AAAS R&D Funding Update July 8, 2002 (will be revised) -

House Approves Record DOD R&D Budget; DOD S&T Jumps to $11.7 Billion

(This analysis is part of a series of AAAS R&D Funding Updates on the FY 2003 congressional appropriations process. This analysis includes information on R&D in House-approved FY 2003 appropriations for DOD. The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D by agency in FY 2003 appropriations, is available on the AAAS R&D Web Site (http://www.aaas.org/spp/rd) in the "FY 2003 R&D" or the "What's New" sections.)

Before departing for a week-long Fourth of July recess, the House of Representatives kicked off the FY 2003 appropriations process by approving the Defense and Military Construction (HR 5010 and HR 5011) FY 2003 appropriations bills for the Department of Defense (DOD). Together, the bills would provide $365 billion for DOD in FY 2003, a 10 percent increase over the $332 billion current DOD budget. **The House would provide $58.8 billion for DOD R&D – an increase of 18.9 percent or $9.4 billion from the FY 2002 level of $49.5 billion that would bring DOD R&D to an all-time high in both current and inflation-adjusted dollars**. In comparison with the request of the Bush Administration, this total represents a 8.1 percent increase, or an additional $4.4 billion for DOD R&D (see Table A).

DOD is by far the largest supporter of R&D in the federal government, accounting for nearly half the total federal R&D portfolio. Because of defense cutbacks following the end of the Cold War, DOD's support for R&D declined by a third following a peak in FY 1987 but has increased dramatically in the past few years. The Bush Administration has made increasing DOD spending in general and DOD development spending in particular a high priority, especially in the aftermath of September 11. The House would add to the Administration's already-generous request for DOD R&D. At $58.8 billion for FY 2003, the House appropriation would well exceed the peak FY 1987 DOD R&D investment of $53.7 billion in today's dollars.

DOD Basic Research ("6.1") and Applied Research ("6.2") would receive comparatively modest increases in funding. Basic Research would rise by 3.0 percent to $1.4 billion, though the Pentagon requested a cut. Applied Research would rise by a larger 9.0 percent from $4.1 billion to $4.4 billion, again in contrast to a requested cut (see Table A). (Table C provides details of "6.1" and "6.2" funding by the military services and agencies). The "6.1" and "6.2" research accounts provide a significant share of federal support for several **key science and engineering disciplines**. DOD provides nearly one-third of all federal support for engineering research and a majority of federal support for some key engineering subfields. DOD also provides more than 40 percent of total federal support for computer science research and plays a prominent funding role in other disciplines such as mathematics, oceanography, medical sciences, chemistry, physics, and environmental sciences. The "6.1" and "6.2" accounts are also important for the nation's **colleges and universities**, which perform more than half of the "6.1" research and roughly 20 percent of "6.2" research.

The "6.1," "6.2," and "6.3" categories are often grouped together as **"Science and Technology" (S&T).** This category encompasses basic research, applied research, and advanced technology development, which contribute to a broad knowledge base with potential applications to a wide variety of military as well as civilian uses. S&T is separate from the "6.4" and higher categories, which are focused on the development and testing of specific weapons systems. In the House bill, **DOD S&T,** including medical research appropriations outside the RDT&E account (see below), **would exceed $11 billion for the first time to reach $11.7 billion**, a 13.7 percent increase, mostly because of a $1.1 billion or 24.3 percent boost for "6.3" funding. Advocates of DOD S&T investments pushed last year for $10 billion in FY 2002 S&T funds, a goal Congress granted, and are pushing for an investment of at least $11 billion in FY 2003. Advocates of DOD S&T in the science and engineering community argue that DOD S&T funding is essential for building the knowledge and technology base for future DOD needs, and have successfully

argued that post-Cold War cutbacks over the past decade eroded this base. In the past year, there has been growing support inside and outside the Pentagon for setting 3 percent of the DOD budget as a target for the proper level of S&T investment. These efforts were dealt a setback by the Pentagon request, which would have cut DOD S&T to $9.7 billion in FY 2003, just 2.6 percent of the overall DOD budget. **The House S&T appropriation of $11.7 billion would be 3.2 percent of the total DOD budget, meeting the target. The House appropriation would bring DOD S&T back up to the FY 1993 level in inflation-adjusted dollars, its peak funding year before steep post-Cold War cuts in the mid-1990s.**

The House bill contains a separate $400 million appropriation, outside the regular R&D accounts, for **medical research** (see Table A). Included in this total is $150 million for breast cancer research and $85 million for prostate cancer research (up slightly from FY 2002) in peer-reviewed, competitively awarded grants. The bill also contains $25 million for other breast cancer research projects, $10 million for ovarian cancer research, and miscellaneous amounts for research on other medical topics. These programs were congressionally initiated in the early 1990s and DOD has never requested funding for them, but Congress has annually provided funding. The House Defense bill also contains numerous congressionally designated appropriations for medical research in DOD's regular accounts, mostly in the Army and Navy, totaling nearly $315 million. Counting these appropriations, the Defense bill provides more than $700 million for congressionally designated medical research projects.

Nearly all ($9.0 billion) of the enormous $9.4 billion DOD R&D increase would go to development activities ("6.4" through "6.7" plus other appropriations), which make up nearly all of the DOD R&D investment. Of the $58.8 billion House appropriation, 89 percent ($52.6 billion) would go to development activities, leaving only 2 percent for basic research ("6.1") and 9 percent for applied research ("6.2"; see Table A). Under the House bill, **Engineering and Manufacturing Development (EMD; "6.5") and Operational Systems Development ("6.7") would receive the largest increases**. EMD would rise by 22.1 percent or $2.4 billion to $13.4 billion while Operational Systems Development would rise by 33.1 percent or $4.8 billion to $19.1 billion. These categories cover advanced development work, mostly performed by industrial firms as defense contractors, on specific weapons systems. Nearly all of the "6.5" increase comes from the $3.5 billion appropriation (same as the request, but up from $1.5 billion in FY 2002), divided between the Navy and Air Force, for the Joint Strike Fighter (JSF), a next-generation fighter in development for future use by all the services and U.S. allies. Over half the total and most of the increase in "6.7" funding would go to the Air Force for advanced development work on new military aircraft.

The **Defense Advanced Research Projects Agency (DARPA),** one of the Defense Agencies, would receive $2.8 billion in the House bill, 24.0 percent more than FY 2002 (see Table B). DARPA's Biological Warfare Defense program would receive $167 million, up from $147 million in FY 2002. Defense Research Sciences, DARPA's basic research program, would rise from $142 million to $199 million (up 39.5 percent). The Defense Agencies in general would do very well in the House bill, especially in the S&T accounts (see Table C). The FY 2003 House bill would continue the trend in recent years of shifting S&T investments from the services to Defense-wide agencies; while Defense-wide S&T would jump by 25.3 percent to reach $5.3 billion, nearly half the total DOD portfolio, the services' S&T portfolios would show smaller increases or, in the Navy's case, decreases.

The largest increase among the Defense Agencies, in the aftermath of the September 11 terrorist attacks, would go to the **Chemical and Biological Defense Program (CBDP)** whose R&D portfolio would jump 81 percent to $995 million, more than double the funding level from FY 2001 (see Table B). The agency funds basic and applied research as well as all forms of development geared toward new technologies to keep U.S. troops safe from biological and chemical attack on the battlefield. CBDP would receive $385 million in funds specifically for domestic homeland security, including funds to develop biological surveillance capabilities for U.S. cities. Last year's big winner in the FY 2002 budget, **the Ballistic Missile Defense Organization (BMDO)**, would decline 2.1 percent from the lofty FY 2002 level to $6.8 billion for R&D; this amount would still be well above the $4.2 billion FY 2001 funding level. BMDO, renamed the Missile Defense Agency in the House bill, no longer funds research; there would be some funds for generic technology development, but now nearly all BMDO R&D funds go to advanced development, testing, and evaluation of missile defense systems. BMDO is charged with developing defensive systems to counter

perceived theater and strategic ballistic missile threats. Although the exact amounts are of course unclear, there appear to be large increases for development programs in classified agencies within the Defense Agencies (such as the National Security Agency; included in "Other *" in Table B).

Among the service branches, Army, Navy, and Air Force R&D budgets would all receive large increases. Army R&D would rise from $7.0 billion to $7.4 billion (a 5.7 percent increase). Navy R&D would rise from $11.4 billion to $13.6 billion (a 19.3 percent increase). And Air Force R&D would rise from $14.5 billion to $18.6 billion (a 28.7 percent increase). As Table C shows, the increases would be largest for advanced development work; the services' basic and applied research programs would mostly show small increases; Army and Navy applied research would actually decline.

Now that the full House has approved the Defense bill, it will take up the nondefense appropriations bills. The House, at the urging of President Bush, had pledged to move the Defense bill first; the Democratic-controlled Senate did not make such a promise, so it will likely concentrate on some of the nondefense appropriations bills first; a Senate Defense bill may not reach the floor until September. Last year, the Defense bill was the last of the 13 appropriations bills to be signed into law.

- July 8, 2002 (will be revised)

AAAS R&D Budget and Policy Program
1200 New York Ave, NW
Washington, DC 20005
(202) 326-6607; -6600
fax (202) 289 4950
science_policy@aaas.org
www.aaas.org/spp/rd (Note: New URL)

Table A. Department of Defense by Program
House Action on R&D in the FY 2003 Budget
(budget authority in millions of dollars)

			Action by House				
	FY 2002	FY 2003	**FY 2003**	Chg. from Request		Chg. from FY 2002	
	Estimate	Request	**House**	Amount	Percent	Amount	Percent
Research, Development, Test, and Evaluation:							
Basic Research ("6.1")	1,372	1,361	**1,414**	53	3.9%	42	3.0%
Applied Research ("6.2")	4,071	3,768	**4,436**	668	17.7%	365	9.0%
Total Research, or Tech. Base	5,443	5,129	**5,849**	721	14.1%	407	7.5%
Advanced Tech. Dev. ("6.3")	4,391	4,511	**5,458**	947	21.0%	1,067	24.3%
Total Science and Technology	9,834	9,640	**11,308**	1,668	17.3%	1,474	15.0%
Demonstration/Validation ("6.4")	10,341	10,519	**10,885**	367	3.5%	544	5.3%
Engineering and Manuf. Dev. ("6.5")	10,977	13,498	**13,404**	-94	-0.7%	2,427	22.1%
RDT&E Management Support ("6.6")	2,845	2,883	**3,047**	164	5.7%	201	7.1%
Operational Systems Dev. ("6.7")	14,361	17,163	**19,111**	1,948	11.4%	4,750	33.1%
BA Adjustment	49	0	**0**	0	--	--	--
TOTAL RDT&E	48,407	53,702	**57,754**	4,052	7.5%	9,347	19.3%
Other appropriations [1]	621	690	**690**	0	0.0%	69	11.1%
Medical research [2]	464	67	**400**	333	495.4%	-64	-13.7%
Total DOD R&D	49,492	54,460	**58,845**	4,385	8.1%	9,353	18.9%
DOD S&T ("6.1" - "6.3" & medical)	10,298	9,707	**11,708**	2,001	20.6%	1,410	13.7%

AAAS estimates based on FY 2003 appropriations bills. Includes conduct of R&D and R&D facilities.
FY 2002 and FY 2003 request figures based on OMB R&D data and supplemental agency budget data.
FY 2002 figures do not reflect supplemental appropriations that may be enacted in July.
All figures adjusted to exclude President's proposal to fully fund federal retiree costs, and therefore differ from figures presented in *AAAS Report XXVII*.
Figures are rounded to the nearest million. Changes calculated from unrounded figures.
[1] R&D support in military personnel, military construction, and other DOD appropriations.
Includes chemical agents and munitions destruction R&D funded outside RDT&E.
[2] Medical research appropriated in Defense Health Programs, not RDT&E. These funds are not included in "6.2."
July 8, 2002 - House-approved appropriations.
Adjusted to reflect amendments approved on the House floor.

Table B. Department of Defense by Agency
House Action on R&D in the FY 2003 Budget
(budget authority in millions of dollars)

			Action by House				
	FY 2002	FY 2003	**FY 2003**	Chg. from Request		Chg. from FY 2002	
	Estimate	Request	**House**	Amount	Percent	Amount	Percent
Research, development, test, and evaluation:							
Army	7,046	6,820	**7,447**	627	9.2%	401	5.7%
Navy	11,371	12,496	**13,562**	1,066	8.5%	2,191	19.3%
Air Force	14,478	17,565	**18,639**	1,074	6.1%	4,161	28.7%
Defense Agencies	15,284	16,599	**17,863**	1,265	7.6%	2,579	16.9%
Defense Adv. Res. Projects Agcy.	*2,251*	*2,683*	***2,791***	*108*	*4.0%*	*540*	*24.0%*
Ballistic Missile Defense Org.	*6,963*	*6,685*	***6,815***	*130*	*1.9%*	*-148*	*-2.1%*
Chem. And Bio. Defense Program	*550*	*933*	***995***	*62*	*6.6%*	*445*	*80.9%*
Defense Threat Reduction Agency	*458*	*452*	***456***	*4*	*0.9%*	*-2*	*-0.5%*
Office of Secretary of Defense	*1,698*	*1,813*	***1,934***	*121*	*6.7%*	*235*	*13.8%*
*Other **	*3,363*	*4,033*	***4,873***	*840*	*20.8%*	*1,510*	*44.9%*
Director of Operational Test & Eval.	230	222	**242**	20	9.0%	12	5.2%
TOTAL RDT&E	48,407	53,702	**57,754**	4,052	7.5%	9,347	19.3%
Other appropriations [1]	621	690	**690**	0	0.0%	69	11.1%
Medical research [2]	464	67	**400**	333	495.4%	-64	-13.7%
Total DOD R&D	49,492	54,460	**58,845**	4,385	8.1%	9,353	18.9%

AAAS estimates based on FY 2003 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2002 and FY 2003 request figures based on OMB R&D data and supplemental agency budget data.

FY 2002 figures do not reflect supplemental appropriations that may be enacted in July.

All figures adjusted to exclude President's proposal to fully fund federal retiree costs, and therefore differ from figures presented in *AAAS Report XXVII* .

Figures are rounded to the nearest million. Changes calculated from unrounded figures.

* Includes classified programs.

[1] R&D support in military personnel, military construction, and other DOD appropriations. Includes chemical agents and munitions destruction R&D funded outside RDT&E.

[2] Medical research appropriated in Defense Health Programs, not RDT&E.

July 8, 2002 - House-approved appropriations.

Adjusted to reflect amendments approved on the House floor.

Table C. Department of Defense S&T by Agency
House Action on R&D in the FY 2003 Budget
(budget authority in millions of dollars)

			Action by House				
	FY 2002	FY 2003	**FY 2003**	Chg. from Request		Chg. from FY 2002	
	Estimate	Request	**House**	Amount	Percent	Amount	Percent
"Science and Technology" (S&T; "6.1" through "6.3")							
Army	2,025	1,587	**2,193**	606	38.1%	168	8.3%
- Basic Research ("6.1")	*229*	*234*	***231***	*-3*	*-1.5%*	*2*	*0.7%*
- Applied Research ("6.2")	*898*	*633*	***876***	*243*	*38.3%*	*-22*	*-2.5%*
- Advanced Tech. Dev. ("6.3")	*898*	*720*	***1,087***	*367*	*50.9%*	*188*	*20.9%*
Navy	2,050	1,607	**2,015**	409	25.4%	-35	-1.7%
- Basic Research ("6.1")	*404*	*410*	***408***	*-2*	*-0.5%*	*3*	*0.9%*
- Applied Research ("6.2")	*776*	*580*	***730***	*150*	*25.9%*	*-46*	*-5.9%*
- Advanced Tech. Dev. ("6.3")	*869*	*617*	***877***	*260*	*42.2%*	*8*	*0.9%*
Air Force	1,563	1,656	**1,841**	185	11.2%	278	17.8%
- Basic Research ("6.1")	*226*	*219*	***226***	*7*	*3.2%*	*0*	*0.0%*
- Applied Research ("6.2")	*766*	*696*	***838***	*142*	*20.4%*	*72*	*9.4%*
- Advanced Tech. Dev. ("6.3")	*571*	*741*	***777***	*36*	*4.8%*	*206*	*36.2%*
Defense Agencies	4,196	4,790	**5,259**	469	9.8%	1,062	25.3%
- Basic Research ("6.1")	*513*	*498*	***550***	*51*	*10.3%*	*37*	*7.1%*
- Applied Research ("6.2")	*1,630*	*1,858*	***1,992***	*133*	*7.2%*	*361*	*22.2%*
- Advanced Tech. Dev. ("6.3")	*2,053*	*2,433*	***2,717***	*284*	*11.7%*	*665*	*32.4%*
TOTAL "6.1" through "6.3"	9,834	9,640	**11,308**	1,668	17.3%	1,474	15.0%
Medical research [1]	464	67	**400**	333	495.4%	-64	-13.7%
DOD S&T ("6.1" - "6.3" & medical)	10,298	9,707	**11,708**	2,001	20.6%	1,410	13.7%

AAAS estimates based on FY 2003 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2002 and FY 2003 request figures based on OMB R&D data and supplemental agency budget data.

FY 2002 figures do not reflect supplemental appropriations that may be enacted in July.

All figures adjusted to exclude President's proposal to fully fund federal retiree costs, and therefore differ from figures presented in *AAAS Report XXVII*.

Figures are rounded to the nearest million. Changes calculated from unrounded figures.

[1] Medical research appropriated in Defense Health Programs, not RDT&E.

July 8, 2002 - House-approved appropriations.

Adjusted to reflect amendments approved on the House floor.