



# AO Lessons Learned Workshop

## Suggestions for Tailoring the AO Process

Orbital Sciences Corporation  
Dulles, Virginia

Rob Fulton  
Vice President, Business Development  
Science & Technology Programs  
Space Systems Group

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[fulton.rob@orbital.com](mailto:fulton.rob@orbital.com)

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# The Challenge

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- AO Process Has Been Successful in Picking Missions with Excellent Science
- But Almost All Have Been Nearly At the Cap and Several Have Had Cost Overruns
- Cost Control Is More Important Than Ever
  - Key to Maintaining Healthy Flight Rate in Flat Budget Era
- What Can We Do to Improve Process to Achieve Better Cost Performance?

# Existing Process Is Evolving

- Past AO's Have Generally Used Two Step Process

- Step 1 Emphasizes Science, Step 2 Emphasizes Implementation
- Evaluation Weightings Provide Strong Positive Incentive (Carrot) to Include As Much Science As Possible

- More Science Means More Points

- Incentives to Stay Within Cost Are Negative (Sticks)

- Risk of TMC Major Weaknesses
  - Threat of Cancellation
  - Stronger Guidelines for Schedule Reserves
  - Cost Reserve Guidelines Become Requirements
  - Increasing Minimum Acceptable Levels of Cost Reserves

	Mars Scout 2006		SMEX 2007
	AO Selection	CSR Downselect	AO Selection
Scientific Merit	40%	25%	25%
Scientific Implementation Merit and Feasibility	30%	25%	25%
Mission Implementation Feasibility and Cost Risk	30%	50%	50%

- SMEX AO Changed Step 1 Weighting

- Same as Mars Scout Step 2 => More Detail for TMC => Greater Proposal Cost
  - Is This Trend What We Want?

## Alternate Approach (1)

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- Give Points for Being Well Within the Cost Cap
  - Provides Positive Incentive for Mission Teams to Keep Science Focused and Within the Cap
  
- Return to Concept of Step 1 as Science Screen and Step 2 as Implementation Screen
  - De-Emphasize TMC in Step 1 While Increasing Science Focus
    - Emphasize First Order Feasibility and Cost Realism Assessment
    - Streamline Amount of Implementation Data Required => Less Effort to Generate and Evaluate Proposals

## Alternate Approach (2)

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- Return to Concept of Step 1 as Science Screen and Step 2 as Implementation Screen
  - Mitigate Risk of Phase A Failures through Step 1 Features such as:
    - Detailed Science Review
    - Counting on Mission Teams to Be More Conservative Because They Are Motivated by the New Cost Incentive
    - Relying on Experience and Sound Judgment of TMC Reviewers for Assessment of Implementation Feasibility and Cost Realism
    - Adding Evaluation of Relevant Experience and Past Performance
      - Good Indicator of Team's Ability to Execute Mission
    - Creating Opportunity for Evaluation Team to Ask Questions to Clarify Proposal
      - Improves Quality of Evaluation
      - Lowers Risk of Rejecting a Good Mission due to Misunderstanding
  - Transition in Step 2 from Emphasis on Science Merit to Implementation Feasibility
    - If Science Does Not Change, It Is Not Re-evaluated, So Why Award Any Points?
    - If It Does Change, Perhaps Penalize By Subtracting Points?

## Alternate Step 1 Proposal Format

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- Consider Viewgraph Format for Step 1 Proposals
  
- Submit Proposal Body in Viewgraph Form
  - Including Science Investigation, Mission Implementation, Management, Schedule, Cost and Cost Estimating Methodology
  - Submit Required Appendices in Current Form
  
- Evaluation Committee Performs Initial Screen
  
- Category 1 (and 2?) Mission Teams Present Viewgraphs to Evaluation Committee
  
- Advantages
  - Easier and Cheaper to Prepare Viewgraphs
  - Oral Presentation Improves Evaluator Understanding of Concept, Minimizes Risk of Misunderstanding and Incorrect Evaluation

## Other Step 1 Streamlining Opportunities

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- Defer Some Topics to Phase A, If Not Critical to Evaluating Mission Value or Feasibility
  - Small Disadvantaged Business Plan
    - At Step 1, Generally Just Acknowledge the Requirement Exists
  - EPO
  - Orbital Debris Appendix
  - WBS and WBS Dictionary
    - Small Value Added: Costs Are Proposed Using NASA's WBS
  - Heritage Appendix
    - Very Detailed Information, More Suited for Phase A
    - Instead Require a Master Equipment List Which Contains Flight Heritage and TRL
- 2007 SMEX AO Required All Launch Vehicle Questions to Go Through NASA HQ
  - Timely Performance Data is Often Critical for Proposal Teams
  - But Answers Sometimes Took Weeks
  - Suggest HQ Allow Direct Interface with KSC to Allow Quicker Answers
- Electronic Proposal Submission
  - Printing and Delivering Hard Copies Is Costly and Time Consuming
  - Recent Proposals Have Cost \$20,000 to \$50,000 to Reproduce
  - Electronic Proposal Submission in Place at GSFC RSDO

## Conclusions

- Current AO Process Has Been Effective in Selecting Scientifically Rewarding, Innovative, Cost-Effective PI Mode Missions
  
- It Can Meet the Challenge of Tighter Cost Control Through
  - Returning to Concept of Step 1 as Science Screen and Step 2 as Implementation Screen
  - Rebalancing of Proposal Scoring to Reward Cost-Conscious Missions
  
- AO Process Can Be Strengthened by Allowing Evaluators to Ask Clarifying Questions of Proposal Teams
  
- AO Process Can Be Simplified by Tailoring Format and Data Requirements