National Aeronautics and
Space Administration
Headquarters
Washington, DC 20546-0001

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Reply to Attn of: Office of Legislative Affairs
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MEMORANDUM FOR THE RECORD

Subject: Hearing before the House Science Committee, Subcommittee on Space and Aeronautics (Chairman Calvert, R-CA) regarding NASA's aeronautics program by the House Subcommittee on Space and Aeronautics on July 18, 2006.

Members Present: See attached.

Witnesses: See attached.

Hearing Summary

On July 18, 2006, the House Space and Aeronautics Subcommittee (Chairman Calvert, R-CA) held the first of two hearings about NASA's efforts to reshape its civil aeronautics research and development program. NASA was unable to testify at this hearing, but provided a letter to the Subcommittee outlining the Agency's Aeronautics Research Program. NASA will testify at the second hearing currently planned for September. This hearing reviewed the results of two reports recently released by the National Research Council (NRC) on NASA's civil aeronautics R&D program. The first, *Aeronautics Innovation: NASA's Challenges and Opportunities*, published in early May, provided recommendations on tools, techniques, and management practices to facilitate and accelerate innovation in NASA's aeronautics programs. The second, *Decadal Survey of Civil Aeronautics*, published in early June, provided a specific set of priority projects to be undertaken in the next 10 years. The overall tone of the hearing was positive, albeit critical of the federal government's investment in aeronautics research and NASA's role in conducting that research.

The main themes included:

- The U.S. Government is not spending enough money on aeronautics research – funding has been cut in half since 1984. Therefore, the U.S. is losing ground to the European and Asian aerospace industry.
- The Aeronautics Research Mission Directorate's (ARMD) new focus on fundamental research is commendable, but too narrowly tailored. At some point, NASA must conduct transitional research and complete demonstration projects too.
- NASA is not working well with its industry partners. ARMD needs to do a better job of consulting with its research users. Also, the division between in-house work and outside work is out of balance.
- The Government must do more to ensure an adequate supply of aeronautics engineers and researchers.

Summary of Member Opening Remarks

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Chairman Calvert (R-CA) acknowledged that Dr. Lisa Porter, Associate Administrator for NASA's Aeronautics Research Directorate (ARMD) would be testifying at the second hearing, currently planned or September. He then outlined the importance of the civil aerospace industry to the United States, emphasizing that the United States must invest in high technology sectors in order to keep ahead of the European and Asian aeronautics industries. Chairman Calvert criticized NASA's aeronautics program for past leadership problems and lack of goals and strategies that has created an appearance that the Agency has no clear vision, adding that White House and congressional support for aeronautics R&D has waned. However, he complimented Dr. Porter for her "admirable job" in restructuring the Aeronautics Research Program and for strengthening fundamental research and developing a broad cooperative research program with the industry. He also commended Dr. Porter for re-committing NASA to work as a full partner with other federal departments and agencies, particularly on the development of the Next Generation Air Transportation System (NGATS). Lastly, the Chairman highlighted the importance of the two reports issued last spring: *Aeronautics Innovation: NASA's Challenges and Opportunities* and the *Decadal Survey of Civil Aeronautics.*

Ranking Democrat Udall (D-CO) expressed his concern about the threat imposed by the European aeronautics industry, saying the United States must invest more in R&D in order to protect its industrial lead. This includes investing in new research to lower aircraft noise and emissions. He criticized the Administration for decreasing NASA's aeronautics budget by 32 percent between FY04 and FY07, stating that this budget decline must be reversed. Mr. Udall then expressed concerns that NASA and ARMD are placing too narrow of a focus on fundamental aeronautics research at the expense of other more demonstrable research projects that are needed to ensure the United States keeps its lead in the global aeronautics marketplace. He criticized NASA for what he said were plants to get rid of its flight research capabilities and many of its flight simulators.

Summary of Opening Remarks From Non-Committee Members

Congressman Kucinich (D-OH) stressed the importance of NASA investing in long-term, high-risk technologies that the private sector is unwilling to perform because they are too risky or expensive. This, he said, has historically been the role of government-sponsored research. He stressed the importance of NASA's investment in aeronautics research both to the Ohio economy (Glenn Research Center) and to the U.S. economy. As a whole, the U.S. civil aeronautics industry contributed $29 billion to the economy in 2005 alone. Therefore, proposed funding cuts to aeronautics research are "pernicious." Already, past cuts have led to a loss of innovation and have eroded the U.S. aeronautics workforce. Specifically for NASA, underfunding the Vision for Space Exploration program has forced NASA to take money from other programs like aeronautics. *Note: Glenn Research Center is in Mr. Kucinich's district.*

Congresswoman Davis (R-VA) also criticized the funding decline for aeronautics research, claiming government funding had decreased by 50 percent from $1.54 billion in 1984 to an Administration proposal of $724 million in FY 2007. She expressed concern that the United States is losing critical expertise in aerospace research disciplines, impacting not only civil aerospace industry, but also the military which depends on NASA's research, its experts and its research facilities to develop new weapons systems. The military needs NASA's wind tunnels, for example, to develop new airframes. Thus, increased funding must be found to fully maintain the wind tunnels and other NASA aeronautics research programs and facilities. Lastly, Congresswoman Davis stated that she believes NASA prefers only to support aeronautics research that has a direct impact on the manned space flight program. *Note: Langley Research Center is in Ms. Davis' district.*

Summary of Opening Remarks Of Other Witnesses

Dr. Kaminski summarized the findings of and the methodologies utilized during the National Research Council's *Decadal Survey of Civil Aeronautics* study. NASA requested the study in order to develop a decadal strategy for the federal government's involvement in civil aeronautics, with a particular emphasis on NASA's research portfolio. Among other things, the report: 1) Recommends that the U.S. government place a higher priority on establishing a stable aeronautics R&T plan, with sustained funding for at least a decade; 2) Encourages NASA to create a more balanced split in the allocation of R&T funding between in-house research and external. The report found NASA had allocated 93 percent of its research funding in-house as of January 2006; 3) Gives NASA five common themes to prioritize research resources, both at the fundamental and practical research levels; and 4) Recommends that NASA do more to consult with universities and the aeronautics industry, to include additional collaborative research and external research opportunities.

Dr. Merrill summarized the findings of and the methodologies utilized during the *Aeronautics Innovation: NASA's Challenges and Opportunities* study. He said there is a growing discrepancy between the needs served by ARMD and the resources available to it, yet there is no agreed upon articulation of what the program should be trying to accomplish in this budget environment. He criticized NASA for spreading its research resources too thinly. As such, NASA's Dr. Merill concluded by stating that ARMD is "on a glide path to becoming irrelevant." Dr. Merrill summarized the report's key findings as follows: 1) NASA needs a strategic focus for aeronautics that is in line with its budget, personnel and technical capabilities is likely to result in a reduced mission scope, but one with greater potential to achieve innovation; 2) ARMD should better consult with its stakeholders; 3) ARMD's portfolio should be better aligned with the competencies of its four research centers and the external partners they support; and 4) ARMD's portfolio should be diversified in terms of the stage of technology being developed and should not just focus on fundamental research. By focusing on fundamental research, NASA risks losing the support of industry stakeholders and risks gains in U.S.-led innovation.

Dr. Romanowski echoed the concerns of others about the decline in federal support for aeronautics research, stating that any increase in aeronautics funding should not come at the expense of other NASA priorities, but from an overall NASA budget increase. Dr. Romanowski criticized ARMD for eliminating cutting-edge demonstration and validation activities (including X planes) in favor of fundamental research. Such projects exemplify the inspiration and vision we need to attract America's best and brightest to aerospace careers. He also said NASA must improve its partnerships with academia, users and manufacturers to create a transparent public development and review process for the forthcoming national aeronautics policy, adding that the policy must include robust technology roadmaps developed in concert with these stakeholders.

Dr. Moin's testimony was more positive toward NAS. (Dr. Moin completed his Postdoctoral study at Ames Research Center and later served as a civil servant research scientist there.) His key points were: 1) Fundamental research is precisely what NASA should be doing, given its limited resources. Therefore, NASA should serve as a bridge between academia, which conducts fundamental research, and industry which ultimately ensures the preeminence of the United States in aerospace technology; 2) An increase in air traffic capacity is the main competitive technical challenged facing the civil aeronautics industry. What is needed here is increased coordinated foundation research, something ARMD leadership is clearly aware of and is taking action to address; 3) NASA should be commended for increasing its emphasis on computational and physics-based modeling; and 4) NASA needs to retain its existing knowledgebase and complement and replenish it with young talented PhD engineers – some of whom are foreign born and will need additional assistance to become part of the U.S. workforce.

Summary of Major Questions/Discussions

Chairman Calvert questioned whether the *Decadal* study provided a solid set of principles for aeronautics research. The panelists said it did, with some taking minor issue with the fact that some research areas were not ranked of higher importance. Dr. Moin said hypersonic research should have been ranked higher due to its impact on space exploration. He also took issue with the study's conclusion that 95 percent of ARMD's research is done in-house. He said the number is closer to 75 percent.

Chairman Calvert also questioned whether ARMD could find savings in its wind-tunnel budget, given that the resources are not fully booked. Dr. Moin said that would not be a wise idea, given that all computational research studies will eventually need wind tunnel research and given that the largest cost was in the manpower for these tunnels and not in the overall cost to operate them.

Chairman Calvert also asked whether NASA is interacting effectively with the military and whether a Defense Advanced Research Program Agency (DARPA) process is needed to inspire more innovative research. Dr. Romanowski said a DARPA-like process could augment NASA's current research process, but should not replace it. He said NASA is doing a better job of working with other agencies, including the military. NASA's involvement in the Joint Planning and Development Office is a positive sign.

Congressman Udall again questioned whether ARMD's focus on fundamental research is too narrow. All panelists, except Dr. Moin, agreed that it is. Dr. Moin reiterated that NASA has no choice but to focus on fundamental research given the current budget climate; that's the only place where NASA can be fully successful in research. If NASA had twice the budget it has for aeronautics research, then it could branch into other transitional and demonstrative research projects. Dr. Kaminski agreed with this budget projection, followed by Dr. Romanowski expressing concern about NASA's decision to shut down the B-757 program at Langley Research Center. Dr. Romanowski believes this decision was based only on a lack of funds.

Congressman Roharbacher (R-CA) said he believes that industry decisions, and not just a lack of U.S. government funding, have caused the U.S. civil aerospace industry to falter. For example, Boeing wants to enter into a joint venture with a Chinese company, resulting in the U.S. civil aerospace industry teaching foreigners how to out-compete the United States. He said he would do everything he can to block this business deal. **Congressman Honda** (D-CA) was quick to respond, stating that globalization is not a bad thing and that 10 percent of the CEOs in Silicon Valley are foreign born, many of them now U.S. citizens.

The hearing testimony can be found on the Office of Legislative Affairs website at http://legislative.nasa.gov

Jennifer A. Palmer

Jennifer Palmer
Legislative Affairs Specialist
Office of Legislative Affairs

Attachment

ENCLOSURE

Members Present:

Ken Calvert, R-TX *(Chair)*	Mark Udall, D-CO *(Ranking Member)*
Dana Roharbacher, R-CA	David Wu, D-OR
J. Randy Forbes, R-VA	Michael M. Honda, D-CA
Tom Feeney, R-FL	Sheila Jackson Lee, D-CA
Mario Diaz-Balart, R-FL	Jim Costa, D-CA

Witnesses:

- **Dr. Paul Kaminski,** Chairman of the National Research Council's Steering Committee that produced the *Decadal Survey of Civil Aeronautics* (released in June 2006);
- **Dr. Steven Merrill,** Executive Director of the National Research Council's Board on Science, Technology, and Economic Policy. He managed the NRC Committee that produced *Aeronautics Innovation: NASA's Challenges and Opportunities* (released in May 2006);
- **Dr. Michael Romanowski,** Vice President for Civil Aviation, Aerospace Industries Association;
- **Dr. Parviz Moin,** Professor of Mechanical Engineering at Stanford University, and director of the Institute for Computational and Mathematical Engineering, the Center for Turbulence Research, and the ASCI Center for Integrated Turbulence Simulations;
- **Congressman Dennis Kucinich** (D-OH); and
- **Congresswoman Jo Ann Davis** (R-VA).
- *NASA was unable to testify at this hearing, but provided a letter to the Subcommittee outlining the Aeronautics Research Program, and will testify at the second hearing currently planned for September.*