

National Aeronautics and Space Administration
Office of the Administrator
Washington, DC 20546-0001



November 4, 2013

Dr. Steven W. Squyres
Chairman
NASA Advisory Council
Washington, DC 20546

STEVE
Dear Dr. Squyres:

Enclosed are NASA's responses to six recommendations from the NASA Advisory Council meeting held July 31 - August 1, 2013, at NASA Headquarters. Please do not hesitate to contact me if the Council would like further background on these responses. I appreciate the Council's thoughtful consideration leading to the recommendations and welcome its continued findings, recommendations, and advice concerning the U.S. civil space program.

I look forward to working closely with you and members of the Council in the future.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Bolden, Jr.", with a long horizontal stroke extending to the right.

Charles F. Bolden, Jr.
Administrator

Enclosures:

2013-02-01 (HEOC-01)

Research Subcommittee of the Human Exploration and Operations Committee

2013-02-02 (HEOC-02)

Priority and Schedule of Commercial Crew Development

2013-02-05 (AFAC-01)

NASA Coordinate Government-Wide Effort to Create Common Asbestos Cost Estimate

2013-02-06 (CSC-01)

Reduce Barriers to ISS Utilization, Including Intellectual Property Rights

2013-02-07 (EPOC-01)

Coordination of Education and Public Outreach Activities

2013-02-11 (ITIC-01)

NASA Information Technology Governance Document

NASA Advisory Council Recommendation

Research Subcommittee of the Human Exploration and Operations Committee 2013-02-01 (HEOC-01)

Recommendation:

NASA should add commercial expertise to the already impressive membership of the Research Subcommittee of the Human Exploration and Operations (HEO) Committee. Specifically, the committee should receive input from research, development and commercialization leaders in one or more of the relevant industries (e.g., pharmaceutical, biological, materials science, etc.) that have experience in applied research.

Major Reasons for Proposing the Recommendation:

The current subcommittee is populated by an impressive cadre of research leaders from academia but commercial opportunities for research in microgravity are also important, as evidenced by several projects that have been achieved to date. Further, such input would provide a valuable link to the activities of the Center for the Advancement of Science in Space (CASIS), which has relationships with the NASA Space Life and Physical Sciences (SLPS) program.

Consequences of No Action on the Proposed Recommendation:

Subcommittee deliberations will reflect only the viewpoints and perspectives of academia, and therefore will not provide NASA with the broadest possible guidance from other important contributors to the research community.

NASA Response:

NASA concurs with this recommendation in principle. Commercial or industrial research is an important component of International Space Station (ISS) utilization, and effective advice from subject matter experts is vital to the successful accomplishment of Agency objectives. Recognizing that commercial research is an important component of ISS utilization, NASA was directed in the 2010 NASA Authorization Act to “enter into a cooperative agreement with an appropriate organization . . . to manage the activities of the ISS National Laboratory . . .” The organization selected to manage the ISS National Laboratory, CASIS, receives guidance from a Board of Directors and a Science Advisory Board. These boards are the primary sources of oversight and guidance for the management of CASIS. The communication and interaction between the Research Subcommittee and the CASIS boards will evolve as the CASIS boards evolve. At this time the CASIS boards are still expanding. We will evolve the membership of the Research Subcommittee accordingly.

The membership of the Research Subcommittee is limited in its Terms of Reference (TOR) to eight, and it currently has seven members. These members were chosen and selected following the criterion described in the TOR as: “[having] a broad awareness of the goals, capabilities, and requirements of human spaceflight and a familiarity with the national research and education community in science and engineering relevant to human

Enclosure

spaceflight.” The members were not expected to represent the perspective of individual scientific disciplines or communities, but rather to assist NASA in developing a stronger strategic connection between research and human exploration. The task of the Research Subcommittee is described in the TOR as “[to] review and assess NASA’s approach, progress, and plans for developing strategies and capabilities that reduce technical barriers to exploration missions and strengthen national research participation in human space exploration.” In the performance of this assignment, representation from the private sector could be valuable, but the perspective most needed might well be from medicine or industrial research and development. As the Research Subcommittee takes up this assignment and its efforts begin to mature, NASA believes that the range of perspectives needed to provide sound advice on the role of research and the involvement of the research community in human exploration will become clearer.

NASA Advisory Council Recommendation

Priority and Schedule of Commercial Crew Development 2013-02-02 (HEOC-02)

Recommendation:

Timely establishment of a commercial capability to deliver U.S. astronauts to low earth orbit is essential to reduce undesirable reliance on a single non-U.S. provider, Soyuz. The Council is concerned that projected funding levels for commercial crew development may be insufficient to provide a safe and robust capability by the target date of 2017. NASA should develop and clearly articulate a plan for establishment of this capability that requires a demonstrated critical look at safety, and that addresses realistic funding levels, the contractor downselect process, and traceable milestones and target dates for initial operating capability. We request a briefing on this topic at the next NASA Advisory Council meeting.

Major Reasons for Proposing the Recommendation:

Rapid establishment of U.S. commercial crew transportation to ISS is critically important to NASA's human space program. There has been a significant shortfall in Commercial Crew Program funding over the past three years, typically ~40% less than requested, and this shortfall may continue. Safely achieving the required capability on the desired schedule in such a funding environment will be challenging, and it is not clear to the Council that NASA has a self-consistent plan in place.

Consequences of No Action on the Proposed Recommendation:

Increased risk to ISS due to dependency on a single source provider for crew transport to and from the ISS.

NASA Response:

NASA concurs with this recommendation. The mismatch between requested and appropriated funds for the program over the past three years has posed planning and implementation challenges; however, NASA's basic strategy remains intact. The Commercial Crew Program partners are working to accomplish a set of agreed-to milestones under Commercial Crew integrated Capability (CCiCAP) Space Act Agreements. In parallel, they have provided draft certification products for NASA's review under Certification Products Contracts (CPC), and NASA is providing feedback on these draft products for a second round of delivery. These CPC products will enable the partners to provide higher quality proposals in response to the Commercial Crew Transportation Capability (CCtCAP) request for proposals to be released this fall. Knowledge of the contents of these proposals and of the final FY2014 appropriation level will allow NASA to further refine its expectations and plans for commercial crew transportation. NASA will provide the requested briefing at the next NASA Advisory Council meeting.

NASA Advisory Council Recommendation

NASA Coordinate Government-Wide Effort to Create Common Asbestos Cost Estimate 2013-02-05 (AFAC-01)

Recommendation:

The Council recommends that NASA, through the CFO Council, coordinate a government-wide, collaborative effort to create common estimates and benchmarks by structure type that can then be used as a baseline for each agency as they create their own estimates for asbestos remediation (such benchmarks are lacking today). Such a government-wide collaborative effort should result in significant cost savings for the Agency (and for the government) and should lead to a satisfactory audit trail for NASA's external auditors. The participation of the Agency's Inspector General Office through the IG Council should be encouraged by the Administration.

Major Reasons for Proposing the Recommendation:

The requirement to estimate unfunded environmental liability for asbestos remediation in all NASA facilities has been imposed by the Federal Financial Accounting Standards Board. Every Federal agency has had some requirement imposed upon them.

Consequences of No Action on the Proposed Recommendation:

Each Federal agency will struggle to develop sound supportable estimates to comply with the standard, resulting in inconsistent methodology across agencies.

NASA Response:

NASA agrees that formulation of a Government-wide, collaborative effort to create a common cost estimating process for asbestos unfunded environmental liability is needed. Every Agency has had some requirement imposed upon them regarding this requirement and a common methodology would provide consistency across all agencies and save on the cost of developing baseline estimates. NASA concurs that the Chief Financial Officer (CFO) Council is the appropriate body to coordinate this Government-wide initiative. NASA submitted the proposal to the CFO Council for consideration. NASA's OCFO is pledged to work with the Council on the coordination of a common cost estimation process for the benefit of all Federal agencies.

Enclosure

NASA Advisory Council Recommendation

Reduce Barriers to ISS Utilization, Including Intellectual Property Rights 2013-02-06 (CSC-01)

Recommendation:

The Council recommends that NASA explore reduction of barriers to ISS utilization, including Intellectual Property (IP) rights.

Major Reasons for Proposing the Recommendation:

Non-NASA funded users of ISS must be able to retain their IP rights. The ability to retain their IP is critical to supporting research and promoting business opportunities.

Consequences of No Action of the Proposed Recommendation:

ISS will be unattractive to universities, private industry, including pharmaceutical companies; and research institutions, thereby limiting utilization.

NASA Response:

NASA concurs with the recommendation. NASA is currently operating a share of the United States' accommodations on the International Space Station (ISS) as a National Laboratory in accordance with Section 507 of the NASA Authorization Act of 2005 (P.L. 109-155). Section 504 of the NASA Authorization Act of 2010 (P.L. 111-267) authorizes NASA to maximize the value of the investment the U.S. Government has made in the ISS and demonstrates the scientific and technological productivity of the ISS over the next decade by entering into a Cooperative Agreement with a 501(c)(3) entity to support research and development and to manage the activities of the ISS National Laboratory.

NASA implemented the direction of the 2010 Authorization Act by initially funding the operation of an independent 501(c)(3) entity (the National Laboratory Entity) to manage non-NASA utilization of the ISS through the ISS National Laboratory.¹ The National Laboratory Entity is expected to capitalize on the unique venue of the ISS as a national resource to promote opportunities for advancing science and technology to other U.S. Government agencies, university-based researchers, and private firms for utilization of the ISS. These organizations will use the ISS as the nation's newest national laboratory to pursue basic and applied research in fields such as human health, energy, and the environment, as well as stimulate educational opportunities in science, technology, engineering, and mathematics (STEM) for the next generation of U.S. scientists and engineers.

The operation of the ISS National Laboratory will open new paths for the exploration and economic development of space through opportunities to expand the U.S. economy in space-based research, applications, and operations through the use of a unique and highly visible national asset with surplus capacity available for a wide spectrum of applications. To facilitate the acceptance and use of the ISS National Laboratory as an attractive and cost-effective

¹ The current National Laboratory Entity is the Center for the Advancement of Science in Space (CASIS) under a cooperative agreement awarded in September 2011.

platform for commercial research applications, NASA will continue to cover ^{TITLE} cost of operating and maintaining the ISS and is highly motivated to work with other agencies and organizations to pursue applications.

Use of the ISS National Laboratory for commercial research is still perceived as a risky venture. Although NASA continues to fund the ISS and has agreed to provide transportation to and from the ISS for research activities, the conduct of microgravity research is an expensive proposition for commercial firms. In order to increase the perceived value of conducting commercial development activities in a microgravity environment, it is incumbent upon NASA to ensure that commercial firms have the maximum opportunity to leverage their investment in activities conducted on the ISS National Laboratory and remove any identified barriers to developing successful commercial applications.

NASA is subject to a set of generally applicable Government-wide statutes and regulations pertaining to rights in intellectual property (both inventions and data) arising from the work conducted under the cooperative agreement. These include, but are not limited to, the Bayh-Dole Act, 35 U.S.C. §§ 200-212; the Stevenson-Wydler Act, 15 U.S.C. § 3701, et seq.; and OMB Circular A-110. Under these laws and regulations NASA, like all Federal agencies, is required to retain, on behalf of the Federal Government, certain rights in intellectual property generated under cooperative agreements to which it is a party. Intellectual property generated under a cooperative agreement includes intellectual property generated by the other, non-Federal party (the "Recipient") and intellectual property generated by entities the Recipient works with under the cooperative agreement (the "sub-recipients").

Recipients and sub-recipients can generally retain the majority of rights in the intellectual property they generate under a cooperative agreement with Federal agencies. However, regulations mandate that the Federal government retain Government-purpose rights in said intellectual property. For example, the Federal Government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any inventions created under a cooperative agreement to which a Federal agency is a party. Similarly, the Federal Government gets the right to (1) obtain, reproduce, publish or otherwise use data produced under the cooperative agreement, and (2) authorize others to receive, reproduce, publish, or otherwise use said data for Federal purposes.

It is important to understand that, in addition to the laws and regulations governing other Federal agencies when they enter into cooperative agreements, NASA is also subject to the Space Act, found in Title 51 of the United States Code. The Space Act makes NASA a "title-taking" agency - i.e., NASA is authorized to take title to inventions created under agreements with NASA as well as inventions created using NASA resources (including funds). NASA may waive its right to take title to said inventions. However, the Space Act, like the more generally applicable laws and regulations described above, requires that the Federal Government retain the right to use said inventions for government purposes.

In summary, while NASA has some discretion in the amount of rights it takes to intellectual property developed under cooperative agreements to which it is a party, the applicable

guidance, regulations, and laws mandate that NASA retain certain minimum rights to said intellectual property on behalf of the entire Federal Government.

In light of the above, NASA is also concerned that the requirements under current law provide a disincentive for commercial companies to invest in microgravity research. Microgravity research activities for NASA applications are not conducted through the ISS National Laboratory. Therefore, any research conducted on the ISS National Laboratory is not being conducted to meet a NASA need or mission requirement. Because work through the ISS National Laboratory is not being conducted to support any NASA need, the traditional approach to intellectual property under which the Government retains rights for Government purposes does not directly benefit the Agency and encumbers the commercialization efforts of ISS National Laboratory users. NASA, therefore, has supported legislation that maximizes the intellectual property rights retained by ISS National Laboratory users:

- The legislation does not affect or impair intellectual property rights that the Federal Government may receive under other agreements. For example, if an ISS National Laboratory user is working under a grant from National Institutes of Health (NIH), the terms and conditions of the grant relating to intellectual property will still apply. However, the Federal Government will not get rights simply because a researcher uses the ISS National Laboratory.
- The proposed legislation exempts inventions arising from use of the ISS under the ISS National Laboratory from NASA's title-taking authority under the Space Act.
- The proposed legislation does include the requirements found in the Bayh-Dole Act that ISS National Laboratory users: (1) disclose inventions and elect to retain title; (2) file patents on elected inventions; and (3) provide reports on their success at commercializing the invention. These requirements are adapted from the Bayh-Dole Act at 35 USC 202(c). The purpose of these provisions is to:
 - Ensure that NASA has the opportunity to evaluate the success of the ISS National Laboratory through reporting of new inventions.
 - Collect and maintain metrics of inventions and "spinoffs" developed with NASA support through the Office of Chief Technologist.
 - Ensure that ISS National Laboratory users diligently pursue commercial applications for inventions developed on the ISS National Laboratory.
- Unlike the Bayh-Dole Act, if the ISS National Laboratory user complies with its requirement to report and patent inventions, the Federal Government does not retain Government purpose rights. The user retains all rights in the inventions. If the user does not retain title or protect the invention, then NASA will have the option to step in and pursue practical use of the invention.

- The ISS National Laboratory user has the right to exclusively license any inventions created by NASA during the conduct of activities on the ISS National Laboratory. This ensures that the user has the opportunity to consolidate commercial rights in any inventions arising from its use of the ISS National Laboratory, even if the invention would otherwise belong to the Government. This provision is drawn from the Cooperative Research and Development Agreement (CRADA) authority in the Stevenson-Wydler Act at 15 USC 3710a (b)(1).
- The Government retains no right to use data created during the conduct of activities on the ISS National Laboratory and, if proprietary data would otherwise be subject to disclosure under the Freedom of Information Act (FOIA), NASA can protect that data for up to five years. The five-year FOIA protection is identical to protection provided to Space Act Agreement partners under 51 USC 20131(b).

Through this proposed legislation, NASA believes that an appropriate balance was struck between the legitimate commercial needs of the ISS National Laboratory users who are being asked to make investments in commercial microgravity research and the Government's interest in ensuring that inventions developed using Government resources and taxpayer-funded facilities are appropriately commercialized. This legislation does not impact NASA's research needs or the rights of the Government in its own research since (1) work for NASA will be conducted outside the ISS National Laboratory and (2) other arrangements between ISS National Laboratory users and the Federal Government are not impacted by the proposed legislation.

Intellectual property rights in inventions made on the ISS is addressed in the Section 223 of S. 1317, NASA Authorization Act of 2013; however, NASA has identified five primary deficiencies in the current bill if the goal of the legislation is to provide ISS researchers with maximum intellectual property rights:

1. Under the language in the Senate bill, inventions created by large-entity contractors during the non-NASA utilization of the ISS National Laboratory would still be required to submit requests for waivers of NASA's title-taking authority under the Space Act in accordance with 14 CFR 1245 Subpart 1. NASA is required under those regulations to determine whether waiving NASA's title-taking authority is in the best interest of the Agency. Commercial utilization is a factor supporting a decision to waive NASA's rights, but a determination that NASA would, in fact, waive its rights under the Space Act is not guaranteed in all cases.
2. The Senate bill provides that NASA obtain Government purpose rights in inventions in the event a large-entity researcher fails to comply with its obligations to commercialize that invention. The Senate language does not address that large-entity users are already required to comply with commercialization obligations and the penalty for non-compliance is not that NASA takes Government purpose rights but that NASA takes title to the invention on behalf of the U.S. Government.

3. The Senate language does not address inventions created by small entities. Under the Senate language, small entities would still be subject to Bayh-Dole, and the Government would take Government purpose rights.
4. The Senate language creates ambiguity around the rights of other agencies who may be in funding or other relationships with non-NASA researchers and may be entitled to receive rights in inventions as a result of those other contracts or agreements. The Senate language does not address the rights that Federal agencies other than NASA may have in ISS research.
5. The Senate language does not address rights in data generated as a result of activities undertaken on the ISS National Laboratory. NASA would continue to receive Government rights in data created by the researcher under that legislation.

The legislation that NASA supports addresses all of the above in a consistent matter and has been coordinated with the United Patent and Trademark Office for consistency with current intellectual property statutes.

NASA Advisory Council Recommendation

Coordination of Education and Public Outreach Activities 2013-02-07 (EPOC-01)

Recommendation:

NASA should learn from the approval process begun during sequestration and develop a new process for dispositioning requests to conduct Education and Public Outreach (EPO) activities that efficiently coordinates with missions, aligns EPO programs with NASA goals, and is cost-effective.

Major Reasons for Proposing the Recommendation:

Fragmented or non-aligned EPO activities dilute the effectiveness and reach of these programs, and undermine NASA's overall strategic EPO objectives.

Consequences of No Action on the Proposed Recommendation:

Continuing development of duplicative and potentially inefficient EPO programs that are not aligned with the Agency's strategic priorities make the cost-benefits harder to evaluate and defend.

NASA Response:

NASA concurs with the recommendation. The Office of Communications and the Office of Education are currently in the process of developing an approach and guidance regarding approval of EPO activities under sequestration in FY 2014. The approach will be developed and implemented in partnership with the Mission Directorates through their representatives on the Education Coordinating Council and Communications Coordinating Council. While the Office of Communications and the Office of Education recognize that the approach in FY 2013 entailed significant effort and coordination, the outcome yielded significant insights that led to several efforts devoted to improving processes and approaches which we believe will result in more effective communications and engagement with stakeholders.

NASA Advisory Council Recommendation

NASA Information Technology Governance Document 2013-02-11 (ITIC-01)

Recommendation:

NASA should produce a clear and concise Information Technology (IT) governance document, including documented processes, policies, and organization roles and responsibilities. The framework should incorporate leading IT governance methods.

Major Reasons for Proposing the Recommendation:

- Clarifies expectations and roles of the Chief Information Officer (CIO) with buy-in from the Mission Directorates.
- Provides clear corporate responsibilities for the growing role of IT in mission development and success.
- Administration guidance is shifting: focus on oversight of IT projects and procurement of commodity IT software, equipment, and services to be applied across the Agency.

Consequences of No Action on the Recommendation:

- NASA continues to be criticized from oversight organizations in the Administration and Congress.
- Development of “highly specialized Mission IT” will miss opportunities to leverage from NASA-wide IT developments.

NASA Response:

NASA concurs with the recommendation and appreciates the interest the NASA Advisory Council is showing in IT governance. The NASA Administrator has stated that improving IT governance is a top priority for the Agency. The Office of the Chief Information Officer (OCIO) is currently implementing eight recommendations provided by the Office of the Inspector General (OIG) in “Audit of NASA’s Information Technology Governance” (Assignment No. A-12-018-00). The Council recommendation aligns closely with the recommendations included in the OIG report. The OCIO will include this recommendation in its response to the OIG and will work closely with the IT Infrastructure Committee of the NASA Advisory Council to ensure it is responsive to the recommendation.