

Testimony of Marion C. Blakey

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"Overview of the NASA Aeronautics Research Mission Directorate's

Budget Request for Fiscal Year 2013"

Subcommittee on Space and Aeronautics

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Introduction

Chairman Palazzo and Ranking Member Costello, thank you for the invitation to discuss NASA's aeronautics budget request for next year. I am Marion Blakey, Chief Executive Officer of the Aerospace Industries Association (AIA), the nation's premier trade association representing aerospace and defense manufacturers. However, today I come not representing AIA, but instead in my role as Chair of the Aeronautics Committee of the NASA Advisory Council.

The Aeronautics Committee reviews NASA's aeronautics research and testing programs and provides advice to senior NASA leaders on those programs. As a standing committee of the Advisory Council, we meet approximately three times each year under Federal Advisory Committee Act (FACA) guidelines. Our advice spans all areas of aviation under the jurisdiction of the Aeronautics Research Mission Directorate (ARMD), including advanced air vehicle development, alternative fuels, UAS integration into our national airspace, and the Next Generation Air Transportation System (NextGen). The members I serve with have highly distinguished, world-class backgrounds in aeronautics, and it is an honor to work with them. We have an excellent working relationship with Dr. Shin and his staff, as well as the full Advisory Council, and we appreciate the support they provide to the committee.

Mr. Chairman, ARMD provides critical support to our nation's aeronautics research efforts. They have a strong track record leading complex, collaborative research with multiple federal agencies, academia, government labs, and industry. Military aeronautics research is focused on defense applications. FAA NextGen activities are focused on near- and mid-term engineering solutions. NASA, by contrast, integrates and adds to this research base. They take the lead in

fundamental research into revolutionary concepts and technologies. They take a comprehensive, integrated look at systems-level solutions. And they operate and maintain unique testing facilities that exist nowhere else in the Federal Government. Simply put, they push the boundaries of our aeronautical knowledge, and bring together our best technical minds to push new technologies into the industry and into the global marketplace.

ARMD's Research Portfolio

You asked me to offer an opinion on how well ARMD's research matches up with the needs of our aerospace industry, and advise you of any gaps in that research. I am pleased to say that on balance I believe Dr. Shin's office is pursuing the right research and with the right priorities. Let me touch on three specific research areas where the Aeronautics Committee has been especially active: Environmental research, UAS integration, and the NextGen program.

Environmental Research

ARMD is heavily involved in research to make our aviation system more environmentally friendly – so-called “Green Aviation” research. Mr. Chairman, U. S. manufacturers are leading the world in developing quieter aircraft that are easier on our environment. The industry has committed to a cap on aviation-related CO² emissions -- “carbon neutral growth” -- by the year 2020. This is well beyond what any other global industry has agreed to, and we are working hard to achieve those goals.

NASA's "Green Aviation" research is a critical part of our overall effort to go beyond CNG 2020, to achieve even further greenhouse gas reductions, and to demonstrate to the world that the government and the aerospace industry are working overtime to address this issue. For example, the Environmentally Responsible Aviation (ERA) project is developing advanced air vehicle concepts that could reduce fuel burn by 40 percent, cut aircraft noise well below stage 4 levels, and nitrous oxide (NOx) emissions by 75 percent. And how will we do this? With new laminar flow concepts for reducing drag. With new composites that reduce weight. New engine combustor designs that cut emissions during takeoff and landing. And by implementing new air traffic management concepts.

NASA's Aeronautics program is also key to our government-wide efforts to develop and certify alternative jet fuels. This is a multi-agency effort, and each agency is responsible for a specific research area. In NASA's case, they are focused on engine performance and emissions from the use of alternate fuels. With their specialized facilities, NASA is conducting fundamental tests in combustion, exhaust plume experiments, and system-level engine testing. For example, the Aviation Alternative Fuel Experiment (AAFEX) – 2 used a NASA Dryden DC-8 to gather emissions test data comparing various alternative fuels to JP-8. This test not only provided data to help us model engine performance and emissions, it helped accelerate development of a standard for particulate data and sampling protocols.

The Committee is strongly supportive of ARMD's "Green Aviation" program. We believe NASA's technical expertise in this area can help the Environmental Protection Agency (EPA) in its standards setting and regulatory policy initiatives as they relate to aviation, and we have

recommended that Dr. Shin and his office take a proactive approach in providing technical assistance to EPA.

Integrating Unmanned Aerial Systems into the National Airspace

If there is one emerging area where the Committee has become increasingly involved, it involves Unmanned Aerial Systems (UAS) and their integration into the National Airspace System (NAS). As you know, the recently-enacted FAA Modernization and Reform Act of 2012 required that UAS systems be integrated into the NAS by the year 2015 and required FAA to establish up to six test ranges to assist in this effort. UAS systems are coming, Mr. Chairman, and a lot of research needs to be done to meet the Act's milestones.

We believe NASA can play an important role in the development of standards, testing, and ultimately the approval of UAS systems. Right now, NASA is working with FAA's Joint Planning and Development Office (JPDO) to develop an interagency research, development and demonstration roadmap for UAS integration. Because this work is so important and evolving so rapidly, in consultation with ARMD the Committee established a UAS Subcommittee this past December. Dr. John Langford of Aurora Flight Sciences has agreed to chair the Subcommittee, and we have balanced representation from industry, academia, and government. We will have more to say on this subject in the future, but we wholeheartedly support NASA's activities in UAS and believe ARMD is uniquely suited to assist in this arena.

Next Generation Air Transportation System (NextGen)

Mr. Chairman, on the NextGen front, the Committee is encouraged by the integrated air traffic management demonstrations being conducted through ARMD's Airspace Systems Program. We think there is major potential for NASA-developed technologies to make a critical contribution to successful implementation of the Automatic Dependent Surveillance – Broadcast (ADS-B) program. As you know, ADS-B is a fundamental building block of the NextGen program. And tools like NASA's Tailored Arrivals and Efficient Descent Advisor (EDA), Airborne Merging and Spacing tool (AMS), and Energy Navigation Concept (eNAV) are important parts of that effort. These technologies are mature enough to transfer to operational use, and will demonstrate the full potential of NextGen in our crowded terminal areas. We expect significant savings in aircraft fuel burn, flight time, and reduced noise, all of which will help make the business case for operators to equip with NextGen technologies. The Committee is working with NASA to calculate in detail the estimated fuel savings associated with these technologies, to support the business case and raise the level of near-term NextGen benefits.

One excellent example of the improved technology transition from NASA to FAA is the Efficient Descent Advisor program. This started in 2008 as a collaborative project between NASA, FAA, Boeing, and airline partners to develop an automation tool that could improve the efficiency of arrival operations in capacity-constrained situations. In testing, they found that EDA reduced the number of maneuver-related arrival clearances by almost two-thirds, reducing controller workload, and saved 180 pounds of fuel per flight. And this is not sitting in the lab -- it transitioned to the FAA last November, and is being planned for deployment.

We are continuing our review of NASA's NextGen work this year. However, since I have been chairman, I have been impressed at the contributions being made by NASA's ARMD team. We are also encouraging ARMD to establish a deeper understanding and collaboration with the international community in NextGen research, because we are not operating in a vacuum and it is critical that our global ATC systems be effectively timed and harmonized.

NASA's FY13 Aeronautics Budget Request

Mr. Chairman, NASA is requesting \$551.5 million for Aeronautics research in FY13. This amount is \$17.9 million below the current year, a decrease of 3.1 percent. The entire decrease is taken against fundamental aeronautics research. In fact, the overall number masks a reduction of \$20 million in hypersonics research. This cut would leave approximately \$5 million to continue that research next year.

NASA's existing hypersonics design capabilities and knowledge base was hard won through decades of investment – from early re-entry system development to the Next Generation Launch Technology program, which ended in 2004. Unfortunately, over the past few years NASA's investment in hypersonics has dropped substantially. In 2006, these programs were funded at approximately \$70 million. This figure dropped to \$25 million by 2012, and would be cut to \$4.5 million in the fiscal year 2013 NASA budget request.

With NASA reducing its focus on hypersonic research so drastically, I am concerned about the overall future of U.S. government capabilities. From the X-15 program of the 1960's to the National Aerospace Plane of the 1980's and the Space Shuttle, NASA has helped develop a

generation of engineers uniquely skilled in hypersonics systems design. If this engineering talent migrates to other disciplines, it will take many years to get it back. Hypersonics has a unique attraction for students, and continues to be a powerful focus of STEM education initiatives. And if successful, hypersonics technologies could lead to dramatic reductions in space launch costs and national defense capabilities that are not available today.

Although the Aeronautics Committee has not made specific recommendations on hypersonics, the trend toward extinction is certainly a cause for concern, and will be a real challenge for ARMD if additional funding is not provided in the appropriations process this year.

Conclusion

In summary, Mr. Chairman we believe NASA's aeronautics research plan is balanced and focused on the most critical areas. They are transitioning their research to industry at an appropriate pace. And they continue to push the frontiers of our fundamental knowledge. This is an important contribution that must be maintained if we are to maintain our global leadership in aeronautics and aerospace.

Thank you for allowing me to represent the Committee today, and I am glad to answer any questions you may have.