Requirements: Perception and Reality

JPL Inputs to the AO Simplification Activity

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Requirements Perception

- Proposal requirements contained in AOs (and supporting appendices and documents)
  - Discovery, Mars Scout, and SMEX each contain roughly 1000 individual requirements
  - Includes ancillary documents
- Many are not germane to the stated selection criteria:
    - The scientific merit of the proposed investigation
    - The scientific implementation merit and feasibility of the proposed investigation
    - The feasibility of the proposed approach for mission implementation, including cost risk (i.e., realism and reasonableness of cost)
- Plethora of requirements translates to additional work for both proposers and reviewers
- How can the requirements burden be reduced?

Align Requirements With Selection Criteria (1)

- Issue:
  - Growth in the number of required proposal elements that aren't absolutely essential to evaluating the Step 1 evaluation criteria
  - Non-essential information is valuable in the overall context of a mission but is not necessary to make a selection
  - Requires enormous resources to prepare
- Suggested Solution(s)
  - Eliminate requirements for proposal materials that are not required to make a selection based on published selection criteria
  - Applies to both Step 1 and Step 2
  - See next chart for Step 1 details

Align Requirements With Selection Criteria (2)

- Suggested Solution(s)
  - Eliminate non-essential Step 1 proposal requirements
    1. Education and Public Outreach
    2. Small Disadvantaged Business Plans
    3. Technology Transfer and Infusion
    4. Assembly, integration, and test flows (the approach to AI&T is appropriate, but not the details)
    5. Environmental test philosophy (test flow and sequence, test margins, and test durations)
    6. Product and mission assurance activities
    7. Statement of Work appendix
    8. Compliance with Federal Procurement Regulations for NASA PI appendix
    9. Summary of Proposed Contributions appendix
    10. Discussion of Compliance with U.S. Export Laws and Regulations appendix
    11. Outline of Technical Responsibilities Between U.S. and International Partners appendix (although foreign contributions should be explicitly identified)
    12. Communications Link Budget Design Data appendix
  - Development could be postponed until Step 2 without affecting selection
  - Items 1, 2, and 3 could be included in the "Certifications" appendix of the AO
    - Ex.: "By signing the proposal, the PI certifies that he/she is committed to implementing E/PO, SDB, and Tech Transfer plans, the details of which will be described in Step 2."
  - Items 4, 5, and 6, are important, but not essential to the evaluation criteria
  - Items 7-12 are all required appendices, and could be postponed to Step 2

Separate Selection From Procurement

- Issue:
  - AOs and proposals currently serve two separate, but related purposes
    - Selection (based on stated selection criteria)
    - Procurement (based on FARs and NASA FAR Supplement)
  - Significant proposal resources are devoted to procurement without the assurance of passing the selection gate
- Suggested Solution(s):
  - Completely separate the selection and procurement processes for both Step 1 and Step 2
  - Postpone procurement-related items until after selection:

    Step 1
    - "Statement of Work" appendix
    - "Compliance with Federal Procurement Regulations for NASA PI" appendix
    - "Summary of Proposed Contributions" appendix

    Step 2
    - Cost element breakdowns
    - Time-phased costs of cost element breakdowns
    - Submission and certification of Phase B cost or pricing data
      - Note: Certified cost and pricing data for Phase A is not required. Instead, this is required only *after* selection for Step 2.

Simplify Cost Requirements

- Issue:
  - The costing landscape (constraints, guidelines, requirements, and evaluation) introduces much complexity to proposal development
- Suggested Solution(s):
  - Revamp Step 1 cost requirements to be commensurate with the level of detail that is known about the mission in pre-phase A
  - Express cost caps in RY$ only
  - Eliminate or simplify funding profile requirements
  - Explicitly define cost terminology
  - Eliminate requests for **optional** cost data (MEL, WBS, WBS dictionary, costed WBS, and BOE details)
  - Replace “pseudo-WBS” cost table with time-phased, costed WBS (consistent with the NASA standard WBS)
  - Eliminate the inappropriate use of S-curves
  - Similar recommendations for Step 2
  - Hold an “AO Cost Simplification” workshop

Reduce/Reset Reviewer Expectations

- Issue:
  - Amount of detail expected in proposals increases with each AO
  - Level of expected detail is incommensurate with
    - Maturity of the mission concept as then understood
    - Funding spent to date developing the proposal
- Suggested Solution(s):
  - Assume that the proposer is the expert on the mission
    - Proposer gets the benefit of doubt
  - Don't verify every single technical claim presented in the proposal; instead, rely on demonstrated institutional capabilities
  - Focus on cost accuracy (and reserves) over cost precision
  - Bin proposals into three categories:
    - (1) doable, (2) maybe doable, or (3) not doable
    - (1) and (2) are acceptable for moving on to Step 2
  - Remind reviewers that:
    - Actual funding spent in Step 1 (pre-Phase A) and Step 2 (Phase A) is much less than standard Phase A guidelines (~10-15% of TMC)
    - Proposals are page limited; many details may be known but could not be included for lack of space
    - Proposers are "*proposing to do*", not "*doing*"

Introduce Repeatability to Science Evaluations

- Issue:
  - Science evaluations from AO to AO are uneven
  - Resubmissions receive inconsistent reviews
- Suggested Solution(s):
  - Increase the number of science reviewers to get better statistics
  - Further limit the number of Co-Is to increase size of the reviewer pool
    - Also use more non-US reviewers
    - ITAR
  - Allow proposers to formally claim “heritage” from a previous submission
    - Formal linkage to previous submissions to highlight inconsistent reviews
  - Increase Program Scientist and/or panel chair oversight
    - Reconcile review differences from previous submissions
    - Eliminate specious review comments

Allow for Interactions with Reviewers in Step 1

- Issue:
  - Proposals consist of very technical and complicated information
  - Review constraints
    - Limited (technically and in numbers) reviewers
    - Page-count limitations
    - Time limitations
  - Potential for overlooked or misunderstood information presented in proposals
  - Can result in mistakenly attributed weaknesses
- Suggested Solution(s):
  - Develop a process to allow interactions between proposers and reviewers to validate review major weaknesses *prior* to categorization
    - Must be simple, quick, and minimize reviewer workload
    - Must limit classes of responses
    - Must not allow for introduction of new, non-clarifying material
    - Similar to peer review process for journals
  - Note: AOs currently state
    - "Proposers should be aware that, during the 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 shall be in writing."
  - NASA should make proactive use of this clause
    - Will help avoid potential procurement issues

Additional Recommendations

- Increase page allocations
  - Allow variable allocation for Multi-element Flight Systems
- Allow flexibility in the number of foldouts
- Simplify requirements for LOEs/LOCs for Co-Is and foreign contributors
- Establish minimum qualifications for science reviewers
  - Must have relevant (e.g., target body) expertise
- Relax conflict of interest (COI) constraints for technical reviewers to acquire appropriate reviewer expertise
  - Relax institutional COIs, not individual COIs

Summary

- Overall, the AO process is a good process
  - Suits the needs of both NASA and the science community
  - Process is not broken, but the trend in AO requirements growth and inconsistencies is not encouraging
- Science traceability is the foundation of the AO process and should not be touched
- Mid-course correction is probably overdue
  - Align requirements with selection criteria
  - Separate selection from procurement
  - Simplify cost requirements
  - Reduce/reset reviewer expectations
  - Introduce repeatability to science evaluations
  - Allow for interactions with reviewers in Step 1