NASA Office of Safety and Mission Assurance

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OSMA Overview

• **Mission:** “The Office of Safety and Mission Assurance (OSMA) provides policy direction, functional oversight, and assessment for all Agency safety, reliability, maintainability, and quality engineering and assurance activities and serves as a principal advisory resource for the Administrator and other senior officials on matters pertaining to safety and mission success” [NPD 1000.3]

• **Objective:** Ensure effective management of NASA programs and operations to complete the mission safely and successfully [NASA 2014 Strategic Plan]

• The Office of Safety and Mission Assurance represents one of three Technical Authority areas: Engineering, SMA, Health and Medical.
NASA Office of Safety and Mission Assurance Initiatives
Independent Verification and Validation (IV&V) Program Cybersecurity

• Develop industry-leading cybersecurity tools and processes

• Promulgating capabilities to design security into new mission architectures
  • Vulnerability assessment, penetration testing, code analysis

  – Enhance understanding by software developers and assurance personnel
  • Information about today’s top exploits
  • Guidelines, tools, resources, and requirements for secure coding
Risk Acceptance (RA)

- Strengthen risk acceptance policies to improve accountability
- Expand on existing risk management requirements
  - Development and documentation of rationale
  - Consideration of alternatives
  - Single signature risk acceptance
  - TA concurrence
- Completing update of risk management directive (NPR 8000.4)
Orbital Debris Environment Characterization

• Fill a key data gap on millimeter-sized debris objects in the range of 700-1000km
  – Pursuing space-based measurements
  – Highest risk to critical satellites (observation, weather)
• Needed for a high-fidelity environment model
  – to support shielding designs
• Exploring flight opportunities for sensor suite
  – Impact detection technologies developed during past 10 years
Output of Space Debris Sensor Simulator
Safety Culture (SC)

• Improve SC via assessment, education, engagement, and guidance
  – Based on five-factor model

• Activities include
  – Ongoing SC surveys and responses at the Centers
  – Training of the NASA workforce during onboarding
  – Targeted organizational safety assessments
  – Issuance of the safety culture handbook
Policy Changes (Complete or Imminent)

• Human Rating Requirements directive (NPR 8705.2)
  – Updates and clarifications based on Constellation/ESD/CCP experiences
• Orbital Debris directive (NPR 8705.6)
  – Reformulation of responsibilities and procedural requirements
• Workmanship standards (NS 8739.1/4/6)
  – Significant technical updates and corrections
  – Details at http://sma.nasa.gov/sma-disciplines/workmanship
• Mishap Investigation (NPR 8621.1)
  – Modification of endorsement and release processes
Summary/Conclusions
BACKUP
## Major Programs and Functions

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<th>MSD (HQ)</th>
<th>SARD (HQ)</th>
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| - Center and Mission Directorate liaisons  
- Safety and Mission Success Reviews  
- NASA Safety Reporting System  
- Annual Operating Agreement reviews | - SMA discipline and program leadership  
- Assessment of SMA capabilities and needs  
- SMA standards and directives management  
- Research, development and test programs  
- Program/project technical reviews  
- Agency-level discipline working groups  
- Safety culture assessments |

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<th>NSC (Cleveland, OH)</th>
<th>IV&amp;V (Fairmont, WV)</th>
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| - SMA Technical Excellence program  
- Mishap investigation program support  
- SMA knowledge management program  
- SMA audits and assessments | - Independent technical analysis of safety and mission critical software products  
- Software SMA support  
- Cybersecurity and information assurance  
- Independent testing  
- Software Assurance Research Program (SARP) management |
SMA Delegated Programs

• Located at centers, provide technical leadership for various SMA discipline areas:
  – Micrometeoroid and Orbital Debris Program (MMOD)
  – Non-Destructive Evaluation Program (NDE)
  – NASA Electronic Parts Program (NEPP)
  – Workmanship Program
  – ELV Payload Safety Program
  – Range Safety Program
  – Software Assurance Research Program