



NASA's Nuclear Power and Propulsion Capability Leadership

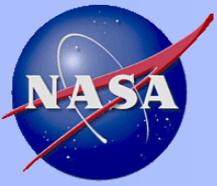
Nuclear and Emerging Technologies for Space (NETS-2016)

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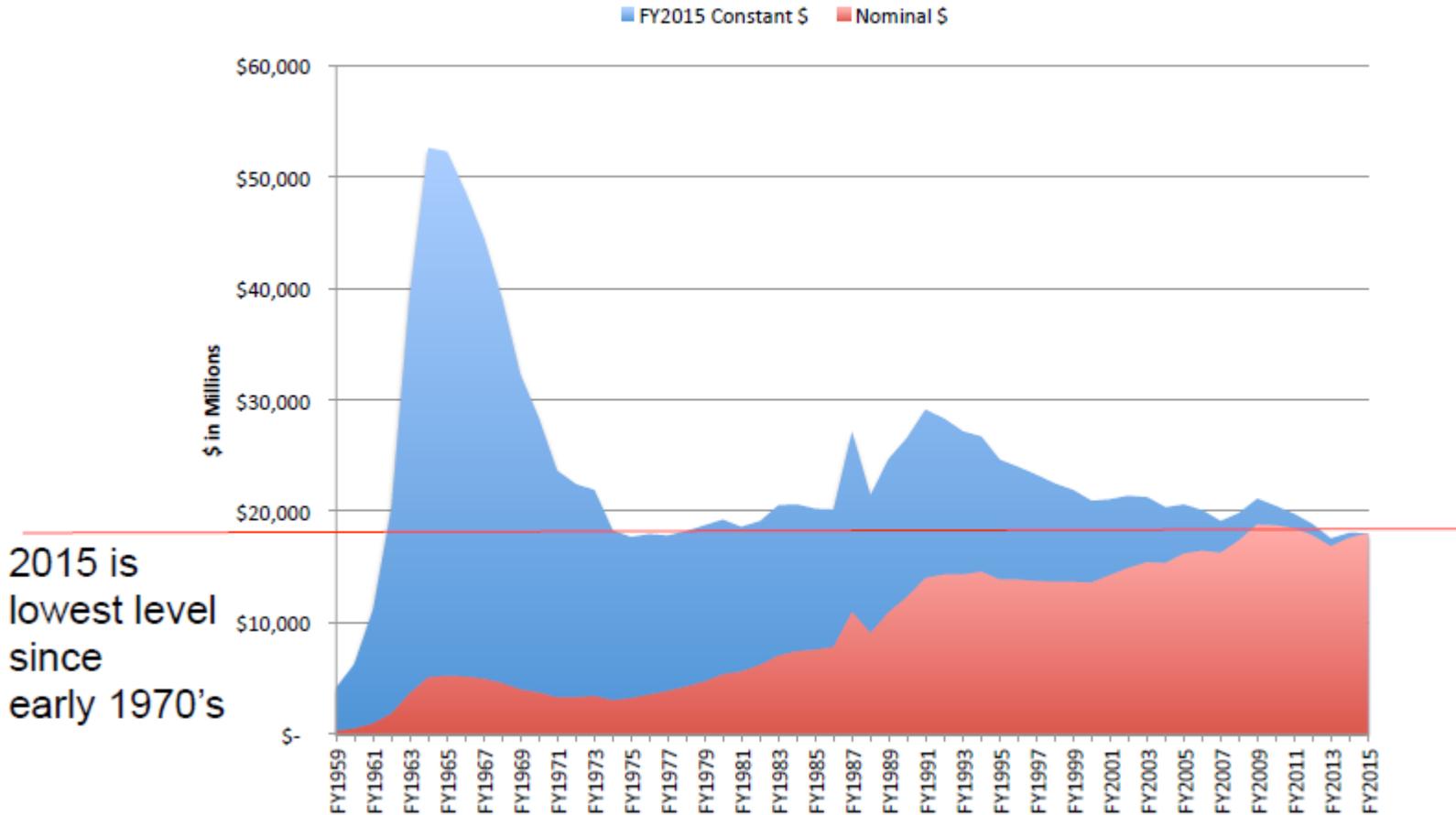
- **What is Capability Leadership?**
- **How Does Nuclear Power and Propulsion Fit?**
- **Top Level Team Challenges?**

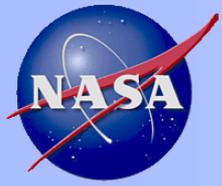


What is Capability Leadership?

Excerpts from the AA's Roadshow

NASA Budget Authority (1959-2015)

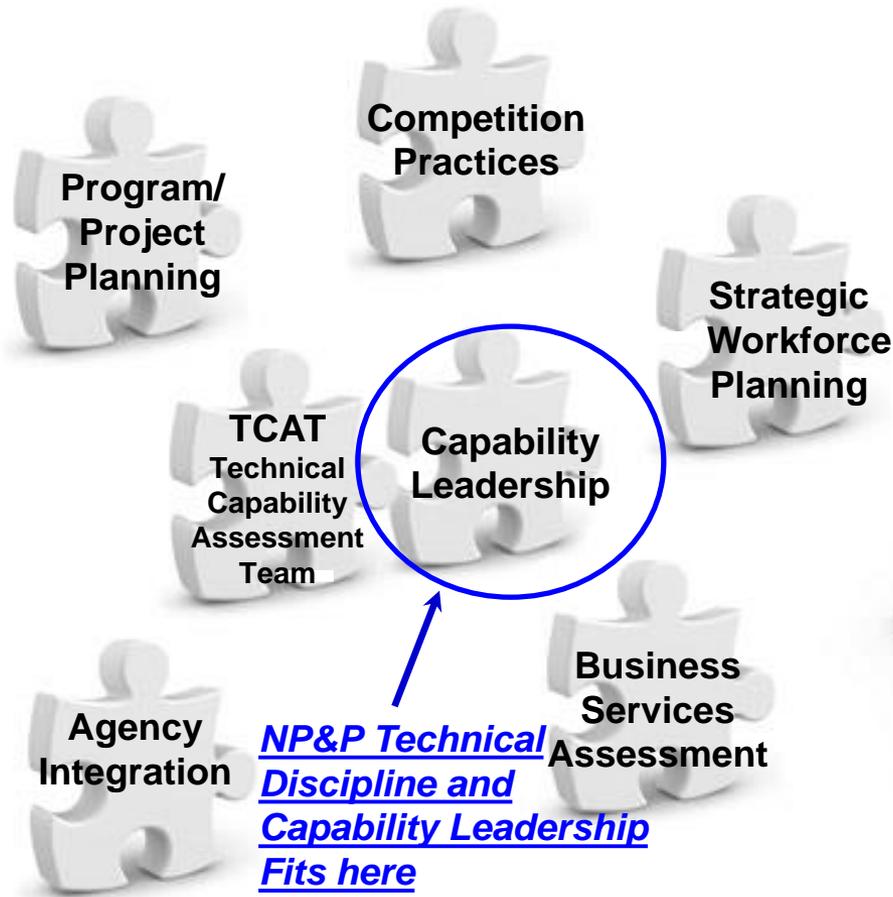




Completing the Puzzle

<https://nbat.hq.nasa.gov>

NEW AGENCY OPERATING MODEL



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

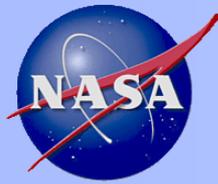


Capability Leadership

Capability leadership is part of the overall puzzle



- **Provides leadership/integration/optimization of agency technical capability**
- **Provide technical based guidance on future needs/gaps investments and solutions for Agency missions**



NASA Capability Leadership Teams

Discipline Capability Leadership Teams:

- Aerosciences
- Avionics
- Electrical Power**
- Flight Mechanics
- Guidance Navigation and Control
- Human Factors
- Instruments and Sensors
- Life Support/Active Thermal
- Loads and Dynamics
- Materials Mechanical Systems
- Non Destructive Evaluation
- Passive Thermal
- Propulsion**
- Software
- Space Environments
- Structures
- Systems Engineering

The Nuclear Power and Propulsion Team has been established across the Power and Propulsion Capability Leadership Teams



Technical Capability Leadership: Governance

- **Office of the Chief Engineer (OCE)** — Administers discipline-level and (interim) system-level Technical Capability Leadership on behalf of Agency
- **NASA Engineering and Safety Center (NESC)** — Designation of Technical Fellows and leadership of technical discipline teams
- **Engineering Management Board (EMB)** (extended as necessary) — Provide integration and communication across technical capabilities and review results of technical assessments to develop agency-wide engineering recommendations for presentation to Agency decision-making forums
 - Core membership includes Engineering Directors or Center Chief Engineers from each Center
 - Extended-EMB include reps from each Center, Mission Directorate, MSD, OSMA, OCHMO, OCS, OCT
- **Agency Program Management Council (APMC)** — Annual review of Agency-level technical capabilities for invest/divest decisions
 - Directs funding source and implementation organization for a specific deliverable, with Capability Leadership Team responsible for oversight of implementation strategy
- **Mission Support Council (MSC)** — Venue for addressing recommendations if appropriate decision thresholds are met
- **Baseline Performance Review (BPR)** — Venue for reviewing Center/MD implementation status of Agency-level technical capability decisions
- **Deputy Associate Administrator** — Address issues when lower level resolution cannot be reached



Nuclear Power and Propulsion (NP&P) Team

The Nuclear Power and Propulsion Team has aspects of both a Capability Leadership Team (CLT) and a Technical Discipline Team (TDT)

- **Asked to provide strategic investment and capability management guidance to agency decision makers**
 - Guidance on partnerships and approaches with other government orgs and industry
 - NP&P gaps and investment priorities
 - Make buy type evaluations
- **Also to provide technical guidance and assessment for more focused technical plans/decisions**
 - Nuclear Power and Propulsion Technology Development Plan



Nuclear Power and Propulsion Capability Leadership model

Power Technical Fellow: Chris Iannello

Propulsion Technical Fellow: Tom Brown

Power Technical Discipline Team (TDT)

Propulsion Technical Discipline Team (TDT)

Nuclear Power and Propulsion Joint Subject Matter Expert Team

Develops Agency-Level Nuclear Strategy and Perspective
(SMEs from Centers, Advisors from MDs)

GRC, MSFC, JPL, JSC
SSC

Power TDT includes discipline experts across NASA's power capabilities – including those related to nuclear systems

Propulsion TDT includes discipline experts across NASA's propulsion capabilities – including those related to nuclear systems

Nuclear Power Subject Matter Experts (SMEs)

Radioisotope Power Systems (RPS)

Fission Power Systems (FPS)

Nuclear Propulsion Subject Matter Experts (SMEs)

Nuclear Thermal Propulsion (NTP)

Nuclear Electric Propulsion (NEP)

Fuel Specialists

Internal Stakeholders

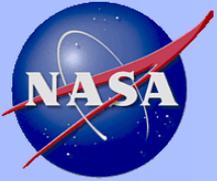
NASA Mission Directorates

& other NASA Stakeholders

External Consultants

DOE-NE75
DOE-NNSA

DoD
Industry
Academia



View from our knothole

Our Challenge is to:

- Understand the real constraints and pressures between near term demands (tyranny of the urgent) and future needs (investment in future)
- Understand and communicate the real benefits to nuclear power and propulsion technologies while being conscience of and addressing the real/perceived challenges
- Be creative – develop innovative approaches that build on small, stepwise successes, removing risk/uncertainty from the affordability story

We have been asked to provide technical guidance, including an integrated NP&P technology development plan – the HOW (which is a great start!). However, we are also challenged to answer the question of WHY (and why now).