

Senate Proposes Record DOD R&D Budget; DOD S&T Jumps to \$11.1 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 Senate-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.)

In a rush to approve all 13 FY 2003 appropriations bills before a month-long August recess, the Senate Appropriations Committee approved on July 18 its version of the FY 2003 Defense appropriations bill (HR 5010) providing funding for the Department of Defense (DOD). Earlier in the month, the full House approved its own version of the bill. **The Senate would provide \$57.7 billion for DOD R&D - an increase of 16.5 percent or \$8.2 billion from the FY 2002 level that would bring DOD R&D to an all-time high in both current and inflation-adjusted dollars.** The House would go even higher with an appropriation of \$58.8 billion, an 18.9 percent increase. Both the House and the Senate would exceed the Bush Administration request, by \$3.2 billion in the Senate appropriation (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. Both the House and the Senate would add to the Administration's request for DOD R&D. At \$57.7 billion for FY 2003, the Senate appropriation would well exceed the peak FY 1987 DOD R&D investment of \$53.7 billion in today's dollars, and the House would go even higher. (For information on the President's FY 2003 request for DOD R&D and historical trends in DOD R&D, please see Chapter 6 of *AAAS Report XXVII: R&D FY 2003*. For information on House appropriations for DOD R&D, please see the July 8 AAAS R&D Funding Update.)

DOD Basic Research ("6.1") and Applied Research ("6.2") would receive significant boosts in the Senate bill, though smaller than the increases for development. Basic Research would rise by 7.6 percent to \$1.5 billion, a gain of \$104 million, though the Pentagon requested a cut. Applied Research would rise by 4.8 percent from \$4.1 billion to \$4.3 billion, again in contrast to a requested cut (see Table A). The House would provide a smaller increase for "6.1" and a larger one for "6.2" funding. (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 Senate 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 \$11.1 billion**, an 8.0 percent increase, mostly because of a \$591 million or 13.5 percent boost for "6.3" funding. The House would go even higher with \$11.7 billion for S&T. 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 Senate S&T appropriation of \$11.1 billion would be 3.0 percent of the total DOD budget, just meeting the target; the House appropriation would total 3.2 percent. The Senate and House appropriations would both 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 Senate bill contains a separate \$394 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 \$10 million for ovarian cancer research, and \$50 million for peer-reviewed 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. These programs are managed by the Army.

Nearly all (\$8.0 billion) of the enormous \$8.2 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 \$57.7 billion Senate appropriation, 89 percent (\$51.5 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 Senate and House bills, **Engineering and Manufacturing Development (EMD; “6.5”) and Operational Systems Development (“6.7”) would receive the largest increases.** EMD would rise by 26.1 percent or \$2.9 billion to \$13.8 billion in the Senate bill while Operational Systems Development would also rise by 26.1 percent to \$18.1 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 (just slightly less than 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.

The **Defense Advanced Research Projects Agency (DARPA)**, one of the Defense Agencies, would receive \$2.7 billion in the Senate bill, 18.9 percent more than FY 2002 (see Table B). DARPA’s Biological Warfare Defense program would receive \$146 million, nearly the same as FY 2002. Defense Research Sciences, DARPA’s basic research program, would rise from \$142 million to \$187 million. The Defense Agencies in general would do very well in the Senate bill, especially in the S&T accounts (see Table C). The FY 2003 Senate and House bills 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 22.3 percent in the Senate plan to reach \$5.1 billion, nearly half the total DOD portfolio, the Army and Navy’s S&T portfolios would decline and the Air Force S&T portfolio would show a smaller increase than the Defense-wide portfolio.

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 84 percent to \$1.0 billion (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, and is heavily involved in developing counter-terrorism technologies.

Last year’s big winner in the FY 2002 budget, **the Ballistic Missile Defense Organization (BMDO)**, would decline 0.8 percent from the lofty FY 2002 level to \$6.9 billion for R&D; this amount would still be well above the \$4.2 billion FY 2001 funding level. BMDO 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. The Senate total includes \$814 million in a special account that the Senate would allow for either BMDO or counter-terrorism activities at the discretion of the President. (This analysis assumes that the money would be allocated to BMDO because of the Administration's stated desire to increase BMDO spending, and because of the great detail the Senate itself provides in how BMDO should allocate the \$814 million.)

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 4.4 percent increase). Navy R&D would rise from \$11.4 billion to \$13.2 billion (a 16.0 percent increase). And Air Force R&D would rise from \$14.5 billion to \$18.4 billion (a 27.3 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 and in some cases would actually decline.

The full House has already approved its Defense bill, and the Senate version now heads to the Senate floor. Although it is ready for floor debate, the Senate calendar for the next two weeks is overloaded with other legislative priorities, including the proposed Department of Homeland Security, so the Senate Defense bill may not be approved by the full Senate before the August recess. When the Senate does approve the bill, the House-Senate conference should be relatively easy because of the similar overall totals in the House and Senate versions, but it may not be possible to schedule a conference until September. Last year, the Defense bill was the last of the 13 appropriations bills to be signed into law, but this year the President and the House would like to make it the first. Considering the slow progress of the other appropriations bills (only the Military Construction bill has been approved by both chambers), this may be a realistic goal, and the Defense bill may be one of the few appropriations bills to be signed into law by the October 1 start of FY 2003. For R&D, the large increases provided in both the House and Senate versions all but guarantee a record year for DOD R&D in FY 2003.

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

	FY 2002 Estimate	FY 2003 Request	FY 2003 House	Action by Senate				
				FY 2003 Senate	Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 2002 Amount	Chg. from FY 2002 Percent
Research, Development, Test, and Evaluation:								
Basic Research ("6.1")	1,372	1,361	1,414	1,476	115	8.5%	104	7.6%
Applied Research ("6.2")	4,071	3,768	4,436	4,264	496	13.2%	193	4.8%
Total Research, or Tech. Base	5,443	5,129	5,849	5,740	612	11.9%	298	5.5%
Advanced Tech. Dev. ("6.3")	4,391	4,511	5,458	4,982	471	10.4%	591	13.5%
Total Science and Technology	9,834	9,640	11,308	10,723	1,083	11.2%	889	9.0%
Demonstration/Validation ("6.4")	10,341	10,519	10,885	10,724	205	2.0%	383	3.7%
Engineering and Manuf. Dev. ("6.5")	10,977	13,498	13,404	13,847	349	2.6%	2,870	26.1%
RDT&E Management Support ("6.6")	2,845	2,883	3,047	3,176	293	10.2%	331	11.6%
Operational Systems Dev. ("6.7")	14,361	17,163	19,111	18,109	947	5.5%	3,748	26.1%
BA Adjustment	49	0	0	0	0	--	--	--
TOTAL RDT&E	48,407	53,702	57,754	56,579	2,877	5.4%	8,172	16.9%
Other appropriations ¹	621	690	690	690	0	0.0%	69	11.1%
Medical research ²	464	67	400	394	327	486.5%	-70	-15.0%
Total DOD R&D	49,492	54,460	58,845	57,663	3,204	5.9%	8,172	16.5%
DOD S&T ("6.1" - "6.3" & medical)	10,298	9,707	11,708	11,117	1,410	14.5%	819	8.0%

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*.

FY 2003 Senate figures adjusted to reflect general reductions.

FY 2003 Senate figures assume \$814 million missile defense/counterterrorism fund will be allocated to missile defense.

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 22, 2002 - Senate Appropriations Committee-approved appropriations.

These funding levels may be amended or rejected on the Senate floor.

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

	FY 2002 Estimate	FY 2003 Request	FY 2003 House	Action by Senate				
				FY 2003 Senate	Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 2002 Amount	Chg. from FY 2002 Percent
Research, development, test, and evaluation:								
Army	7,046	6,820	7,447	7,358	538	7.9%	312	4.4%
Navy	11,371	12,496	13,562	13,188	692	5.5%	1,817	16.0%
Air Force	14,478	17,565	18,639	18,424	859	4.9%	3,946	27.3%
Defense Agencies	15,284	16,599	17,863	17,308	709	4.3%	2,024	13.2%
<i>Defense Adv. Res. Projects Agcy.</i>	2,251	2,683	2,791	2,677	-6	-0.2%	426	18.9%
<i>Ballistic Missile Defense Org.</i>	6,963	6,685	6,815	6,906	221	3.3%	-57	-0.8%
<i>Chem. And Bio. Defense Program</i>	550	933	995	1,010	77	8.3%	460	83.7%
<i>Defense Threat Reduction Agency</i>	458	452	456	468	16	3.6%	10	2.2%
<i>Office of Secretary of Defense</i>	1,698	1,813	1,934	1,988	176	9.7%	290	17.1%
<i>Other *</i>	3,363	4,033	4,873	4,258	225	5.6%	894	26.6%
Director of Operational Test & Eval.	230	222	242	301	79	35.6%	71	30.9%
TOTAL RDT&E	48,407	53,702	57,754	56,579	2,877	5.4%	8,172	16.9%
Other appropriations ¹	621	690	690	690	0	0.0%	69	11.1%
Medical research ²	464	67	400	394	327	486.5%	-70	-15.0%
Total DOD R&D	49,492	54,460	58,845	57,663	3,204	5.9%	8,172	16.5%

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

July 22, 2002 - Senate Appropriations Committee-approved appropriations.

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

	FY 2002 Estimate	FY 2003 Request	FY 2003 House	Action by Senate				
				FY 2003 Senate	Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 2002 Amount	Chg. from FY 2002 Percent
"Science and Technology" (S&T; "6.1" through "6.3")								
Army	2,025	1,587	2,193	1,983	395	24.9%	-42	-2.1%
- Basic Research ("6.1")	229	234	231	271	37	15.7%	42	18.3%
- Applied Research ("6.2")	898	633	876	776	143	22.6%	-121	-13.5%
- Advanced Tech. Dev. ("6.3")	898	720	1,087	936	215	29.9%	37	4.1%
Navy	2,050	1,607	2,015	1,911	304	18.9%	-139	-6.8%
- Basic Research ("6.1")	404	410	408	425	15	3.7%	21	5.1%
- Applied Research ("6.2")	776	580	730	759	179	30.9%	-17	-2.2%
- Advanced Tech. Dev. ("6.3")	869	617	877	727	110	17.9%	-142	-16.4%
Air Force	1,563	1,656	1,841	1,698	41	2.5%	135	8.6%
- Basic Research ("6.1")	226	219	226	217	-1	-0.6%	-8	-3.7%
- Applied Research ("6.2")	766	696	838	823	127	18.3%	57	7.4%
- Advanced Tech. Dev. ("6.3")	571	741	777	657	-84	-11.4%	86	15.1%
Defense Agencies	4,196	4,790	5,259	5,131	341	7.1%	935	22.3%
- Basic Research ("6.1")	513	498	550	563	65	13.0%	50	9.8%
- Applied Research ("6.2")	1,630	1,858	1,992	1,905	47	2.5%	275	16.9%
- Advanced Tech. Dev. ("6.3")	2,053	2,433	2,717	2,663	230	9.4%	610	29.7%
TOTAL "6.1" through "6.3"	9,834	9,640	11,308	10,723	1,083	11.2%	889	9.0%
Medical research ¹	464	67	400	394	327	486.5%	-70	-15.0%
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