Position Statement on the National Aeronautics and Space Administration (NASA) FY 2014 Budget Request submitted by the NASA Task Force of ASME’s Aerospace Division within Technical Communities of the Knowledge and Community Sector

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Introduction to ASME and the NASA Task Force
The NASA Task Force of ASME’s Aerospace Division within Technical Communities of the Knowledge and Community Sector is pleased to have the opportunity to provide its views on the Fiscal Year (FY) 2014 budget request for NASA.

ASME is a nonprofit, worldwide engineering society serving a membership of over 130,000 people. It conducts one of the world’s largest technical publishing operations, holds more than 30 technical conferences and 200 professional development courses each year, and sets many industrial and manufacturing standards. The Aerospace Division represents approximately 15,000 members from industry, academia, and government. Aerospace Division members are involved in all aspects of aeronautical and aerospace engineering at all levels of responsibility. They have a long-standing interest and expertise in the nation’s federally funded aeronautics, exploration, space operations, and aerospace research and development activities at NASA, and the agency’s efforts to create a pipeline of young engineers interested in aerospace and aeronautics. In this statement, the Task Force will address programs that are critical to the long-term health of the nation’s aerospace workforce and the global economic competitiveness of the US aerospace industry.

Key Recommendations for FY 2014:

- The Aerospace Division is concerned about proposed flat and reduced funding for key research and education accounts within NASA. Flat funding amounts to effective reductions in funding when adjusted for inflation and would have a particularly negative effect on NASA’s aeronautics research programs. NASA’s R&D and educational activities will require sustained increases in funding in order to maintain and enhance space exploration outcomes and competitiveness in the US aeronautics industry and workforce against emerging countries investing in space exploration, like China.

- The Task Force highly recommends that Congress and the Administration work to increase the aeronautics portion of NASA’s research budget to maintain funding and activities for aeronautics research at the FY 2012 level of $569.4 million. Achieving this goal will help maintain the research programs needed to support and maintain a world-class aeronautics and aerospace industry and globally competitive research workforce.

National Aeronautics Research and Development Policy and Plan
The National Science and Technology Council (NSTC) released their “National Aeronautics Research and Development Policy” in December 2006, to establish long-term goals for US aeronautics R&D endeavors.
The NSTC followed this policy with a “National Aeronautics Research and Development Plan,” updated by the Obama Administration in 2010. This plan noted the continued importance of aeronautics research and development to US national security and global economic competitiveness. These policy documents recognize the necessity for federal leadership in advanced R&D and emphasize the federal role in advanced aircraft technologies and systems research but also call for private sector contributions in identifying and applying technological innovations. However, these policies alone cannot provide the necessary gains in aeronautics technology without the proper amount of funding and the sustained commitment on the part of the Administration and Congress.

**Overview of NASA’s Fiscal Year 2014 Budget Request**

The Task Force recognizes the unprecedented fiscal challenges our country faces and supports the Administration’s strategy of promoting fiscal discipline in a smart way – strategically cutting programs where possible and investing in programs which improve our long-term economic competitiveness. In accordance with the terms of the NASA Authorization Act of 2010 (P.L. 111-267), the Administration is continuing the implementation of significant changes to NASA’s programming in FY 2014, including the continuation of a series of new exploration, R&D, and technology demonstration programs and several programs geared towards partnerships between NASA Centers and commercial sector aeronautics and aerospace companies.

The Administration’s overall budget request of $17.72 billion for NASA in FY 2014, compared to $17.77 billion in FY 2012, is significant considering the current fiscal environment, but the Task Force has severe reservations about the Administration’s proposed budget freeze at this reduced level over the next 5 fiscal years, through FY 2018.

NASA is already struggling to support several new research and technology initiatives needed to serve the nation’s long-term space exploration needs. Constrained research funding will force NASA to abandon worthy research endeavors, including proven and promising research programs and technology development efforts such as NASA’s Mars science programs. Due to recurrent under-funding of NASA’s research and development focused directorates over the last several years, NASA became an agency focused on operations and execution to the detriment of its concurrent mission to develop and research the aeronautics and aerospace platforms of tomorrow. Given the challenges faced by NASA as it transitions to new mandates from Congress – mandates which assume significant out-year budget growth - and the current challenges faced by the broader US aeronautics industry and aeronautics workforce, the Task Force urges the Administration to reassert its commitment to revitalizing research and development at NASA, particularly through proposals to engage US industry in a variety of new space technology development and demonstration programs in NASA’s new ‘Space Technology’ budget portfolio.

NASA’s ‘Space Technology’ development proposal reflects one of the most important recommendations from the Review of US Human Space Flight Plans Committee, also known as the ‘Augustine Committee’, that is, the revitalization of NASA’s innovative space technology development efforts. The US record on space exploration stands among the greatest achievements of humankind and one of our greatest achievements as a nation, and maintaining this mission is critical to US leadership in space.

At a time when America faces unprecedented challenges to its economic leadership, NASA must continue to play a leading role in funding engineering-related research, particularly for aeronautics and aerospace programs, if we are to continue our leadership in activities ranging from commercial
aeronautics and aerospace activities to national space exploration priorities. Therefore, the Task Force views the Administration’s notional freeze on NASA’s budget as detrimental to encouraging new research and technology demonstration programs critical to placing NASA and the US aeronautics and aerospace industries back on course to developing space exploration programs which are truly ‘worthy of a great nation’.

Need to Expand Aeronautics Research
The Task Force has consistently noted the value of NASA’s aeronautics research and technology (R&T) programs contained within the Aeronautics Research Mission Directorate (ARMD). This portion of the NASA budget offers immediate and practical benefits for the nation, and the Task Force is concerned about the Administration’s proposed $565.7 million budget for ARMD in FY 2014, a -0.65 percent decrease from FY 2012. In light of this reduced funding path, the Administration’s out-year budget plan for ARMD will be insufficient to support the development of important aeronautics research missions if ARMD is to ramp up work on its Integrated Systems Research Program (ISRP), and also force NASA to abandon much of its hypersonic aviation research efforts.

Aeronautic products represent our greatest single national export. These exports are now being threatened by foreign competition whose governments are largely supportive of their aeronautics enterprises. This represents not only a commercial threat but a potential threat to our national security as well. Strong investment in fundamental engineering research in aeronautics will ensure that the US will retain its long-term leadership in this field.

NASA’s proposed investment in aeronautics research for FY 2014 represents less than 1 percent of the more than $79.7 billion in net US exports of aeronautics products in 2012. The Task Force recommends that the aeronautics portion of the NASA budget be increased to $1.0 billion over the next five years, with a long-term target of attaining a level of 10 percent of the total NASA budget. Achieving this target would re-establish aeronautics funding, as a percentage of the NASA budget at its pre-1990 level, and put US aeronautics R&D funding at levels commensurate with the needs of a world-class aeronautics and aerospace industry.

An increase in R&D funding for Aeronautics could provide immediate and strategic benefits to the US economy. More funding will allow rapid improvements in fuel economy and noise abatement technology development through full-scale or sub-scale flight demonstrations that speed transition of these technologies into production aircraft, and leverage current Aeronautics investments in environmentally responsible aviation technologies. Strategically, more R&D funding could allow the ARMD to take a greater role in Next Gen technology development for air traffic control, and to possibly take a lead role in the National Airspace System, leading the way to safely flying unmanned vehicles in our national airspace and maintaining US leadership in this critical technology.

US Aeronautics and Aerospace Workforce
Several interrelated critical challenges confront the US aeronautics enterprise – a sharp decrease in the number of new commercial and military aircraft programs, a decline in the quality of the research infrastructure, and erosion in the technologically literate workforce needed to ensure pre-eminence in an increasingly competitive marketplace. Robust investment by NASA in aeronautics research and space technology development addresses all these problems and will help balance NASA’s portfolio to reflect the importance of aeronautics and aerospace to the global economy.
Aeronautics faces the same pressures being felt by the space industries, where fewer research dollars over time has resulted in fewer companies with skilled workers capable of designing and building complex aeronautical systems. As result, the US is increasingly dependent on immigration and outsourcing to meet its technical workforce needs. In fact, the NSF’s 2012 S&T Indicators report found that over 50 percent of Doctorate level engineers working in the US engineering fields, including aeronautical and aerospace engineering, came from foreign backgrounds, an increase from 41 percent in 2000. Investment in aeronautics is a matter of strategic importance, as it creates highly skilled manufacturing jobs and helps create a foundation for a strong national defense. Additionally, the same report found that both the number and percentage of science and engineering doctoral degree recipients with temporary visas reporting plans to stay in the US peaked in 2007 and declined in 2009 after rising since 2002, indicating that the US cannot take its scientific workforce for granted during tough economic times. The Task Force calls on Congress to create legislation that allows the best and brightest students trained in our universities to find a path to permanent residency.

While regional economies differ, the Aerospace industry overall suffers from a lack of available young workers with advanced technology degrees who can step in to replace retiring, experienced workers. The aerospace industry looks to NASA to create a demand for long-term R&D to encourage students to go to graduate school and on to companies who are doing aeronautical research and development. There is a clear correlation between research dollars and the number of graduate students in a particular field. Therefore, as the funding for aeronautics has decreased by more than half over the last decade, the number of younger faculty and graduate students decreased. There is a lag between funding increases and student enrollment increases, and this decade-long erosion must begin to be reversed now. Accordingly, the Task Force reiterates its support for a revitalization of aeronautics and aerospace research and development efforts at NASA.

Recommendations Concerning ITAR Restricted Research
The Task Force again recommends that NASA receive increased funding for research programs conducted through academic partnerships, and recommends maintaining NASA’s education budget at a minimum FY 2012 level of $136 million. In this context, Congress should consider having a broad range of technologies reviewed and declared non-International Traffic in Arms Regulation (ITAR) restricted in order to reduce costs and barriers to performing research in academic laboratories.

While basic research does not face ITAR restrictions, many applied and advanced categories of research on space related technologies face significant barriers for foreign nationals at academic institutions. At present almost all space launch technologies are ITAR restricted, eliminating the possibility for many foreign students to participate in the research at many universities. Recognizing that many aerospace companies perform restricted work and need to hire legal residents or US citizens, the Task Force recommends that a process be established to screen new foreign engineering students and start the green card process and path to citizenship as a part of their student employment through US taxpayer funded grants working on technology in the aerospace and astronautics fields. This would restrict funding to individuals that would later be eligible for employment in the US after conclusion of their PhD, allowing for easier entry into the US aeronautics workforce. This would also reduce the cost to small business hiring new non-US graduates and streamline the US aeronautics workforce development pipeline.

Conclusion
Our nation is facing an ongoing struggle in two areas that are interrelated, which are: declining technical workforce and foreign competition for aeronautics and space exploration leadership. We believe one element of the solution to both problems is investment in aeronautics research and development. There is a strong correlation between technical degrees being awarded and consistent funding for research and development. NASA can help its own workforce problems as well as some of the same problems facing the rest of the country by increasing, in a persistent fashion, research in aeronautics. This in turn would have a positive effect on the US economy in the long run by enabling our country to better compete in the future global marketplace.

The Administration’s proposed NASA budget for FY 2014 indicates an overall philosophical commitment to revitalizing space technology research and development efforts, which the Task Force fully supports. However, a strong aeronautics R&D program is also essential for the national necessity of retaining a US world-class aeronautics workforce and the Administration’s 5-year (FY 2014-FY 2018) funding freeze for NASA is incongruent with the Administration’s overall goal of spurring a revitalization of R&D at NASA and in the US aeronautics industry. Aeronautics is a vital industry that produces tangible economic and security benefits for the nation. NASA’s charter for aeronautics and space means that it must address both. Therefore, the Task Force reiterates its support for an expansion in NASA’s overall ARMD’s budget portfolio to ensure support for existing long-term aviation research and infrastructure goals as well as the development of new space technology research and development capabilities.

As other nations seek to expand their efforts in aeronautics and space exploration, there is a strong rationale for Congress to consider real increases to the NASA aeronautics and space technology budgets. Congress must help the US remain competitive and innovative in this vital area by providing adequate funds and consistent support for NASA’s missions. Furthermore, NASA’s aeronautics budget should reflect the priorities laid out in the NSTC National Aeronautics Research and Development Policy, which supports stable and long-term foundational research. Only a robust aeronautics budget will meet this goal. The decrease in NASA’s aeronautics budget is a step in the wrong direction. The US must maintain and expand its investments in scientific research to ensure continued US leadership in space exploration and aeronautics and aerospace technological development.

This testimony represents the considered judgment of the NASA Task Force of the Aerospace Division of ASME’s Technical Communities of the Knowledge and Communities Sector and is not necessarily a position of ASME as a whole.