

USERS' ADVISORY GROUP

EXPLORATION & DISCOVERY SUBCOMMITTEE REPORT

November 15, 2018

Exploration & Discovery Membership

- Chair: General Lester Lyles (USAF, ret.)
- DFO: Brandon Eden
- Members:
 - Tony Bruno
 - Wes Bush
 - Mary Lynne Dittmar
 - Marilyn Hewson
 - The Honorable Kay Ivey
 - Dennis Mulenburg
 - Fatih Ozmen
 - Gwynne Shotwell
 - Eric Stallmer
 - Dave Thompson
 - Pam Vaughan
 - Stuart Witt

Exploration & Discovery Scope

- *Assessing whether each element of the current U.S. Exploration program aligns with the Goals of Space Policy Documents 1, 2, 3*
- *Determining if there are regulatory and policy barriers that hinder any Space participant from achieving the goals and objectives of the SPDs*
- *Assessing a need for an integrated approach to coordinate/combine S&T, R&D priorities or resources*
- *Determining if roadmaps concepts/technologies for Lunar and eventually Martian exploration can be accelerated by refining/streamlining/integrating them*
- *Ensuring there is balance between Exploration and Discovery (E&D) in the various space programs, including whether Science Missions can contribute to the objectives and safety of Human Exploration*
- *Examining organizational, policy, cultural, process issues identified from earlier NASA, GAO, or other studies that may enhance the paths of E&D*
- *Determining if there are alternatives to the current Lunar lander development*
- *Coordinating topics with other subcommittees to determine any overlaps or duplications*

Exploration & Discovery *Summary of Activities*

- Top issues request from subcmte members
- Discussions with various subcmte members and their space teams
- White papers received from numerous sources
- Exploration & Discovery discussions at the NASA Advisory Council, The Space Science Board of the National Academy of Science and Engineering
- November 9, 2018 Teleconference with subcmte. members to discuss findings from these deliberations.

Exploration & Discovery *Topics of Focus*

1. *There is a need for a resilient “space architecture” that is safe/fast/sustainable - for the entire Exploration Mission (Lunar to Mars).*

DISCUSSION: Need to examine/discuss alternative architectures for early Lunar exploration with flexible utilization of existing systems and approaches for future Martian missions.

Exploration & Discovery *Topics of Focus*

2. *Need to ensure a balance between Exploration and Discovery in future Space Missions, including how Exploration can enable Science (vice versa).*

DISCUSSION: Ongoing detailed discussions already underway with UAG members and NAE/NAC.

Exploration & Discovery *Topics of Focus*

3. *How do we maintain/ensure continued U.S. presence and leadership in Low Earth Orbit?*

*DISCUSSION: Can the ISS be extended beyond 2024?
Are there options for ISS utilization after 2024 ?*

Exploration & Discovery *Topics of Focus*

OTHER TOPICS :

- *Acquisition reform*
- *Security Clearance*
- *S&T coordination (S&T subcommittee topic)*
- *Regulation and Policy barriers (new NASA Advisory Council Committee will provide some insights; will continue to look for other barriers)*

***USERS' ADVISORY GROUP
NATIONAL SECURITY SUBCOMMITTEE
REPORT***

November 15, 2018

National Security Subcommittee *Membership*

- Chair: Adm. James Ellis, Jr. (USN, Ret.)

- DFO: Jolene Meidinger

- Members:
 - Tory Bruno
 - Wesley Bush
 - Dean Cheng
 - Tim Ellis
 - Marillyn Hewson
 - Gen. Lester Lyles (USAF, Ret.)
 - Col. Pamela Melroy (USAF, Ret.)
 - Dennis Muilenburg
 - Fatih Ozmen

- Members (continued):
 - Bud Peterson
 - Harrison Schmitt
 - Gwynne Shotwell
 - Bob Smith
 - Mandy Vaughn
 - Stuart Witt

National Security Subcommittee **Scope**

The scope of national security space issues within the purview of the Subcommittee includes:

- *Reviewing national security considerations relevant to National Space Policy and National Security Space Strategy including:*
 - *Space systems, space capabilities, and space architecture*
 - *Future national security space requirements*
 - *System resiliency, robustness, and interoperability*
 - *Interagency collaboration/cooperation*
 - *The evolving national security space threat environment*
- *Making recommendations on national security considerations to the UAG affecting coordination, cooperation, and technology and information exchange among the civil, national security, commercial, and international space sectors.*
- *Assisting other UAG subcommittees in reviewing classified elements within the scope of their efforts.*

National Security Subcommittee *Summary of Activities*

- Held multiple administrative/preparatory telecons to develop Terms of Reference, identify potential topics of focus, validate clearance levels, and develop an initial meeting plan.
- On November 14, 2018, held an in-person classified session for an extensive review of national security space (NSS) programs and policy followed by a high-level update on NSS risk and the current space threat environment.
- External Participants: Mr. Steve Kitay, DASD for Space Policy
Mr. Jason Lurie, ODNI

National Security Subcommittee *Topics of Focus*

WHERE ARE WE, WHERE DO WE NEED TO BE, AND HOW DO WE GET THERE?

- **Readiness:** Consider the ability of the U.S. to deter or defeat threats and the use of force in space.
- **Strategy:** Assess the whole-of-government strategy for addressing the challenges in the national security space environment.
- **Planning:** Evaluate the integration of space capabilities into U.S. national security plans.
- **Space Protection:** Accelerating the creation of capabilities to safeguard our national security interests in space: force structure, decision making processes, command and control, and TTP.

***USERS' ADVISORY GROUP
ECONOMIC DEVELOPMENT AND
INDUSTRIAL BASE SUBCOMMITTEE REPORT***

November 15, 2018

Economic Development and Industrial Base

Membership

- Co-Chairs: Mary Lynne Dittmar and Eric Stallmer
- DFO: Nate McIntyre
- Members:
 - Tory Bruno
 - Steve Crisafulli
 - Tim Ellis
 - The Honorable Kay Ivey
 - Fred Klipsch
 - Gwynne Shotwell
 - Bob Smith
 - David Thompson
 - Stuart Witt

Economic Development & Industrial Base

Scope

The scope of the Subcommittee may include:

Developing recommendations for accelerating the economic development of low-Earth orbit, the Moon, and cislunar space;

Developing a framework for understanding and applying different contracting mechanisms to include public-private partnerships, other transaction agreements (OTA), space act agreements (SAA), cost-plus, etc.;

How to manage the range of space-related spectrum issues;

Possibilities for the expansion of use-lease and Commercial Space Launch Act (CSLA) agreements, especially when related to latent or mothballed infrastructure, and excess capacity;

Strengthening and expanding the overall US space industrial base and infrastructure.

When the topic overlaps with another subcommittee's area, the Subcommittee Chair will coordinate with the other Subcommittee Chair and the UAG Chair and relevant Designated Federal Officers to determine which subcommittee will deliberate on the topic, or if joint deliberations are needed.

Economic Development & Industrial Base Subcommittee

Summary of Activities

- After reviewing inputs the Chairs held 2 telecons to identify potential topics of focus and develop a preliminary work plan.
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- The Chairs held a meeting with Subcommittee DFO Nate McIntyre and with UAG DFO Brandon Eden to develop Terms of Reference (ToR) and further refine the plan. The ToR was distributed to members for comment.
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- The Chairs and DFO held a telecon with members to discuss the ToR and topics. The Chairs asked members to respond with their top three priorities.

Economic Development & Industrial Base

Topics of Focus

- *Develop recommendations for accelerating the economic development of Low Earth Orbit (LEO) and cislunar space**
- *Develop a framework for understanding and applying different contracting mechanisms to include public-private partnerships, other transaction agreements (OTA), space act agreements (SAA), cost-plus contracts, etc.*
- *Develop recommendations for strengthening and expanding the overall U.S. industrial base and infrastructure*

**This topic is expected to address International Space Station planning*

***USERS' ADVISORY GROUP
TECHNOLOGY AND INNOVATION
SUBCOMMITTEE REPORT***

November 15, 2018

Technology and Innovation Subcommittee

Membership

- Chair: Col Pamela A. Melroy (USAF, ret)
- DFO: Mr. Nate McIntyre
- Members:
 - Mr. Wes Bush
 - Mr. Dean Cheng
 - Mr. Tim Ellis
 - The Hon. Kay Ivey (*Governor of Alabama*)
 - Mr. Fred Klipsch
 - Gen Lester Lyles (USAF, ret)
 - Mr. Fatih Ozmen
 - Dr. Bud Peterson
 - Dr. Harrison "Jack" Schmitt
 - Dr. David Wolf

Technology and Innovation Subcommittee

Scope

- Reviewing new technologies and new applications of technology, as well as business innovation practices and new business models, and
- Making recommendations relevant to these topics on national policy, technology and operations architectures, and inter-department and agency coordination.

Technology and Innovation Subcommittee

Summary of Activities

- Held 2 administrative/preparatory telecons to develop Terms of Reference and identify focus areas. Two areas of high interest were identified:
 1. Space technology roadmap review
 2. Space data as a US government capability vs buying as a service
- Additional topics of interest to be pursued:
 1. Balancing performance-based regulations that encourage innovation with necessary commonality/standardization
 2. Developing a list of game-changing technologies

Technology and Innovation Subcommittee

Topics of Focus

- Expected outcomes
 1. Space technology roadmap review. Review US Government department and agencies space technology roadmaps to uncover synergies, overlaps, and inconsistencies that could be better aligned for national impact.
 2. Data as a capability vs a service. Evaluate and recommend best practices for US government on owning data capability vs buying data commercially (Earth Observation, Space Situational Awareness, weather). First deep dive will be Space Situational Awareness as this will support SPD-3, National Space Traffic Management Policy. White paper with recommendations for each data area as outcome to include findings and recommendations.

***USERS' ADVISORY GROUP
OUTREACH & EDUCATION
SUBCOMMITTEE
REPORT***

November 15, 2018

Outreach & Education Membership

- Chair: Eileen Collins
- DFO: John Gaine (NASA)
- Members:
 - George P. "Bud" Peterson
 - Mandy Vaughn
 - Pam Vaughan
 - Stuart Witt

Outreach & Education Scope

The UAG Education & Outreach Subcommittee has a twofold mission:

- 1) To explore and recommend ways to improve our country's education system in an effort to strengthen technical expertise which will allow the United States to retain its preeminent global space programs.
- 2) To collaborate with space program stakeholders to insure the National Space Council has access to the information and conditions that contribute to strong United States leadership in space. The subcommittee will chronicle the interactions between its members and the stakeholder community.

Outreach & Education *Summary of Activities*

- Held one administrative/preparatory telecon to develop Terms of Reference, identify potential topics of focus, and develop a work plan.
- Have participated in one listening session during the Von Braun Symposium
- Also attend ___ other fact finding events

Outreach & Education Topics of Focus

Focus 1:

Improve the high dropout rate of first year engineering students: Reach out to university leadership and professors on innovative ways to encourage engineering students to stay in engineering. Encourage private industry and local businesses to support innovative ways to educate/inspire K-12 students and teachers in space-related educational subjects. Efforts should emphasize lower population areas that do not have access to universities/museums/non-profits/large industry.

Focus 2:

Space Education Contract Incentives: Add education incentive clauses to space-related government contracts. Use NASA incentives as an example, and focus on agencies such as NOAA, NRO and the Air Force". In addition, NASA Grand Challenge programs provide an excellent example to other government agencies on ways to involve students in actual space-related projects.

Future:

Improve NASA communication and outreach to the public, working with NASA Advisory Council.

Other:

UAG Outreach: Our committee will track UAG member's attendance at conference/symposium/public outreach events.

***USERS' ADVISORY GROUP
SPACE POLICY AND INTERNATIONAL
ENGAGEMENT SUBCOMMITTEE
REPORT***

November 15, 2018

Space Policy and International Engagement (SPIE)

Membership

- Chair: Dr. David Wolf
- DFO: Mr. Neal Newman
- Members:
 - Dr. Buzz Aldrin
 - Mr. Dean Cheng
 - Dr. Mary Lynne Dittmar
 - Admiral James Ellis, Jr. (USN, Ret.)
 - Dr. Fred Klipsch
 - Col. Pam Melroy (USAF, Ret.)
 - Mr. Dennis Muilenburg
 - Mr. Eric Stallmer

Space Policy and International Engagement (SPIE)

Scope

- *The function of the UAG is "to ensure that the interests of industry, other non-Federal entities, and other persons involved in aeronautical and space activities are adequately represented."*
- *The SPIE Subcommittee will review the U.S. space enterprise and the landscape of existing and potential U.S. and international space treaties, laws, policies, and practices and develop recommendations to advance U.S. interests and leadership within the global space enterprise.*

Space Policy and International Engagement (SPIE)

Summary of Activities

- SPIE Subcommittee held three administrative/preparatory telecons to develop Terms of Reference, and identified the following main focus areas:
 - Space Policy
 - Review existing U.S. space policies, laws, and regulations for potential gaps, shortfalls, inconsistencies, or obsolete content.
 - International Engagement
 - Review existing U.S. space related treaty commitments, and consider approaches to advance U.S. space policy objectives in appropriate international venues (e.g. the United Nations Committee on the Peaceful Use of Outer Space (UN COPUOS) and other select aerospace venues.
 - Explore Opportunities
 - Assess opportunities for international partnerships to further U.S. space programmatic and policy objectives.
 - Assess opportunities for the U.S. space enterprise to contribute to broad international and global goals.

Space Policy and International Engagement (SPIE)

Strategic Questions

- Should international partnerships be pursued primarily (or only) for direct aeronautics and space programmatic benefit, or are there opportunities to advance broader U.S. foreign policy, strategic, or other objectives?
- Are there strategic relationships with particular international partners (or regions), disciplines, or practices (e.g. space situational awareness, threat detection, asset protection, lunar landers, propulsion, interface standards) that would benefit from specific focus?
- As global space capabilities rapidly develop both in the government and commercial sectors, are there cooperative/collaborative models beyond traditional government to government bilateral or multilateral approaches?
 - International Space Station partners;
 - United Kingdom – United States of America Agreement (aka “Five Eyes”);
 - Other unique cases/issues to be assessed (e.g. Public Law 112-55 prohibiting civil space engagement with China)?