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# **NASA GODDARD SPACE FLIGHT CENTER SUPPLY CHAIN MANAGEMENT**

## **A High Level Look at Risks and Opportunities**

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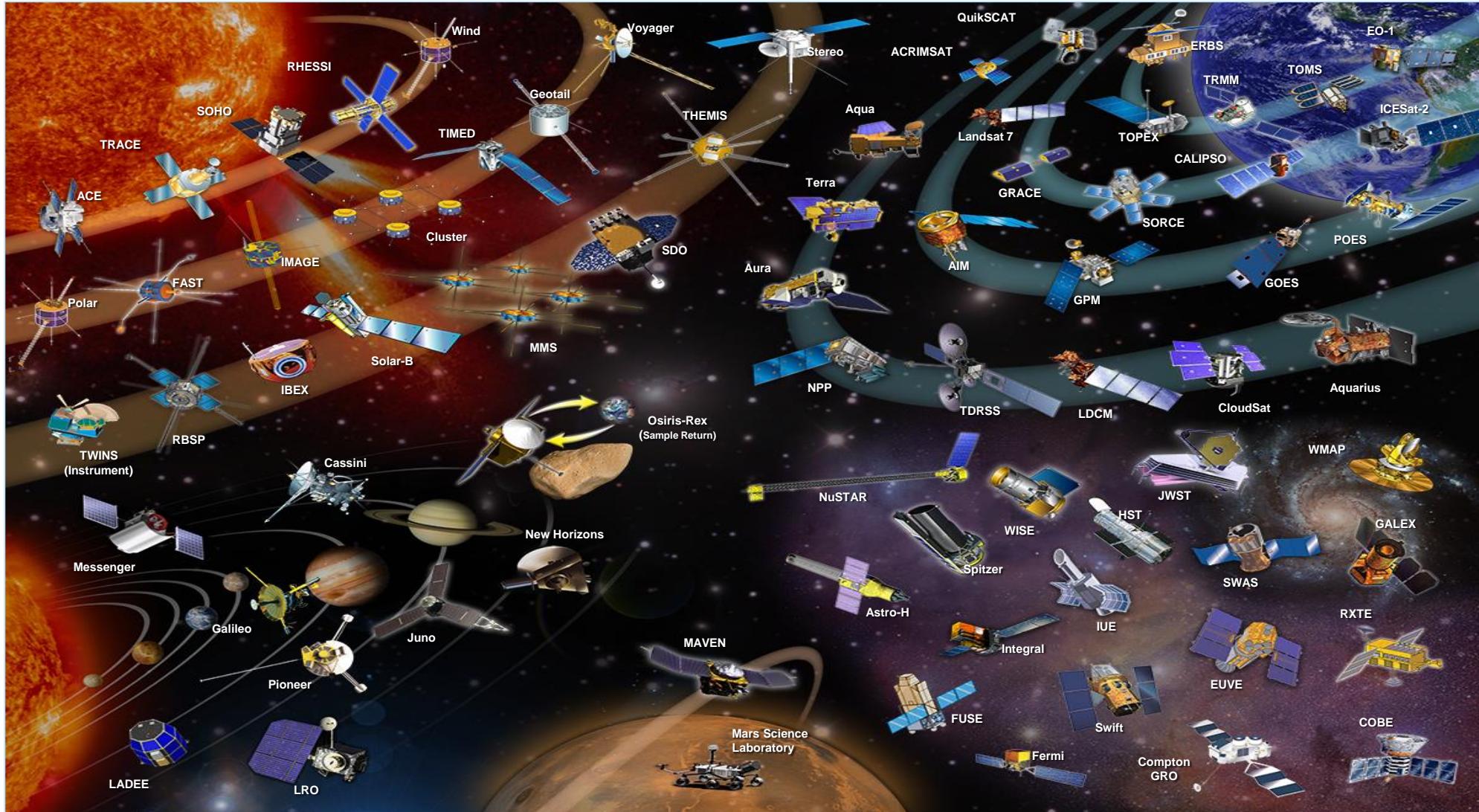
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## **NASA Goddard Space Flight Center (GSFC) Diverse Mission Portfolio**

- **GSFC is a mission focused organization that has a strong successful history of missions, projects and instruments in space and earth science, and communications and technology missions.**
- **At GSFC we manage, build, and procure spacecraft, instruments, spacecraft components, material and electronic components in order to produce successful spaceflight missions.**

# NASA GSFC Diverse Mission Portfolio

## Requires an Extensive Supplier Base

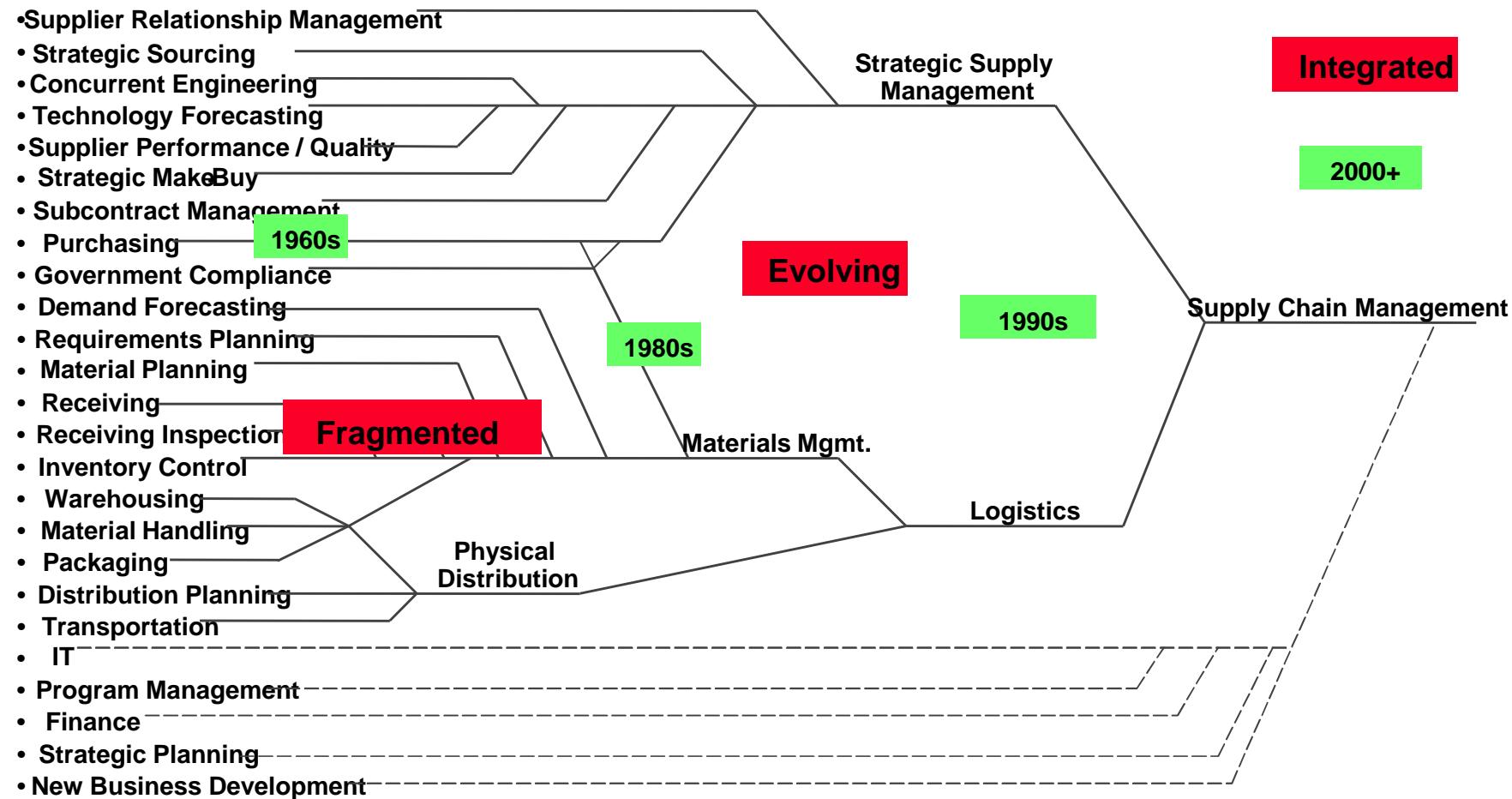




## Evolution of Supply Chain Management at GSFC

- GSFC performs many functions in support of the supply chain in order to accomplish each project or mission. Since we both manage and build spacecraft, we act as customer, stakeholder, supplier and manufacturer in the supply chain management process.
- Organizations at GSFC that support the supply chain process include the New Opportunities Office, the Procurement Operations Division, the Information and Logistics Management Division, the Flight Projects Directorate, the Applied Engineering & Technology Directorate, the Safety & Mission Assurance Directorate, and other organizations.
- Currently, the Supply Chain Management function at GSFC does not operate in an end-to-end integrated fashion except through supporting an individual flight project.
- An information based and end-to-end integrated supply chain management process could contribute toward bringing efficiencies and better outcomes throughout the supply chain management activity.

# Evolution of Supply Chain Management (Simplified Model)





# A High-Level Perspective of GSFC Supply Chain Management

- Supply Chain Management can be broken down into four core functions. Category 1 is Supplier Development and Relationship Management. In this category we lay the ground work for partnerships and future supplier relationships as well as maintaining current relationships.
- Category 2 is Supplier Selection. Strategic Make/Buy decisions are made at the Agency level in deciding whether or not a mission will be competed or directed, or out of house or in-house. Also Project Managers are major decision makers in Supplier Selection in decisions how to acquire major components. Systems Engineers make tactical make/buy recommendations on whether a COTS item or build to print item or a make item is best suited for attaining the mission's performance objectives. Also the Procurement Office performs a critical role in leading project teams in complying with all U.S. Government laws and NASA policies in Supplier Selection throughout spacecraft, spacecraft component and piece part procurement actions.
- Category 3 is Supplier Performance Management. Project managers, Contracting Officers, Engineers, Safety Mission Assurance and other professionals work together as needed to make sure that suppliers build and deliver what we intend and what we require in order to meet mission requirements.
- Category 4 is Supplier Assessments. GSFC, under the leadership of the Safety and Mission Assurance Directorate, has a strong program in Supplier Assessments that is focused on ISO 9001 / AS9100 quality management standards, contractual requirements applied for the design, build and delivery of products and services, and identifying risks and concerns related to supplier and project performance.
- All core functions are project mission success and issue resolution focused. There is a strong focus on "meeting our commitments" including cost, schedule and technical performance.



# A High-Level Perspective of GSFC Supply Chain Management

## Core Functions

### 1. Supplier Development / Relationship Management

- New Business/Partnership Opportunity Document (POD) for AO/NRA
- Procurement Policy
- Technology Investments

### 2. Supplier Selection

- Make/Buy Decisions
- Procurement/Purchasing
- Compliance

### 4. Supplier Assessments

- Project/Contract Oversight
- Engineering
- Safety and Mission Assurance

### 3. Supplier Performance Management

- Project/Contract Oversight
- Engineering
- Safety and Mission Assurance

All core functions are project mission success and issue resolution focused. There is a strong focus on “meeting our commitments” with respect to cost, schedule and performance.



## Opportunities in Supply Chain Management (SCM) at NASA GSFC

- Opportunity: A strong SCM program can provide a strategic and risk-based look to drive efficiencies and better outcomes. Challenges:
  - Our 50+ year history of mission success aligned with today's increasing cost pressures creates a challenging environment for proposing and gaining project acceptance of process innovation changes
  - Projects are organized to be reactive and issue focused while making minimal investments in the future supply chain. Projects typically ask for the same or lower level of effort from supporting organization. (e.g. no Supply Chain Management role currently exists as part of project teams)
  - Government procurement rules limit or exclude ability to develop qualified supplier lists; procurement processes must often be repeated by the next project even when you have found a capable supplier
- Opportunity: Changes in technology and the changing supply landscape is providing a strong driver to accept greater use of components not specifically designed for a particular mission. Progress:
  - Developed Directives for proactively handling inherited items that are based on changes from previous developments; consider design, environment and failures/anomalies
  - We provide assessment of risk level of "heritage components" for project component decision-makers in order to make better risk informed decision on how and when to deploy scarce resources toward meeting overall mission objectives

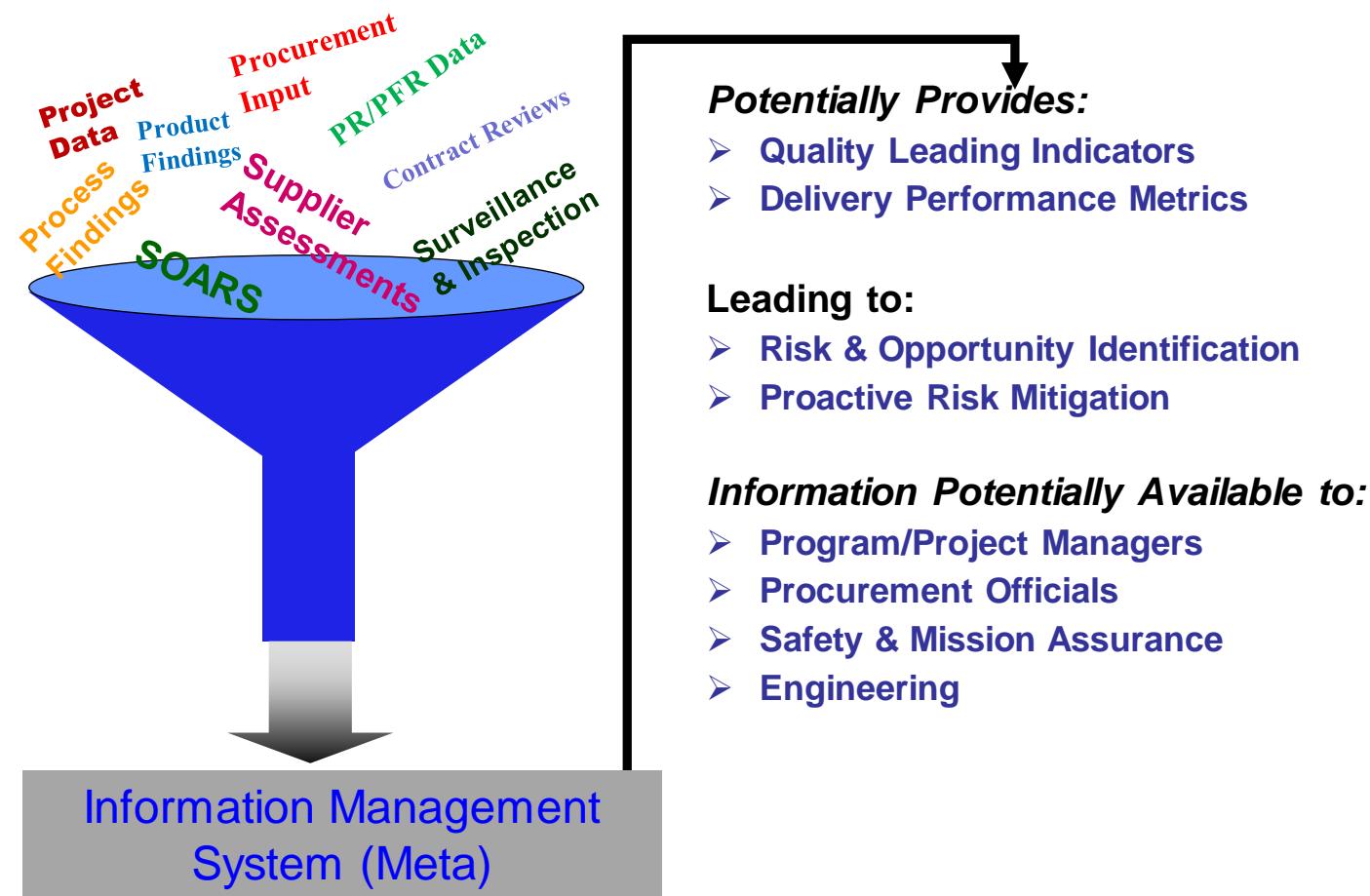


## **Vision of GSFC Information Management System - Meta**

- We have improved our ability to collect data from multiple sources that can be useful in understanding our Supply Chain. We have developed an information management system that is called “Meta” that supports our capability.
- Meta will support our capability to turn the data into information that will give us a more complete picture of a supplier. Example information products could include: Quality Leading Indicators and Delivery Performance Metrics.
- This information can be potentially used by NASA Project Managers, Procurement Officials, Engineers and Safety and Mission Assurance Professionals that can potentially lead to better risk identification and proactive risk mitigation.
- Overall, we want to measure success of our Information Management System by its ability to be a useful tool that can support identifying supply chain process efficiencies and better supply chain outcomes (i.e. performance, schedule, cost).

# Vision of GSFC Information Management System - Meta

## Collecting Supplier Data

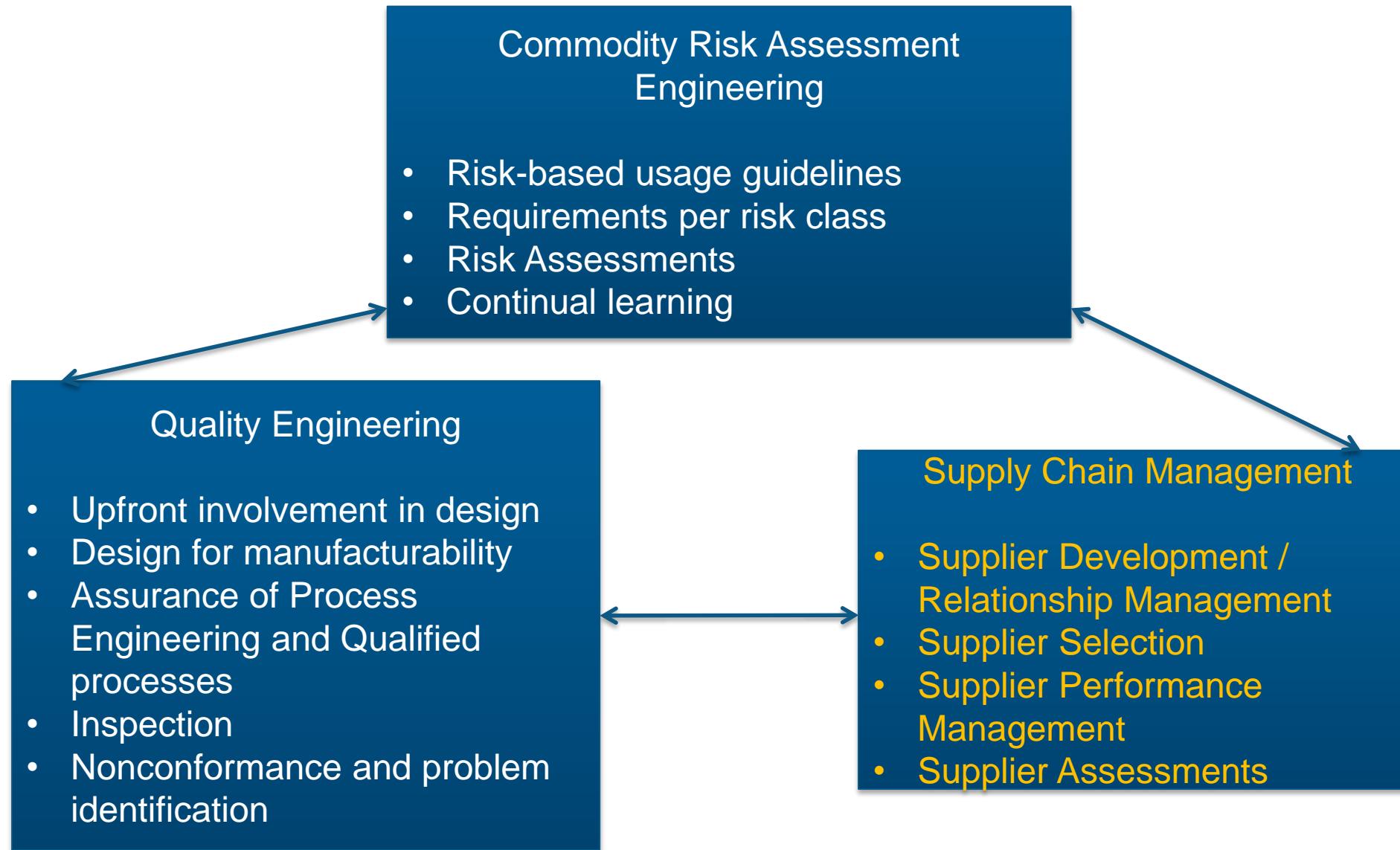




## Key Attributes of GSFC Risk-Based Mission Assurance

- Commodities Risk Assessment Engineering (CRAE) establishes requirements based on the risk classification of the mission and risk assessments for nonconforming and out-of-family items. The CRAE also determines the impact and recommends appropriate actions to pursue when requirements are not met.
- Quality engineering (QE) will use the requirements established by CRAE (and be a contributor to that process). QE will have some upfront involvement in the design and early development to facilitate design for manufacturability.
  - They will facilitate process engineering including qualified and controlled processes.
  - They will work collaboratively with the Supply Chain Management process as Suppliers are identified and selected. They will participate in the Supplier Performance management and Supplier Assessment processes.
  - They inspect items and identify nonconformances and problems or concerns. They provide their assessments to the CRAE group for a project-specific “tactical” risk assessment, then to the management systems branch for follow-up with the vendor. Management systems will explore special procurement options (PODs w/ IDIQ, etc.) for blanket purchases for the Center when needed to achieve supply management objectives.
- The CRAE group provides the ultimate disposition to the supply chain group for lessons learned capture, and back to quality engineering to bring to the project decision process and risk board. Supply Chain management maintains the records of nonconforming, out-of-family, and other items of concern, while CRAE learns from the process and improves its ability to perform risk assessments, and possibly updates requirements or guidelines.

# Key Attributes of GSFC Risk-Based Mission Assurance



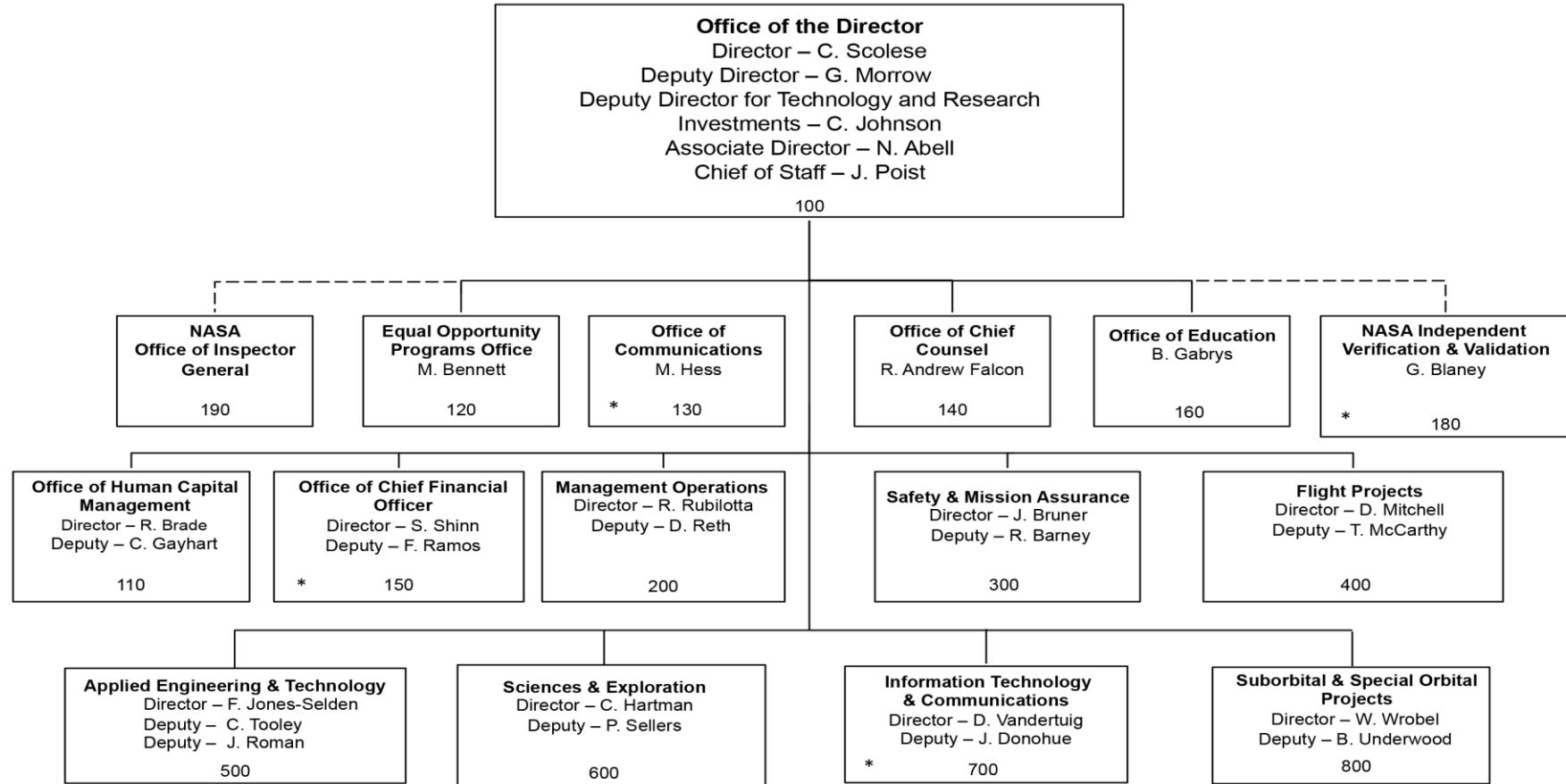


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## Back-up Slides



# Goddard Space Flight Center Organization Chart



Updated: June 2016

\* Reports directly to NASA Headquarters

## GODDARD LOCATIONS



### GREENBELT – MAIN CAMPUS

Greenbelt, MD

Develops and operates unmanned scientific spacecraft. Manages many of NASA's Earth observation, astronomy, and space physics missions



### WALLOPS FLIGHT FACILITY

Wallops Island, VA

Manages and implements suborbital research programs at NASA's only launch range. Launches low-cost, versatile suborbital and orbital rockets, balloons, and aircraft in support of Goddard Earth, space science research, and human exploration missions



### GODDARD INSTITUTE FOR SPACE STUDIES

New York City, NY

Provides critical perspective for monitoring global climate and developing an understanding of Earth systems



### INDEPENDENT VERIFICATION AND VALIDATION FACILITY

Fairmont, WV

Provides elaborate testing on software to ensure computer programs developed for missions operate perfectly

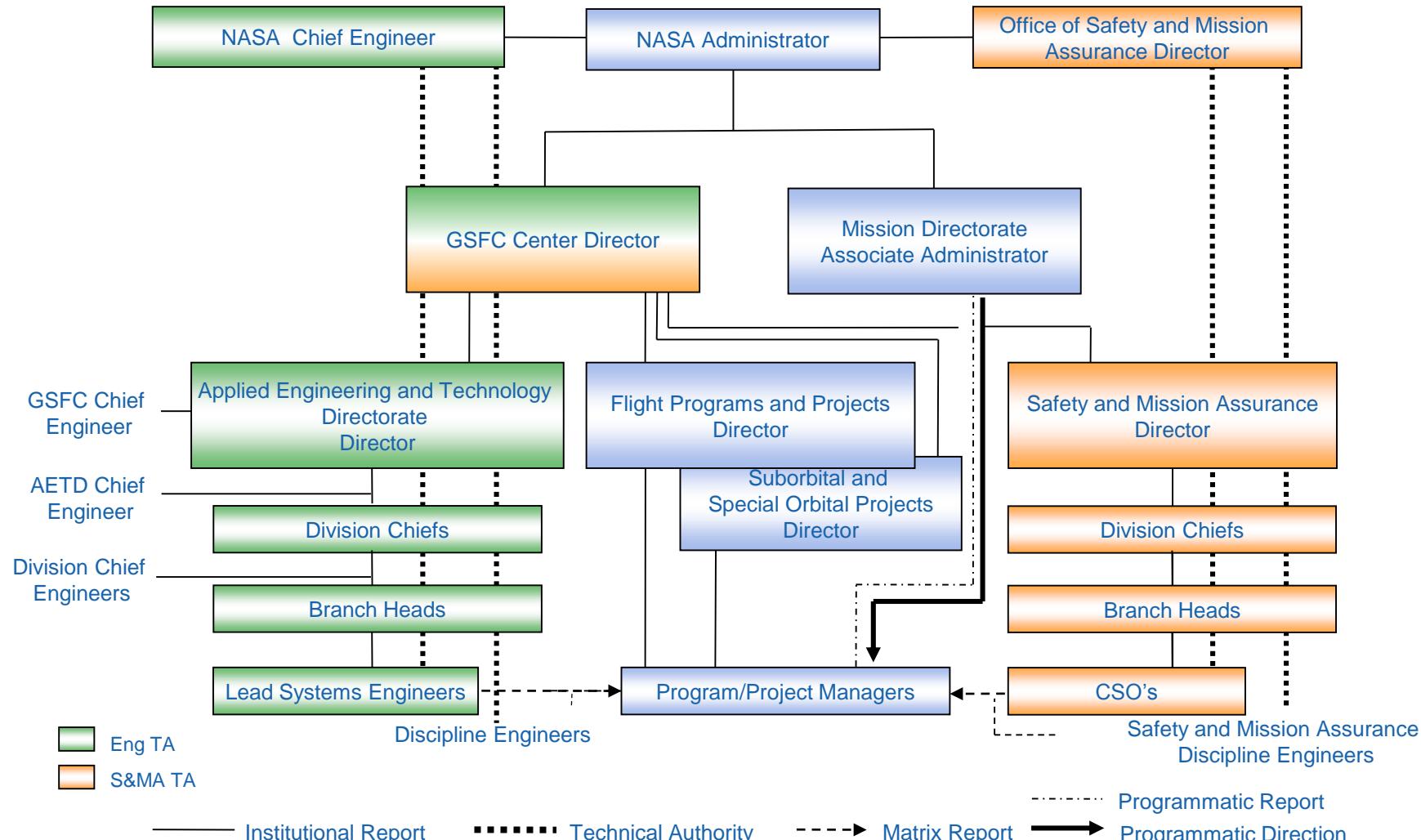


### WHITE SANDS GROUND TERMINAL

Las Cruces, NM

Provides ground terminals for data downlink from Space Network (SN) assets and command and control of SN

# NASA Governance Model



# GSFC Safety and Mission Assurance Organization

