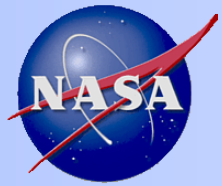


# ***Office of the Chief Engineer Update***

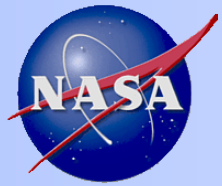
**Dawn M. Schaible**

**July 29, 2014**



# ***OCE Mission***

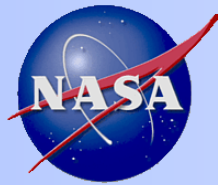
1. Advise Agency leadership on the technical and programmatic readiness of NASA programs and projects
2. Execute Agency's Engineering Technical Authority
- 3. Integrate and provide leadership for the Agency's technical capabilities***
4. Provide "value added" independent assessment across all of NASA's program
5. Steward Agency-level policy and standards for engineering and program and project management
6. Share program/project management and engineering best practices, and lessons learned
7. Support the workforce with training and knowledge management services needed to continuously improve program/project management and engineering skills



# ***Why Technical Capability Leadership?***

- In an environment of highly constrained budgets, managers are driven to make decisions based on the immediate needs of their programs and projects not necessarily the long term needs of the Agency.
- Years of operating in this difficult environment (budget constrained, limited long term investment) could lead to an imbalance in our technical capabilities.
- We need the right set of technical capabilities to achieve our goals: such as putting humans on Mars, a robotic mission on Europa, or unmanned autonomous vehicles in our air space.
- In addition to investing strategically, we must also divest in areas that are not needed in the future.
- Bottom line: NASA must find a way to make strategic investments into the technical capabilities that we need for our future missions and make the hard decisions to stop doing things that are not required.

***IMPERATIVE: Establish a more efficient operating model that maintains critical capabilities AND meets current and future mission needs***



# ***Technical Capability Leadership Model***

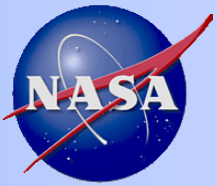
- Technical capabilities will be agency capabilities, not Center capabilities and not Mission capabilities
- A technical capability will function as an aligned unit, to advance the capability to meet current and future mission needs
- NASA Technical Fellows will serve as Technical Capability Leaders for their discipline areas
- Other Technical Capability Leaders will be identified based on need for more formal Agency-level coordination
- Engineering Management Board will facilitate integration across multiple agency capabilities necessary to enable technical advancements
  - Ensure consistency across the agency in roadmap development and implementation plan execution
  - Review, prioritize and provide advocacy for Technical Capabilities investments at Agency BPR
  - Integrate across multiple Agency capabilities as necessary to enable technical advancement in support of new missions

***A technical capability is both workforce and assets***



# ***NASA Technical Fellows Disciplines***

- 15 NASA Technical Fellows are currently active
  - Aerosciences - Dave Schuster (LaRC)
  - Avionics - Oscar Gonzalez (GSFC)
  - Electrical Power – Chris Iannello (KSC)
  - Flight Mechanics – Dan Murri (LaRC)
  - Guidance, Navigation, and Control - Neil Dennehy (GSFC)
  - Human Factors - Cynthia Null (ARC)
  - Life Support / Active Thermal - Hank Rotter (JSC)
  - Loads and Dynamics - Curt Larsen (JSC)
  - Materials - Bob Piascik (LaRC)
  - Mechanical Systems – Joe Pellicciotti (GSFC)
  - Non-Destructive Evaluation - Bill Prosser (LaRC)
  - Passive Thermal – Steve Rickman (JSC)
  - Propulsion – Tom Brown (MSFC)
  - Software - Mike Aguilar (GSFC)
  - Structures - Ivatury Raju (LaRC)
  
- Four additional disciplines to be added
  - Systems Engineering, Space Environments, Cryogenics, Instruments and Sensors



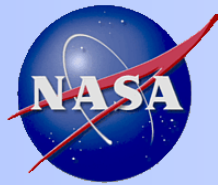
# ***NASA Technical Fellows - Original Roles***

- Serve as senior technical expert for the Agency in support of the Office of the Chief Engineer, the NESC, and NASA Programs
- Maintain NESC Technical Discipline Teams with ready-experts
- Provide leadership and act as role models for NASA discipline engineering communities beyond the Technical Discipline Teams
- Serve as an independent resource to the Agency and industry to resolve complex issues
- Provide technical consistency across NASA through inputs to Agency-level specifications and standards and the tailoring of those standards for programs and projects
- Document and periodically update the State of the Discipline to include **discipline specific gap analyses to identify areas that require strategic investment to develop foundational engineering sciences**
- Promote discipline stewardship through workshops, conferences and assorted discipline-advancing activities
- Ensure lessons learned are identified, widely shared across engineering organizations, and incorporated into Agency processes
- Serve as an advocate for their discipline



# ***Technical Capability Leaders - New Expanded Roles***

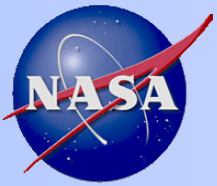
- Advises Agency and ensures proper alignment across Missions and Centers consistent with Agency and capability advancement needs
- Establishes plans/roadmaps to provide technical guidance to the Agency in the identification and prioritization of tasks necessary to enable discipline level and system-level performance for future missions
- **Determine gap areas for advancement and strategic investment**
- Advises on capability sizing and strategic hiring, including contracting, across all Centers, so as to avoid Agency excess capacity, duplication in a capability area, or excessive contracting of intrinsic NASA technical capability areas
- Determine investment and divestments within capability scope, including advising Centers on assets, and coordinating with other capability areas so as not to duplicate scope between areas
- Solicit innovative ideas from outside the capability area, related to such things as technical content, new approaches, workforce skills, asset use, and disposition
- Establishes standards and specification within capability scope



# ***Chief Engineer, Chief Scientist, Chief Technologist Vision for FES***

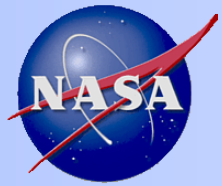
- Foundational Engineering Sciences (FES)
  - Utilize the existing programmatic portfolio within the Space Technology Mission Directorate (STMD) to manage these new investments
  - Evaluate and prioritize the input from the Engineering, Technology and Science Communities
  - Partner with Industry, Academia and other Government Agencies
  - Select a portfolio of pilot projects and begin to invest in Foundational Engineering Sciences for our future



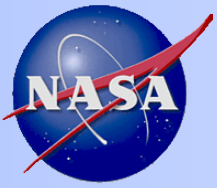


# Summary

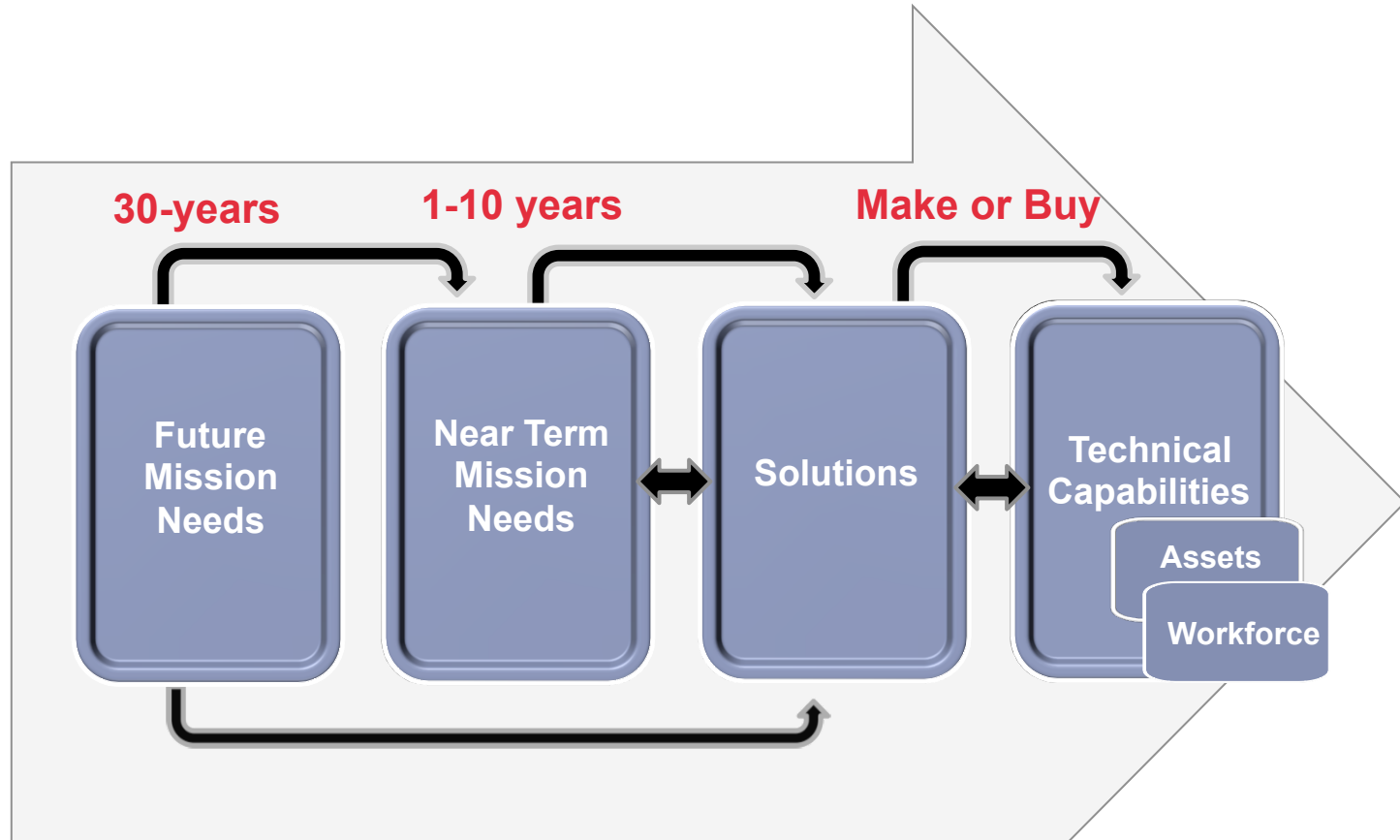
- The Office of the Chief Engineer will integrate and provide leadership for the Agency's technical capabilities
  - Technical Capability Leadership model will leverage the knowledge and leadership of the NASA Technical Fellows
  - Engineering Management Board will provide integration and prioritization across multiple Technical Capability areas
  - Technical Capability Leaders/NASA Technical Fellows will identify gaps and needed investments for engineering capabilities
  - This model will utilize efforts like Foundational Engineering Sciences to address critical knowledge gaps



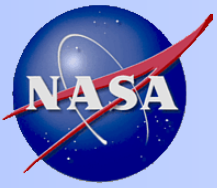
# ***Backup***



# The Big Picture



***We want to make decisions about our capabilities and solutions based on future & current mission needs***



# Linking Solutions to Technical Capabilities

