractor cross-checks all the Scientific and VC Operational Panel members against the lists of personnel and organizations identified in each proposal submitted to determine whether any organizational Conflict of Interest (COI) exists.
- The non-Civil Servant TMC Panel members will be hired as contractors through the NASA Science Office for Mission Assessments (SOMA)'s Evaluations, Assessments, Studies, Services, and Support 3 (EASSS 3) contractor.
- The EASSS 3 contractor cross-checks all contracted TMC Panel members against the lists of personnel and organizations identified in each proposal submitted to determine whether any organizational COI exists.
- All contracted evaluators must divulge any other financial, professional, or personal potential COIs, and whether they work for a profit-making company that directly competes with any profit-making proposing organization.
- All Civil Servant and Intergovernmental Personnel Act (IPA) evaluators must self-certify their COI status by reviewing a combined listing of individuals and organizations associated with the Vigil proposals.
- The TMC evaluators must notify the SOMA Acquisition Manager in case of a potential COI. The Scientific and VC Operational evaluators must notify the Program Scientist in case of a potential COI.

Conflicts of Interest (COI) Prevention and Mitigation Requirements

- Community standards for conflicts of interest will be applied to all evaluators as directed in SMD Policy Document SPD-01A, *Handling Conflicts-of-Interest for Peer Reviews*. Under certain restricted situations, a waiver for SPD-01A, Section 2(b)(v) may be requested. Standards for financial conflicts of interest as specified in 18 U.S.C. § 208 will be applied to Civil Servant and IPA evaluators. The HQ Office of General Counsel will be consulted as necessary.
- All known potential COI issues are documented, and a COI Mitigation Plan is developed to minimize the likelihood that an issue will arise in the evaluation process. Any potential COI issue is discussed with the Program Scientist and the SMD Deputy Associate Administrator for Research and documented in the COI Mitigation Plan. All determinations regarding possible COIs that arise will be logged as an appendix to the COI Mitigation Plan.
- If any previously unknown potential COI arises during the evaluation, the conflicted member(s) will be notified to stop evaluating proposals immediately, and the Panel Chair will be notified immediately. If a COI is confirmed, the conflicted member(s) will be immediately removed from the evaluation process, and steps will be taken expeditiously, to remove, mitigate, or accept any actual or potential bias imposed by the conflicted member(s). The steps will be documented in the COI Mitigation Plan.
- Members of the Scientific/VC Operational and TMC Panels are prohibited from contacting anyone outside their panel for scientific/operational/technical input, or consultation, without the prior approval of the Program Scientist. If authorized by the Program Scientist, the Deputy AA for Research should be notified.

Handling of Proprietary Data

- All proposal and evaluation materials are considered proprietary.
- Viewing of proposal materials will be only on a need-to-know basis.
- Each evaluator who is not a Civil Servant or IPA will sign a Non-Disclosure Agreement (NDA) that must be on file with the NRESS contractor or the EASSS 3 contractor prior to any proposals being distributed to that evaluator.
- Civil Servants and IPA evaluators are under statutory obligations and are not required to sign an NDA.
- A record will be kept of who has been supplied with what materials.
- Evaluators will be briefed at a Kickoff web conference on how to handle the proposal materials. Evaluators will be briefed that they are not allowed to discuss proposals with anyone outside the Evaluation Panels ever, unless authorized by NASA. Evaluators will be briefed to not contact anyone outside of the Evaluation Panels to gain insight on any proposal related matter without expressly getting authorization from the Program Scientist (Dr. J. Daniel Moses).

Handling of Proprietary Data (continued)

- Any Observers at Review Panels will not have access to proposals or evaluation materials (See Slide 55 for more information).
- During the Evaluation, all proprietary information that needs to be exchanged between evaluators will be transferred securely via the Remote Evaluation System (RES) website maintained by SOMA, via the NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES), via the secure NASA's Box file transfer capability, via the secure ScienceWorks system maintained by SMD, via secure Webex, via NASA's Google docs, or via encrypted email, parcel post, fax, or regular mail. Proprietary information will not be sent via unencrypted email.
- Web conferences or teleconferences among evaluators will be conducted via controlled Web conference and teleconference lines. Virtual meeting information is confidential. The meeting numbers and pass codes are posted in a file on the RES or on NASA's Google docs. Participants will be briefed to ensure they do not provide this information to anyone or distribute this information via unencrypted email or text messages.
- When the evaluation process is complete, proposal materials will be deleted/destroyed. Some copies (for archival purposes) will be maintained at NASA HQ by the Program Scientist, and in the SOMA vault. Also, all proposal material from the selected project(s) will be provided to the Living With a Star (LWS) Program at NASA Goddard Space Flight Center (GSFC). All other proposal materials will be destroyed.

Principles for Evaluation

- All proposals are to be treated fairly and equally.
- Merit and Risk are to be assessed on the basis of the material provided in the proposal and through the clarification process.
- Evaluation Ratings shall reflect the written strengths and weaknesses.
- Everyone involved in the evaluation process is expected to act in an unbiased objective manner; advocacy for particular proposals is not appropriate.

General Evaluation Ground Rules

- All proposals are evaluated to uniform standards established in the Vigil FMO AO, and without comparison to other proposals.
- All evaluators are experts in the areas that they evaluate.
- Non-panelist/mail-in evaluators (to provide special science or operational expertise to the Scientific and VC Operational Panel) and specialist evaluators (to provide special technical expertise to the TMC Panel) may be used, respectively, based on need for expertise in a specific science or technology/engineering area that is proposed.

Evaluation Criteria from Vigil FMO AO:

A. Scientific VC Operational Merit of the Proposed Investigation (Form A, AO Section 7.2.2);

B. Scientific and VC Operational Implementation Merit and Feasibility of the Proposed Investigation (Form B, AO Section 7.2.3);

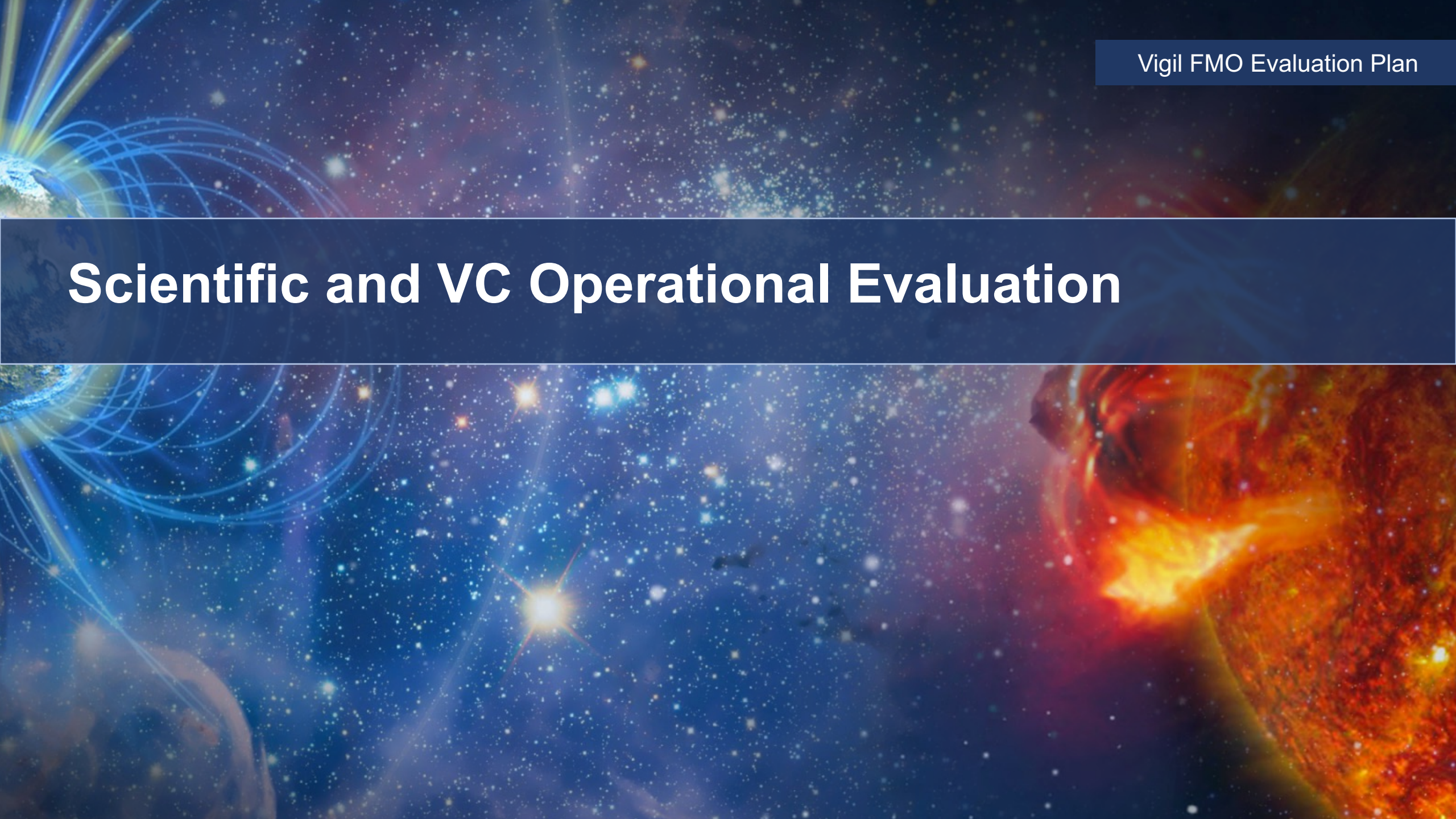
C. TMC Feasibility of the Proposed Mission Implementation (Form C, AO Section 7.2.4);

Weighting: the first criterion is weighted approximately 40%; the second and third criteria are weighted approximately 30% each

Other Selection Factors (Section 7.3):

- Programmatic factors
- Compatibility with the Vigil Spacecraft, other potential payload components, and mission operations
- PI-Managed Mission Cost

Scientific and VC Operational Evaluation



Scientific and VC Operational Panel Composition and Organization

- The Program Scientist leads the Scientific and VC Operational Panel.
- Scientific and VC Operational evaluators are typically, but not exclusively, recruited from the academic, governmental, and industrial research communities.
- The approach to evaluator identification is reviewed by the pre-evaluation Steering Committee convened by the DAAR (Steering Committee Meeting 1, page 13).
- The Scientific and Vigil-Complementary (VC) Operational Panel evaluates the *Scientific VC Operational Merit of the Proposed Investigation* (A Factors, AO Section 7.2.2), and the *Scientific and VC Operational Implementation Merit and Feasibility of the Proposed Investigation* (B Factors, AO Section 7.2.3).
- The Scientific and VC Operational evaluation is conducted via one Panel.
  - The Panel will be chaired by the PS and may be co-chaired by a member from the scientific community.
  - The Panel may have an Executive Secretary.
- Each proposal is evaluated by assigned panel members.
  - The Lead Evaluator for each proposal will lead the discussion. At least two secondary (supporting) evaluators are assigned to each proposal.
  - At the request of the Lead Reviewer, a Supporting Reviewer or the Executive Secretary, if available, will take notes on the discussion.
- The TMC Panel may provide comments and questions to the Panel, and vice versa.
- The Science and VC Operational Panel may request clarifications from proposers on any Potential Major Weaknesses (PMWs) that are identified during the evaluation process in Forms A, and B.

Scientific and VC Operational Panel Procedures

- Non-US Panel evaluators will review a version of the proposal in which any export-controlled material has been redacted. Proposers are required to indicate such material; NRESS-II personnel will redact the proposal pdf.
- Each Science and VC Operational Panel member evaluates proposals as directed by the Chair.
  - If special science or operational expertise is required, the Panel may use non-panelist evaluators to assist with one or more proposals.
  - Non-panelist evaluators evaluate only those parts of proposals pertinent to their scientific specialties.
- Each proposal may be discussed by the evaluators in web conferences.
  - Findings in the form of Strengths and Weaknesses form the basis for initial panel discussions.
  - Each assigned evaluator provides an individual evaluation prior to the web conferences.
  - During the web conference, the proposal and the individual evaluations, including those from non-panelist/mail-in evaluators, are discussed.
  - Following the web conference, the Lead Evaluator captures/synthesizes individual evaluations including discussions and generates a Draft Evaluation Form including draft findings. Draft findings include PMWs to be sent to the proposers for clarification.
  - After PMW clarification responses are received, a web conference is held to consider clarification responses. Draft findings are updated if applicable.
  - No overall merit rating is assigned at the web conferences.

Scientific and VC Operational Panel Procedures

- A meeting of the Panel is held upon completion of individual evaluations for all proposals.
  - The Panel compiles all of the findings for each proposal.
  - For each proposal, the Chair or designated Lead Evaluator leads the discussion, summarizes the proposed investigation, and documents the results.
  - After the Panel completes its draft evaluations, a plenary panel meeting will be held where the evaluations of all proposals are reviewed by all unconflicted science evaluators to ensure that standards have been applied uniformly and in an appropriate and fair manner.
  - After the discussion, each member of the Panel assigns ratings for Science VC Operational Merit (Form A) and Science and VC Operational Implementation and Feasibility (Form B) to each proposal. Non-panelist evaluators do not assign ratings.
  - The Lead Evaluator synthesizes and documents Panel evaluations.

A & B

Scientific and VC Operational Panel Evaluation Factors

Criterion A: Scientific VC Operational Merit of the Proposed Investigation. This criterion assesses the intrinsic scientific and VC operational merit of the proposed investigation. Scientific and VC operational merit will be evaluated for the Baseline Investigation and the Threshold Investigation; Science Enhancement Options beyond the Baseline Investigation will not contribute to the assessment of the scientific and VC operational merit of the proposed investigation.

Factors from Vigil FMO AO, Section 7.2.2

- Factor A-1. Compelling nature and scientific priority of the proposed investigation's science goals and objectives.
- Factor A-2. Programmatic value of the proposed investigation.
- Factor A-3. Likelihood of scientific and VC operational success.
- Factor A-4. Scientific and VC operational value of the Threshold Investigation.

Factors A-1 through A-3 are evaluated for the Baseline Investigation assuming it is implemented as proposed and achieves technical success. Factor A-4 is similarly evaluated for the Threshold Science Investigation.

Evaluation Criterion A

- **Factor A-1. Compelling nature and scientific priority of the proposed investigation's science goals and objectives.** Compelling nature and scientific priority of the proposed investigation's science goals and objectives. This factor includes the clarity of the goals and objectives; how well the goals and objectives reflect program, Agency, and national priorities; the potential scientific impact of the investigation on program, Agency, and national science objectives; and the potential for fundamental progress, as well as filling gaps in our knowledge relative to the current state of the art. This evaluation factor also includes the extent to which the proposed science investigation addresses national applications objectives for proposals that include an applications dimension.
- **Factor A-2. Programmatic value of the proposed investigation.** This factor includes the unique value of the investigation to make scientific and VC operational progress in the context of Vigil, as well as other ongoing and planned missions; how well this investigation addresses national objectives in space weather to advance understanding and enable better forecasting; the relationship to the other elements of NASA's science programs; how well the investigation may synergistically support ongoing or planned missions by NASA and other agencies; and the necessity for a space investigation to realize the goals and objectives. This evaluation factor also includes the extent to which the proposed investigation addresses unique science and application areas that are not being addressed by other missions (both NASA and non-NASA missions) expected to be in operation at the start of the proposed investigation.
- **Factor A-3. Likelihood of scientific and VC operational 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 investigation requirements for guiding development and ensuring scientific and VC operational success.
- **Factor A-4. Scientific and VC operational value of the Threshold Investigation.** This factor includes the scientific and VC operational value of the Threshold Investigation using the standards in the first factor of this section and those in Section 2.3.1, and whether that value is sufficient to justify the proposed cost of the project.

Scientific and VC Operational Panel Evaluation Factors

Criterion B: Scientific and VC Operational Implementation Merit and Feasibility of the Proposed Investigation. This criterion assesses the merit of the plan for completing the proposed investigation, including the scientific and VC operational implementation merit, feasibility, resiliency, and probability of scientific and VC operational success of the proposed investigation.

Factors from Vigil FMO AO, Section 7.2.3

- Factor B-1. Merit of the instrument and investigation design for producing anticipated data to address the science goals and objectives and VC operational objectives.
- Factor B-2. Probability of technical success.
- Factor B-3. Merit of the Open Science/VC Operations and Data Management Plan including data analysis, Data Management Plan, Software Management Plan, and Open Science Plan.
- Factor B-4. Resiliency.
- Factor B-5. Probability of team success.
- Factor B-6. Merit of the Diversity and Inclusion Plan.
- Factor B-7. Maturity of proposed Level 1 science and VC operations requirements and Level 2 project requirements.

Evaluation Criterion B

- **Factor B-1. Merit of the instrument and investigation design for producing anticipated data to address the science goals and objectives and VC operational objectives.** This factor includes the degree to which the proposed investigation will address the goals and objectives; the appropriateness of the selected instrument(s) and investigation design for addressing the goals and objectives; the degree to which the proposed instrument(s) and investigation can provide the necessary data; and the sufficiency of the data gathered to complete the scientific investigation and meet VC operational requirements.
- **Factor B-2. Probability of technical success.** This factor includes the maturity and technical readiness of the instrument(s) or demonstration of a clear path to achieve necessary maturity; the adequacy of the plan to develop the instrument(s) 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 instrument(s) within the investigation design.

Evaluation Criterion B

- **Factor B-3. Merit of the Open Science/VC Operations and Data Management Plan including data analysis, Data Management Plan, Software Management Plan, and Open Science Plan.** This factor includes the merit of plans for data analysis and data archiving to meet the goals and objectives of the investigation; to result in the publication of science discoveries in the professional literature; and to preserve data and analysis 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 the professional literature (e.g., refereed journals); and assessment of the proposed plan for the timely release of the data to the public domain for enlarging its science impact.
- **Factor B-4. Resiliency.** This factor includes both developmental and operational resiliency. Developmental resiliency includes the approach to descoping the Baseline Investigation to the Threshold Investigation if 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 team success.** This factor will be evaluated by assessing the experience, expertise, and organizational structure of the science and VC operations team and the investigation design considering any proposed instruments. The scientific expertise of the PI will be evaluated but not their experience with NASA investigations. 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 during evaluation.

Evaluation Criterion B

- **Factor B-6. Merit of the Diversity and Inclusion Plan.** This factor includes the alignment of the proposal with NASA's core value of inclusion, the effectiveness of the plan in achieving its objectives in the context of mission success, the inclusion of mentoring and career development opportunities to train the next generation of science leaders, and transparency of annual reporting to NASA. This factor will be evaluated solely by IDEA SMEs but it will not be provided a separate grade or score.
- **Factor B-7. Maturity of proposed Level 1 science and VC operations requirements and Level 2 project requirements.** This factor includes assessment of whether the Level 1 science and VC operations requirements are mature enough to guide the achievement of the objectives of the Baseline Investigation and the Threshold Investigation, and whether the Level 2 requirements are consistent with the Level 1 requirements. The Levels 1 and 2 requirements will be evaluated for whether they are stated in unambiguous, objective, quantifiable, and verifiable terms that do not conflict and for whether they are traceable to the science objectives. They will be evaluated for the adequacy, sufficiency, and completeness, including their utility for evaluating the capability of the instrument(s) and other systems to achieve the investigation objectives.

The review of the merit of the Diversity and Inclusion Plan is led solely by individuals with practical and/or research experience in IDEA topics and the application of IDEA principles to teams.

Scientific and VC Operational Evaluation Products: Findings

- **Major Strength:** A facet of the implementation response that is judged to be of superior merit and can substantially contribute to the ability of the investigation to meet its scientific and/or VC operational objectives.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the investigation's ability to meet its scientific and/or VC operational objectives.
- **Minor Strength:** An aspect of the proposal that is judged to contribute to the ability of the investigation to meet its scientific and/or VC operational objectives.
- **Minor Weakness:** A deficiency or set of deficiencies taken together that are judged to weaken the investigation's ability to meet its scientific and/or VC operational objectives.

Note: Findings that are considered "as expected" are not documented on Forms A and B.

Science Evaluation Grade Definitions

Excellent: A comprehensive, thorough, and compelling proposal 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 proposal of very high merit that fully responds to the objectives of the AO, whose strengths fully outbalance any weaknesses.

Good: A competent proposal that represents a credible response to the AO, having neither significant strengths nor weaknesses and/or whose strengths and weaknesses essentially balance.

Fair: A proposal that provides a nominal response to the AO, but whose weaknesses outweigh any perceived strengths.

Poor: A seriously flawed proposal 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).

Note: Only Major Findings are considered in the adjectival rating.

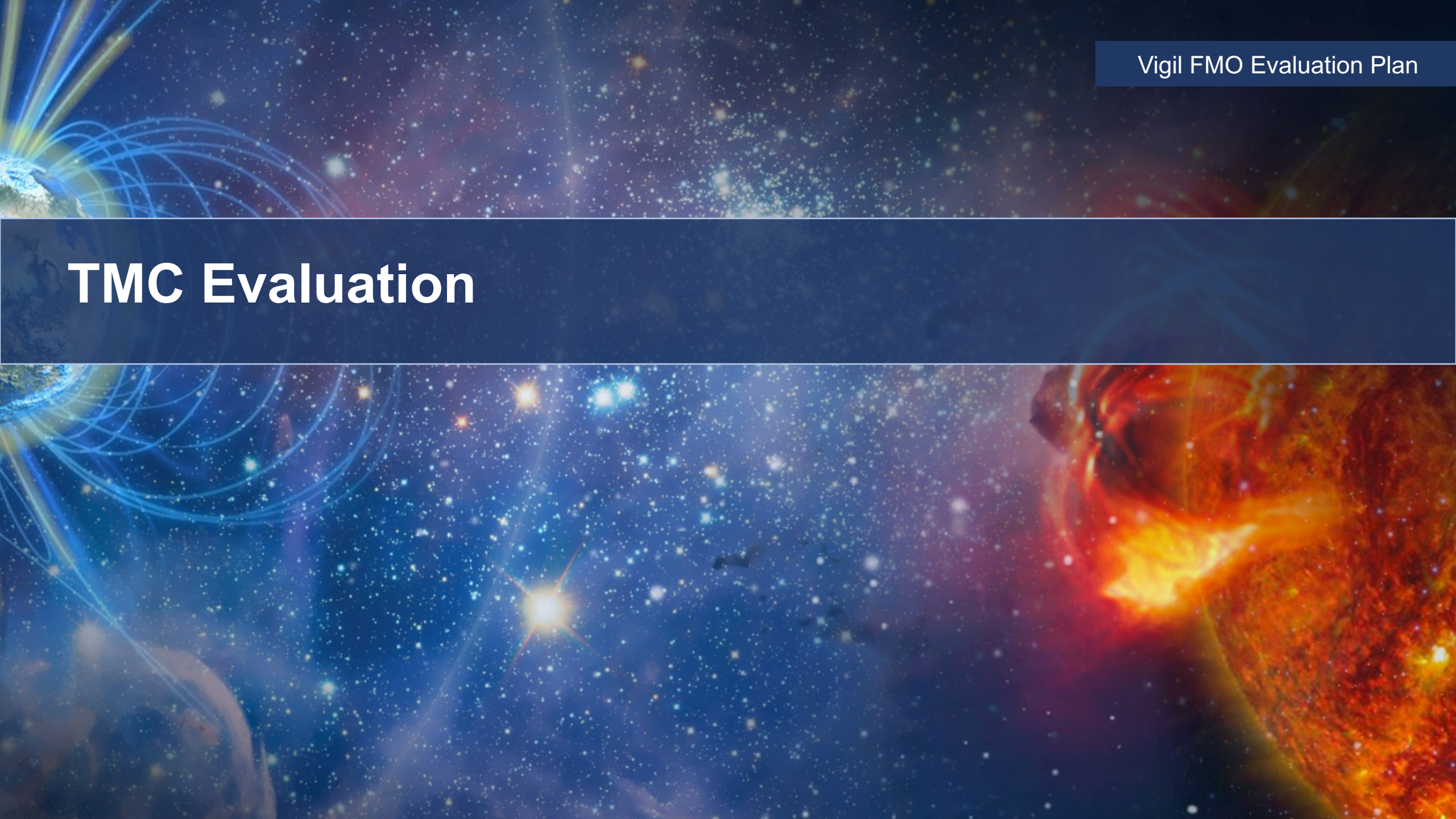
Scientific and VC Operational Evaluation Products

For each proposal, this process results in Form A and Form B, each of which includes

- Proposal title, PI name, and submitting organization;
- Proposal summary;
- Based on findings, adjectival median rating for *Scientific VC Operational Merit of the Proposed Investigation* (Form A), and for *Scientific and VC Operational Implementation Merit and Feasibility of the Proposed Investigation* (Form B), ranging from “Excellent” to “Poor”*; half-grades (*e.g.* Very Good/Good) are not permitted during polling;
  - If the median rating falls between two grades (*e.g.,* Very Good and Good), the median rating will be stated as a mid-point between the grades (*e.g.,* Very Good/Good)*;
- Summary rationale for the median rating;
- Narrative findings, identified as major or minor strengths or weaknesses; and
- Comments to the Proposers, comments to the Selection Official*, and comments to the TMC Panel* (optional)

*** Note: Not provided to proposers**

TMC Evaluation



TMC Panel Composition and Organization

- The Acquisition Manager, who is a Civil Servant in the NASA Science Office for Mission Assessments (SOMA) at NASA Langley Research Center (LaRC), leads the TMC Panel.
  - NASA SOMA works directly for NASA Headquarters and is firewalled from the rest of NASA LaRC.
- TMC Panel evaluators are a mix of the best non-conflicted contractors, consultants, and Civil Servants who are subject matter experts in the areas of the proposals that they evaluate.
- The TMC Panel develops findings for each proposal that are based on individual comments and reflect the general agreement of the entire panel.
  - Comments that are *as expected* are not included as findings.
  - Comments that are *above expectations* result in strengths.
  - Comments that are *below expectations* result in weaknesses.
- Additionally, specialist evaluators may be called upon in cases where technical expertise is needed that is not represented on the panel.
  - Specialist Evaluators evaluate only those parts of a proposal that are specific to their particular expertise.
  - Specialist Evaluators provide only findings; they do not participate in polling on Form C.
- Consistency Review for Form C findings ensures similar findings are treated equivalently across different proposals.
- Only TMC evaluators who have participated in the TMC Plenary may participate in polling on Form C.

TMC Panel Evaluation Factors

Criterion C: TMC Feasibility of the Proposed Investigation Implementation. This criterion assesses technical and management approaches of all submitted investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule.

Factors from Vigil FMO AO, Section 7.2.4

- Factor C-1. Adequacy and robustness of the instrument implementation plan.
- Factor C-2. Adequacy and robustness of the investigation design and plan for investigation operations.
- Factor C-3. Adequacy and robustness of the flight systems (not in consideration for this opportunity).
- Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team.
- Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.

The panel also provides comments to the Selection Official. While not considered in the evaluation, they may be considered during selection. Topics can include:

- **Size and nature of contributions,**
- **Fraction of PIMMC expended before KDP-C,**
- **The managerial and spaceflight experience of the PI, and whether appropriate mentoring and support tools are in place,**
- **Career development opportunities to train the next generation of engineering and management leaders.**

Evaluation Criterion C

- **Factor C-1. Adequacy and robustness of the instrument implementation plan.** The maturity and technical readiness of the instrument(s) will be assessed, as will the ability of the instrument(s) to meet investigation 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 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 plans for advanced engineering developments to mature systems within the proposed cost and schedule when systems having a TRL less than 6 are proposed.
- **Factor C-2. Adequacy and robustness of the investigation design and plan for investigation operations.** This factor includes an assessment of the overall investigation design, design margins, and the concept for investigation operations (including communication and ground systems). This factor includes investigation 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 Investigation.

Evaluation Criterion C

- **Factor C-3. Adequacy and robustness of the flight systems.** This factor is not a consideration for this opportunity.
- **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; the management approach including the roles; the commitment, qualifications, and experience of any named Key Management Team members, the implementing organization, and the known partners; the spaceflight experience of any named Key Management Team members (PI excepted); the implementing organization and known partners against the needs of the investigation; the prior working relationships of the implementing organization and known partners; the commitments of partners and contributors; and the scope of work covering all elements of the project, including contributions. Also evaluated under this factor is the adequacy of the proposed risk management approach, including 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 management of the risk of contributed critical goods and services will be assessed, including the plans for any international participation, the commitment of partners and contributors, as documented in Letters of Commitment, and the technical adequacy of contingency plans, where they exist, for coping with the failure of a proposed cooperative arrangement or contribution. This factor also includes assessment of 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 meeting the proposed delivery readiness dates. Also evaluated under this factor are the proposed project and schedule management tools to be used on the project.

Evaluation Criterion C

- **<u>Factor C-5</u>. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.** This factor includes elements such as cost, cost risk, cost realism, and cost completeness including assessment of the basis of estimate, the adequacy of the approach used to develop the estimated cost, the discussion of cost risks, the adequacy and allocation of cost reserves by phase, and the scope of work. The adequacy of the cost reserves and understanding of the cost risks will be assessed. This factor also includes an assessment of the proposed cost relative to estimates generated by the evaluation team using parametric models and analogies.

TMC Cost Evaluation

- The evaluation assesses the cost risk, cost realism, and cost completeness including the basis of estimate, the adequacy of the approach used to develop the estimated cost, the discussion of cost risks, the adequacy and allocation of cost reserves by phase, and the scope of work (covering all elements of the mission).
- An independent cost verification of the proposed cost for Phases A-D is performed using at least two independent cost models.
- An independent cost verification of the proposed cost for Phase E is performed using at least one cost model.
- The likelihood and cost impact of major weaknesses is assessed.
- Cost threat impacts to the proposed unencumbered cost reserves are assessed.
- The adequacy of the remaining unencumbered cost reserves is assessed.
- All draft Forms C and Cost Evaluation Summaries (CESs) are completed prior to the Plenary Meeting.
- The entire panel participates in the Cost deliberations.
- All information from the entire evaluation process is considered in the final cost assessment.
- All cost findings are included on the Form C and considered in the TMC Risk Rating.

Cost Threat Matrix

- The *likelihood* and *cost impact*, if any, of each weakness is stated as "This finding represents a cost threat assessed to have an 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, which results in a reduction from the proposed unencumbered reserves."
- 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 threat.
- The cost threat matrix defines the adjectives that describe the *likelihood* and *cost impact*.
- The minimum cost threat threshold is $400K for Phases A/B/C/D *and $250K for Phase E*.

			Cost Impact (CI) **% of PI-Managed Mission Cost to complete Phases B/C/D or *% of Phase E* not including unencumbered cost reserves or contributions**				
	Likelihood of Occurrence	**Weakness**	**Minimal** 2.5% < CI ≤ 5% *2.5% < CI ≤ 5%*	**Limited** 5% < CI ≤ 10% *5% < CI ≤ 10%*	**Moderate** 10% < CI ≤ 15% *10% < CI ≤ 15%*	**Significant** 15% < CI ≤ 20% *15% < CI ≤ 20%*	**Very Significant** CI > 20% *CI > 20%*
Likelihood (L, %)	Almost Certain (L > 80%)						
	Very Likely (60% < L ≤ 80%)						
	Likely (40% < L ≤ 60%)						
	Possible (20% < L ≤ 40%)						
	Unlikely (L ≤ 20%)						

Note: For each proposal, the percentages in the above table will be converted to dollars by the cost estimator depending on the proposed PIMMC.

TMC Evaluation Products: Findings

- **Major Strength:** A facet of the implementation response that is judged to be well above expectations and can substantially contribute to the ability of the project to meet its technical requirements on schedule and within cost.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technical objectives on schedule and within cost.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, *but is not a discriminator in the assessment of risk*.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, *but is not a discriminator in the assessment of risk*.

Note: Findings that are considered "as expected" are not documented on the Form C.

TMC Evaluation Products: Risk Ratings

Based on the narrative findings, each proposal will be assigned one of three risk ratings, defined as follows:

Low Risk: There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the proposer's capability to accomplish the investigation well within the available resources.

Medium Risk: Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Investigation design may be complex and resources tight.

High Risk: One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.

Note: Only Major findings are considered in the risk rating.

TMC Panel Product: Form C

For each proposal, the TMC Evaluation will result in a Form C for Categorization, Steering, and Selection that contains:

- Proposal title, PI name, and submitting organization;
- Based on the findings, an adjectival median risk rating for the TMC Feasibility of the Proposed Mission Implementation of “Low Risk,” “Medium Risk” or “High Risk”;
  - A median score that falls between two risk ratings will be “rounded” to the higher risk rating.
- Summary rationale for the median risk rating;
- Narrative findings, identified as major or minor strengths or weaknesses; and
- Comments to the Proposers, comments to the Selection Official*, and comments to the Scientific and VC Operational Panel* (optional).

*** Note: Not provided to proposers.**

Clarifications Process

Clarifications Process

Section 7.1.1 of the AO states “Proposers should be aware that, during the proposal evaluation and selection process, NASA may request clarification of specific points in a proposal; if so, such a request from NASA and the proposer’s response must be in writing”.

In particular, before finalizing the proposal evaluation “NASA will request clarification on potential major weaknesses (PMWs) in the A, B, and C factors that have been identified in the proposal. NASA will request clarification in a uniform manner from all proposers.”

PIs whose proposals have no PMWs will be informed that no PMWs have been identified.

All PIs are allowed the same number of pages for Clarifications, including those who have no PMWs.

The full set of clarification responses to the factors above will be considered by the Science and VC Operations Panel and the Technical Management and Cost (TMC) panel. Only the responses will be provided to the other panel.

Proposers will have at least 48 hours to respond.

Clarification Process Requirements (1 of 3)

Clarifications Responses must conform to the following requirements:

Requirement 1: The clarification response shall consist of three documents: one Clarification Response Document that addresses the PMWs for the A and B Factors (combined, except for Factor B-6), one Clarification Response Document that addresses the PMWs for Factor B-6, and one Clarification Response Document that addresses the PMWs for the C factors.

Requirement 2: Each Clarification Response Document shall be a single unlocked (*e.g.*, without digital signatures) searchable Adobe Portable Document Format (PDF) file, composed of the response text, figures, and/or tables. Images (*e.g.*, figures and scans) shall be converted into machine-encoded text using optical character recognition. Animations shall not be included. Links to materials outside of the response are not permitted. Comment fields shall not be inserted.

Requirement 3: The Clarification Response Documents shall be presented in 8.5 x 11 inch paper (or A4). Text shall not exceed 5.5 lines per vertical inch and page numbers shall be specified. Margins at the top, both sides, and bottom of each page shall be no less than 1 inch if formatted for 8.5 x 11 inch paper; no less than 2.5 cm at the top and both sides, and 4 cm at the bottom if formatted for A4 paper. Type fonts for text, tables, and figure captions shall be no smaller than 12-point (*i.e.*, no more than 15 characters per horizontal inch; six characters per horizontal centimeter). Fonts used within figures shall be no smaller than 8-point.

Requirement 4: For the PMWs for the A and B Factors combined, less Factor B-6, the Clarification Response Document shall not exceed eight pages. For the PMWs for Factor B-6, the Clarification Response Document shall not exceed one page. For the PMWs for the C Factors, the Clarification Response Document shall not exceed six pages. Text, table(s) and figure(s) are permitted; however, all material shall be within the page limits specified above and shall abide by limitations in Requirements 2, 3 and 9. Each response file shall not exceed 10MB.

Clarification Process Requirements (2 of 3)

Requirement 5: The Clarification Response Documents shall not contain International Traffic in Arms Regulations (ITAR), Export Administration Regulations (EAR), or classified material.

Requirement 6: The Clarification Response Documents shall label each PMW response with the PMW number provided. Each PMW clarification response shall contain only information specific to the PMW. A clarification response may point back to references in the proposal; however, PMWs' references to locations in the proposal indicate that they have already been evaluated and a re-reference alone does not obligate a re-consideration of those data. References to proposal material is expected to use the proposal section numbers and page number on the proposal page (as opposed to the electronic PDF file page number).

Requirement 7: The Clarification Response Document may include additional information on any criteria or requirements relevant to the proposed investigation (*e.g.,* for TMC Feasibility of the Proposed Investigation Implementation, advances in proposed technologies since proposal submission). However, this additional information counts against the total page limitation for the Clarification Response Document that contains it.

Requirement 8: The clarification responses shall not include more than two new references in response to any single PMW or in support of any single additional information response. All references shall be to peer-reviewed literature, or to full conference proceeding papers (not just abstracts) that are published and accessible. References included in the proposal do not constitute new references. References shall be restricted to those with a publication or release date before the PMW sent date.

Clarification Process Requirements
(3 of 3)

Requirement 9: The clarification response may include, outside the four Clarification Response Documents, complete versions of a modified Science and VC Operations Traceability Matrix (STM; Table B1), Mission Traceability Matrix (MTM; Table B2), Total Mission Cost Profile tables (Tables B3a and B3b in Excel format), Master Equipment List (MEL; Table B5 in Excel format), schedule foldouts (AO Requirement B-33) and associated table of dates (AO Requirement B-34 in Excel format), Summary of Proposed Program Cooperative Contributions table (AO Requirement B-50a), ~~and/or~~ Letters of Commitment (AO Requirement 70)**, and/or draft Mission Definition Requirements Agreement (MDRA; AO Requirement B-56a)**. These modified fold-out(s)/table(s) shall have modifications clearly marked by the use of a different color font or by a colored-bordered box (labeled “PMW Clarification”). The page-limited Clarification Response Documents shall provide the description of the updates and changes to the modified fold-out(s)/table(s) as text. The complete versions of the modified STM, MTM, Total Mission Cost Profile table, MEL, schedule, Summary of Proposed Program Cooperative Contributions table, ~~and~~ Letters of Commitment**, and draft MDRA** will not count against the page limit. Any new or other fold-out(s) will each count as two pages against the response page limit. **[Amended February 5, 2024]**

Categorization, Steering, and Selection

Categorization Process and Proposal Categories

Subsequent to the evaluation process, NASA will convene a Categorization Committee, composed wholly of Civil Servants and Intergovernmental Personnel Act appointees (some of whom may be from Government agencies other than NASA) and appointed by the Associate Administrator for the Science Mission Directorate. The Categorization Committee will consider the *Scientific and VC Operational Merit*, *Scientific and VC Operational Implementation Merit and Feasibility*, and *TMC Feasibility of the Proposed Mission Implementation* and, based on the evaluations, categorize the proposals in accordance with procedures required by NFS 1872.404. The categories are defined in NFS 1872.404(k) as follows:

Category I. Well-conceived, meritorious, and feasible investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that data can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.

Category II. Well-conceived, meritorious, and feasible investigations that are recommended for acceptance, but at a lower priority than Category I, whatever the reason.

Category III. Meritorious investigations that require further development. Category III investigations may be funded for further development and may be reconsidered at a later time for the same or other opportunities.

Category IV. Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason.

Evaluation Conclusion and Steering Committee

- Once Categorization has been completed, the Evaluation is considered complete unless any issue is questioned by a subsequent AO Steering Committee review.
- NASA will convene a Steering Committee, composed wholly of CS and IPA appointees (some of whom may be from Government agencies other than NASA), appointed by the Associate Administrator for the Science Mission Directorate.
- The Steering Committee will then review the results of the evaluations and categorizations.
- The Steering Committee conducts an independent assessment of the evaluation and categorization processes regarding their compliance to established policies and practices, as well as the completeness, self-consistency, and adequacy of all supporting materials.

Selection Process

- After the review by the Steering Committee, the sponsoring Division prepares one or more options for the selection decision.
- The sponsoring Division presents the final evaluation results and its selection recommendation to the Associate Administrator for the Science Mission Directorate, who will make the final selection(s).
- As the Selection Official, the SMD Associate Administrator may consult with senior members of SMD and the Agency concerning the selections.
- As part of the selection process, a decision will be made as to whether any Category III proposals will receive funding for technology development.

Selection Factors

A full discussion of the factors considered in the selection process can be found in AO Section 7.3. This includes the following:

- This selection recommendation is based on the proposal categorization and evaluations and is influenced by Division programmatic considerations. These considerations may be project-specific constraints (*e.g.*, accommodation, budget), strategic factors (*e.g.*, portfolio balance, enabling developments for future investigations), and other programmatic factors.
- The selection decision will take into account an ESA-performed accommodation study (with NASA input) of selectable proposals to assess the extent to which the proposed instrument/instruments is/are compatible with the Vigil spacecraft, other potential payload components, and operations, and provide the results of that study to NASA.
- The Selection Official may consider a wide range of programmatic factors in deciding whether or not to select any proposals and in selecting among top-rated proposals, including, but not limited to, planning and policy considerations, available funding, career development opportunities, programmatic merit and risk of any proposed partnerships, and maintaining a programmatic and scientific balance across SMD.
- The overriding consideration for the selection of a proposal submitted in response to this AO will be to maximize scientific and VC operational value (which includes both science and VC operational return and risk) while advancing NASA's science goals and objectives within the available budget for this program.

Observers and Transition Briefing

Observers and Transition Briefing

- Civil Servants (CSs), Intergovernmental Personnel Act Assignees (IPAs), and Contractors with downstream implementation responsibilities may be invited to attend panel meetings and Site Visits as Observers.
- All invited observers must be approved by both the SMD Program Officer and Deputy Associate Administrator for Research.
  - 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.
- Approved Observers include: (this list will be updated as Observers are approved):
  - LWS Program: Mike Delmont, Nick Chrissotimos, Joe Burt, Bob Jenkens, Bill Sluder, and Lourdes Wisniewski. Program individuals are invited due to their positions in organizations which will oversee implementation of the Selected Investigation. Their participation as Observers will provide early knowledge of any potential implementation challenges for the Selected Investigation.
  - NOAA: James Spann.
  - ESA: ~~TBD.~~ **Giuseppe Mandorlo, Erik De Witte, Massimo Palomba, Mark Dean, Vanina Ficaja, Adriano Lupi, Paolo Corradi, and Jussi Luntama. [Amended February 5, 2024]**
- After the Selection is announced, a Transition Briefing will be provided by a subset of the Evaluation Team to CSs, IPAs, and Contractors in the Program and at NASA HQ who have implementation responsibilities.

Approvals

Approval

Mr. Washito A. Sasamoto
Acquisition Manager
Science Office for Mission Assessments

Dr. Cindy L. Daniels
Director
Science Office for Mission Assessments

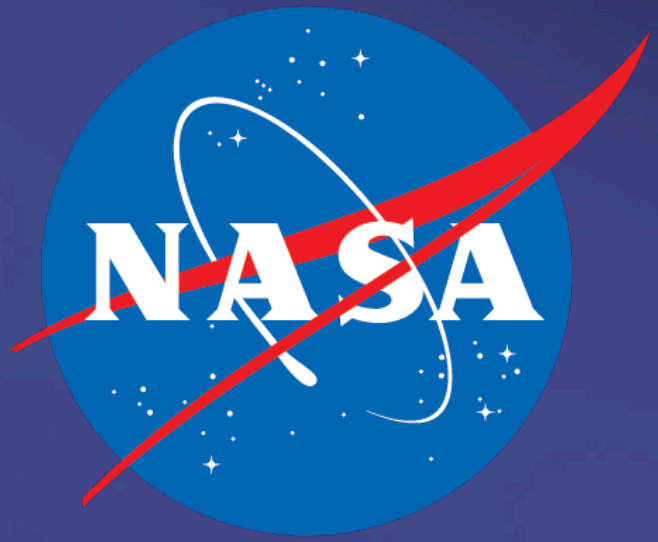
Dr. J. Daniel Moses
Program Scientist
Heliophysics Division, SMD

Ms. Margaret A. Luce
Director, Acting
Heliophysics Division, SMD

Dr. Michael H. New
Deputy Associate Administrator for Research, SMD

Change Log

Revision #	Date	Changes
Initial Release	December 19, 2023	-
A	February 5, 2024	Added Deputy PE Ursula K. Rick as a Co-Lead of the overall Evaluation Panel, as well as the Scientific and VC Operational Evaluation Panel on Slide 6.
A	February 5, 2024	Exempted the draft Mission Definition Requirements Agreement (MDRA) from the page limits in Requirement 9 on slide 48.
A	February 5, 2024	Added list of Approved Observers from ESA on slide 55.


NASA