

# Aeronautics Committee Report to the NASA Advisory Council

Gen. Lester Lyles (Chairman)

Dr. John Sullivan

Dr. Gene Covert

Dr. Ilan Kroo

Dr. Ray Colladay (ex-officio)

April 17, 2008

# Areas of Interest Explored at Current Meeting

- Feedback from the National Academy/ASEB Workshop of the Next-Gen R&D Plan
- Briefing on NASA ARMD TPS Technology Development
- Discussion with ARMD Senior Management on candidate systems level research projects

# Feedback from the National Academies/ASEB Workshop on the NextGen R&D Plan

Briefing by Dr. Neil Cheatwood and Dr.  
Anthony Calimino on NASA ARMD TPS  
Technology Development

# Thermal Protection System (TPS) Taxonomy



**High Mass Mars Entry Systems (HMMES)**

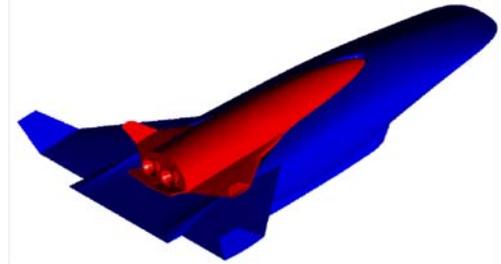
## Single Use (HMMES)

TPS designed for a single mission with expendable materials.

**Ablators (>3000°F) ESMD,SMD,ARMD**

**Ceramic Composites (<3500°F) ESMD,ARMD**

**Deployable TPS (<1000°F) ARMD**



**Highly Reliable Reusable Launch Systems (HRRLS)**

## Multiple Use (HRRLS)

TPS designed for several missions without loss in performance.

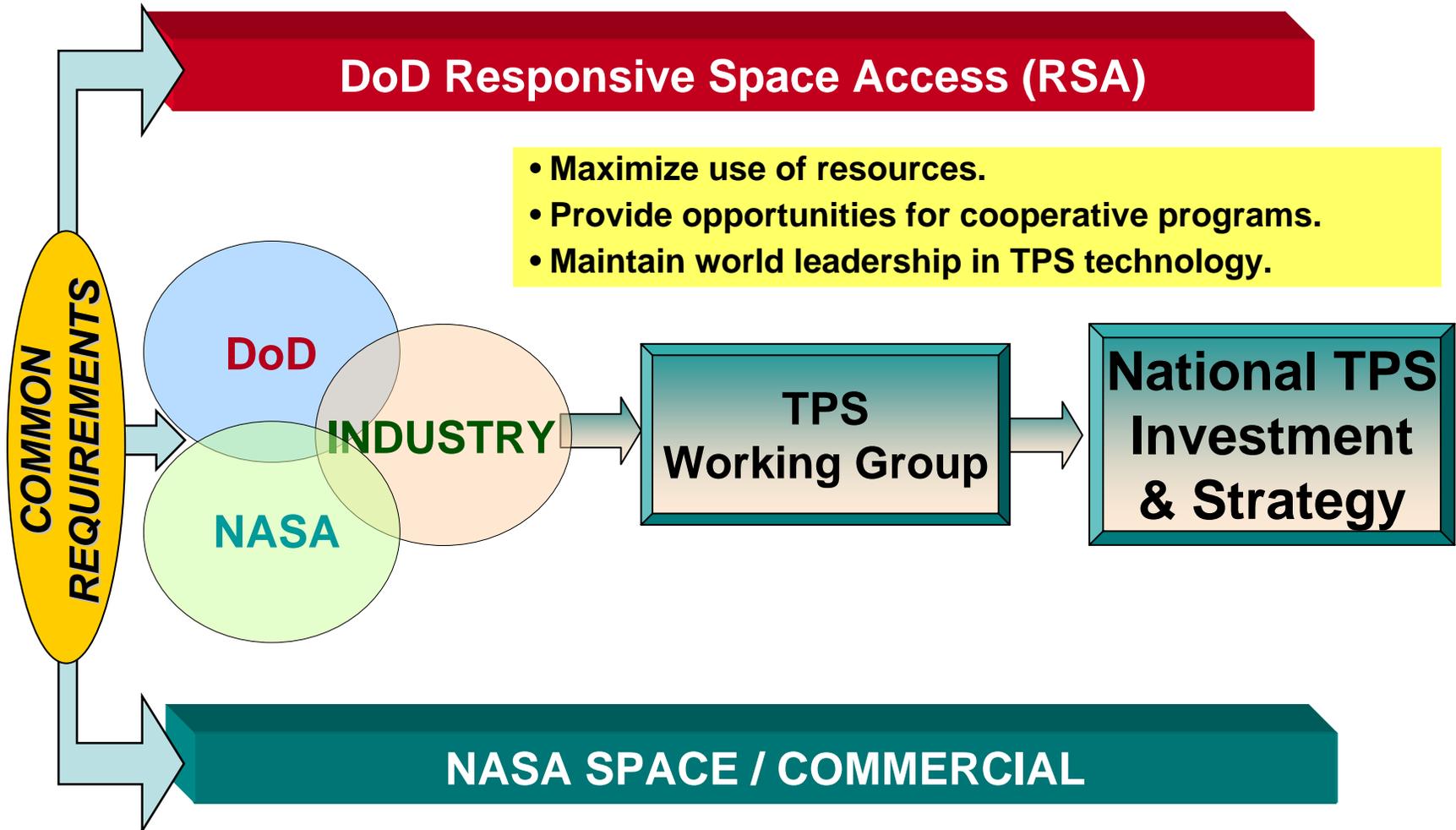
**Metals (<2000°F) AFRL**

**Ceramic Composites (<3000°F) ARMD, AFRL**

**General (<2000°F)**

# Leveraging Technology Development through the National TPS Working Group

NASA, DOD, and industry representatives regularly come together to develop a strategy and process for coordinating TPS materials development.

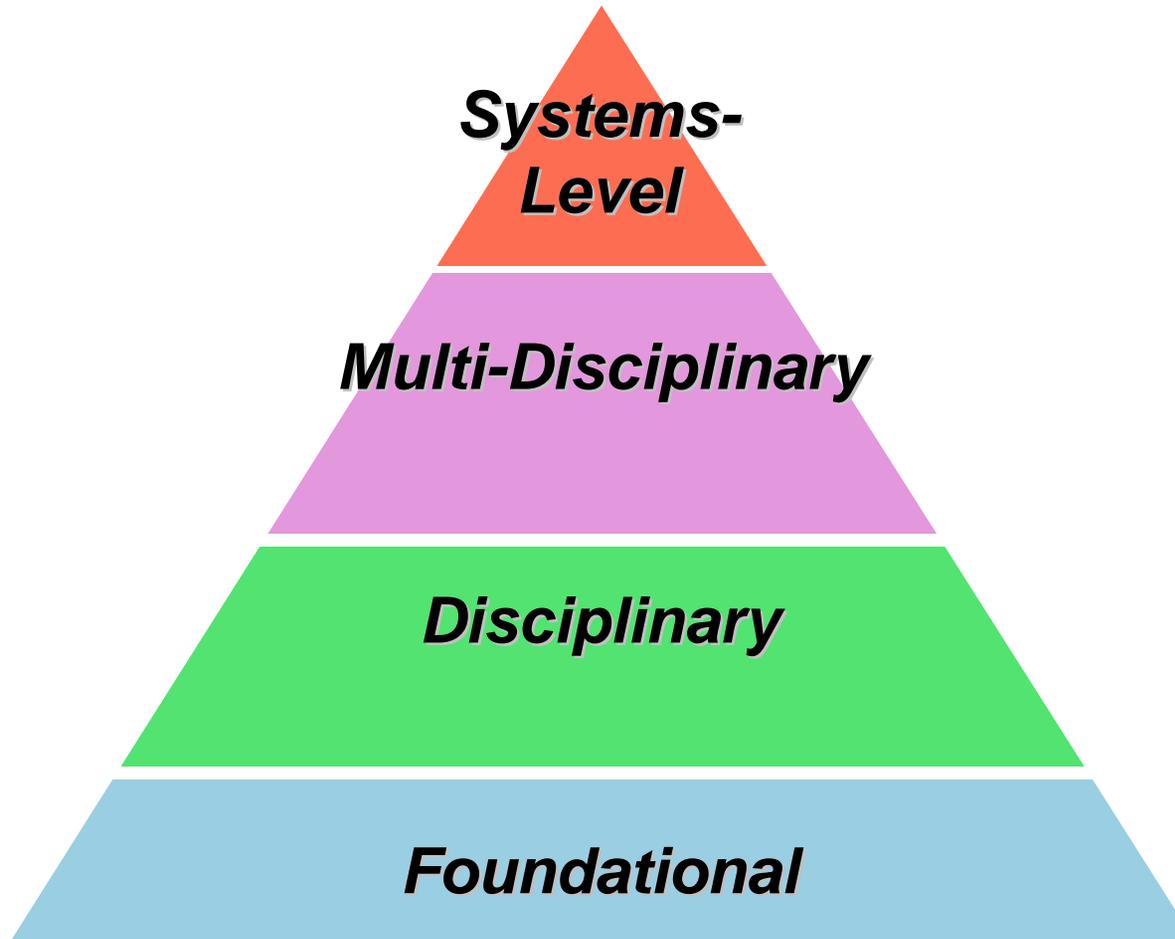


Discussion with ARMD Senior  
Management on candidate systems-  
level research projects

# Observation

The National Aeronautics R&D Policy and the follow-on Implementation Plan lay out the roles and responsibilities of participating federal agencies, including NASA, in a collaborative effort to advance U.S. technological leadership in aeronautics. In the Committee's view, the NASA Aeronautics program, while currently conducting high quality research, is insufficient in scope to achieve the U.S. leadership objectives implicit in the President's Aeronautical R&D Policy.

# NASA Aeronautics Research





**Individual Blade Control in the 40x80  
A NASA/ARMY/ZF Luftfahrttechnik  
Collaboration**



**Quiet Spike™  
A Gulfstream Aerospace / NASA  
Collaboration**



**Ultra-High Bypass ratio turbofan  
model in the 9' x 15' Acoustic Wind  
Tunnel  
A NASA/ P&W Collaboration**



**X-48B Blended Wing Body  
A NASA/Boeing/AFRL Collaboration**

# Recommendation

ARMD should plan and develop candidate systems-level research projects of highest priority that should be evaluated and considered by NASA for augmentation in the FY2010 (and out years) budget request. These projects should be consistent with the objectives and themes of the National Aeronautical R&D Policy and Implementation Plan, leverage NASA's unique expertise and competencies, and reflect the priorities of the NRC's Decadal Survey for aeronautics.

# **Concluding Remarks and Committee Next Steps**

## **Next Meeting Plans**

- **Briefing on the status of the JPDO/NASA Research Transition Teams for NextGen**
- **Briefing from the National Academy/ASEB on the NextGen workshop report**