

DOD “S&T” Falls in House Plan Despite Added Funds

AAAS R&D Funding Update on DOD R&D in FY 2008 House Appropriations

(Updated August 16 – updates in [])

Highlights

- **The House would provide \$77.6 billion for Department of Defense (DOD) R&D programs in FY 2008, a cut of 0.8 percent or \$641 million from this year’s total (see Table A).** But the House could add \$2.9 billion or more in supplemental development funds this fall to make the final 2008 total an increase.

- House appropriators would add hundreds of millions to DOD’s future-oriented investments, primarily for earmarked projects, but would still leave funding down from this year’s funding level. DOD proposed to slash “Science and Technology” (S&T) spending 22 percent or \$3.1 billion down to \$10.9 billion, erasing seven years of gains; [the House would add back \$1.7 billion, \$1.5 billion of it in earmarks, to bring DOD S&T to \$12.6 billion, down 9.7 percent (see Table C).] S&T funding, which includes basic research, applied research, medical research, and technology development, would fall to 2.63 percent of the regular DOD budget.

- **DOD’s support of basic and applied research would fall in the FY 2008 House appropriation, though not as much as DOD requested.** Basic research (“6.1”) would fall 0.5 percent to \$1.6 billion, keeping funding roughly even in real terms with the last seven years (see Table A). [The House bill would cap indirect costs on basic research grants at 20 percent. Applied research (“6.2”) would fall 4.8 percent to \$5.1 billion, despite House additions of \$718 million, almost entirely for earmarks.] The research-oriented Defense Advanced Research Projects Agency (DARPA) would see its budget fall 2.5 percent to \$3.0 billion (see Table B).

- **The Air Force would be the big winner in the 2008 budget.** Air Force R&D would climb 6.7 percent to \$26.2 billion because of increases to various space and classified weapons development programs, and is certain to climb even higher when supplemental funds are added later in the year (see Table B). Among the Defense Agencies, the House would boost funding tremendously for the Chemical and Biological Defense Program (CBDP) to \$1.1 billion, a 17 percent increase.

DOD R&D in FY 2008 House Appropriations

On July 25, the House Appropriations Committee approved its version of the FY 2008 Defense appropriations bill (HR 3222) providing funding for most of the Department of Defense (DOD). [The full House debated and approved the bill on August 4.] The House bill contains nearly \$460 billion in 2008 discretionary spending for most of DOD’s programs. A separate bill funds DOD military construction accounts, and the Defense bill excludes (for the moment) more than \$140 billion in supplemental funds requested for ongoing war operations that Congress plans to consider this fall and could add to the Defense bill in House-Senate conference.

The House Defense bill appears to provide less for DOD R&D in 2008 than the current year, the first time in more than a decade that DOD R&D would decline (see Figure 1). But the primary reason DOD R&D would decline \$641 million or 0.8 percent to \$77.6 billion in the House appropriation (see Table A) is that Congress has not yet considered \$2.9 billion in development funds requested as part of a \$140+ billion 2008 supplemental war funding package. Since Congress is expected to approve most of the supplemental request intact, the final DOD R&D total for 2008 is likely to be another large increase when all is said and

done, and will almost certainly be another record high. Thus, the decline in defense R&D shown in Figure 1 for 2008 is likely to be temporary.

In the meantime, House appropriators would add \$1.4 billion to the regular Pentagon R&D request, roughly half for research and half for development, to moderate proposed cuts in both research and development programs. (All figures in this analysis exclude the \$2.9 billion supplemental request from the FY 2008 Request figures to facilitate comparisons with FY 2008 House figures. FY 2007 figures INCLUDE \$1.1 billion in 2007 supplemental R&D funding enacted in May.)

On the research side, the House would add \$845 million to the Pentagon’s request for basic and applied research, [nearly all of which (\$820 million) would go to earmarked projects,] to turn steep requested cuts into more moderate cuts. Although physical sciences research is a top priority for the Bush Administration on the nondefense side of the budget through continued support of the American Competitiveness Initiative (ACI), DOD support of research would fall in 2008 even though DOD is the fifth largest federal supporter of the physical sciences. **DOD basic research funding (the “6.1” category) would fall 0.5 percent in the House mark to \$1.6 billion, [a slight cut of \$8 million compared to a \$136 million requested cut after the House’s addition of \$119 million in “6.1” earmarks and some small program increases.]** Since 2001, basic research has remained at roughly \$1.5 billion in today’s dollars (see Figure 2), a trend the House would continue. The Pentagon has proposed steep cuts to “6.1” funding every year in recent years, primarily from the proposed elimination of congressional earmarks of the year before, but every year Congress adds them back in. Basic research in the three services would fall in the House appropriation, but funding for basic research in the Defense Agencies would increase 11 percent to \$331 million. Funding for the three-service University Research Initiatives, which awards basic research grants competitively to university performers, would receive a combined \$272 million, down 5.4 percent from 2007 though up from the request. The Defense Research Sciences program, funded in the three services and in DARPA, would receive a combined \$970 million, down 1 percent instead of a 6 percent requested cut. The largest increase among basic research programs would go to the fledgling National Defense Education program (NDEP), more than doubling from \$19 million this year to \$44 million in 2008. (For details of DOD R&D in the FY 2008 budget request, see Chapter 5 of *AAAS Report XXXII: R&D FY 2008* or the February 21 AAAS R&D Funding Update on DOD.)

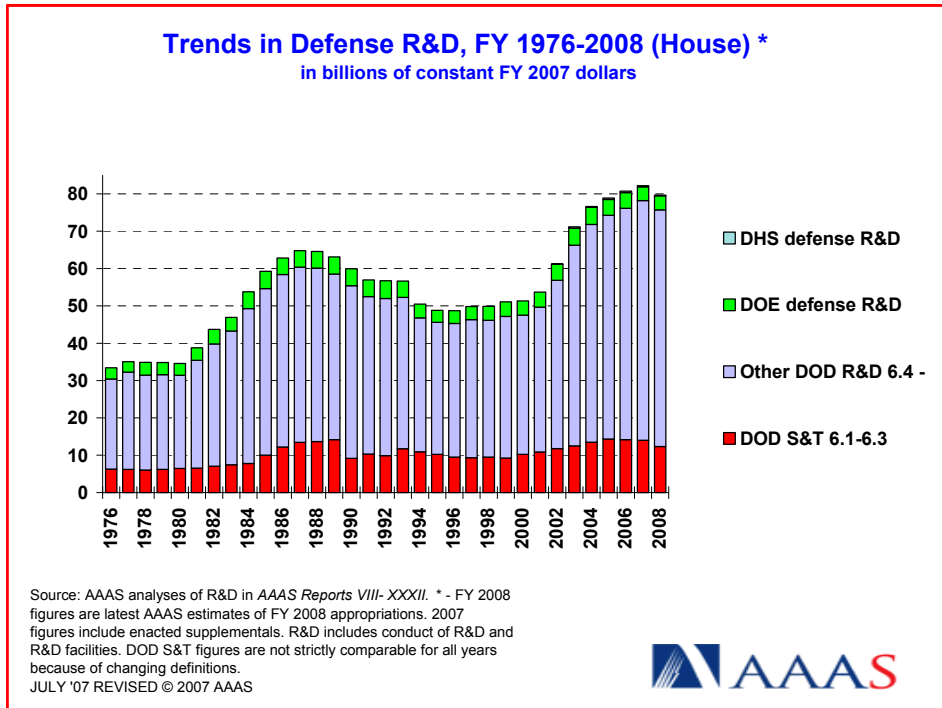


Figure 1. (Click on the image for PDF)

[A provision in the House Defense bill would limit indirect cost reimbursements on basic research grants to 20 percent. Currently, university and other external research performers are reimbursed for indirect costs associated with the performance of research at rates negotiated through a government-wide process overseen by the Office of Management and Budget (OMB). Leading research universities usually receive indirect cost reimbursements exceeding 50 percent of direct costs, so the House provision could dramatically reduce “6.1” research awards to many institutions., but particularly universities. Half the “6.1” research portfolio goes to universities (48 percent in 2006), but only 17 percent to other external institutions; 35 percent is performed in DOD labs and would not be affected by the provision. The provision only applies to basic research grants; roughly 40 percent of all DOD R&D to universities comes from the “6.1” accounts, so many universities would feel a big impact. Among other federal agencies, only some extramural U.S. Department of Agriculture (USDA) research grants have an indirect cost cap, in most years at 20 percent. Other agencies do not have indirect cost limits.]

The House would add \$718 million to the request for applied research (the “6.2” category) for a 4.8 percent cut instead of an even steeper cut in the DOD request. [Despite the additional House dollars, nearly all (\$701 million) for earmarked projects, applied research in the three services and the Defense Agencies would all fall compared to 2007 because the number of earmarks would be less than last year (see Table C). Bucking the trend would be a 35 percent increase in applied research in the Chemical and Biological Defense Program to \$349 million, mostly for the core program rather than for congressionally designated projects.]

In a repeat of the usual pattern, the House would restore funding to medical research programs the Pentagon proposes to cut. The House would give medical research in the Defense Health Program \$454 million (see Table A), down from \$680 million this year but more than triple the request, including \$218 million (the same as this year) for breast, ovarian, and prostate cancer research through peer-reviewed, competitively awarded grants. Over the years, the DOD peer-reviewed program has become a major force in cancer research; by comparison, NIH spending on these three cancers totals \$1.2 billion this year. In addition to these congressionally initiated but peer reviewed research programs, there are several earmarked medical research projects in this account and hundreds of millions of dollars in earmarked medical research programs in Army accounts.

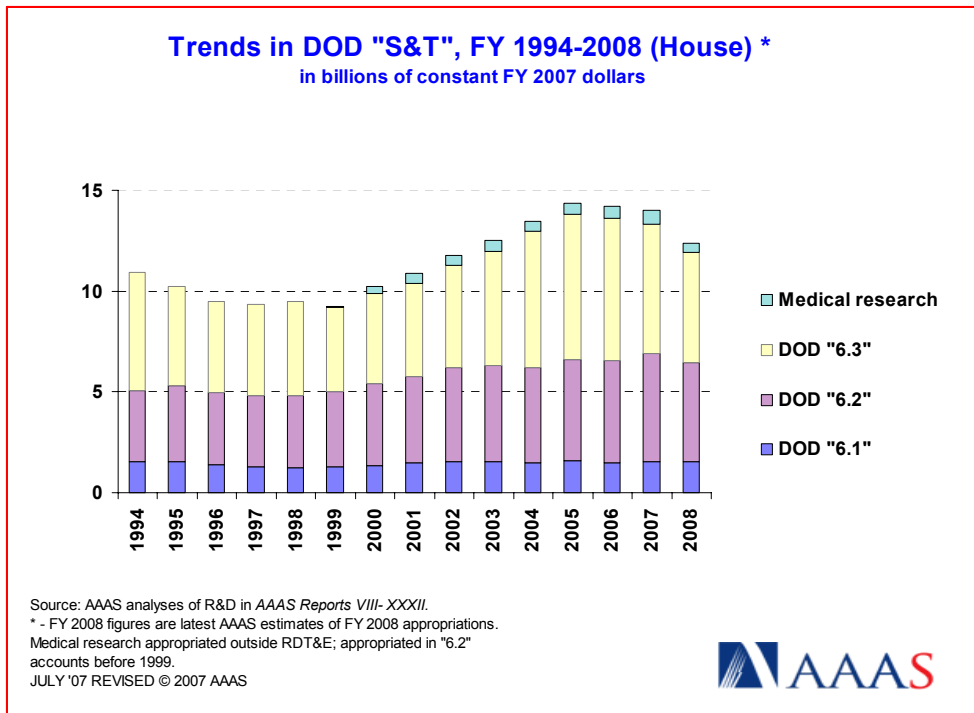


Figure 2. (Click on the image for PDF)

DOD funding of “S&T” (the “6.1” through “6.3” categories plus medical research) **would fall to \$12.6 billion in FY 2008, a dramatic drop of 9.7 percent** (see Table C and Figure 2), with cuts in all categories. [Despite the House adding \$1.7 billion to the request for S&T, \$1.5 billion of which would go to earmarks, the additional dollars would not be enough to reverse the \$3.0 billion or 22 percent cut in the 2008 request.] For every year this decade, Congress has been far more supportive of S&T funding than the Pentagon. In what has now become an annual ritual, the Pentagon proposes sharp cuts each year and Congress adds billions of dollars in the appropriations process. Last year, the Pentagon requested a 19 percent cut in S&T, but Congress ended up appropriating just a 1 percent cut, primarily but not entirely through the addition of earmarks. So far, this year’s 2008 appropriations season looks to be the same, though the Pentagon’s requested cut is so steep that the House is unable to bring S&T funding back to 2007 funding levels in its 2008 appropriations.

Advocates of DOD S&T in the science and engineering community argue that S&T funding is essential for building the knowledge and technology base for future DOD needs. Over the past decade, there has been growing support inside and outside the Pentagon for setting 3 percent of the DOD budget as a goal for the proper level of S&T investment. But the Pentagon has never fully endorsed this goal: although the 2001 Quadrennial Defense Review, DOD’s military strategy document, included the 3 percent goal, the 2005 QDR does not contain it, and the annual DOD budget request has never met the 3 percent figure. It has been up to Congress to boost S&T funding so that the last six budgets have met that goal (after taking out Iraq and Afghanistan war spending). In 2007, DOD S&T equals 3.2 percent of the regular DOD budget (excluding emergency war funding), but the House 2008 appropriation would fall short with a ratio of 2.6 percent.

The House 2008 appropriation would mark a continuing retreat from DOD S&T’s record-high 2005 funding level in real terms (see Figure 2). DOD S&T increased in the first half of this decade after hitting post-Cold War lows in the late 1990s. The good news in the House appropriation is that the House-proposed cuts would be concentrated in the “6.3” programs (down 14 percent), meaning that “6.2” funding would remain close to recent funding levels, while “6.1” funding would remain flat at the average of \$1.5 billion in today’s dollars over the last seven years.

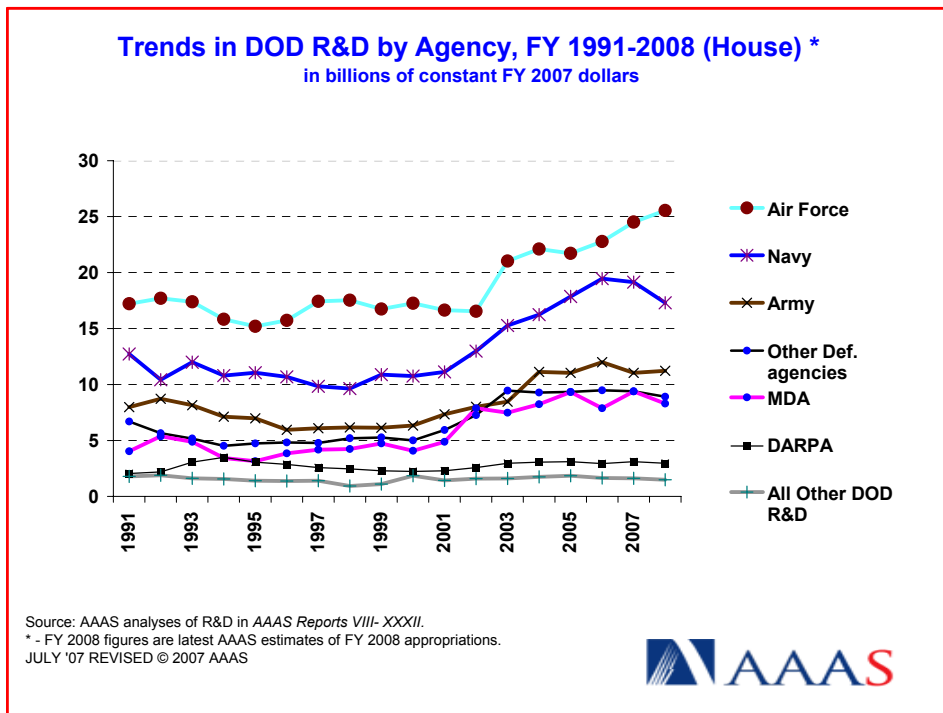


Figure 3. (Click on the image for PDF)

Air Force weapons development programs would be the biggest winners in the 2008 budget. DOD weapons development (the non-S&T portion of DOD R&D) would increase \$722 million or 1.1 percent to \$64.9 billion in the House, entirely due to an enormous increase in Air Force R&D to an unprecedented \$26.2 billion (up 6.7 percent), a total likely to go even higher when 2008 supplemental appropriations are added (see Table B and Figure 3). The Air Force increase would go to programs in the “6.4” and higher categories for engineering, development, and testing work on specific weapons systems. By contrast, Navy R&D would fall sharply and Army R&D would increase slightly (see Figure 3). The Joint Strike Fighter (JSF) would receive \$4.2 billion for continued development, split between the Air Force and the Navy, to remain the largest single development project. The suite of Army programs known as the Future Combat Systems (FCS) would receive \$3.2 billion for development, well below the request and the \$3.4 billion current year total.

R&D in the Defense Agencies would fall \$1.2 billion or 5.7 percent to \$20.7 billion (see Table B). The research-oriented **Defense Advanced Research Projects Agency (DARPA) would see its budget decline \$78 million or 2.5 percent in the House.** Slightly more than half of DARPA’s budget goes to “6.1” and “6.2” activities, with the remainder devoted to “6.3” technology development. Its broad research portfolio is aimed at expanding the frontiers of knowledge and military technology to provide future solutions to DOD’s technology needs. DARPA’s basic research funding would increase 12.5 percent in the 2008 House appropriation to \$163 million, but its applied research programs are a mix of increases and decreases combining for a net cut, due partly to congressional frustration that DARPA has been unable to spend all of its past budgets. The House would spotlight the Defense Threat Reduction Agency (DTRA) with a 2.4 percent increase to \$467 million instead of a requested cut; the House would give DTRA, primarily an applied-research agency, \$26.5 million in new funds for R&D on fissile material detection devices. The Chemical and Biological Defense Program (CBDP) is another relatively research-oriented agency, devoting nearly 40 percent of its resources to research. Within a \$1.1 billion total budget (up 17 percent), CBDP applied research would increase 35 percent to \$349 million, but its “6.1” basic program would fall 3 percent to \$101 million, primarily from the transition of several projects from the basic to the applied phase.

Among other Defense Agencies, the Missile Defense Agency (MDA) remains the largest with a House appropriation of \$8.5 billion, down \$883 million or 9.4 percent from 2007 because of House concerns about unrealistic missile defenses deployment schedules (see Table B). MDA no longer funds research and is a development-oriented agency with almost all of its funding in the “6.4” category; its budget has grown dramatically in recent years (see Figure 3) and would remain high by recent historical standards even after the House cut.

Impacts of Defense R&D

The Department of Defense (DOD) is by far the largest supporter of R&D in the federal government, accounting for more than half the total federal R&D portfolio. Defense-related R&D is also funded by the Department of Energy (DOE), which is responsible for maintaining the U.S. nuclear weapons stockpile, and the new Department of Homeland Security (DHS), whose primary mission is homeland defense but also performs biodefense R&D related to military security (see Figure 1). The House would bring total defense R&D in 2008 to \$81.6 billion (see Table D), down 0.7 percent or \$614 million from the current year but headed to a record total once 2008 supplemental appropriations are added this fall.

Outlook for Defense R&D

[The full House debated and approved the Defense bill on August 4, just before the August congressional recess.] The Senate Appropriations Committee is expected to mark up its version of the bill in September. Congress will try to send a final version of the bill to President Bush before the October 1 start of FY 2008; appropriators are likely to add more than \$140 billion in supplemental appropriations in House-Senate conference to pay for war operations, though the supplementals could also be considered in a separate bill. Although President Bush has threatened vetoes of many of the domestic spending bills for exceeding his

budget requests, the Defense bill will come in well under his request and is not expected to attract a veto unless Congress succeeds in attaching policy language limiting the Iraq war.

(This analysis is one of a series of AAAS R&D Funding Updates on FY 2008 congressional appropriations. The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D in FY 2008 appropriations, is available on the AAAS R&D Web Site (<http://www.aaas.org/spp/rd>) in the "FY 2008 R&D" or the "What's New" sections.)

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Table A. DOD R&D by Program in FY 2008 House Appropriations

**Table A. Department of Defense by Program
House Appropriations Committee Action on R&D in the FY 2008 Budget
(budget authority in millions of dollars)**

	FY 2007 Estimate	FY 2008 Request	Action by House				
			FY 2008 House	Chg. from Request Amount	Percent	Chg. from FY 2007 Amount	Percent
Research, Development, Test, and Evaluation:							
Basic Research ("6.1")	1,564	1,428	1,555	127	8.9%	-8	-0.5%
Applied Research ("6.2")	5,329	4,357	5,074	718	16.5%	-255	-4.8%
Total Research, or Tech. Base	6,893	5,785	6,630	845	14.6%	-263	-3.8%
Advanced Tech. Dev. ("6.3")	6,436	4,987	5,562	575	11.5%	-874	-13.6%
Total Science and Technology	13,329	10,772	12,192	1,420	13.2%	-1,137	-8.5%
Adv. Component Dev. ("6.4")	15,826	15,662	15,952	290	1.9%	127	0.8%
System Dev. And Demon. ("6.5")	19,356	18,098	18,380	281	1.6%	-976	-5.0%
Management Support ("6.6")	4,226	4,129	4,261	131	3.2%	35	0.8%
Operational Systems Dev. ("6.7")	24,317	26,456	25,447	-1,008	-3.8%	1,130	4.6%
BA Adjustment	-271	0	0	0	--	--	--
TOTAL RDT&E	76,782	75,118	76,231	1,114	1.5%	-551	-0.7%
Other appropriations ¹	752	887	887	0	0.0%	135	18.0%
Medical research ²	680	134	454	319	237.4%	-226	-33.2%
Total DOD R&D	78,214	76,139	77,572	1,433	1.9%	-641	-0.8%
DOD S&T ("6.1" - "6.3" & medical)	14,008	10,906	12,645	1,739	15.9%	-1,363	-9.7%

AAAS estimates based on FY 2008 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2007 and FY 2008 request figures based on OMB R&D data and supplemental agency budget data.

FY 2007 figures adjusted to reflect supplementals enacted in the 2007 emergency supplemental bill (P.L. 110-28).

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

FY 2008 figures exclude \$2.9 billion supplemental development request.

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 31, 2007 - AAAS estimates of House Appropriations Committee-approved appropriations.

These figures may be amended or rejected by the full House.

Table B. DOD R&D by Agency in FY 2008 House Appropriations

**Table B. Department of Defense by Agency
House Appropriations Committee Action on R&D in the FY 2008 Budget
(budget authority in millions of dollars)**

	FY 2007 Estimate	FY 2008 Request	Action by House				
			FY 2008 House	Chg. from Request Amount	Percent	Chg. from FY 2007 Amount	Percent
Research, development, test, and evaluation:							
Army	11,042	10,590	11,510	920	8.7%	468	4.2%
Navy	19,143	17,076	17,719	643	3.8%	-1,424	-7.4%
Air Force	24,514	26,712	26,164	-548	-2.1%	1,649	6.7%
Defense Agencies	21,899	20,560	20,659	99	0.5%	-1,240	-5.7%
<i>Defense Adv. Res. Projects Agcy.</i>	3,115	3,086	3,037	-48	-1.6%	-78	-2.5%
<i>Missile Defense Agency</i>	9,381	8,796	8,498	-298	-3.4%	-883	-9.4%
<i>Chem. And Bio. Defense Program</i>	981	1,021	1,147	126	12.3%	166	17.0%
<i>Defense Threat Reduction Agency</i>	456	416	467	51	12.3%	11	2.4%
<i>Office of Secretary of Defense</i>	2,174	2,089	2,177	89	4.2%	4	0.2%
<i>Other *</i>	5,791	5,153	5,332	180	3.5%	-459	-7.9%
Director of Operational Test & Eval.	184	180	180	0	0.0%	-4	-2.0%
TOTAL RDT&E	76,782	75,118	76,231	1,114	1.5%	-551	-0.7%
Other appropriations ¹	752	887	887	0	0.0%	135	18.0%
Medical research ²	680	134	454	319	237.4%	-226	-33.2%
Total DOD R&D	78,214	76,139	77,572	1,433	1.9%	-641	-0.8%

AAAS estimates based on FY 2008 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2007 and FY 2008 request figures based on OMB R&D data and supplemental agency budget data.

FY 2007 figures adjusted to reflect supplementals enacted in the 2007 emergency supplemental bill (P.L. 110-28).

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* Includes classified programs.

¹ R&D support in military personnel, military construction, and other DOD appropriations.

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Table D. DOE Atomic Energy Defense Activities and DHS Defense R&D

	FY 2007 Estimate	FY 2008 Request	Action by House				
			FY 2008 House	Chg. from Request Amount	Percent	Chg. from FY 2007 Amount	Percent
National Nuclear Security Administration (NNSA)							
Naval Reactors	750	776	776	0	0.0%	26	3.5%
Weapons Activities	2,655	2,730	2,476	-254	-9.3%	-179	-6.7%
Nonproliferation & Verification R&D	270	266	484	218	82.1%	214	79.1%
Total NNSA R&D	3,675	3,772	3,736	-36	-0.9%	61	1.7%
Environmental Management	21	21	108	87	414.8%	87	414.8%
Other AEDA R&D	3	3	3	0	0.0%	0	0.0%
TOTAL DOE Defense R&D	3,699	3,796	3,848	52	1.4%	148	4.0%
Dept. of Homeland Security defense	296	175	175	0	0.0%	-121	-40.9%
Total Defense R&D (DOD, DHS, DOE)	82,209	80,110	81,595	1,485	1.9%	(614)	-0.7%

AAAS estimates based on FY 2008 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2007 and FY 2008 request figures based on OMB R&D data and supplemental agency budget data.

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Table C. DOD S&T by Agency in FY 2008 House Appropriations

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(budget authority in millions of dollars)**

	FY 2007 Estimate	FY 2008 Request	Action by House				
			FY 2008 House	Chg. from Request Amount	Percent	Chg. from FY 2007 Amount	Percent
"Science and Technology" (S&T; "6.1" through "6.3" plus medical research)							
Army	2,837	1,728	2,665	937	54.2%	-172	-6.1%
- <i>Basic Research</i> ("6.1")	366	306	352	46	15.1%	-14	-3.8%
- <i>Applied Research</i> ("6.2")	1,204	686	1,107	421	61.4%	-97	-8.0%
- <i>Advanced Tech. Dev.</i> ("6.3")	1,267	736	1,206	470	63.8%	-61	-4.8%
Navy	2,046	1,667	1,866	200	12.0%	-179	-8.8%
- <i>Basic Research</i> ("6.1")	492	467	490	23	4.8%	-2	-0.4%
- <i>Applied Research</i> ("6.2")	786	678	754	76	11.2%	-32	-4.1%
- <i>Advanced Tech. Dev.</i> ("6.3")	768	522	623	101	19.4%	-145	-18.9%
Air Force	2,602	1,964	2,058	95	4.8%	-543	-20.9%
- <i>Basic Research</i> ("6.1")	409	375	383	8	2.0%	-26	-6.3%
- <i>Applied Research</i> ("6.2")	1,156	1,011	1,124	113	11.1%	-32	-2.8%
- <i>Advanced Tech. Dev.</i> ("6.3")	1,038	577	552	-25	-4.4%	-486	-46.8%
Defense Agencies	5,845	5,413	5,602	188	3.5%	-243	-4.2%
- <i>Basic Research</i> ("6.1")	298	280	331	51	18.2%	33	11.2%
- <i>Applied Research</i> ("6.2")	2,184	1,982	2,090	108	5.4%	-94	-4.3%
- <i>Advanced Tech. Dev.</i> ("6.3")	3,363	3,152	3,181	29	0.9%	-182	-5.4%
TOTAL "6.1" through "6.3"	13,329	10,772	12,192	1,420	13.2%	-1,137	-8.5%
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