NASA ADVISORY COUNCIL
National Aeronautics and Space Administration
Washington, DC 20546
Dr. Kenneth M. Ford, Chairman

June 18, 2010

Mr. Charles F. Bolden, Jr.
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Administrator Bolden:

The NASA Advisory Council held a very productive public meeting at the NASA Johnson Space Center on April 28-29, 2010.

As a result of its deliberations, Council approved seven observations, three findings, and eight recommendations at this meeting. They are enclosed for your consideration, along with the minutes from our Council meeting to provide additional background and context.

Thank you for the opportunity to provide our insight and advice concerning NASA and the U.S. civil space program. If you have any questions or wish to discuss further, please contact me.

Sincerely,

Kenneth M. Ford
Chairman

Enclosures

Enclosure

Tracking Number: 2010-02-01 (AC-01)
Unmanned Aircraft Systems Operations in the National Airspace System

Observation:
The Council endorses the NASA Aeronautics Research Mission Directorate taking on the important problem of Unmanned Aircraft Systems (UAS) operations in the National Airspace System (NAS).

Tracking Number: 2010-02-02 (AC-02)
Systems Verification and Validation

Observation:
The Council endorses the NASA Aeronautics Research Mission Directorate (ARMD) taking on the important problem of systems Verification and Validation (V&V). V&V affects all modern aircraft and air transportation and space systems. This is an extremely challenging area in which the Council feels will require new and innovative approaches and may require expertise outside of NASA's current skill set. The Council urges NASA to acquire current state of the art expertise in V&V and current practice in dealing with real-world problems in this area. We also suggest ARMD use this area as a challenge problem to stimulate ideas and solutions.

Tracking Number: 2010-02-03 (AC-03)
Agency-Wide Plan for NASA's Most Critical Facilities

Recommendation:
During the review of the Aeronautics Test Program (ATP), the Aeronautics Committee noted a decreasing utilization trend of ATP facilities that if left unabated will result in an increasing budget shortfall affecting the operations of these facilities. The Council recommends that an Agency-wide plan be developed to stabilize and where possible reverse the situation including supporting and improving the technical capabilities and operations of the most critical facilities and de-accessioning some facilities through sale or gifts.

Major Reasons for the Recommendation:
The utilization data for the ATP facilities shows a continued downward trend due to many factors including decreasing program usage, competition from abroad, and increasing use of analytical methods. If left unabated, this trend represents a "going out of business" approach for the ATP facilities. The cost gap is increasingly difficult to close and could result in shrinking capabilities of the facilities and severely constraining NASA's ability to do experimental research. While analytical methods can provide valuable results, the Aeronautics Committee feels that analysis via computational fluid dynamics is not a sufficient replacement. Additionally, some of these facilities will be essential for future national air and space priorities. There have been numerous studies looking at this problem, including the recent strategic planning done by ATP. Based on that, a plan adopted by NASA as a whole would be very helpful in setting priorities for investment of resources as well as for exploring the transfer of other facilities to the private or non-profit sector to maintain and develop.

Tracking Number: 2010-02-04 (CSC-01)
NASA Commercial Orbital Transportation Services Program

Observation:
The Council observes that the NASA Commercial Orbital Transportation Services (COTS) program to develop and demonstrate commercial capabilities for the delivery of cargo to the International Space Station (ISS) is moving forward at a deliberate pace. The Commercial Space Committee intends to closely follow the progress of the COTS Cargo program and the use of the proposed $312 million in new funding allotted to "incentivize" the program's participants. The Committee respectfully requests that NASA keep it informed of developments on the program. The Committee believes that the Commercial Orbital Transportation Services (COTS) program could be a viable model for the commercial crew program.

Tracking Number: 2010-02-05 (EPOC-01)
Public Engagement Not a "Mission Requirement"

Recommendation:
The Council recommends that representatives of the NASA Communications and Education Offices be included in reviews during all phases of development to ensure that missions serve NASA's educational and public outreach goals.

Major Reasons for the Recommendation:
NASA is an organization of engineers and scientists who do not necessarily understand the importance of public outreach. Public Affairs continues to fight a needless battle to include public access and interaction as a requirement for every NASA mission. Engineers have always resisted including cameras and crew time as a priority mission requirement –as both require the expenditure of scarce resources. Public access to missions should always be a priority requirement that is built into the design of any mission.

Tracking Number: 2010-02-06 (EPOC-02)
No Budget for NASA Headquarters Public Affairs

Recommendation:
The Council recommends that the NASA Office of Communications (formerly, Office of Public Affairs) and Office of Education be funded at a level proportionate and appropriate to its mission, goals, and objectives in engaging the public.

Major Reasons for the Recommendation:
The Public Affairs budget in Washington has been zeroed out for several years forcing the department to operate on non-appropriated money.

Tracking Number: 2010-02-07 (EC-01)
Re-Vectoring the NASA Exploration Systems Mission Directorate

Observation:
The Council applauds the efforts of NASA Associate Administrator Doug Cooke and his team in efforts to re-vector activities within the Exploration Systems Mission Directorate in light of Presidential guidance.

Tracking Number: 2010-02-08 (EC-02)
Cancellation of NASA Constellation Program and New Orion Requirement

Observation:
The Council observes that with the cancellation of the NASA Constellation Program, there are no active human exploration development programs or projects. What remains instead are commercial Low Earth Orbit (LEO) activities and enabling technologies that are required to underpin a variety of potential future exploration missions. Care should be taken that the new requirement for the Orion Crew Return Vehicle (CRV) not encroach on the present Exploration Systems Mission Directorate (ESMD) technology plan.

Tracking Number: 2010-02-09 (SC-01)
Resolution of the Pu-238 Production Issue

Observation:
The Council is grateful for the current resolution of the Plutonium-238 (Pu-238) production issue with the Department of Energy.

Tracking Number: 2010-02-10 (SC-02)
Revival of NASA's Technology Programs

Observation:
The Council is encouraged by the excellent planning for revival of NASA's Technology programs, including plans for a technology flight test program.

Tracking Number: 2010-02-11 (SC-03)
Revising the Kepler Mission Data Policy

Finding:
The Council concurs with the Science Committee's endorsement of the recommendation from the Astrophysics Subcommittee on revising the NASA Kepler mission data policy and supports its implementation.

Tracking Number: 2010-02-12 (S0C-01)
Ensuring International Space Station Capabilities are More Widely Known

Recommendation:
The Council recommends that NASA make the International Space Station (ISS) capabilities, achievements, and potential services more widely known outside the NASA community, especially within the business world. Consideration should be given to new and innovative approaches for doing so.

Major Reasons for the Recommendation:
The Space Operations Committee is very impressed with the past, current, and future capabilities of ISS. Some examples include: microbial vaccine development for staph aureus (MRSA) and salmonella, cancer treatment delivery, plant growth, macromolecular crystallization for Duchenne's muscular dystrophy, regenerative environmental systems, and education, to name a few. Research includes not only NASA and the international partners, but Department of Defense, National Institutes of Health, and commercial partners through the National Laboratory. NASA has used Space Act Agreements with various commercial organizations. While these appear to be quite successful, the committee believes there are still missed opportunities in the commercial sector, as many non-traditional partners are not aware of the capabilities and potential of ISS. The Space Operations Committee recommends that NASA look for new ways to make these capabilities known, either by marketing, appearing at non-traditional gatherings, broad announcements, or short educational articles in business publications. Some industry examples are: health care, environmental, or energy.

Tracking Number: 2010-02-13 (S0C-02)
Operational Model for Commercial Space Vehicles

Recommendation:
The Council recommends that NASA develop an operational model for commercial space vehicles that will enable NASA flight resources and crews to be committed to commercial space systems.

Major Reasons for the Recommendation:
As SOMD support of ISS operations moves from "government owned and operated" space operations, to "privately owned and leased" space operations, there will be major changes. These changes involve not only the obvious new hardware, software, documents, and procedures, but new risks, new relationships, a new business model, and a new culture. The model should address basic systems requirements, such as failure tolerance, NASA Program Management, NASA Engineering, Ground Operations, Flight Operations, Flight Crew involvement in development, certification requirements (what is required to commit NASA resources, pilots and passengers to the flight system), certification buyoff (how will NASA verify certification requirements), roles and responsibilities of NASA and the system developer, for ground operations, flight operations, and flight crew operations, and the role of company and

government pilots/astronauts. The operational model should be drawn up initially for the cargo mission. An operational plan for the crew mission should follow.

Tracking Number: 2010-02-14 (TIC-01)
NASA Technology Executive Council Approach

Finding:
The Council strongly supports the newly defined "push" model for the development of disruptive space technologies and the NASA Technology Executive Council process for managing and prioritizing future NASA technology investments. Among other things, the Council likes the openness of the technology research calls being proposed by the NASA Chief Technologist.

Tracking Number: 2010-02-15 (TIC-02)
NASA Life and Physical Sciences

Recommendation:
The Council recognizes the importance of life and physical sciences research in future human exploration activities and urges the Agency to engage in deliberative and inclusive discussions about how to manage it coherently across the NASA organization.

Major Reasons for the Recommendation:
The Committee wants to ensure that this topic, which extends across almost all NASA's activities, is well-coordinated.

Tracking Number: 2010-02-16 (TIC-03)
Embracing Innovation Outside Technology

Finding:
The Council believes that NASA should continue embracing innovation in process areas within NASA such as business and acquisition practices, and external partnerships. The Technology and Innovation Committee was particularly impressed with the Space Operations Mission Directorate's innovative flight hardware service contract with Hamilton Sundstrand for water production services on the International Space Station (ISS) and encourages additional similar innovations along these lines or other new approaches. The Council wants NASA to be innovative at its core, not just in specified "innovation programs."

Tracking Number: 2010-02-17 (TIC-04)
Share the Work, Share the Results

Recommendation:
The Council strongly urges NASA to quickly engage with other Federal Agencies and Departments as it develops its new technology programs. NASA can both benefit from and contribute to research and development in other parts of the U.S. Government.

Major Reasons for the Recommendation:
NASA can both benefit from and contribute to research and development in other parts of the Government. The benefit will redound not just to NASA and the other agencies, but to the entire country.

Tracking Number: 2010-02-18 (TIC-05)
Encouraging Diversity of Thought

Recommendation:
The Council encourages NASA to engage in cross-fertilization of personnel between NASA Centers and between NASA and outside organizations through Intergovernmental Personnel Act (IPA) agreements and rotational assignments as a way of encouraging innovation as the Agency plans and implements its new technology programs and in general. Innovation results from exposure to new ideas, new people, new workplaces.

Major Reasons for the Recommendation:
Innovation results from exposure to new ideas, new people, new workplaces.