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**Position Statement on the Fiscal Year 2014 Budget Request for the Department of Defense
Research, Development, Test and Evaluation (RDT&E) and
Science and Technology (S&T) Programs
Submitted by the ASME Department of Defense Task Force**

July 17, 2013

Introduction

The Department of Defense (DOD) Task Force of the Board of Government Relations Inter-Sector Committee on Federal R&D of the ASME Public Affairs and Outreach Sector is pleased to comment on the Fiscal Year (FY) 2014 budget request for the Research, Development, Test and Evaluation (RDT&E) and the Science and Technology (S&T) portion of the DOD budget request.

With over 130,000 members, ASME is a worldwide engineering society focused on technical, educational and research issues. It conducts one of the world's largest technical publishing operations, holds over 30 technical conferences and 200 professional development courses each year, and sets many industry and manufacturing standards. This testimony represents the considered judgment of experts from universities, industry, and members from the engineering and scientific community who contribute their time and expertise to evaluate budget requests and policy initiatives the DOD recommends to Congress.

Importance of National Security Research

Since World War II the United States has led the world in science, innovation, and defense technology. The National Academy of Science's landmark series report, "Rising Above the Gathering Storm", evaluated the position of the United States in several critical areas: technology, education, innovation, and highly skilled workforce development. While the reports indicate that the U.S. maintains a slight lead in research and discovery, the committee has repeatedly stated that it was "deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gaining strength." Proper attention should be given to the vital role that DOD S&T programs play in meeting this challenge.

Our statement addresses three (3) primary funding areas: Science and Technology (S&T); Operational Test and Evaluation (OT&E); and the University Research Initiative (URI). Our statement also outlines the consequences of inadequate funding for defense research. These include a degraded competitive position in developing advanced military technology versus potential competitors that could harm the United States' global, economic, and military leadership.

DOD Request for RDT&E and Defense Science and Technology

The Administration requested \$67.3 billion for the Research, Development, Test and Evaluation (RDT&E) portion of the FY2014 DOD budget, a 6.3 percent decline from the FY 2012 enacted amount of \$71.8 billion and a more dramatic reduction from the final FY 2011 appropriated level

of \$76.1 billion. These resources are used mostly for developing, demonstrating, and testing weapon systems, such as fighter aircraft, satellites, and warships. The FY2014 budget request for the Defense Science and Technology (S&T) portion of RDT&E is \$11.9 billion, a 0.6 percent decline from the FY 2012 actual funding level of \$12.1 billion.

The FY 2014 budget request for Defense S&T, if implemented, would represent a significantly reduced investment in critical areas of national security research. We strongly urge Congress to consider additional resources to maintain stable funding in the S&T portion of the DOD budget. At a minimum, \$15.7 billion would be needed for Defense S&T to meet the three percent of Total Obligational Authority (TOA) guideline recommended by a National Academies study and set out as a DOD goal in the 2001 Quadrennial Defense Review.

A relatively small fraction of the Research Development Test & Evaluation (RDT&E) budget is allocated to S&T programs. While the FY 2014 S&T request represents only about 17 percent of the RDT&E total, these accounts support all of the new knowledge creation, invention and technology developments for the military. While funds for Basic Research (6.1) would receive an increase under the President's request, Applied Research (6.2) and Advanced Technology Development (6.3) are programmed for funding reductions.

Basic Research (6.1)

Basic Research accounts would rise 7.7 percent to \$2.16 billion for FY 2014. While basic research accounts comprise only a small percentage of RDT&E funds, the programs that these accounts support are crucial to fundamental scientific advances and for maintaining a highly skilled science and engineering workforce. Maintaining a skilled workforce, in particular, is critical given the large turnover that will occur in the next few years in key science and engineering industries. The National Science Foundation's 2012 Science and Engineering (S&E) Indicators Report shows that the US severely lags the rest of the world, in both real terms and on a percentage basis, with only 4.4 percent of first university degrees being granted in engineering versus 12.1 percent for the European Union and over 31 percent in China¹. Combined with the NSF's findings that the average age and retirement rate of the engineering workforce will continue to rise over the next few years², the Task Force reiterates the need for robust S&T programs at DOD as critical to our economic competitiveness and national security.

Basic research accounts are used mostly to support science and engineering research and graduate education at universities in all 50 states. Almost all of the current high-technology weapon systems, from advanced body armor, vehicle protection system, to the global positioning satellite (GPS) system, have their origin in fundamental discoveries generated in these basic research programs. Proper investments in basic research are needed now, so that the fundamental scientific results will be available to create innovative solutions for future defense challenges. In addition, many of the technical leaders in corporations and government laboratories that are developing current weapon systems were educated under basic research programs funded by DOD. Failure to invest sufficient resources in basic, defense-oriented research will reduce innovation and weaken the future scientific and engineering workforce. Several of the proposed reductions to individual S&T program elements are dramatic and could have negative impacts on future military capabilities. The Task Force supports the President's request of \$2.16 billion for Basic Research (6.1).

¹ Table 2-32: <http://www.nsf.gov/statistics/seind12/appendix.htm>

² <http://www.nsf.gov/statistics/seind12/c3/c3h.htm>

Applied Research (6.2)

Applied Research would be reduced from \$4.73 billion in FY 2012 to \$4.62 billion in FY 2014, a 2.2 percent decline. The programs supported by these accounts apply basic scientific knowledge, often derived from basic research programs, to support important defense needs. Applied research programs may involve laboratory proof-of-concept and are generally conducted at universities, government laboratories, or by small businesses. Many successful demonstrations led to the creation of small entrepreneurial companies. Some devices created in these defense technology programs have dual use, such as GPS, and the commercial market far exceeds the defense market. However, without initial support by Defense Applied Research funds, many of these companies would not exist. Like 6.1 Basic Research, 6.2 Applied Research has also funded the education of many of our best defense industry engineers. Failure to properly invest in applied research would stifle a key source of technological and intellectual development as well as stunt the creation and growth of small entrepreneurial companies. The Task Force urges Congress to support a budget consistent with the FY 2012 funding level of \$4.73 billion for Applied Research (6.2) in FY 2014.

Advanced Technology Development (6.3)

Advanced Technology Development would experience a 2.4 percent decline, from \$5.32 billion in FY 2012 to \$5.19 billion in FY 2014. These resources support programs where readily available technology can be transitioned into weapon systems. Without the real system level demonstrations funded by these accounts, companies are reluctant to incorporate new technologies into weapon system programs. This line item funds research in a range of critical material technologies, including improved body armor to protect troops against improvised explosive devices (IEDs) and lightweight armor for vehicle protection. With the problems faced in Iraq and Afghanistan with IEDs and the need for improved armor systems, it does not seem wise to cut materials research. Fortunately, in the past few years the United States Congress has recognized that such cuts are not in the best interest of the country, and has appropriated additional resources to maintain healthy S&T programs in critical technologies. The Task Force urges Congress to support a budget consistent with the FY 2012 funding level of \$5.32 billion for Advanced Technology Development (6.3) in FY 2014.

Defense Wide Research

S&T funding for Defense Wide account activities would increase by 5.7 percent to \$5.48 billion. Each of the individual service branches would see reduced budgets under the President's request – with the largest cuts proposed for Army accounts at 8.35 percent. Air Force S&T funds would decline 5.1 percent, followed by the Navy with a 2.12 percent reduction.

The Administration has requested a small 1.81 percent increase for the Defense Advanced Research Projects Agency (DARPA) at \$2.87 billion for FY 2014. Basic research at DARPA, however, would increase 4.5 percent. Applied Research would receive a 1.4 percent increase, while Advanced Technology Development would receive a 6.2 percent increase. The Task Force supports the President's request of \$5.48 billion for Defense Wide research agencies.

Operational Test and Evaluation (OT&E) Request

Funds for the Operational Test and Evaluation (OT&E) function help ensure that new technology and weapon systems are thoroughly tested, effective, and safe for our troops. The FY 2014 request of \$186.3 million represents a reduction of 1.0 percent from the FY 2012 appropriated amount of \$188 million. While the FY 2014 request still represents an improvement from recent years, even this amount is at a reduced level from historical standards (the 2005 appropriated

amount was \$310 million). The Task Force urges Congress to provide strong funding for OT&E in FY 2014.

University Research Initiative (URI) Request

The University Research Initiative (URI) supports graduate education in Mathematics, Science, and Engineering. The program would see a funding reduction to \$330.3 million in FY 2014 from \$337 million in FY 2012, a 2.0 percent reduction. Within the FY 2014 request, the Administration has requested a decrease for the Navy URI account, while the Army and Air Force URI initiatives would receive essentially flat funding.

Sufficient funding for the URI is critical to educating the next generation of engineers and scientists for the defense industry. A lag in program funds will have a serious long-term negative effect on our ability to develop a highly skilled scientific and engineering workforce to build weapons systems for years to come. While DOD has enormous current commitments, these pressing needs should not be allowed to squeeze out the small but very important investments required to create the next generation of highly skilled technical workers for the American defense industry. The Task Force urges Congress to provide funding of \$337 million, consistent with the FY 2012 level of funding, for URI programs in FY 2014.

Reduced S&T Funding Threatens America's National Security

Science and technology have played a historic role in creating an innovative economy and a highly skilled workforce. Study after study has linked over 50 percent of our economic growth over the past 50 years to technological innovation. The "Gathering Storm" report places a "special emphasis on information sciences and basic research" conducted by the DOD because of the large influence on technological innovation and workforce development. The DOD, for example, funds 40 percent of all engineering research performed at our universities. US economic leadership depends on the S&T programs that support the nation's defense base, promote technological superiority in weapons system, and educate new generations of scientists and engineers.

Prudent investments also directly affect U.S. national security. There is a general belief among defense strategists and some members of Congress that the United States must have the industrial base to develop and produce the military systems required for national defense. A number of disconcerting trends, such as outsourcing of engineering activities and low participation of U.S. students in science and engineering, threaten to create a critical shortage of native, skilled, scientific and engineering workforce personnel needed to sustain our industrial base. Programs that boost the available number of highly educated workers who reside or are born in the U.S. are important to stem our growing reliance on foreign nations to fill the ranks of our defense industries and to ensure that we continue to produce the innovative, effective defense systems of the future.

Recommendations

In conclusion, we thank the committee for its ongoing support of Defense S&T. This Task Force appreciates the difficult choices that Congress must make in this tight budgetary environment. We believe, however, that there are critical shortages in the DOD S&T areas, particularly in those that support the basic research and technical education that are critical to U.S. military in the global war on terrorism and defense of our homeland.

| The Task Force recommends the following:

- We urge this subcommittee to support the funding request at least at the FY 2012 level for Defense S&T (6.1, 6.2, and 6.3) programs, OT&E accounts, and URI programs in FY 2014. We urge Congress to continue to work towards the recommendations of the *Rising Above the Gathering Storm* report, which called for a 10 percent increase in defense basic research.
- 6.2 Applied Research funds are critical to bridging the ‘valley of death’ for defense researchers and entrepreneurs. The Task Force recommends that the subcommittee provide additional funding for the 6.2 Applied Research account to ensure workforce and project stability in this critical area of defense research.
- We also recommend that the committee support the long term goal – as outlined in the 2001 Quadrennial Defense Review - of devoting three percent of the Department’s baseline budget to Defense S&T programs - 6.1 basic research, 6.2 applied research, and 6.3 advanced technology development.

This statement represents the views of the ASME Department of Department of Defense (DOD) Task Force of the Board of Government Relations Inter-Sector Committee on Federal R&D of the ASME Public Affairs and Outreach Sector and is not necessarily a position of ASME as a whole.

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