Enterprise SMA Division Role in the NASA Safety Program

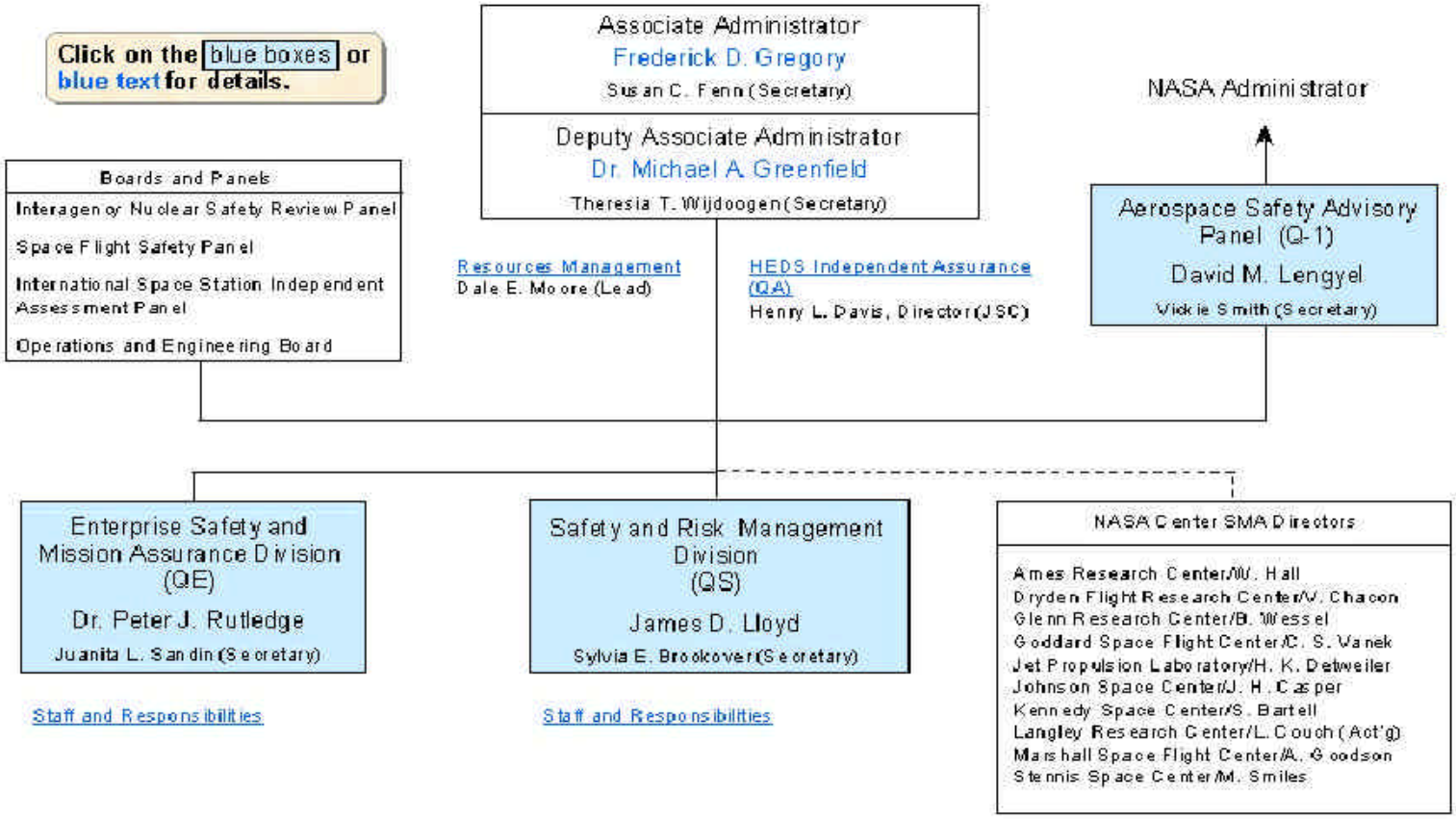
Safety Directors' Meeting

March 20, 2001

Pete Rutledge, Ph.D.
Code QE
Office of Safety and Mission Assurance

OSMA Organizational Chart

Office of Safety and Mission Assurance (Code Q)



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Code QE Mission

The Enterprise Safety and Mission Assurance Division

- **contributes to an increased probability of safety and success**
- **for all NASA missions**

by

- **facilitating the implementation planning,**
- **overseeing the execution,**
- **and evaluating the performance of safety and mission assurance (SMA) and related processes**
- **for NASA's strategic enterprises.**

Code QE Goals

- SMA Annual Operating Agreement (AOA).
  - Develop, maintain, or improve implementation planning;
  - identify gaps; and
  - assist in resolving shortfalls in SMA processes at all NASA centers.
- Program and Process Surveillance.
  - Continuously perform Headquarters-level oversight for the design and operation of major NASA programs; e.g.,
    - Space Shuttle,
    - International Space Station,
    - X-programs, and
    - science missions.
  - Assure implementation of NASA policy and SMA processes meets Agency and Enterprise expectations.

Code QE Goals

- **Independent Assessment (IA).**
  - **As needed, conduct independent assessments of programmatic and technical issues that have a bearing on the safety and success of NASA missions as an aid to Agency and Enterprise decision-making.**
- **Process Verification (PV).**
  - **Conduct periodic evaluations of the performance (including recommendations for improvement) of safety and mission assurance processes at all NASA centers.**
  - **Combine this with special assessments and continual insight to ensure that center SMA processes meet OSMA and Enterprise expectations.**

Code QE Goals

- **Risk Management (RM).**
  - **Develop and maintain the Agency infrastructure needed to support program/project risk management and risk-based decision-making; i.e.,**
    - **policies, procedures, guidelines, methods, tools, and training.**
  - **Monitor and assess the implementation of risk management by NASA programs and projects.**

Code QE Staff Members

• Card, Mike	AOA, JSC
• Hill, Bill	Space Shuttle, HEDS, KSC
• Martin, Pat	Space Science, JPL
• Mielec, Roger	ELVs, MSFC, SSC
• Moyer, Ron	Risk Mgt, 7120, QE budget
• Napala, Phil	PV, Earth Science, GSFC
• Newman, Steve	IA, PBMA
• Patrican, Rich	ISS
• Richardson, Pam	Aero, ARC, DFRC, GRC, LaRC
• Sandin, Juanita	Sec'y
• Stamatelatos, Michael	PRA
• Wander, Steve	IA, PBMA, X-vehicles
• White, Gil	ISS

Annual Operating Agreement (AOA)

- Annual requirement--due to HQ by Oct. 1
- Agreement between SMA Director & Center Director
- SMA products & services per 8700.1 to support customers
- Identifies “shortfalls”
- SMA metrics
- OSMA gap analysis (QS/QE)
- AA, OSMA <u>concurs</u>
- Enterprise AA <u>approves</u>
- Mike Card, QE, is lead

Negotiate shortfalls

Process Verification (PV)

- Based on (not limited to) AOA processes
- All centers, including HQ
- 2 year cycle
- OSMA (QE/QS) review team + center personnel
- QE/QS director chair the review alternately
- 5-day stay time
- Outbrief to Center Director
- Written report in 30 days
- Corrective action reporting not required
- Phil Napala, QE, is lead

Independent Assessment (IA)

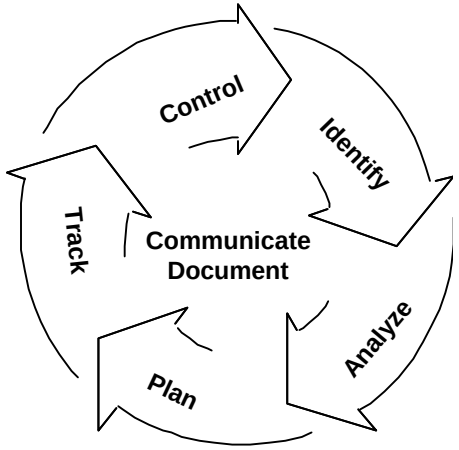
- QE/QS core team
  - Steve Newman, QE, Lead
  - Steve Wander, QE
  - Claude Smith, QS
- Assess programmatic issues; e.g.,
  - Shuttle ground processing
  - X-33, X-34, X-37, X-38
  - Code S/Y space mission concept formulation process
  - ELVs
- Convert lessons learned from IAs to best practices
  - Process-Based Mission Assurance (PBMA)
    - Great Web site just starting-- https//neptune.hq.nasa.gov/pbma

Program & Process Surveillance

- Day-to-day insight & oversight (and processes to establish SMA mission confidence)
  - Space Shuttle (Prelaunch Assessment Review (PAR))
    - Bill Hill
  - International Space Station (Joint PAR)
    - Rich Patrican
    - Gil White
  - Science Missions (Integrated Mission Assurance Review (IMAR))
    - Pat Martin
  - ELVs
    - Roger Mielec

Risk Management & Risk Assessment

- **Risk Management**
  - Risk Management content of NPG 7120.5
  - Continuous Risk Management (CRM) training course
  - SOLAR risk management training modules
  - NPG 8705.X, Risk Management
- **Risk Assessment**
  - Build agency capability in PRA
  - PRA awareness training
  - PRA methodology training
  - PRA Procedures Guide
  - PRA policy
  - PRA software applications & training; i.e., SAPHIRE, QRAS



QE Budget--Technical Projects (RTOPs)

- 323-48 Risk Management
- 323-50 Risk Assessment
- 323-71 Mission Assurance Project Applications
- 323-72 Failure Detection & Prevention
- 323-74 Cost Benefit & Management Studies
- 323-75 Human Reliability
- 323-99 Human Space Flight

Ron Moyer, QE, is primary POC

OSMA Enterprise & Center POCs

- **Enterprises**
  - Human Space — Code M — Bill Hill
  - Aeronautics — Code R — Pam Richardson
  - Space Science — Code M — Pat Martin
  - Earth Science — Code Y — Phil Napala
- **Centers**
  - ARC — Pam Richardson
  - DFRC — Pam Richardson
  - GRC — Pam Richardson
  - GSFC — Phil Napala
  - JPL — Pat Martin
  - JSC — Mike Card
  - KSC — Bill Hill
  - LaRC — Pam Richardson
  - MSFC — Roger Mielec
  - SSC — Roger Mielec

Policy, Procedures, & Standards Development

- QE becoming increasingly involved in development of SMA policies, procedures, and standards; e.g.,:
  - NPG on SMA roles in human space flight
  - SMA policy for ELVs, spacecraft, and instruments
  - SMA roles and responsibilities for ELVs
  - NPG on SMA in science mission requirements
  - NASA-STD on science mission classification
  - SMA roles and responsibilities for spacecraft and instruments
  - Design criteria for X-vehicles
  - PRA policy
  - NPG on risk management
- QE works with QS on other SMA document development

QE's Relevance to NASA Safety Program

- AOA--includes center safety products & services vs. resources; shortfalls; metrics
- PV--evaluates center safety processes
- IA--in most cases, safety is primary focus
- Program Surveillance--safety is primary focus
- RM--safety is one important type of risk to be managed
- RA--safety is the most-often assessed risk
- QE budget--can support safety in a number of areas; e.g., risk management/assessment, human reliability, human space flight
- Enterprise/Center POCs--facilitate communication on all matters among enterprises, centers, and OSMA
- SMA document development--including safety