



NATIONAL INSTITUTE FOR ROCKET PROPULSION SYSTEMS

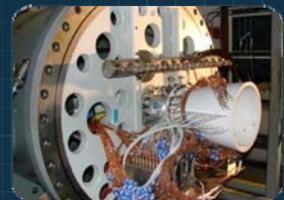
NIRPS and JANNAF Propulsion Industrial Base Overview and Status

Rajiv Doreswamy, Ph.D

Manager, NIRPS

December 3, 2014

Addressing the challenges to the
Rocket Propulsion Industrial Base



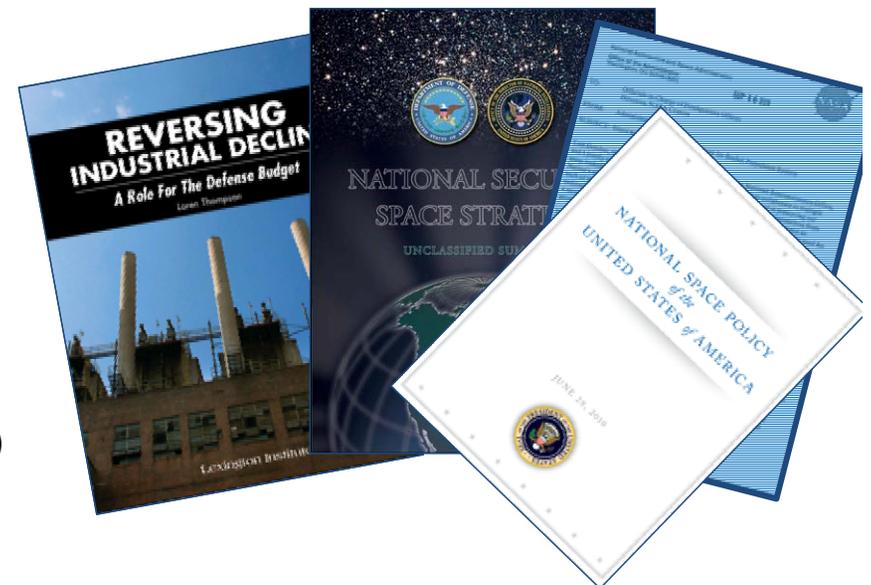
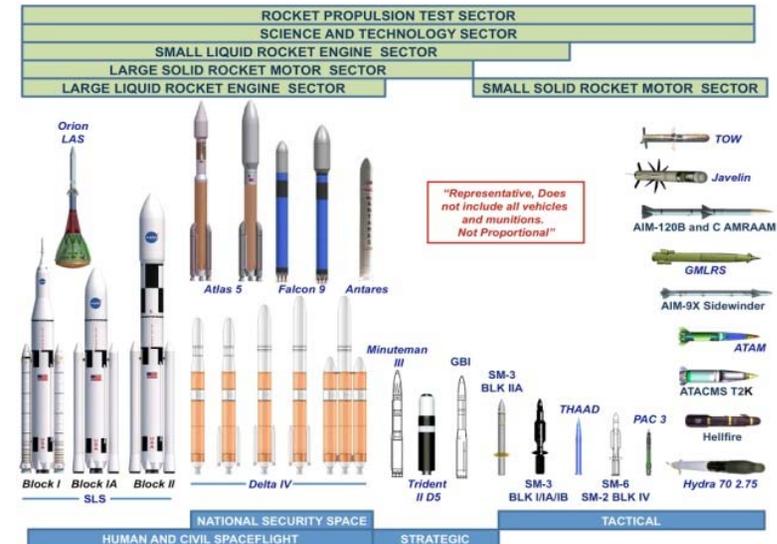
NIRPS is Executing Tasks of National Importance

Why NIRPS?

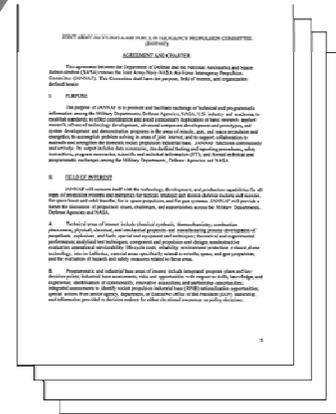
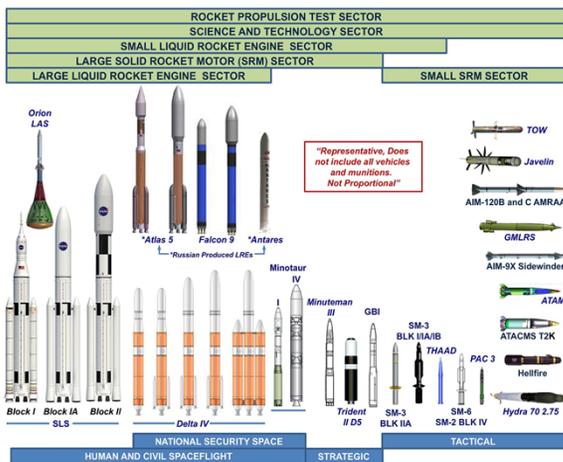
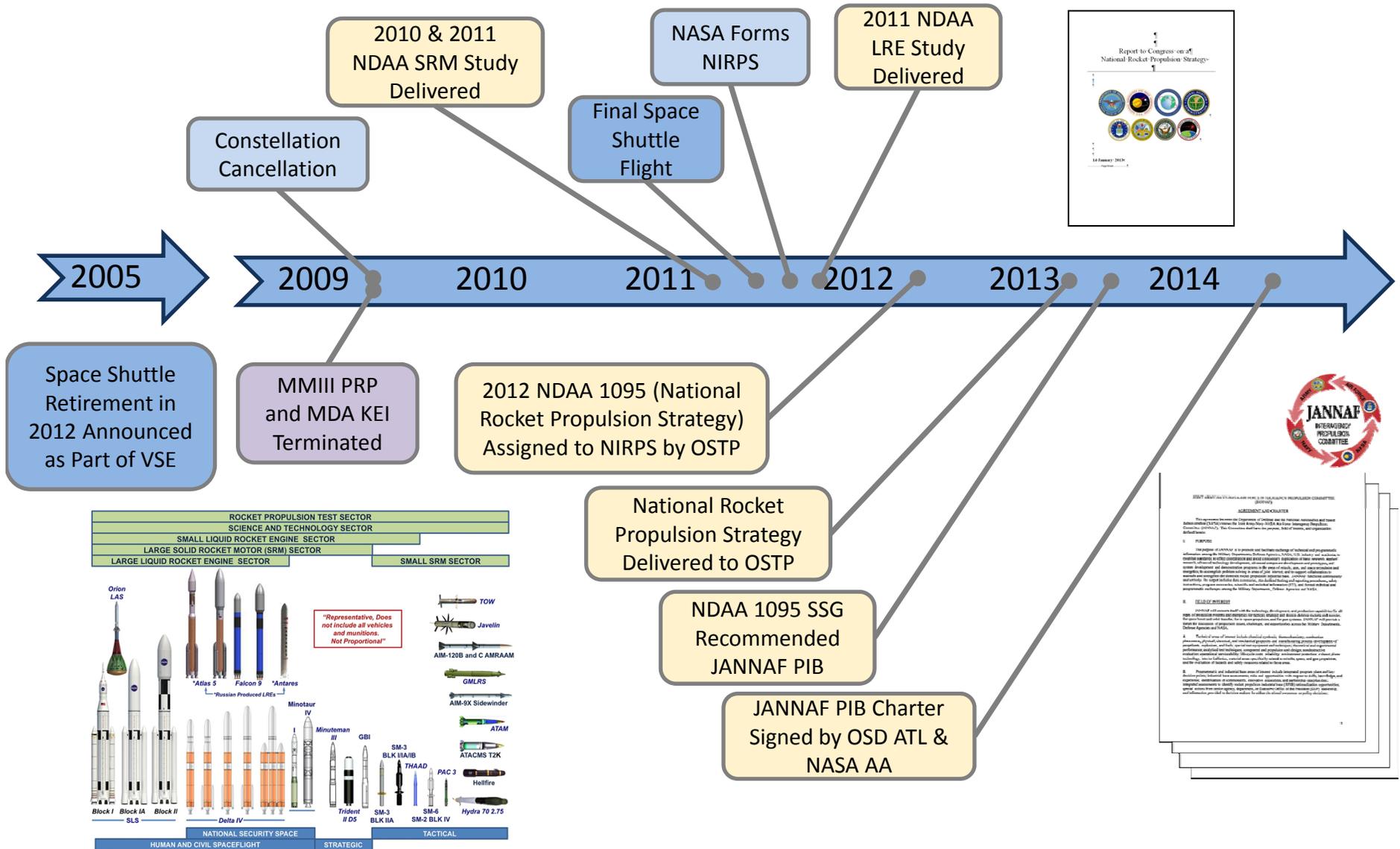
- Addresses Congressional and Executive Office concerns about Rocket Propulsion Industrial Base (IB)
 - Widespread recognition of the problem
 - Sustainment of the solid rocket motor and liquid rocket engine industrial base is a national challenge that spans multiple departments and agencies of the U.S. Government.
 - Integrated approach among the leadership of US Government Agencies
 - Need for accurate analysis and data to inform decision makers across USG Agencies

What is NIRPS?

- National Institute for Rocket Propulsion Systems
- Started on September 16, 2011 through authorization letter signed by NASA Administrator Charlie Bolden to work together with USAF and NRO to address Rocket Propulsion Industrial base concerns
 - For NASA, Marshall Space Flight Center (MSFC) named as lead
 - Resource light but with “results heavy”



Path to JANNAF PIB



Highlights of the National Space Transportation Policy

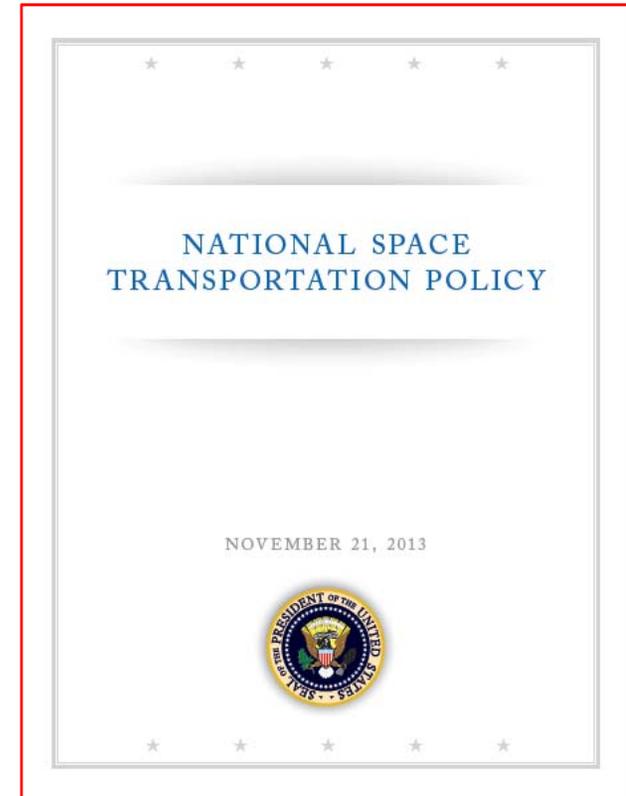
Goals

- *Promote and maintain a dynamic, healthy, and efficient domestic space transportation industrial base;*
- *Encourage and facilitate the U.S. commercial space transportation industry to increase industry robustness and cost effectiveness, foster innovation-driven entrepreneurship and international competitiveness, and benefit the U.S. economy;*
- Conduct and promote technology research and development activities to improve the afford- ability, reliability, performance, safety, and responsiveness of U.S. space transportation capabilities, while increasing collaboration and coordination among departments and agencies;
- Enable the capabilities to support human space transportation activities to and beyond low Earth orbit, including services to and from the International Space Station and the development of a deep-space-capable transportation system; and
- Foster the development of U.S. commercial spaceflight capabilities serving the emerging non- governmental human spaceflight market.

US Space Transportation Industrial Base

To promote a healthy and efficient United States Government and private sector space transportation industrial base, departments and agencies shall:

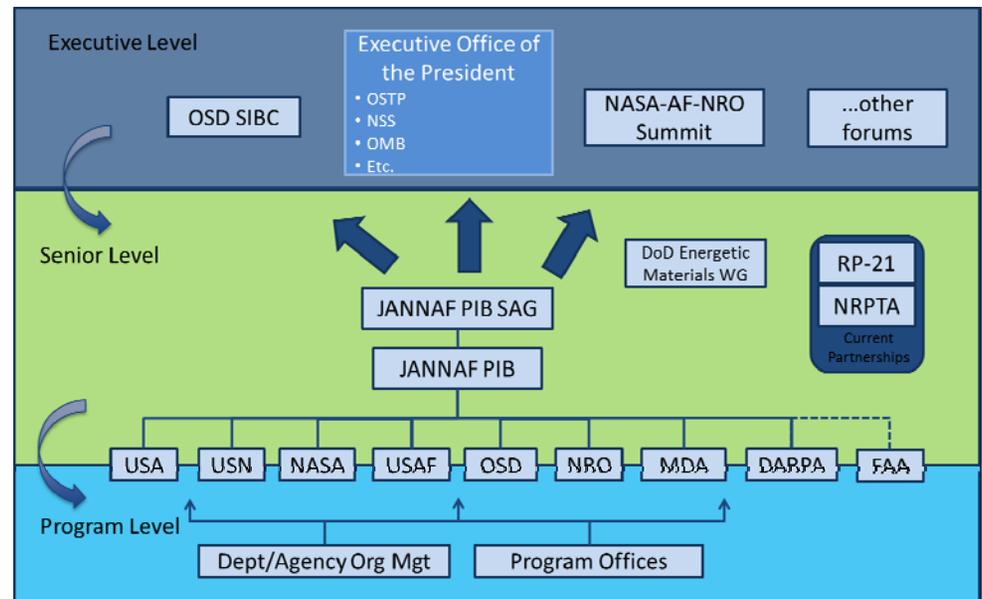
- *Make space transportation policy and programmatic decisions in a manner that considers the health of the U.S. space transportation industrial base; and*
- *Pursue measures such as public-private partnerships and other innovative acquisition approaches that promote affordability, industry planning, and competitive capabilities, infra- structure, and workforce.*



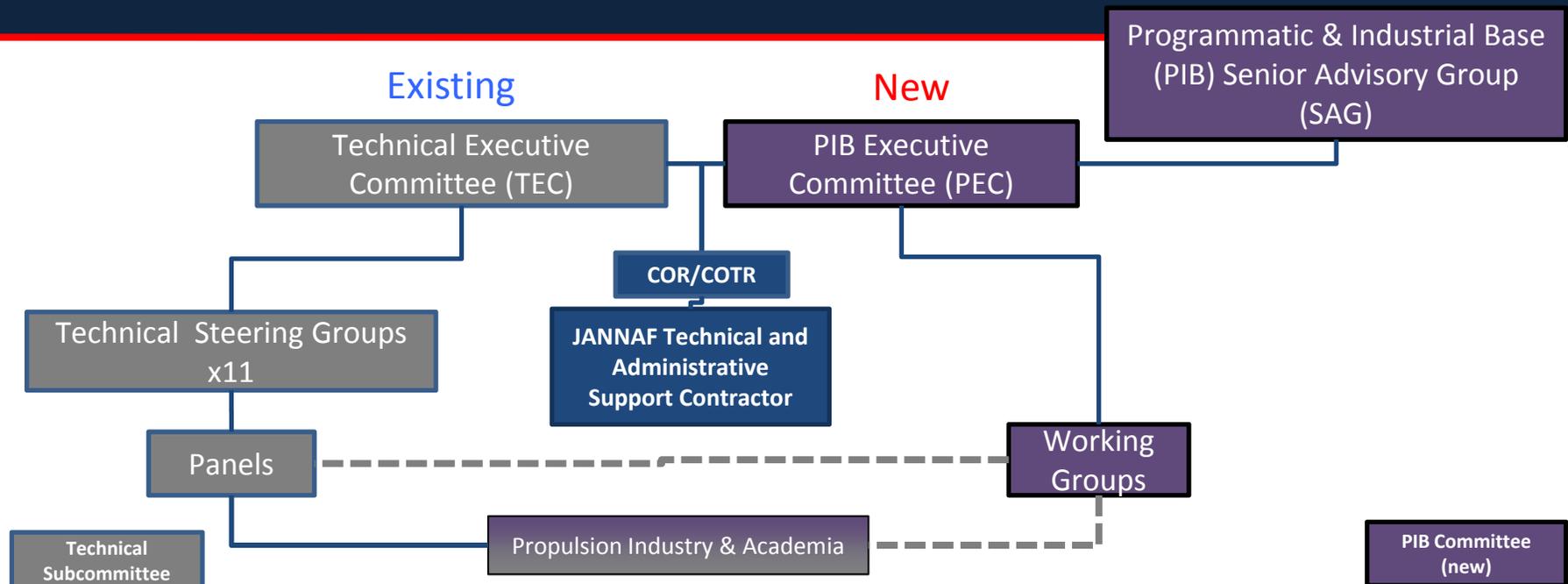
NIRPS and the JANNAF PIB align with the NSTP

JANNAF PIB Enhances Interagency Communication and Collaboration

- Program/Project/PEO interaction in areas of mutual interest.
- PIB integrates information and issues for Senior Leader discussion in the Senior Advisory Group.
- PIB SAG determines if interagency Executive level forums need to be engaged on issues or information.
- Similarly, Executive and Senior Level actions flow to PIB Working Groups, which are supported by Programs/Projects/PEOs.



JANNAF Operational Structure



- Pre-existing JANNAF 'technical' activities are not affected.
- Inclusion of Programmatic and Industrial Base Committee leverages existing JANNAF framework.
- New PIB functions require PEO/Program Office participation, which is a different group than traditional JANNAF.
- PIB Senior Advisory Group is at the PEO/PO/Command flag officer-level, senior leaders/managers.
- PEC members represent key program, project and IB stakeholders.
- Working Groups formed to address specific areas, permanent and ad hoc.

Cross Agency Collaboration Joint Army Navy NASA Air Force (JANNAF)



- **Programmatic & Industrial Base (PIB) Products & Activities:**
 - Integrated (i.e. collated) program plans & key decision points
 - Industrial base assessments
 - Risks and opportunities with respect to skills, knowledge, and experience.
 - Identification of commonality, innovative acquisition, and partnership opportunities
 - Integrated assessment to identify RPIB rationalization opportunities
 - Special actions from senior agency, department, or EOP leadership
 - Provide decision makers information for situational awareness or decisions in a timely and efficient manner
- **Special Studies Initiated for Issues Critical to US Government Rocket Propulsion Activities**
 - Small Solid Rocket Motor Capability
 - Large Liquid Rocket Engine Industrial Base Sustainability
 - Ammonium Perchlorate Industrial Base
 - Helium Legislation Effects
 - Liquid Rocket Engine Risk Reduction with USAF (pending ATP)

NIRPS is playing a key role to tackle the problems facing the Nation's Rocket Propulsion Industrial Base

- **Developing Propulsion Supply Chain Analysis Methods to inform decision makers**

- Developed and Executing Propulsion Supplier Integrated Modeling and Analysis (PropSIMA), hybrid Supply Chain Database with Probabilistic Scenario Analysis and Forecasting (under contract w/ Aerospace Corp.)
- Support to HEOMD/SLS architectural IB Impacts
 - SLS Exploration Upper Stage (EUS)
 - RS25 Restart
- USAF & NASA request for updated RMD700 including
 - Hydrocarbon Booster Engine risk reduction efforts and IB Impacts
 - IB Impacts due to New Commercial Entrant(s)
- Identifying supply chain risks
 - Sole source critical suppliers
 - Foreign sources
 - Disruption due to new technologies (Additive Mfg, etc)

- **Other Collaborative efforts with DOD**

- Cross-Program Phasing Plans (NASA/DOD ammonium perchlorate acquisitions)
- Integration of NIRPS and RP21 Propulsion Technology Road Maps

- **Building Strategic relationships through action**

- Leveraging strengths of Department of Commerce and Defense Logistics Agency
- Examining RPIB Impacts due to Additive Manufacturing technology insertion





NIRPS

National Institute for
Rocket Propulsion Systems

<http://nirps.msfc.nasa.gov/home>

Collaboration and Integration Across the USG

- 2011 – NASA Administrator Authorization letter for NIRPS (MSFC designated as lead for NASA)
 - Fly out of Shuttle, Cancellation of Constellation Program, Other Government Agency programs
 - MSFC formed a small focused team to implement NIRPS,
- 2012- NDAA, Section 1095- “sustainment of the solid rocket motor and liquid engine industrial base is a National challenge”
 - OSTP tasked NIRPS to lead National Rocket Propulsion Strategy study - report delivered January 2013
 - NIRPS led a predesignated High-Level Interagency Team
 - Developed a Government-wide strategy to collaborate, coordinate, and integrate cross Government activities and inform Agency and executive branch decision makers
- 2013- First NIRPS Intergovernmental Review Held
 - Review team concurred that NIRPS was addressing the right issues and doing it efficiently
- 2013 – 1095 Senior Steering Group recommended formulation of Programmatic & Industrial Base (PIB) subcommittee under Joint Army Navy NASA, and Air Force (JANNAF) as the primary interagency forum
- 2013 DoD and NASA agreed on a renewed JANNAF Charter
 - JANNAF PIB Senior Advisory Group (SAG) established
 - Co-Chaired by NASA (Dale Thomas, MSFC Associate Director) and DoD (Mary Margaret Evens, DUSD for Manufacturing and Industrial Base Policy)
 - **Members from Army, Navy, Air Force, NRO, MDA, OSD, & NASA**
 - NASA Membership (Deputy AA for ESD; AAA for LSP; MSFC Associate Center Director, Technical; AAA for HSF Capabilities)
- 2014- JANNAF NASA/DOD PIB Charter Signed

NIRPS: Positive Value and Lasting Impact

- **NIRPS is Executing tasks of National Importance**
 - Leading JANNAF PIB implementation
 - JANNAF Charter Approval (NASA/DoD) complete July 2014
 - Rocket Engine Supply Chain Modeling and Analysis
- **NIRPS is adding positive value to the Propulsion Ecosystem**
 - Enabling Collaboration across the US Government
 - Engaging with Industry and Academia
 - Building Supply Chain Modeling and Analysis Capability for NASA and the US Government
- **NIRPS is “resource light” but “results heavy”**
 - Small Core Staff, augmented by in-kind contributions of the NIRPS community
- **NIRPS is transitioning from Formulation to Implementation**
 - JANNAF Support Contract Acquisition is underway- transition from DoD to NASA by June 2015
- **Plan forward:**
 - NIRPS charter finalized and approved by the NASA AA
 - Agency Sponsorship and Resource Support in FY 16 and outyears

Slide 12

ldt8

use this as the "get off the stage" chart drawing on the results of the NIR, in particular emphasize the NIR's point that NIRPS is accomplishment heavy & resource light. That's a good thought to leave with the audience. Also thank them (Team Redstone) for their contribution to the NIRPS. Also say something about standing up the JANNAF PIB function, initial offering at December JANNAF meeting.

ldthomas, 9/24/2013