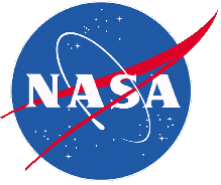


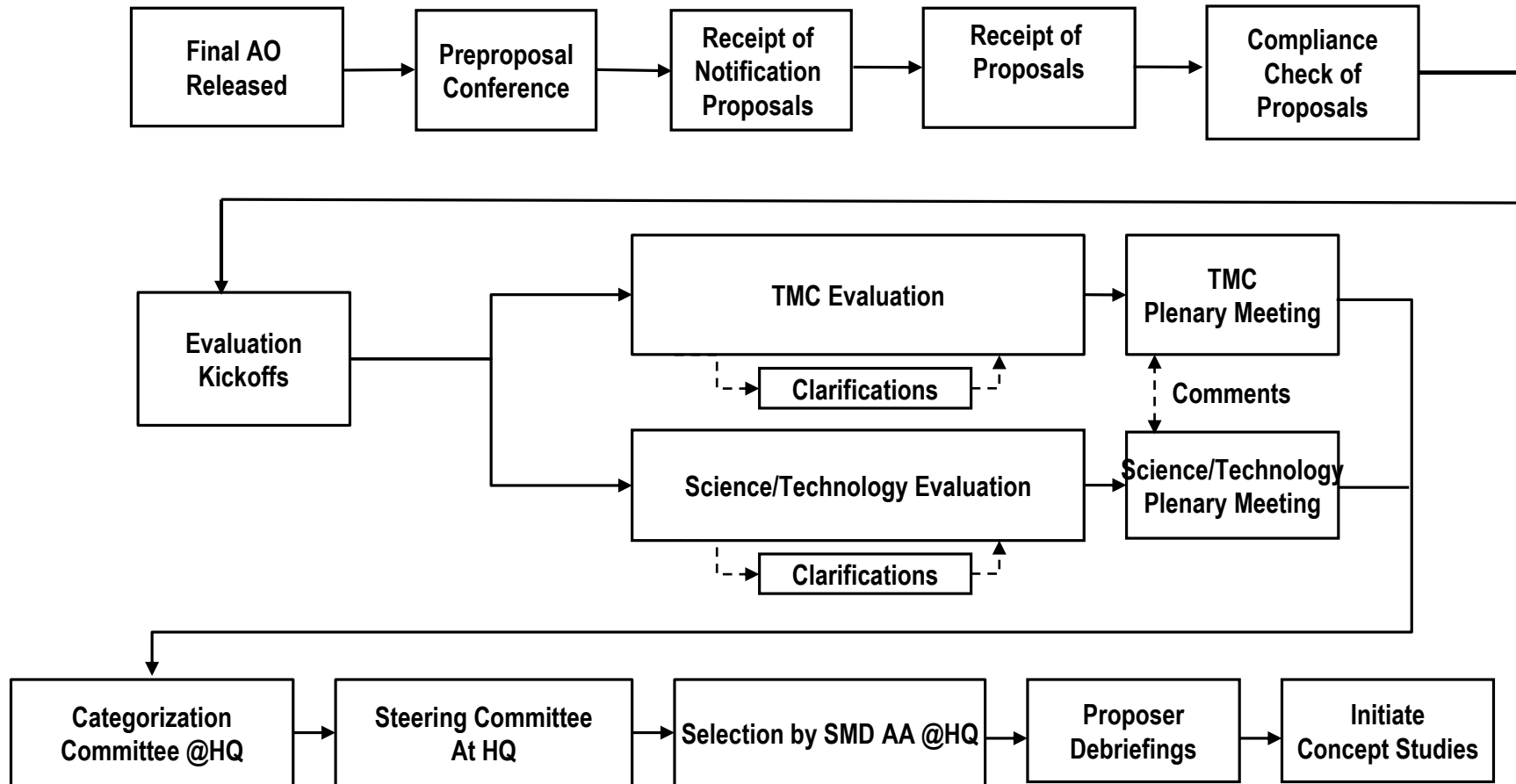
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# **2018 Heliophysics Mission of Opportunity (MO)**

## Solar Terrestrial Probes Evaluation Process

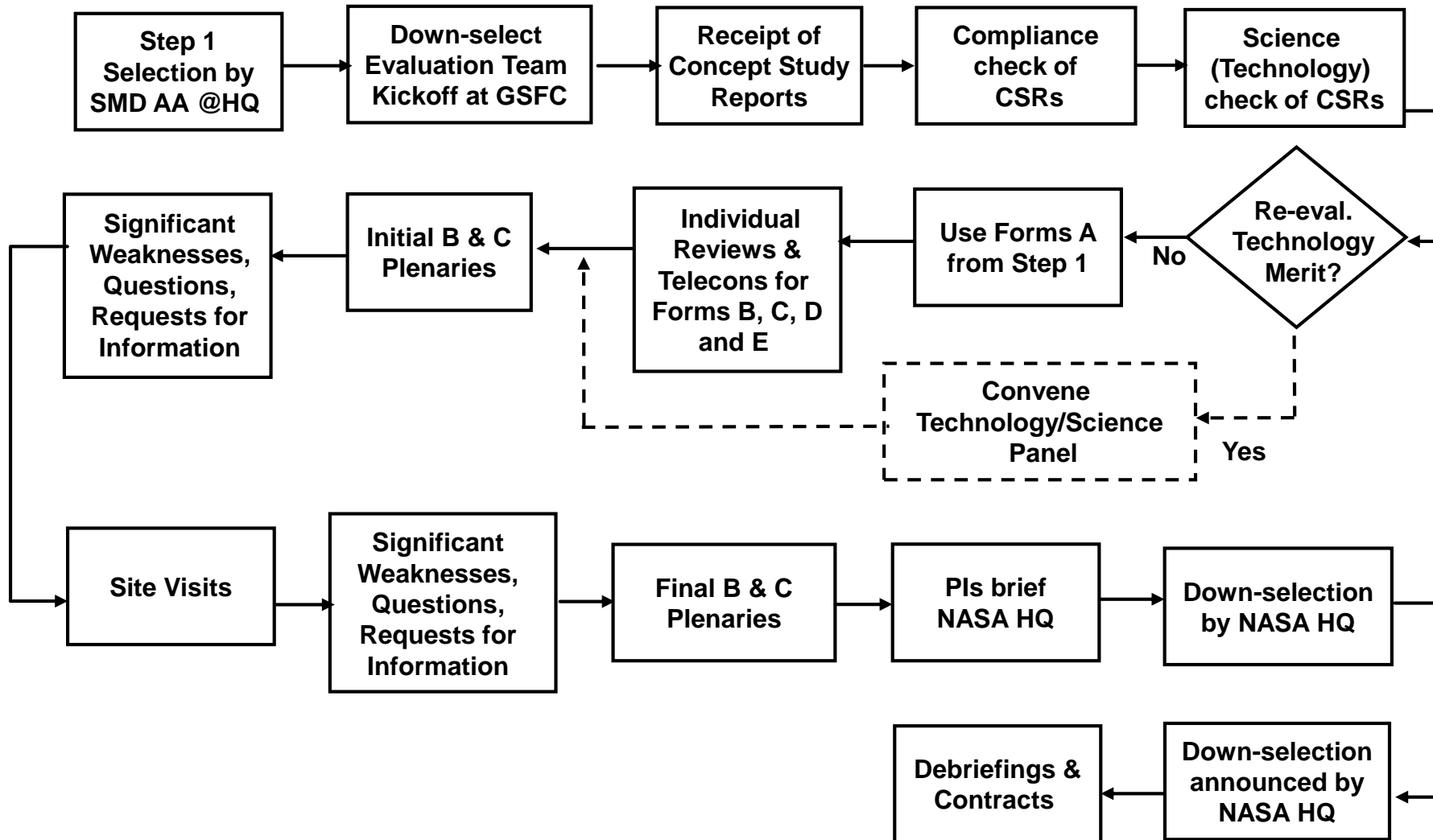


# Evaluation and Selection Overview





# What Follows Selection?





# 2018 TechDemo MO Evaluation Criteria Factors A and B

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- **Factor A: Intrinsic Technology Merit of the Proposed Investigation 40%**
  - A-1: Compelling nature, *and value* of the proposed investigation's technology goals and objectives
  - A-2: Programmatic value of the proposed investigation
  - A-3: Likelihood of technology success
  - A-4: Technology value of the Threshold Investigation
  - A-5: Merit of any Science Options (SEOs), if proposed
  
- **Factor B: Experiment Technology Implementation Merit and Feasibility of the Proposed Investigation 30%**
  - B-1: Merit of the investigation design for addressing the technology goals and objectives
  - B-2: Probability of technical success
  - B-3: Merit of the data analysis, data availability, and data archiving plan
  - B-4: Technology resiliency
  - B-5: Probability of investigation team success
  - B-6: Merit of any Science Enhancement Options (SEOs), if proposed



# 2018 Heliophysics Science MO Evaluation Criteria Factors A and B

- **Factor A: Intrinsic Science Merit of the Proposed Investigation 40%**
  - A-1: Compelling nature and priority of the proposed investigation's science goals and objectives
  - A-2: Programmatic value of the proposed investigation
  - A-3: Likelihood of science success
  - A-4: Science value of the Threshold Investigation
  - A-5: Merit of any Science Options (SEOs), if proposed
  - A-6: Merit of any PI-developed Technology Demonstration Opportunities (TDOs), if proposed
- **Factor B: Experiment Science Implementation Merit and Feasibility of the Proposed Investigation 30%**
  - B-1: Merit of the instrument and investigation design for addressing the science goals and objectives
  - B-2: Probability of technical success
  - B-3: Merit of the data analysis, data availability, and data archiving plan
  - B-4: Science resiliency
  - B-5: Probability of investigation team success
  - B-6: Merit of any Science Enhancement Options (SEOs), if proposed
  - B-7: Merit of any PI-developed Technology Demonstration Opportunities (TDOs), if proposed



# 2018 HPD MO Evaluation Criteria Factor C

- **Factor C: TMC Feasibility of the Proposed Investigation Implementation 30%**

- C-1: Adequacy and robustness of the instrument implementation plan

- C-2: Adequacy and robustness of the investigation design and plan for operations

- C-3: Adequacy and robustness of the flight systems

- C-4: Adequacy and robustness of the management approach and schedule, including the capability of the management team

- C-5: Adequacy and robustness of the cost plan, including cost feasibility and cost risk

**Note for TechDemo:**

- For TechDemo, Factors C-1 and C-3 are amended so that plans for the maturation of systems that contain the proposed technologies result in TRL 5 by PDR.
- Factor C-4 is amended to delete evaluation of the PI's spaceflight experience. The capability of the management team will be evaluated as a whole, as opposed to assessing the capabilities of each of the Key Team Members independently. Comments about the managerial experience of the PI, and whether appropriate mentoring and support tools are in place, will be made to the Selection Official but these comments shall not impact the "Technical, Management, and Cost Feasibility" rating.



# Factor A & B Evaluation Process

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- The evaluation criteria of Factors A and B were evaluated by panels of experts that are peers of the proposers
- Each proposal received at least three rounds of presentation and discussion during the science/technology plenary panel meeting
- Each proposal was assigned a primary reviewer and two secondary reviewers
- The primary reviewer was specifically selected as a subject matter expert on the topic of the proposal assigned for primary review
  - Write-in reviewers were used on an ad hoc basis



# TMC Evaluation Subfactors

- **Instruments**

- Ability to meet investigation requirements
- Design, accommodation, interface, heritage, and technology readiness
- Hardware and software designs, heritage, and margins
- Development and integration
- Systems engineering
- Environmental concerns
- New technology/advanced dev and backup plans

- **Investigation Design and Operations**

- investigation design and investigation architecture
- Spacecraft design and design margins
- Concept for operations (including communication, navigation/tracking/trajectory analysis, and ground systems and facilities)
- Launch services
- investigation resiliency (including reserves and margins, redundancy)

- **Flight Systems**

- Hardware and software designs, heritage, and margins
- Development and integration
- Spacecraft systems engineering, qualification, verification, mission assurance, launch operations
- New technology/advanced dev and backup plans
- Maturity and technical readiness

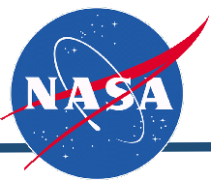
- **Management and Schedule**

- Organizational structure and WBS
- Management approach, including systems engineering
- Roles, qualification, and experience
- Commitment, spaceflight experience, and relevant performance
- Risk management approach, including risk mitigations
- De-scopes
- Contributions, including international participation, commitment, and contingency plans
- Project schedule and schedule margins
- Project and schedule management tools

- **Cost**

- Cost risk, realism, and completeness
- Basis of estimate – methods and rationale used
- Discussion of cost risks
- Cost reserves by phase
- Understanding of the scope of work
- Cost reserve adequacy and understanding of cost risks
- Proposed cost relative to TMC estimate
- Cost management tools





# TMC Evaluation Process

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- The Technical, Management, and Cost (TMC) review of criterion ***TMC Feasibility of the Proposed Investigation Implementation*** was accomplished with 1 subpanel.
- The Acquisition Manager, a civil servant at the NASA Science Office for Mission Assessments (SOMA), oversaw the process.
  - SOMA is a NASA HQ office located at NASA Langley Research Center (LaRC) and is firewalled off from the rest of LaRC.
- The subpanel was chaired by a highly experienced individual.
- TMC evaluators were a mixture of contractors, consultants, and civil servants who were experts in their respective fields.
  - Evaluators read all proposals and participated in rating all proposals.
  - Additionally, specialist evaluators were called upon when highly specific technical expertise, not otherwise represented on the panel, was needed.
    - Specialists only evaluated the relevant sections of the proposals for which their expertise was necessary.
    - Specialists only provided findings and did not participate in rating any proposals.



## TMC Evaluation Process (2)

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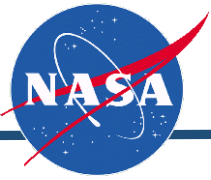
- Evaluators and specialists participated in weekly, secure, teleconferences to develop preliminary findings (strengths/weaknesses)
- Clarifications of potential major weaknesses were considered during the third round of teleconferences
- The panel met in a plenary session to finalize findings and to determine risk ratings
- Consistency checking was implemented throughout the evaluation process to ensure that all proposals were evaluated fairly and held to the same standards
- For each proposal, this process resulted in a TMC Feasibility of the Proposed Investigation Implementation adjectival risk rating (Low, Medium, or High Risk) and supporting documentation for this rating



# Intellectual Property Protection

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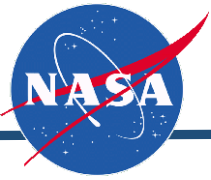
- All proposal and evaluation materials were considered proprietary
- Viewing of proposal materials was only on a need-to-know basis
- Each reviewer (except civil servants) signed a Non-Disclosure Agreement prior to any proposals being distributed to that reviewer
- Reviewers were not permitted to discuss proposals with anyone outside their review team (Technology or TMC)
- All proprietary information exchanged between reviewers was exchanged *via* the secure NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES), *via* the secure Remote Evaluation System (RES) web site maintained by SOMA, *via* the secure Science Works System maintained by SMD, *via* controlled WebEx, *via* NASA's Large File Transfer capability, or *via* encrypted email. Proprietary information was not sent via unencrypted email.



# Conflicts of Interest

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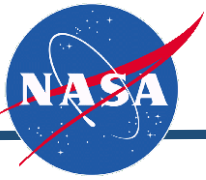
- NASA assumes responsibility for ensuring that proposals are evaluated fairly and objectively without actual or apparent conflict of interest on the part of the reviewers. It is NASA policy that NASA civil service personnel be in charge of and direct all aspects of the evaluation, categorization, and selection processes.
- Appropriate safeguards, including organizational firewalls, were implemented during the 2018 HPD MO review processes to mitigate conflicts of interest.
  - All members of the evaluation panels were cross checked against lists of personnel and organizations mentioned in each proposal to ensure no individual or organizational conflict of interest existed.
  - Reviewers were personally responsible for identifying and calling to the attention of the Responsible Program Scientist any conflicts of interest situations. All reviewers were required to divulge whether they had any financial, professional, or personal potential conflict of interest.
- Specific rules for addressing personal or institutional conflicts of interest are defined by SMD Policy Document, SPD-01A, Handling Conflicts-of-Interest for Peer Reviews.



# Categorization

<b>CATEGORY I</b>	Well-conceived and scientifically and technically sound 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 data that 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.
<b>CATEGORY II</b>	Well-conceived and scientifically <u>or</u> technically sound investigations, which are recommended for acceptance, but at a lower priority than Category I.
<b>CATEGORY IV</b>	Proposed investigations that are recommended for rejection for the particular opportunity under consideration, whatever the reason.
<b>CATEGORY III</b>	Scientifically or technically sound investigations, which require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities.

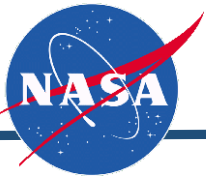
- Only Category I investigations were recommended for selection.



# Steering Committee

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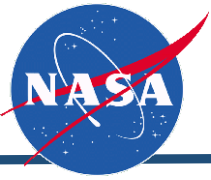
- An *ad hoc* **AO Steering Committee** reviewed the results of the evaluations and categorizations. The AO Steering Committee conducted an independent assessment of the evaluation and categorization processes regarding their compliance to established policies and practices, as well as the completeness, self-consistency, and adequacy of all supporting materials
- The Steering Committee found that all rules, procedures and practices had been followed
- The Steering Committee accepted the Categorizations by the Categorization Committee



# Selection

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- Selection Official: Associate Administrator for SMD
- The SMD Science Management Council, sitting as a selection board in accordance with its charter, included the Deputy Associate Administrators, SMD Division Directors, and representatives from Office of the General Counsel, Office of the Chief Engineer, Office of Procurement, and Office of International and Interagency Relations.
- Selection Factors include
  - Evaluations and categorization rationales
  - Other programmatic factors (e.g. balance, funding, policy)



# Finding Definitions

## Factor A&B

**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 project to meet its technology objectives.

**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 merit.

**Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technology objectives.

**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 merit.

## Factor C

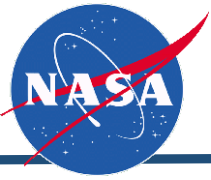
**Major Strength:** A facet of the implementation response that is judged to be well above expectations and can substantially contribute to the ability of the project to meet its technical requirements on schedule and within cost.

**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.

**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 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.





# Factor A&B Ratings

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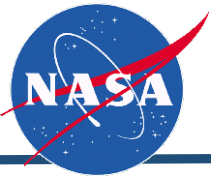
**Excellent:** A comprehensive, thorough, and compelling proposal of exceptional merit that fully responds to the objectives of the AO as documented by numerous and/or significant strengths and having no major weaknesses.

**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 or research or lack of focus on the objectives of the AO).



# TMC Risk Definitions

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**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