



The American Heritage Defense Corporation

Pilot Program to Broaden Defense Science, Engineering, Technology and Workforce for America's Security (SETWAS)

[Issues (Data)]

These are challenging times in the history of our great nation. At a time when our defense establishments are facing a critical shortage of American educated scientists and engineers, there are serious threats from abroad towards our national defense and homeland security. The technological workforce that constitutes America's global prowess is aging, and there is an urgent need to broaden the base of participation of American citizens in defense science and engineering in order to replenish the nation's technological workforce, as well as conduct research and development of advanced systems to improve our nation's defense. The Department of Defense needs to increase its efforts to include more institutions of higher learning in its core mission-oriented funding programs, particularly Historically Black Colleges and Universities and Minority Institutions (HBCU/MI).

There is a direct correlation between the degree of participation of Universities and other Non-Profit Organizations in Department of Defense sponsored research and development, and the affiliation of these institutions with Federally Funded Research and Development Centers (FFRDC) and other University Affiliated Research Centers (UARC) (See Appendix 1). The top institutions receiving Department of Defense funding, such as the Massachusetts Institute of Technology (MIT), Johns Hopkins University, University of California System and others, have direct affiliation with one or more Federally Funded Research and Development Centers and University Affiliated Research Centers. These affiliations, or even the mere proximity of these Institutions to major centers of Research and Development activities funded by the Department of Defense, have proven to impact directly on the exposure of the students and faculty to challenging and exciting careers in science, engineering and technology. It follows that in order to promote the broadening of the base of production of future US scientists, engineers and technologists, new acquisition policies and new programs are needed which will encourage the establishment of such clusters of research and development activities in the proximity of Institutions where more Americans go to seek their degrees in science and engineering.

To date there are no FFRDC or UARC managed by minority institutions, and the list of the top 50 Universities that receive the bulk of Department of Defense 6.1 and 6.2 funding (see Appendices 2 through 4) does not include a single Historically Black College or University or Minority Institution (HBCU/MI). The United States cannot be assured that it is engaging its best and brightest young men and women in the enterprise of defense science and engineering when a significant population group, i.e. those attending HBCU/MI are not even exposed to the mission-oriented challenges of the day.



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[Resolution (Program)]

This proposal addresses a new paradigm for infusing defense science and engineering development investments into traditionally underrepresented institutions for the purpose of yielding more return on these investments with regard to the production of homegrown engineers and scientists. This proposed program is unique in that it seeks to resolve several issues with a unified approach – an approach which does not compromise any of the missions of the Department of Defense, and which does not divert mission critical funding away from their intended objectives. In fact, the proposed approach aims at admitting more American institutions of higher learning into the community of entities that are prominent in defense contracting, while at the same time increasing the exposure of more American college students to mission-oriented applied research projects. In particular the proposed approach reaches beyond basic research (6.1) into applied research (6.2), advanced technology development (6.3), demonstration and validation (6.4), engineering manufacturing development (6.5), management support (6.6) and operational systems development (6.7) activities related to department of defense missions. In addition, the proposed program also resolves the issue of how best to provide technical assistance to, and develop the infrastructure at HBCU/MI so that they are able to compete effectively in the defense-contracting arena. The proposed program consists of four key components: (1) SETWAS Alliance; (2) SETWAS Collaboratories; (3) SETWAS Internships; and (4) SETWAS Research and Development Centers.

SETWAS Alliance

The cornerstone of the proposed program is the establishment and promotion of the SETWAS Alliance, which will be an alliance between HBCU/MI, department of defense agencies, industry prime contractors, and other private and public entities (large and small) that are prominent in defense contracting. The overlapping interests of the SETWAS Alliance members and stakeholders is the common need to train and engage the best and brightest American scientists, engineers and entrepreneurs in the business of developing technologies and systems for the defense and security of the homeland. The American Heritage Defense Corporation (AHDC), a non-profit 501(c)3 research and development corporation, proposes to identify and solicit the participation of SETWAS Alliance partners and stakeholders – via briefings, meetings, and workshops.

SETWAS Internships

The merit and value of internships are evidenced by the popularity of such programs. SETWAS internships will be unique in that unlike most internships that engage students during the summer or winter breaks only, and may not be linked to the study program that the students are engaged in, SETWAS internships will be structured specifically to complement the degree programs that the students are enrolled in. SETWAS Internships will be continuous throughout the year, and will provide students the much-needed exposure to real life mission oriented research and development projects. In order to allow students to work hand in hand with their department of defense and industry mentors while they are on campus, we propose to establish SETWAS Collaboratories



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(see next section), which will utilize modern information technologies to bridge the distances between the University campuses and the locations of those mentors.

SETWAS Collaboratories

SETWAS Collaboratories will be web-based collaboration sites that will allow department of defense and industry mentors and their student-interns to remotely create and use collaboration workspaces containing areas for defining and viewing tasks, deadlines, and status as well as real-time audio and video conferencing and editable spaces that teams can use to update and exchange documents. While off site at locations separated by distance from the department of defense and industry laboratories, the students will be able to interact with their mentors and continue to function as interns throughout the year.

SETWAS Research and Development Centers

Notwithstanding the fact that HBCU/MI currently lack the capacity and infrastructure to play major roles in applied research and other mission oriented department of defense projects, these institutions nonetheless have the ability to host consortia of SETWAS Alliance partners who are performing mission oriented projects under contract to the department of defense. In other words, a particular cluster of SETWAS Alliance partners could jointly respond to some need of the department of defense under the mutual agreement that the physical location for performing that project will be hosted by the participating HBCU/MI. By so doing, eligible students at the host HBCU/MI will have the opportunity to work as year round paid interns at those research and development facilities, and the host institution will gain more familiarity with the project requirements and be able to supplement its academic staff with research adjuncts that are dedicated to the applied research projects. Over time, the host HBCU/MI will acquire a critical mass of its own experts to be able to play increasingly leading roles in obtaining contracts for applied research efforts.

[Details of Pilot Program]

Scope of Pilot Program

We are requesting funding to conduct a pilot program that will demonstrate the proof of concept of the first three components of the SETWAS proposal – i.e. SETWAS Alliance, SETWAS Internships and SETWAS Collaboratories. We believe that the fourth component – SETWAS Research and Development centers - will evolve naturally from the successes of the first three, and will be funded to support specific missions of the department of defense. For the pilot program we propose to start up the SETWAS Alliance with three regional clusters – (1) Eastern United States Cluster, (2) Southern United States Cluster and (3) Southwestern United States Cluster, since these regions cover the locations of most of the HBCU/MI on the mainland, and the hub institutions happen to be located within States that are impacted by the 2005 Base Realignment and Closure (BRAC). We anticipate that the success of the pilot program will make it easier



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to justify and establish more clusters around the country. The hub institutions at these clusters will be: Morgan State University for the Eastern Cluster, Alabama A&M University for the Southern Cluster, and University of Texas El Paso for the Southwestern Cluster. Each cluster will be paired up with a military agency located in the region e.g. Eastern Cluster/Aberdeen Proving Ground; Southern Cluster/ U.S. Army Space and Missile Defense Command and Southwestern Cluster/Fort Bliss. The major defense contractors supporting each participating military agency will be solicited for participation in the alliance. Other HBCU/MI will also be solicited for participation in the Alliance and will be affiliated with the regional cluster of their choice, regardless of proximity. Thus a pilot SETWAS Alliance will be formed to prove the concept that these various entities can in fact share the common interest of working together to train the future generation of scientists and engineers who will be graduating from their partner institutions. A select number (see budget details for actual number, based on funding level) of students enrolled in science, engineering and business management disciplines at participating institutions will be paired up with mentors from both government and industry organizations that are engaged in cutting edge applied research and development projects. Collaboratory tools such as Internet portal, audio-visual facilities, software and hardware will be installed at the Universities to support the activities of the student-interns. The pilot program is proposed for the duration of three years.

Requested Funding

A detailed break down of the annual estimates of the costs associated with the proposed pilot program is presented in Appendix 5. It is estimated that \$3 million will be needed per year for each of the proposed three years to demonstrate the proof of concept of the proposed program.

Suggested Language

Congress directs the Secretary of Defense to implement a Pilot Program to broaden defense science, engineering, technology and workforce for America's security (SETWAS). Congress appropriates \$3 million per year for the next three years beginning in FY 08 to program element PE# 0602228D8Z (DOD HBCU/MI Program) to fund the American Heritage Defense Corporation (AHDC), a non-profit 501(c)3 research and development corporation for the execution of a pilot program to demonstrate the proof of concept of the SETWAS proposal. The program manager for this program element shall report back to Congress within 30 days of enactment of this legislation with a concrete plan for implementing this program.



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APPENDIX 1

A sample of Federally Funded Research and Development Centers administrated by Universities & Colleges

	Yr Est.	Budget	Institution
Ames Laboratory	1947	\$29M (FY2003)	Iowa State University
Argonne National Lab.	1946	\$475M (Est. Annual)	University of Chicago
Brookhaven National Lab.	1947	\$467M (FY2005)	Stony Brook University
Lawrence Berkeley	1931	\$500M (FY2004)	University of California
Fermi National Lab.	1967	\$316M (FY2005)	University Res. Assoc.
Jet Propulsion Laboratory	1944	\$1.0B (Est. Annual)	California Institute of Tech.
Lawrence Livermore	1952	\$1.6B (FY2003)	University of California
Lincoln Laboratory	1951	\$328M (FY1994)	Mass. Institute of Tech.
Los Alamos National Lab.	1943	\$1.2B (Est. Annual)	University of California
National Astronomy Center	1960	\$10.8M (FY2006)	Cornel University
Princeton Plasma Laboratory	1951	\$70M (FY2003)	Princeton University
Software Engineering Inst.	1984	\$33M (FY 1994)	Carnegie Mellon University
Stanford Accelerator Center	1962	\$280M (FY 2005)	Stanford University

NOTES:

- This list does not include many FFRDCs managed by consortia of Universities, Non Profit Corporations and Industry
- The list does not include University Affiliated Research Centers (UARC)



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APPENDIX 2

Top 50 University Recipients of DOD 6.1 Funding in Fiscal Year 2002

Institution Name	State	Total 6.1 (\$000)
1 Massachusetts Institute of Technology	MA	43,802
2 Pennsylvania State University, All Campuses	PA	35,357
3 University of California, Los Angeles	CA	31,784
4 University of Washington	WA	29,884
5 Stanford University	CA	25,811
6 University of Southern California	CA	25,758
7 Duke University	NC	25,607
8 University of Michigan, All Campuses	MI	24,245
9 University of California, San Diego	CA	24,117
10 University of California, Santa Barbara	CA	19,964
11 University of Illinois at Urbana-Champaign	IL	19,925
12 California Institute of Technology	CA	19,478
13 Georgia Institute of Technology, All Campuses	GA	19,098
14 Johns Hopkins University	MD	18,888
15 University of Texas at Austin	TX	17,044
16 Carnegie Mellon University	PA	16,527
17 Cornell University, All Campuses	NY	15,209
18 Princeton University	NJ	13,452
19 State University of New York, System Office	NY	12,598
20 Woods Hole Oceanographic Institution	MA	12,493
21 University of Pennsylvania	PA	12,282
22 Virginia Polytechnic Institute & State University	VA	11,476
23 University of New Mexico, All Campuses	NM	11,032
24 University of Arizona	AZ	10,977
25 University of Wisconsin - Madison	WI	10,389



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26	University of Maryland System Administration	MD	10,334
27	University of Colorado, All Campuses	CO	10,303
28	Harvard University	MA	10,081
29	Northwestern University	IL	9,692
30	Purdue University, All Campuses	IN	9,479
31	North Carolina State University at Raleigh	NC	9,311
32	Ohio State University , All Campuses	OH	9,190
33	Arizona State University Main	AZ	9,051
34	University of Minnesota, All Campuses	MN	8,667
35	University of Virginia, All Campuses	VA	8,335
36	Rutgers, State University of New Jersey, All Campuses	NJ	8,262
37	University of Miami	FL	8,105
38	University of California, Davis	CA	7,776
39	University of California, Irvine	CA	7,672
40	Brown University	RI	7,491
41	Baylor College of Medicine	TX	7,040
42	Rice University	TX	6,918
43	San Diego State University	CA	6,893
44	University of North Carolina at Chapel Hill	NC	6,576
45	University of Pittsburgh, All Campuses	PA	6,305
46	New Mexico Institute of Mining and Technology	NM	6,129
47	Boston University	MA	6,005
48	University of South Carolina, All Campuses	SC	5,967
49	University of Florida	FL	5,947
50	University of Texas Southwestern Medical Center, Dallas	TX	5,862



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APPENDIX 3

Top 50 University Recipients of DOD 6.2 Funding in Fiscal Year 2002

Institution Name	State	Total 6.2 (\$000)
1 University of Southern California	CA	32,586
2 University of Hawaii System Office	HI	20,131
3 Pennsylvania State University, All Campuses	PA	16,757
4 University of South Florida	FL	15,729
5 University of Dayton	OH	14,528
6 Carnegie Mellon University	PA	12,883
7 Georgia Institute of Technology, All Campuses	GA	10,429
8 Johns Hopkins University	MD	9,687
9 Auburn University, All Campuses	AL	7,572
10 University of Central Florida	FL	7,369
11 Massachusetts Institute of Technology	MA	7,206
12 University of Texas at Austin	TX	6,794
13 Vanderbilt University	TN	6,051
14 Florida State University	FL	6,000
15 University of Washington	WA	5,727
16 Stanford University	CA	5,274
17 University of Pennsylvania	PA	4,727
18 Northwestern University	IL	4,677
19 Florida Atlantic University	FL	3,640
20 University of Maryland System Administration	MD	3,519
21 University of California, Los Angeles	CA	3,441
22 University of California, Irvine	CA	3,426
23 University of Mississippi, All Campuses	MS	3,391
24 Boston University	MA	3,287
25 University of Illinois at Urbana-Champaign	IL	3,269



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26	Washington State University	WA	3,221
27	University of Delaware	DE	3,051
28	Cornell University , All Campuses	NY	2,839
29	Ohio State University , All Campuses	OH	2,821
30	Rutgers, State University of New Jersey, All Campuses	NJ	2,709
31	New York University	NY	2,686
32	Utah State University	UT	2,519
33	University of California, San Diego	CA	2,513
34	Washington University	MO	2,388
35	University of Rhode Island	RI	2,322
36	University of Massachusetts at Amherst	MA	2,282
37	University of California, Santa Barbara	CA	2,202
38	Colorado State University	CO	2,090
39	Purdue University, All Campuses	IN	2,015
40	University of California, Riverside	CA	1,996
41	University of North Carolina at Charlotte	NC	1,980
42	Georgetown University	DC	1,922
43	Princeton University	NJ	1,909
44	University of Texas at Dallas	TX	1,879
45	Yale University	CT	1,854
46	Columbia University	NY	1,821
47	University of Arizona	AZ	1,801
48	Rensselaer Polytechnic Institute	NY	1,789
49	University of Colorado, All Campuses	CO	1,777
50	Drexel University	PA	1,694



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APPENDIX 4

Top 50 University Recipients of DOD 6.1 + 6.2 Funding in Fiscal Year 2002

Institution Name	State	Total 6.1 + 6.2 (\$000)
1 University of Southern California	CA	58,343
2 Pennsylvania State University, All Campuses	PA	52,114
3 Massachusetts Institute of Technology	MA	51,007
4 University of Washington	WA	35,611
5 University of California, Los Angeles	CA	35,225
6 Stanford University	CA	31,085
7 Georgia Institute of Technology, All Campuses	GA	29,527
8 Carnegie Mellon University	PA	29,410
9 Johns Hopkins University	MD	28,575
10 University of California, San Diego	CA	26,629
11 University of Michigan, All Campuses	MI	25,935
12 Duke University	NC	25,774
13 University of Texas at Austin	TX	23,838
14 University of Illinois at Urbana-Champaign	IL	23,194
15 University of Hawaii System Office	HI	22,269
16 University of California, Santa Barbara	CA	22,166
17 University of South Florida	FL	20,409
18 California Institute of Technology	CA	20,363
19 Cornell University, All Campuses	NY	18,048
20 University of Dayton	OH	17,762
21 University of Pennsylvania	PA	17,009
22 Princeton University	NJ	15,361
23 Northwestern University	IL	14,369
24 State University of New York System Office	NY	13,969
25 University of Maryland System Administration	MD	13,853



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26 Woods Hole Oceanographic Institution	MA	13,549
27 University of Central Florida	FL	13,224
28 University of Arizona	AZ	12,778
29 Virginia Polytechnic Institute and State University	VA	12,221
30 University of Colorado, All Campuses	CO	12,080
31 Ohio State University, All Campuses	OH	12,011
32 University of Wisconsin-Madison	WI	11,990
33 University of New Mexico, All Campuses	NM	11,869
34 Purdue University, All Campuses	IN	11,494
35 Harvard University	MA	11,346
36 University of California, Irvine	CA	11,098
37 Rutgers, State University of New Jersey, All Campuses	NJ	10,971
38 Vanderbilt University	TN	10,643
39 Auburn University, All Campuses	AL	10,484
40 North Carolina State University at Raleigh	NC	10,168
41 Arizona State University Main	AZ	9,893
42 University of Miami	FL	9,682
43 University of Minnesota, All Campuses	MN	9,333
44 Boston University	MA	9,292
45 University of Virginia, All Campuses	VA	9,220
46 Brown University	RI	9,147
47 Florida State University	FL	9,135
48 University of Delaware	DE	8,313
49 University of California, Davis	CA	7,876
50 Yale University	CT	7,700



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APPENDIX 5

Breakdown of Annual Budget for Pilot SETWAS Program

SETWAS Alliance

Direct Expenses		
Staff		300,000
Travel		15,000
Workshops/Conferences/Materials		20,000
	Total Direct Expenses	335,000
	Indirect Expenses 20%	67,000
Subtotal for SETWAS Alliance	\$	402,000

SETWAS Internships

Direct Expenses		
Staff		300,000
Students:		
Number of Students		30
Stipend/Student		30,000
Total Estimate for Students		900,000
Travel		90,000
Materials		45,000
	Total Direct Expenses	1,335,000
	Indirect Expenses 20%	267,000
Subtotal for SETWAS Internships	\$	1,602,000

SETWAS Collaboratories

Direct Expenses		
Staff		300,000
Portal Development Sub-grant		100,000
Off the Shelf Software Tools		100,000
Hardware		300,000
Materials		30,000
	Total Direct Expenses	830,000
	Indirect Expenses 20%	166,000
Subtotal for SETWAS Collaboratories	\$	996,000
Total Cost Estimate for Pilot SETWAS	\$	3,000,000