

National Research Council Assessment of NASA's Meteoroid and Orbital Debris Programs

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Introduction

On April 26, 2010, NASA requested that the NRC conduct a study to:

- **Review NASA's existing efforts, policies, and organization with regard to orbital debris and micrometeoroids, including efforts in the following areas:**
 - Modeling and simulation;
 - Detection and monitoring;
 - Protection;
 - Mitigation;
 - Reentry;
 - Collision assessment risk analysis and launch collision avoidance;
 - Interagency cooperation;
 - International cooperation;
 - Cooperation with the commercial space industry.
- **Assess whether NASA should initiate work in any new orbital debris or micrometeoroid areas.**
- **Recommend whether NASA should increase or decrease effort, or change the focus of, any of its current MMOD efforts (within a fairly constrained budget) to improve the office's ability to serve NASA and other national and international activities.**



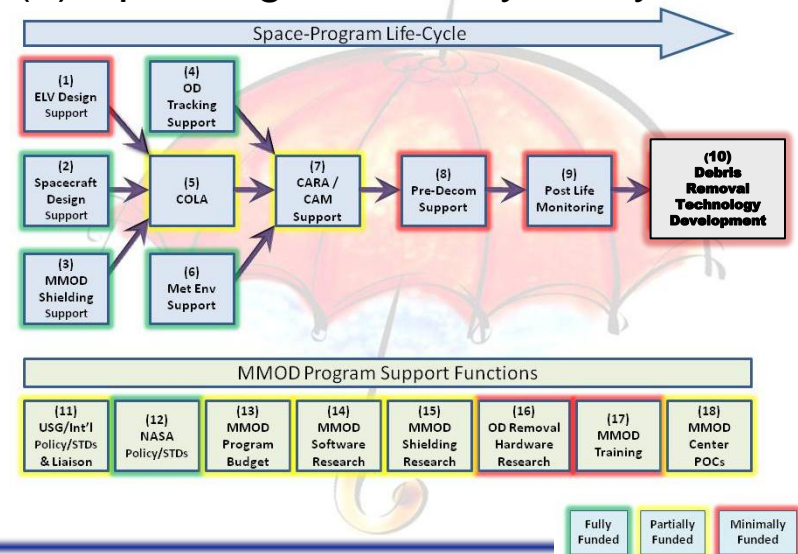
Review Committee Findings and Recommendations (by category)

• Findings (32)

- Recurring (4 or more citations)
 - (9) Model improvements
 - (5) Improve Interagency Coordination
 - (5) MMOD Management
 - (4) Reduce Uncertainties
- Individual (3 or less citations)
 - Improve Radar Measurements
 - Program Resources
 - Focus on Risk Integration
 - Spaceflight Anomaly Analysis
 - Active Debris Removal

• Recommendations (24)

- (7) Improve Models & Updates
- (6) Interagency Coordination
- (6) Reduce Model Uncertainties
- (2) Active Debris Removal
- (1) Review MMOD Management
- (1) Develop MMOD Strategic Plan
- (1) Spaceflight Anomaly Analysis

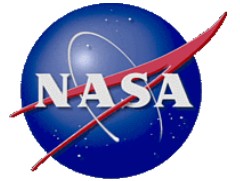




Summary

- **NASA appreciates the efforts of the NRC and the Review Committee to evaluate NASA's Micrometeoroid and Orbital Debris (MMOD) Program.**
 - NASA commends the NRC in assembling an outstanding Review Committee of professionals.
 - The NRC Review Committee's report provides NASA with an excellent independent view of current NASA's MMOD efforts.
- **NASA is evaluating the Findings and Recommendations in the Review Committee's Report to develop a strategy to improve NASA's MMOD efforts in technical, outreach, and administrative areas.**
 - Currently, NASA's Office of Safety and Mission Assurance is implementing the Review Committee's Recommendation to develop a NASA Strategic Plan for MMOD efforts.
 - The NASA Strategic Plan for MMOD efforts will need to take into account the current environment of decreasing Agency budgets and limited staffing.

NASA is committed to protecting unique national assets and protecting the fragile space environment for future generations.



**Thank You for your support to
NASA's MMOD Program!!**

Questions?