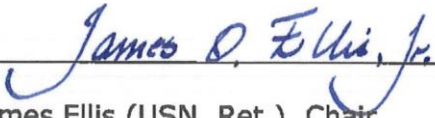


National Space Council User's Advisory Group

June 19, 2018
NASA Headquarters
Washington, DC

MEETING MINUTES



Adm. James Ellis (USN, Ret.), Chair



Mr. Brandon Eden, Executive Secretary

National Space Council Users' Advisory Group

NASA Headquarters

300 E Street SW

Washington, DC

Minutes of the First Meeting

June 19, 2018

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Tuesday, June 19, 2018

Call to Order, Announcements

Mr. Brandon Eden, Executive Secretary of the National Space Council (NSpC) Users' Advisory Group (UAG), introduced himself and welcomed the meeting participants. NASA chartered and is sponsoring the UAG upon the request of the White House. The UAG exists to ensure that industry and other stakeholders are adequately represented in the Space Council. Mr. Eden noted that this was a Federal Advisory Committee Act (FACA) public meeting, that formal minutes were being taken for the public record, and that all discussions were on the record. Each UAG member had been appointed by the NASA Administrator, Mr. James Bridenstine, as either Representatives of specific entities, or as Special Government Employees (SGEs). All SGEs were required to recuse themselves whenever they might have a conflict of interest.

Opening Remarks by Chair, UAG

Adm. James Ellis welcomed the UAG members, other participants, and listeners. This was the inaugural session of UAG, and the purpose of the day's meeting was to address organization and structure. The UAG was enabled by legislation enacted decades ago, but it had only now been formed after 25 years of dormancy. UAG is to function as a think tank for the NSpC, in addition to advising the Council. UAG has many opportunities and few constraints. It will be a conduit for new ideas and will work to identify obstacles that can be quickly removed. This is both a challenge and an opportunity.

The organization is for all users of space, and so there will be continued outreach to those who were not present. UAG members are free to shape the Group as they deem appropriate. They can innovate to facilitate the goals of the NSpC, and they can expect NSpC tasking. In turn, NSpC expects UAG to take the initiative. Therefore, it is important to understand the NSpC priorities. While NASA is overseeing implementation, facilitation, and other aspects of the NSpC mission, additional organizations are involved. UAG should collect inputs from all space stakeholders. The Department of Defense (DOD), industry, and the science community are also users to which UAG must reach out. Through individual members and/or subcommittees, UAG will co-locate with existing venues, like the National Space Symposium, the Universities Space Research Association (USRA), and others. UAG will meet with NSpC annually, but otherwise will be able to hold its meetings independently.

Adm. Ellis invited the UAG members to review the charter, objectives, and scope, which are broad. UAG duties include: ensuring the interests of industry and other non-federal entities involved in aeronautical and space activities are represented on NSpC; providing subject matter expertise to the Council; submitting reports; conducting studies, reviews, etc., requested by NSpC; and reporting to the Council.

Adm. Ellis then presented a proposal for six UAG subcommittees and chairs:

- Exploration and Discovery – Gen. Lester Lyles, Chair
- National Security Space – Adm. James Ellis, Chair
- Economic Development and Industrial Base – Dr. Mary Lynne Dittmar and Mr. Eric Stallmer, Co-Chairs
- Technology and Innovation – Col. Pamela Melroy, Chair
- Outreach and Education – Col. Eileen Collins, Chair
- Space Policy and International Engagement – Dr. David Wolf, Chair

The UAG Executive Committee will be comprised of the six subcommittee chairs.

Opening Remarks by NSpC Executive Secretary

Dr. Scott Pace, Executive Secretary of NSpC, began by noting that this is the third incarnation of the Space Council. The first was during the space race of the 1960s, and the second was during the administration of President George H. W. Bush. The latter dealt with the aftermath of the Cold War and addressed cross-cutting issues like international partnerships and other areas beyond the scope of an individual agency. The current space environment includes many public and private sector actors, along with intense globalization. Not all of the international entities are fully engaged in all activities, but are all interested in what space activities can do for their people. The new private sector involvement has raised questions about how to innovate at less cost. The second NSpC reached out to the national labs for innovation, but now that role is now filled by industry and others outside the Federal government. The NSpC priority is a unity of effort, so that stakeholders can proceed in roughly the same direction. There are already directions provided from the Decadal Surveys, the NASA Advisory Council (NAC), and others, but the NSpC is the only place where it all comes together. It provides the larger perspective that is needed at this time.

Dr. Pace said that the NSpC is mindful of UAG member time, and therefore wants members to leverage their existing schedules to use their networks and other resources. However, they should also take a step further to connect with larger communities. None of this happens without public support, and the public trust must be earned. NSpC has embraced exploration because it is highly visible. While the White House and Congress are very supportive of ambitious directions, public support is crucial. There needs to be growth in international investments in order to expand the sector, and that requires being indispensable from the commercial standpoint.

There is a process here. In terms of reinvigorating the NSpC, it is to work through the differences among the various players. It is not to take over the Federal agencies. When problems occur in programs that have national impact, NSpC will be involved. The process is a cycle, which Dr. Pace described. The President directs the top-level tone and direction, to grow the economy and sector. He also wants faster growth, not just for the sake of speed, but for rapid feedback as well. He wants to have smart people in the right places. NSpC tries to set up framework agreements and set up boundaries with agencies. The Interagency Working Group addresses what it can, but these are not easy issues. A lot of staff work is involved in shaping this effort in terms of principles.

Dr. Pace next turned to space exploration priorities. While other countries rejected the previous administration's plan for human exploration of Mars, they can envision going to the moon. Similarly, commercial companies saw no benefit from human exploration of Mars but did see a case for a return to the moon. The focus on Mars drove international partners away instead of aligning them with the United States. Space Policy Directive 1 corrects this and redirects NASA to the moon, with commercial and international partners. The United States is doing this because it is in our best interests and that of our allies. This is bigger than projects and hardware and astronauts.

In order to address commercial space priorities, the United States must retain its lead, and that means streamlining the regulatory system. National security space priorities are rooted in the fact that space is now recognized as a war-fighting domain. The United States' adversaries have weapons that threaten our space assets, which are considerable. The United States needs to dominate in space, as the nation is extremely reliant on it. Therefore, we need to make our space systems more resilient and less vulnerable to attack. The White House seeks to ensure that this happens. Space Policy Directive 2 provides more details in this area.

Transportation is a Federal Aviation Administration (FAA) responsibility, under Title 49. Other activities are under the Commerce Department. There is also a need to have a specific voice for commercial spectrum issues within the Federal Communications Commission (FCC), and this must be addressed from a space perspective. Space Policy Directive 3, signed just the day before, addresses space traffic management and will provide a broader civil interface through the Commerce Department.

Adm. Ellis asked about priorities that UAG might address. Dr. Pace replied that there is a need to strengthen public engagement with space, first. Next, the United States must increase commercial activities in low-Earth orbit (LEO), and shift from owning the International Space Station (ISS) to leasing portions of it. This will not be easy, as the nation does not want to lose the gains from LEO, nor the international partnerships involved. It is important to preserve the capabilities, if not the facilities. He is interested in determining where people can make money in space. The third priority is accelerating the return to the moon. Program management is a consideration – where are the necessary people who have a sense of urgency? Fourth is where the country competes and where it cooperates internationally, including the countries with which there is some friction. The success in keeping ISS out of geopolitics has taken a huge effort, which requires examination. Finally, there is a need for exploration-enabled science and science-enabled exploration. There is a relationship between the two, as they create opportunities for each other. There should be more geologists on the moon, for example. Science, technology development, and the science community are crucial.

Mr. Salvatore Bruno noted that commercial entities have had opportunities in LEO. He wondered if UAG might also consider cis-lunar space opportunities. Dr. Pace said that that was absolutely the case. Not only are there research needs, there is also a national security aspect – it is an integrated whole. Mr. Wes Bush observed that UAG meetings are public, but that is not always possible in the national security space. Dr. Pace replied that the National Space Strategy lays out priorities, and NSpC works closely with the National Security Council. In areas of overlap, NSpC will probably take the lead. Acquisition reform is a big concern. There are various organizational approaches that were considered, but this is being resolved. Adm. Ellis added that technology can drive things as well, and much of that will be in the classified area.

Ms. Marillyn Hewson asked how UAG might contribute to the space force. Dr. Pace answered that there is a need to speed up acquisition, identify capabilities where the effort can succeed, get right the people with hands-on experience, and obtain sufficient resources. It is also necessary to see the context regarding the major threats that exist. This should all take place as soon as practical, ideally starting with the Fiscal Year 2020 (FY20) budget. The Honorable Harrison Schmitt pointed out that the nuclear Navy has managed to stay young, which could be a model. NASA is not that young. Dr. Pace thought it was a matter of how to attract young people, by giving them something interesting to do. They want tacit, hands-on experience. The military gives responsibility to young people. Hon. Schmitt noted that that will require Congressional action and a restructuring of the civil service system.

Mr. Fatih Ozmen expressed concern about stove-piping and asked if it would make sense to have a group examine the committees and subcommittees that might contribute to that. Adm. Ellis said that he was open to that in the discussion of the groups. The elements will get worked out in the subcommittees, and the plenary group will make the recommendations. The process is designed to pull it together at this level. Dr. Pace added that sometimes issues have to go to the principals. This is why all final recommendations must go through the plenary group in a FACA environment. Where consensus does not exist, the discussion will be public. It is not required to have consensus.

Mr. Dennis Muilenburg pointed out that there will be a need to think differently about sectors and government agencies. For example, frequency management is beyond the purview of a U.S. agency, as it is international. Similarly, space use at the edge of the atmosphere will no longer make sense. Trends for the future are becoming apparent. There will be commercialization of space and there are other

international agencies with requirements. The nature of commercializing space calls for stakeholders to think differently. Dr. Pace said that he was hopeful that the space and frequency issues would work in favor of the United States, noting that U.S. space interests often did well at the International Telecommunication Union (ITU) because our needs and interests in space aligned well with those of the developing countries. The biggest areas of problems he had internationally were countries that had narrow interests. Regarding the seamlessness of hypersonic vehicles and air traffic management, there are fundamental legal and practical considerations about flying over sovereign air space, as well as overflight in space. However, there is also a need for international traffic management and interfaces.

Deregulation and Space Traffic Management Initiatives

Mr. James Uthmeier of the Department of Commerce (DOC), explained that the Trump Administration has established requirements to reduce rules, especially when implementing new ones. Mr. Uthmeier is focused on the deregulation of space. DOC hopes to enable more commercial success in space, and to that end is also addressing the entire supply chain. The Department also wants to determine how to continue government research and growth while better developing a market. DOC is creating a single interface for companies, a "one-stop shop." The right organization must be in place to ensure that everyone is working on the same page. When a company meets with DOC about space, the Department will have the right people at the table. As part of this effort, DOC has submitted a reprogramming plan to Congress, to establish a space office at Commerce and to take on mission support services.

To be clear, DOD will continue collecting data, and DOC will be the interface supporting companies to launch successfully and obtain their own data. Right now, for example, the Federal government provides raw weather data, which should go over to the commercial side. The appropriators in the House of Representatives approved the re-organization and discussions are ongoing with the Senate. DOC hopes to establish the right infrastructure and streamlining process to move into the future. At present, companies go overseas when they do not receive Federal support, so industry has been invited to discuss definitions in order to enable flexibility, and to explain what they need from DOC. A new rule will be issued later this year. In addition, DOC will convene discussions among the big lending institutions and NASA. Finally, in the area of Space Situational Awareness and Space Traffic Management (SSA/STM), the current requirement is to work through the Department of State. However, there will be more initiatives to protect U.S. businesses and assets.

Adm. Ellis asked for a list of DOC priorities. Mr. Uthmeier replied that getting the new office stood up to have a true advocate for industry is first. The second priority is cutting red tape. Third is establishing creative ways to help businesses, enable space-oriented infrastructure, and address the frequency of launches. Fourth is to expose our ideas for investment overseas. Finally, the Federal government must work together in a cross-agency approach that can move quickly, keeping in mind the needs and constraints of national security.

Col. Eileen Collins urged including the minimization of orbital debris as a priority, as it is an international issue that constitutes a major threat. This is also a technology problem. Mr. Uthmeier agreed, noting that this is above and beyond what he does, but Commerce is working hard to look at this. Ms. Collins explained that she had wanted to get it on the record because it is an important issue that calls for an international effort. Dr. Pace added that there is a strategy on debris in the works. Guidelines are going through the United Nations (UN) into nations' laws and regulations. However, it is important to avoid a top-down, centralized approach. Regarding export control, NSpC has been hearing from companies about the problems of dealing with antiquated, non-user-friendly IT systems. There may also be friction in terms of what happens commercially on ISS. As the nation transitions to a different use model of ISS, there will need to be more government-to-government dialogues about trade and impact, and DOC can help with that.

Mr. Stuart Witt asked what DOC might do about past contracting practices. This is not a one-size-fits-all issue, but he would like to see a review of what does and does not work, and what might work in the future. Hon. Schmitt noted that international forums work out some of the issues mentioned, and they operate on consensus. He wondered if those would be reviewed as well. Mr. Uthmeier said that the reviews are under consideration. Dr. Pace urged caution in creating new international organizations, though he was initially a skeptic of the consensus required in ITU and is now a fan. That organization has turned out to protect U.S. interests and is helpful overall. It is easy for leading countries to find themselves isolated or outnumbered, but finding our way forward with like-minded countries is probably the best hope for the United States. Hon. Schmitt said that his experience was that it was important to have the U.S. commercial sector deeply involved. It helped illustrate to other countries the value of our technologies. Dr. Pace added that one of the most impressive things was the breadth and diversity of the U.S. delegation. Other countries did not always have that, and it is something to build on.

Mr. Uthmeier closed by stating that the DOC Secretary, Mr. Wilbur Ross, will come to the next UAG meeting.

Space Exploration Priorities: ISS Transition and Lunar Exploration Roadmap

Mr. James Bridenstine, NASA Administrator, thanked the UAG members for their participation, stating that the UAG can be effective in moving the country forward. He sees the NSpC and UAG as key in the interagency space area. When he served on the House Armed Services Committee, he identified communications architectures that need to be brought together. It is notable that commercial interests jump in to act while DOD takes 2 years to do an analysis that is already obsolete upon publication. The issues then become how to develop a low-latency capability for bandwidth, how might the United States best take advantage of it, how do Federal agencies work together to maximize that capability, what does DOD need and how does it get out in front on that, and are we communicating it early enough to have the capabilities?

NASA plays a role in the robotic servicing piece, because the Agency has thousands of satellites in LEO. The congestion is a massive challenge that is only growing with greater launch cadences. The prediction is that collisions will occur at a rate of one every 4 to 9 years. That raises the issue of how to prevent this congested, contested environment in LEO. NASA's role could be the robotic element. In addition, the Restore-L mission addresses the issue, though it does not go far enough. NASA can make the investments that industry does not where there is no commercial payoff. However, NASA can also license those activities to companies.

Mr. Bridenstine explained that when he was in Congress, tornadoes occasionally killed some of his constituents. At the same time, there were delays in the weather models and missions that ought to protect his constituents. He therefore worked on developing commercial activities to mitigate the gaps in data delivery. The companies had problems due to the fact that the data had to be given away free internationally, however. The United States needs to think about its capabilities. While we receive a lot of our data from the international community, we might try to find a way to license companies so that the data do not have to be given away. The global public good is not a global public good if the framework prevents it from being created to begin with. Our international obligations constrain us and prevent the government from keeping up. Mr. Bridenstine hopes UAG can help in this area. The transformational things happening in space are critical, and the government must be responsive to that.

Mr. Stallmer asked if Mr. Bridenstine had any insight or thoughts about the Space Force that had been announced the day before by the President. Mr. Bridenstine replied that as a member of the House Armed Services Committee, he voted to support the Space Corps proposal the three times it came up. This is not

an easy thing, but it is an idea whose time has come. The United States faces unprecedented challenges in space and has been contested in space. It is become a very dangerous environment. His Navy experience showed that two things matter: how good your commerce is, and how good your defense of that commerce is. The same is true in space. Commerce is critical for space, which is a major industry and an element of our international export strategy. The commerce is there right now, but the defense of that commerce is not. Therefore, the White House is moving forward on that. Mr. Bridenstine gave the example of General Billy Mitchell, who after World War I was vocal about the need for an air force with a bombing ability. While his advice was ignored for many years, WWII proved him to be right, and the U.S. Air Force (USAF) was created as a result. The Space Force is an idea whose time has come, though it is not yet clear what it will look like. Military services organize, train, and equip. A Space Force within the military would come out of USAF, and it could take many different forms. There is a lot of work to be done.

Mr. Bruno asked about whether the government might be a customer in LEO and cis-lunar space. Mr. Bridenstine said that it will be, and there are international consortia interested in taking ISS over commercially. These are serious conversations currently underway. It is important to not have a gap in LEO; rather, there should be a permanent human presence there. ISS is a government function that could transition to where the government is a tenant alongside private industry tenants. Following that, the government could be the anchor customer for lunar capabilities with payloads from various sources. There is a lot that can be done, but he supports being a customer. The Federal government should lead where the commercial side is not yet ready, or take over where industry cannot operate.

Mr. Muilenburg observed that UAG is eager to help strengthen public advocacy for space exploration and asked how that might best occur. Mr. Bridenstine replied that a recent Pew Research Center poll found that 72 percent of Americans think the United States should be a leader in space. That is an enormous level of agreement. In addition, 80 percent of Americans believe ISS has been a good investment for the U.S. taxpayer. This says that NASA has communicated well how ISS establishes U.S. leadership. The poll shows that 65 percent of Americans believe the United States should lead in the use of space to understand Earth, and to track objects that could be a threat to Earth. However, he was surprised to see that the exploration of the moon and Mars was at the 15-20 percent approval level. This means there is a need to change that narrative.

NASA excels at transdisciplinary thought. When the Agency does human exploration, it conducts science that helps our own planet. He gave the example of Mars losing its oceans and atmosphere, which scientists need to understand. The United States must be the first nation to discover life on another world, not the second. That is why exploration is important. However, astronauts returning to Earth face significant health problems and deficits. For example, it takes an astronaut up to 60 days just to be able to touch his or her nose with a finger. This illustrates why there are issues with sending them on a 6-month journey to Mars, where they will have to do the hardest work they have done in their lives. This is the kind of thing that must be tested and addressed.

NASA operates in a different environment from that of the Apollo era. The level of redundancy is an example. There must be a sustainable lunar architecture, and the sustainability element is key. This shows the need to communicate to the American people why it is important to go to the moon. It is good that Americans see the importance of studying Earth from space, but they also need to understand the importance of studying other planets and bodies.

The Hon. Harrison Schmitt cited the geopolitical context in going back to the moon and on to Mars. Mr. Bridenstine said that the United States has the opportunity to open dialogues with Russia due to our ISS collaboration, as long as the United States leads. Hon. Schmitt pointed out that China wants to lead, too. Mr. Bridenstine said that he thinks the United States can do this. We are the only nation that has

successfully landed on Mars, for example, having done it seven times and preparing for an eighth. He believes our leadership position is sustainable.

Ms. Hewson asked what the U.S. government should own to support U.S. businesses in space. Mr. Bridenstine replied that the Lunar Gateway provides an opportunity to take advantage of commercial partnerships in a new way. The United States is going to the moon, and the Gateway will provide even greater access to the moon rather than diminishing that access. With Apollo, NASA missed a lot of science – the ice being an example - by going to a single spot on the moon. The United States wants to do more science on the moon and will use the Gateway to do so. The country needs a station orbiting the moon that enables other travel in the solar system as well. The Gateway will provide this kind of broad access. This is the United States' opportunity to prove those technologies and lead internationally.

Dr. Buzz Aldrin said that the Chinese will have a halo orbit around L2, with the capability of a landing on the dark side of the moon. The United States denied the Chinese the opportunity to go to the ISS. If the Chinese launch as planned, they can launch to larger inclinations than what is planned by the United States. We denied them something, and they can deny us something and encourage other international partners to join them. Therefore, we should attract other nations with compelling inclinations. The country needs an organization and a plan that international partners would like to have. Mr. Bridenstine offered to discuss this further.

Formation of Work Plan and UAG Subcommittees

Adm. Ellis explained that his list of six proposed subcommittees was a draft, though each subcommittee was the result of a specific conversation with Vice President Pence on the topic of the NSpC charge. The UAG was free to reorganize the subcommittees as long as the issues are covered. He asked each member to communicate to Mr. Eden about a couple of committees of interest to them. There may need to be some shuffling around in order to achieve balance. Adm. Ellis's initial choices for chairs might change as well.

Adm. Ellis elaborated on what some of the subcommittees might cover. In the Exploration and Discovery Subcommittee, the "discovery" element addresses science. The National Security Space Subcommittee might be best for people with active security clearances. The Economic Development and Industrial Base Subcommittee addresses a major NSpC focus. The Outreach and Education Subcommittee is important and will address making the case for support of space exploration. The Space Policy and International Engagement Subcommittee is an area in which technology has outpaced both policy and international agreements.

Gen. Lyles pointed out that the subcommittees are broad, and he wanted to know about the subsets and specificity under each. Adm. Ellis said that aside from Dr. Pace's top five priorities, this is an ongoing dialogue. The subcommittee chairs will help prioritize, which will involve tradeoffs. He wants to increase the pace and sustain the work going forward, and would prefer to decide on a few things for focus rather than be spread too thin. That was also advice from Vice President Pence. It is important to identify the issues to work on quickly rather than seek complete solutions. UAG will learn the NSpC priorities as they evolve.

Dr. Aldrin asked if UAG should look at the education pipeline. He also stated that there are disadvantages to international cooperation. Adm. Ellis thought that while the pipeline might be beyond UAG, they need to point it out and note the linkage to space. International bodies share interests, which can lead to some issues over who gets what. The commercialization of LEO falls under the Economic Development and Industrial Base Subcommittee. Ms. Collins asked why UAG did not include any members of the active duty military. Adm. Ellis said that there was some thought that the retired military members could serve

that function. DOD is also a user of space, and there will be outreach to that department in order to address their needs. DOD is also represented on the NSpC.

Dr. Wolf asked what license UAG has to investigate some of these issues. Adm. Ellis replied that in regard to “third rails,” sensitive areas, etc., there are none. UAG needs to emphasize what is important within its charge, and there is nothing to stop them from following up on their priorities. Dr. Wolf observed that those they talk to might not agree. Adm. Ellis said that while that is true, they work for the Vice President and are almost obligated to think broadly about where the important issues lie. Most of what the subcommittees focus on should be welcome.

He turned to the schedule. The UAG charter says they should meet three times per year, and at least once with NSpC. Other than the joint meeting, the UAG sessions will be decoupled from NSpC. Members will have other obligations resulting in conflicting schedules, so he wanted to get a sense of the number of meetings they wanted to hold. Gen. Lyles pointed out that the NAC subcommittees meet right before the NAC meetings, which is one way to structure it. Hon. Schmitt advised quarterly meetings. Mr. Fred Klipsch said that the subcommittees will need to meet in order to organize. Adm. Ellis said that he envisioned an organizational teleconference for the subcommittees, with their meetings before the UAG meeting. Ms. Mandy Vaughn said that much of what they will want to do will be cross-cutting more than strictly in the purview of any one subcommittee.

Dr. Mary Lynne Dittmar asked if the subcommittees will need to take findings and recommendations to the Executive Committee and then to the UAG. Adm. Ellis thought that was the way they would do it, though there might be quorum concerns. He could see UAG holding meetings at NASA facilities outside of Washington. They have already been invited to both Huntsville, Alabama, and the NASA Johnson Space Center (JSC), for example. As for field hearings, they might be able to put panels together at other events so that they are listening as well as speaking. This will likely be in the form of small groups. People are curious about this effort and UAG wants their input. The subcommittees and UAG as a whole can also request briefings. There is a lot of interest in addressing this group. If members need something broader and more in-depth, they should tell him and Mr. Eden. He has had international partners express interest. There are many opportunities, but they need to make sure they advance the issues.

Adm. Ellis asked the industry representatives which meetings they considered to have the most impact, both national and worldwide. Mr. Ozmen said that they might consider whether to have a website and social media presence. This can be hard to manage and would require a budget, but it could broaden the base. Adm. Ellis said that he would like to float a NASA-designed website up to NSpC, but he advised caution with social media. He would investigate further. Hon. Schmitt said that on the science side, there are annual meetings of groups with which NASA is loosely affiliated. The Lunar Exploration Analysis Group (LEAG) is one. USRA also hosts a group. The Solar System Exploration Research Virtual Institute (SSERVI) meets at the NASA Ames Research Center (ARC) each year. In addition, there are conferences for the broader community, such as the American Geophysical Union (AGU); every discipline has its annual meetings. UAG cannot appear at all of them, but there are many from which to choose. Adm. Ellis said that he would like Hon. Schmitt's help in capturing those communities without becoming too specialized. UAG does not have unlimited time or funds, so would he would rather find opportunities where some of the members are already involved, then pull in one or two more members. He added that the legal pieces of some of the security policies are huge, with a great deal of uncertainty. There needs to be that understanding. Hon. Schmitt noted that a lot of non-space-faring nations would like to see the policies change, which he considered inadvisable. Adm. Ellis said he would like to talk with these groups, agreeing that they should not dictate policy.

He would like the subcommittees to be aligned by July 1, 2018. He asked that as UAG members volunteered for subcommittees, they also submit their priorities and questions. He would then have a

teleconference of the Executive Committee to address this, the schedule, and the priorities. He would like to have a couple of issues to take forward to the next NSpC meeting, which would mean having another UAG meeting before then. It is important to emphasize UAG's expertise and collective insights. He would like to have the subcommittees to bring forward six or seven important recommendations that the Executive Committee could take to UAG and then to NSpC. Within the FACA guidelines, UAG can do pretty much whatever the members want, so they need to determine how to add value and make progress.

Adm. Ellis asked that each UAG member volunteer to be on at least two subcommittees, ideally as many as they feel they could be part of and have time for. Dr. Robert Smith said that it would be helpful to have criteria for the recommendations, for example placing an emphasis on something that could be implemented and is economically feasible. The direction would be helpful so they do not spend too much time arguing about outcomes. Adm. Ellis agreed and asked for UAG member thoughts on this. He promised to put together some guidelines on the qualities a recommendation should have. He added that there are things that do not make economic sense and have no business case but still need to be done.

Public Input

Adm. Ellis opened the microphones for public comment.

Mr. Joseph Gillen, affiliated with a small consulting group, said that he believed he was speaking for a larger community of the many individuals who are retired or left the industry and who are chomping at the bit to use their talents and passions to become involved in this effort. This included public outreach and specialty areas. He asked if there might be any way that UAG could use their help. Adm. Ellis thanked Mr. Gillen and said that UAG will find ways to fully engage and communicate.

Ms. Stephanie Wan introduced herself as the former chair of the Space Generation Advisory Council, which is affiliated with the UN and provides a youth perspective on space policy. The Council has an observer with the UN Committee on the Peaceful Uses of Outer Space. She said that the workforce, the younger generation, is a great community for UAG to work with. Adm. Ellis praised Ms. Wan's initiative, thanked her, and said that he is familiar with her organization. It is important, and will be included in outreach.

Mr. Keith Cowing of nasawatch.com stated that UAG appeared to have only one member under the age of 50. He also stated that the panel seemed to be largely made up of big aerospace representatives. He asked if the lack of younger people was deliberate. Mr. Stallmer said that there were some younger people in the room, Ms. Vaughn stated that she was younger, and Ms. Gwynne Shotwell said she represented many younger individuals. Dr. Wolf said that he has mentored younger astronauts and was still in frequent contact with many of them, but he welcomed anything Mr. Cowing could do to help with connections.

Mr. Asian Zuckery thanked the UAG members for their service and said he would be happy to help.

Mr. Gary Barnhart of Extraordinary Innovative Space Partnerships said that it is important that UAG be involved in LEO commercialization, as the attention paid now will make a tremendous difference. There is interest from a number of groups, such as the Planetary Society, as well as the broader entrepreneurial community. An example of the latter is a ULA initiative that now has over 160 participants. He suggested that UAG seek out such groups.

Mr. Keith Catterfelt asked about the best way for younger people to get involved in the effort. Adm. Ellis said that he appreciates this kind of support. Subcommittee membership is limited to UAG participants, but there are generational or space organizations with which young people can associate. The interest in

space is a passion we all share, and he advised interested individuals to make their presence and views known with the other organizations.

Roundtable Discussion and Final Wrap-Up

Adm. Ellis asked the UAG members for their thoughts at the end of the meeting. Mr. David Thompson thanked Adm. Ellis and the other UAG members. Mr. Witt thought that they have a short-term opportunity in which to be bold. Dr. Aldrin explained that he is establishing a human spaceflight institute for academic judgment of innovative, game-changing ideas, located in Houston. Col. Collins said that it is an honor to chair the outreach subcommittee and members had sent ideas to her already. She is a member of many of the organizations mentioned and wants to hear from the public. Speaking for Mr. Muilenburg, who had had to leave, Mr. James Hughes said that Mr. Muilenburg was grateful for the privilege of serving. Mr. Klipsch appreciated the opportunity to serve. He suggested that the process for output and what it might look like be a future topic. Ms. Vaughn said that this was a good opportunity to make a real impact.

Gen. Lyles also appreciated the opportunity to serve. He pointed out that the UAG charter refers to both aeronautics and space, and yet there was nothing in UAG related to aeronautics. He asked how it might be addressed. Adm. Ellis replied that there will be no spin-off group, but there was a lots of aeronautics representation on UAG. There are both legal boundaries and other boundaries that are blurring. If they need specificity, that will be addressed. Mr. Stallmer and Dr. Dittmar both said that it was an honor to be present. The Honorable Kay Ivey said she was thrilled to have a vision of the United States as a leader in space again and looked forward to working with this group.

Mr. Bruno said that they will be bold. Dr. Pamela Vaughan said she was proud and honored to be there. Dr. Smith thanked Adm. Ellis, and Ms. Shotwell urged UAG to get the work done. Dr. Wolf compared this to his astronaut class, and said he was feeling again that this is a great opportunity. Ms. Lisa Callahan, a spokeswoman for Ms. Hewson, thanked the group and took note of the diversity of the people in the room. Mr. Ozmen was grateful for the leadership and said that this is a time to take advantage of the opportunities. Mr. Bush called it a unique moment. Mr. Tim Ellis said that in regard to public outreach, they share the dream of going to the moon and Mars, which calls for bold, inspirational ideas.

Adm. Ellis thanked everyone for being part of this. Space is daunting in many ways. There is now an opportunity to do things differently. How we differentiate ourselves will be hugely important. They will find the things to which they can uniquely add value.

Adjournment

The meeting was adjourned at 1:53 p.m.

Appendix A Agenda

National Space Council Users' Advisory Group First Meeting

**Tuesday, June 19, 2018
9:00 a.m. to 2:00 p.m.**

**NASA Headquarters
Executive Conference Center, Room 8Q40B
300 E Street, SW
Washington, DC 20546**

Public Agenda

- | | | |
|------------|--|-----|
| 9:00 a.m. | Call to Order, Announcements, Mr. Brandon Eden Executive Secretary Users' Advisory Group | |
| 9:03 a.m. | Opening Remarks by Chair Users' Advisory Group (UAG), Admiral James Ellis (USN Ret.)
Chair Users' Advisory Group | |
| 9:10 a.m. | Opening Remarks by Executive Secretary National Space Council, Dr. Scott Pace Executive Secretary National Space Council | |
| 9:20 a.m. | Candidate Topics for UAG Review Dr. Scott Pace | |
| 10:00 a.m. | Deregulation and Space Traffic Management Initiatives, Mr. James Uthmeier Department of Commerce | |
| 10:45 a.m. | Space Exploration Priorities; ISS Transition and Lunar Exploration Roadmap, Mr. James Bridenstine NASA Administrator | |
| 11:30 a.m. | Lunch | |
| 12:30 p.m. | Formation of Work Plan and UAG Subcommittees | All |
| 1:30 p.m. | Public Input | |
| 1:40 p.m. | Roundtable Discussion and Final Wrap-Up | All |
| 2:00 p.m. | Adjournment | |

Appendix B

National Space Council Users' Advisory Group Membership

Adm. James Ellis, *Chair*

Retired 4-star Admiral, former head of STRATCOM

Buzz Aldrin

Apollo 11 Astronaut

Salvatore Bruno

President and CEO of United Launch Alliance

Wesley Bush

CEO of Northrop Grumman

Dean Cheng

Scholar at the Heritage Foundation

Col. Eileen Collins

Retired U.S. Air Force; Four-time Shuttle Astronaut

Steve Crisafulli

Former Speaker of the Florida House of Representatives

Mary Lynne Dittmar

President and CEO of the Coalition for Deep Space Exploration

Tim Ellis

CEO of Relativity Space

Marilyn Hewson

CEO of Lockheed Martin Corporation

Homer Hickam

Author of "Rocket Boys" and former NASA Marshall Spaceflight Center engineer

The Honorable Kay Ivey

Governor of Alabama

Fred Klipsch

Founder and Chairman of Hoosiers for Quality Education

Gen. Lester Lyles

Retired 4-star Air Force General and Chair of the NASA Advisory Council

Col. Pamela Melroy

Retired U.S. Air Force; Three-time Shuttle Astronaut; and former Deputy Director of the Tactical Technology Office, Defense Advanced Research Projects Agency (DARPA)

Dennis Muilenburg

CEO of the Boeing Company

Fatih Ozmen

CEO of the Sierra Nevada Corporation

G.P. "Bud" Peterson

President of the Georgia Institute of Technology

Eric Schmidt

Google and MIT Media Lab

The Honorable Harrison "Jack" Schmitt

Former U.S. Senator and Apollo 17 Astronaut

Gwynne Shotwell

President and COO of SpaceX

Bob Smith

CEO of Blue Origin

Eric Stallmer

President of the Commercial Spaceflight Federation

David Thompson

Founder and CEO of Orbital ATK

Pamela Vaughan

Board Certified Science Teacher

Mandy Vaughn

President of VOX Launch Company

Stuart Witt

Founder of Mojave Air and Spaceport, former Navy pilot, former Chairman of the Commercial Spaceflight Federation

David Wolf

Four-time Shuttle Astronaut and Physician

Appendix C

Meeting Attendees

UAG Membership

James Ellis, *UAG Chair*

Buzz Aldrin

Salvatore Bruno

Wes Bush

Eileen Collins

Mary Lynne Dittmar

Tim Ellis

Marillyn Hewson

Kay Ivey

Fred Klipsch

Lester Lyles

Dennis Muilenburg

Fatih Ozmen

Harrison Schmitt

Gwynne Shotwell

Robert Smith

Eric Stallmer

David Thompson

Pamela Vaughan

Mandy Vaughn

Stuart Witt

David Wolf

Brandon T. Eden, *UAG Executive Secretary*

Other Attendees

Barbara Adde

William Beckman

Cindy Brennan

Sandy Coleman

Mat Dunn

Martin Frederick

Rebecca Gilchrist

Newt Gingrich

Adam Greenstone

Marchel Holle

Tim Hughes

Teddy Jonston

Cody Knipfer

Doug Lauren

Alex MacDonald

Mark Mozena
Scott Pace
Ben Preugh
Diane Rausch
Alex Rodriguez
Robbie Sabbathier
Tommy Sanford
Elizabeth Sheley
Jared Stout
James Uthmeier
Stephanie Wan
Nate McIntyre

Appendix D
List of Presentations

LIST OF PRESENTATIONS

Users' Advisory Group to the National Space Council – Adm. James Ellis

Update on the Activities of the National Space Council – Dr. Scott Pace