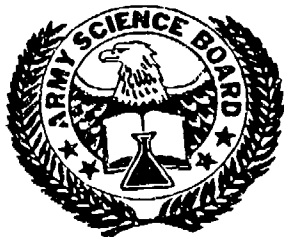


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ARMY SCIENCE BOARD

AD HOC SUBGROUP FINAL REPORT

INITIATIVES TO IMPROVE THE PARTICIPATION OF
HISTORICALLY BLACK COLLEGES AND
UNIVERSITIES/MINORITY INSTITUTIONS (HBCU/MIS)
IN
ARMY RESEARCH, DEVELOPMENT AND ACQUISITION
ACTIVITIES TO STRENGTHEN THEIR INFRASTRUCTURE

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CONFLICT OF INTEREST STATEMENT

Conflicts of interest did not become apparent as a result of this panel's recommendations.

REPORT DOCUMENTATION PAGE

FORM APPROVED
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Washington Hq Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, D.C. 20503.

1. AGENCY USE ONLY (Leave Blank) N/A		2. REPORT DATE January 6, 1992	3. REPORT TYPE AND DATES COVERED Army Science Board Ad Hoc Subgroup		
4. TITLE AND SUBTITLE Army Science Board 1991 Ad Hoc Subgroup, "Initiatives to Improve the Participation of Historically Black Colleges and Universities/Minority Institutions (HBCU/MIs) in Army Research, Development and Acquisition Activities to Strengthen Their Infrastructure"			5. FUNDING NUMBERS N/A		
6. AUTHOR(S) Dr. Wesley L. Harris, Chair Dr. Crystal C. Campbell Dr. William R. Hemel			Mr. Dean C. Borgman Dr. Meredith C. Gourdine Dr. Elizabeth J. Rock Dr. Judith P. Swazey		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Science Board Office of the Assistant Secretary of the Army (Research, Development and Acquisition) (OASA (RDA)) ATTN: SARD-ASS Washington, D.C., 20310-0103			8. PERFORMING ORGANIZATION REPORT NUMBER N/A		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Deputy Assistant Secretary for Research and Technology OASA(RDA) ATTN: SARD-ZT Washington, D. C. 20310-0103			10. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A		
11. SUPPLEMENTARY NOTES N/A					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for Public Release; distribution is unlimited.			12b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) <p>Pursuant to the language included in Executive Order 12677 and Public Laws 99-383 and 99-661 and to Secretary of Defense directive, the Army Science Board (ASB) was directed to review the Army's activities involving Historically Black Colleges and Universities/Minority Institutions (HBCU/MIs). An ASB Ad Hoc Subgroup (AHSB) was duly established; the initial report was dated November 8, 1991. This final report fulfills all ASB responsibilities indicated in the Terms of Reference of the OASA (RDA) January 14, 1991 tasking letter.</p> <p>As a result of the AHSB's evaluations during the past year, questions were raised and conclusions drawn relative to current Army program efforts. It is concluded that the HBCU/MIs are a valuable resource and represent an area of long-term importance to the Army, with the potential to provide a variety of Army needs; it is emphasized, however, that potential benefits will be realized only through the creation of a true partnership between the Army and the HBCU/MIs through the establishment of a centralized, consistently-funded, coherently managed program, and through infrastructure support for the HBCU/MIs.</p> <p>In response to the recommendations of this report, the ASA (RDA) issued new policy guidance in March and April 1992 (Appendix E).</p>					
14. SUBJECT TERMS HBCU/MIs; Science and Engineering; Mathematics; Research; Education			15. NUMBER OF PAGES 66	16. PRICE CODE N/A	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT None		

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KEY RECOMMENDATIONS

1. A centralized, consistently-funded, coherently managed program is required to capture the now existing valuable resources at HBCU/MIs and is so recommended to the Army. It is further recommended that this program be institutionalized and made a part of the office of the Deputy Assistant Secretary for Research and Technology (SARD-ZT), Office of the Assistant Secretary of the Army (Research, Development and Acquisition) OASA(RDA).

2. It is strongly recommended that this centralized Army program office enhance its share of valuable resources in the HBCU/MIs and develop and implement a vigorous effort to improve HBCU/MIs infrastructure at carefully selected HBCU/MIs. Army programs to support and enhance HBCU/MI development should explicitly recognize multiple goals: (a) research; (b) infrastructure, institutional development; and (c) educational and human development.

3. This ASD AHSG strongly recommends that the Army establish several research centers where each center would be based on an Army key emerging technology coupled to an academic discipline.

4. Additional legislative initiatives and/or regulatory changes are not required to effect the ASB's AHSG recommendations.

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SECTION I

INTRODUCTION

Public Law 99-383 established the "Task Force on Women, Minorities, and the Handicapped in Science and Technology." The final report, "Changing America: The New Face of Science and Engineering," was published in December 1989. The final report included the following words: "It is time for action. Our interim report and many other studies have detailed the looming crisis in the science and engineering work force. America faces a shortfall of scientists and engineers by the year 2000. We can meet these shortfalls only by utilizing all our talent, especially those traditionally underrepresented in science and engineering--women, minorities and people with disabilities. Without this kind of world-class science and technical excellence, America's competitive prospects dim."

The Department of Defense (DoD) Task Force on "Human Resource Management in Science and Technology" published its final report in July 1989. On March 30, 1990, Secretary of Defense Richard Cheney endorsed its recommendations for implementation by the Services. The DoD Report on "Science and Engineering Education Activities of the Department of Defense for the Committees on Armed Services of the United States Congress," March 1990, included the following words: "A number of factors may impact DoD's ability to recruit and retain qualified scientific and technical personnel. Chief among the concerns are changing demographics that will markedly affect the composition of the work force. This concern is most concisely addressed in the White Paper, 'Human Resource Management in Science and Technology: Year 2000,' prepared for Secretary of Defense Carlucci by the Task Force of the same name in 1988 (3). The report notes in particular that by the year 2000, 85% of the increase in new entrants to the work force are projected to be women, minorities, handicapped persons and immigrants; groups which traditionally have tended to choose concerns other than science and engineering." The report has an immediate recommended action "to implement a systematic plan to expand intervention programs to meet needs in scientific, engineering and technological occupations. Consistent with demographic projections, intervention efforts should target minorities, women and disabled persons."

Executive Orders 12236 and 12320 signed by former Presidents Carter and Reagan respectively and Executive Order 12677 signed by President Bush on April 28, 1989 command the Department of Education with counsel from an advisory commission to "supervise the annual development of a Federal program designed to achieve an increase in the participation by HBCU in federally sponsored programs. Particular emphasis shall be given to facilitating technical, planning, and development advice to HBCU, with the goal of ensuring the long-term viability of these institutions." Executive Order 12677 of April 28, 1989 is included in Appendix C of this report.

In response to the above and having cognizance of the existence of approximately 250 institutions of higher education with predominantly minority enrollment (HBCU/MI) in this

country, the Assistant Secretary of the Army (Research, Development and Acquisition), Mr. Stephen K. Conver, by letter of January 14, 1991 (Appendix A) to the Chair of the ASB, Dr. Duane A. Adams, requested appointment of a suitable panel; identified TOR; and requested an initial panel report by March 31, 1991.

As stated, the TOR requires that the panel address the following questions:

- a. What initiatives can be developed to improve the participation of HBCU/MIs in Army research, development, and acquisition (RDA) activities with the explicit goal to strengthen their infrastructure?
- b. Which of the programs run by the military services, DoD agencies, or other government departments supporting the education of minority students in science and technology could be adopted by the Army?
- c. How can the educational programs for science and engineering (S&E) be substantially strengthened at all or most HBCU/MIs?
- d. What can be done by the Army to enable more HBCU/MIs to increase their output of S&E graduates and improve their employment, competitiveness and prospects?
- e. What legislative initiatives and/or regulatory changes are needed to effect the ASB panel's recommendation?

SHORTFALL IN SCIENTISTS AND ENGINEERS

The distribution of 22-year-olds in the U.S. and the changing labor pool have been documented.¹ The distribution shows a declining number of college age youth until the turn of the century. The changing labor pool clearly indicates that 68.4% of 42,800,000 new entrants into the labor force between 1988 and 2000 will be minorities and women.² These factors represent both opportunities and challenges to the S&E education communities and to industry. For example, to hold constant our S&E production rate, more students will have to be attracted and retained to degree completion in S&E fields. This is illustrated by noting that we would need approximately 135,000 more high school sophomores today in order to produce the same number of Ph.D.s in S&E fields in the year 2004 as we did in 1988.² The expected demand for new S&E personnel by the year 2000 generates greater stress in the pipeline. This demand for S&E personnel in private industry is expected to increase by over 600,000 between 1988 and 2000.³

1. See Section VI References
2. See Section VI References
3. See Section VI References

DEMOGRAPHICS

In 1990, the National Science Foundation (NSF) reported on women and minorities in S&E.⁴ Based on this 1990 NSF report, S&E and total U.S. employment profiles of women and minorities are given in Table 1 for 1978 and 1988. These data have been persistent over the last three years. Women, blacks, and Hispanics remain underrepresented in the S&E work force. Hence, these population groups represent a source of S&E talent. It should be noted that Asian Americans are not underrepresented in the S&E work force.

In 1990, approximately 70% of black recipients of bachelor degrees in engineering were the product of 16% of all engineering schools in the U.S. Also in 1990, approximately 80% of Hispanic recipients of bachelor degrees in engineering were the product of 16% of all engineering schools in the U.S. This is shown in Table 2. A more detailed breakout of the top 15 schools is given in Table 3. An examination of the performance of the top 10% of engineering schools producing black and Hispanic recipients of bachelor degrees clearly indicates the strong role played by the HBCU/MIs in that production.

The first essential point to be observed in the demographics is the substantial human resource pool represented by minorities. This pool is currently underutilized in S&E fields. The second essential point is the dominant role presently enjoyed by HBCU/MIs in the production of bachelor degrees in engineering for blacks and Hispanics.

4. See Section VI References

SECTION II

HBCU/MI FUNDING EFFORTS BY ARMY AND OTHER AGENCIES

The AHSG was briefed by a large number of federal agencies and offices regarding their HBCU/MI programs and accomplishments. Included were the Office of Naval Research (ONR), the Air Force Office of Scientific Research (AFOSR), the National Science Foundation (NSF), the National Institute of Health (NIH), National Aeronautics and Space Administration (NASA), and the Department of Energy (DoE).

In general, the HBCU/MI programs of these agencies and offices are well-conceived, managed and executed. The non-DoD agencies mentioned above have very large programs compared to the Service programs. Their efforts focus on improving both the education and research competitiveness of the HBCU/MI. NSF's program stands out in that they maintain strict oversight of institutions and organizations that they support.

The ONR and AFOSR programs also fund general education as well as scientific and engineering research in support of their military missions. These programs are centrally managed and have given clear, high level policy guidance to top and middle management. The Army Research Office (ARO) HBCU/MI program is well-conceived, managed and executed. Also, the total funding level to HBCU/MIs exceeded that of the other Services in FY90. (The data for this comparison is the Annual Federal Performance Report for FY90, made by the Services to the White House Initiative Office on Historically Black Colleges and Universities and separate data on minority institutions furnished to the committee by the Army Small and Disadvantaged Business Utilization Office of the Pentagon.) Within the category of basic research funding to HBCU/MIs, the Army's funding level again exceeds that of the Navy and Air Force. This is due almost exclusively to mission-related research funded by the ARO in science, mathematics and engineering. What is missing in the Army is that its laboratory system needs to be more aware of the opportunities available to it from HBCU/MIs. These colleges and universities have the potential to provide for the manpower deficiencies predicted by demographics for the year 2000 and beyond.

Recommendations of this report include a thrust that will forge a strong research and technology partnership between the Army laboratories and HBCU/MIs that will hopefully remedy this situation to the mutual benefit of both the Army and the HBCU/MI.

SECTION III A

CURRENT ARMY HBCU/MI ACTIVITIES

In the course of the study, the AHSG had the opportunity to review and observe many ongoing activities associated with HBCU/MI participation. These observations provide important insight into current Army practices in terms of strengths and weaknesses.

Findings

At the Department of Army (DA) level, the Army is promoting support for HBCU/MIs with respect to relevant Congressional acts, Executive Orders, and Secretary of Defense directives. Data describing aggregate Army funding to HBCU/MIs are being compiled and monitored, and compliance feedback is being given to office, center and laboratory upper management.

In 1988, the ASA(RDA) sent a memo to the ARO, Army Materiel Command (AMC), Office of the Surgeon General (OTSG), and Chief of Engineers (COE) concerning funding for HBCU/MIs; the memo directed that 3% of funds awarded to higher education institutions be set aside for HBCU/MIs in FY89, 4% in FY90 and 5% in FY91. In 1990, the Secretary of the Army (SA) extended the HBCU/MI set-aside to all Army commands which fund programs or procure services from higher education institutions; the memo established a funding set-aside of 4% for FY90 and 5% for FY91-93. See Appendix C.

The AHSG found that it was not possible to accurately evaluate the Army's performance concerning the 5% goal. With the exception of ARO (which has exceeded this percentage), data provided to the AHSG attempting to quantify grant and contract support to HBCU/MIs was unclear and too aggregated. Analysis could not be obtained that showed funding per institution, specific purpose, source with the Army, type of funding, and a clear comparison with R&D funding by the Army to majority institutions.

Some organizations are meeting compliance expectations, and some are not. Generally, the AHSG found Army organizations have inconsistent understandings as to the actual compliance objectives they are being asked to satisfy. This confusion centers around the 5% funding goal discussed above. The 5% criteria is not fully understood and the funding lines to which the 5% is applied is not fully understood.

Perhaps as a general result of the lack of clarity referred to above, overall Army efforts involving HBCU/MI participation appear to be unfocused, uncoordinated, and nonuniform with consequent impacts on effectiveness and commitment. Some organizations have virtually no present HBCU/MI efforts, while others had aggressive and productive programs. There is clear evidence that the predominant management process is to delegate responsibility for compliance with DA guidance to fairly low management levels. This, in principle, is the correct thing to be doing, except that the application of the 5% objective in this manner results in ineffectively small budget control levels.

The 5% goal is significant because it signifies the Army's commitment to strengthening HBCU/MIs and improving the production of minority S&Es. To the extent it is implemented, it also will help to forge R&D relationships between the Army and HBCU/MIs. However, the AHSG believes that the 5% goal should represent a baseline objective, in part because the actual amount of money it involves is relatively small, given the fact that most Army 6.1 funds, approximately \$180M in FY90, were spent internally. In FY90, for example, the Army spent approximately one-third of these funds for research at academic institutions.

It was observed that most Army managers are viewing HBCU/MI involvement mostly from the perspective of minority affirmative action matters, rather than as a critical future S&E manpower resource issue. This obscures the real reason and purpose underlying the HBCU/MI mandates. This is not a social program--doing good. This program aims to enhance national competitiveness and defense security by increasing the output of S&E graduates across the board.

The issue is not whether the 5% goal is being met, rather, it is what the Army wants to do, and can do within the framework of its RDA missions and budget, to strengthen the infrastructure of HBCU/MIs and assist them in educating and training S&Es.

The AHSG was encouraged by very aggressive efforts by ARO and selected individuals at the working levels who have taken part in HBCU/MI programs. ARO has been successful in initiating several major HBCU/MI programs. In several cases, and also with several non-DoD agencies, the dedication and commitment of specific individuals has produced outstanding results. Individual efforts such as these are clearly having a dramatic impact on the HBCU/MIs specifically involved in the terms of their ability to develop business practices and infrastructure.

Conclusions

Current Army activities in HBCU/MI involvement are not consistently organized and executed. There is a need for better communications to lower management levels regarding fundamental objectives, expected compliance levels, and strategy.

The adequacy of the ill-defined 5% guideline is dependent on how it is applied. It must be applied at a higher budget line level to be able to create a budget item of sufficient size to fund the needed multi-million dollar effort.

Army management must provide realistic incentives for the various levels of responsibility to assure the success of research partnership with HBCU/MIs.

Recommendations

A centralized, consistently-funded, coherently managed program is required to capture the now existing valuable resources at HBCU/MIs and is so recommended to the Army. It is further recommended that this program be institutionalized and be made a part of the office of the Deputy Assistant Secretary for Research and Technology (SARD-ZT), OASA(RDA).

SECTION III B

EXISTING AND EMERGING OPPORTUNITIES

Within the spectrum of HBCU/MIs, there now exist valuable resources producing scholarship, rich intellectual property, and highly educated and trained graduates at all degree levels in S&E. There also are HBCU/MIs which have, with additional resources and input, the potential to be effective and useful in the Army R&D effort as well as in the Army's need for highly-trained and educated S&Es.

Findings

Site visits to HBCUs which are doctoral degree granting institutions revealed activity in research areas of direct relevance to the Army's R&D effort. These research areas are identified in Table 4. Of course, Table 4 is not inclusive of all HBCU research, but rather it is a presentation of information obtained by the AHSG during this study. Several of the HBCU/MIs were observed to have excellent equipment, facilities, space, black and Hispanic graduate students, and very capable faculty. For example, Howard University, North Carolina A&T University, University of Texas at El Paso, City University of New York, and University of Puerto Rico at Mayaguez are HBCU/MIs which are currently performing high quality research and should be of direct interest to the Army. This group of "existing opportunity" institutions is playing a meaningful role in advancing the health and wealth of the nation's R&D effort as well as our higher education enterprise.

Several of the HBCU/MIs, which were visited by the AHSG or which were described during the various briefings, demonstrated potential to be effective and useful in assisting the Army R&D effort and/or the Army's need for highly trained S&Es. Emerging opportunity institutions--Virginia State University, Spelman College, St. Paul's College, Fisk University and New Mexico Highland University, Tennessee State University, Morehouse College, Central State University, to name just a few examples--focus on teaching and nurturing undergraduates. These institutions also have the potential to support R&D. Perhaps more significant, however, is the role and function they now fill. The academic staff of these institutions pride themselves on teaching excellence and often go the "extra mile" to help their students excel in spite of past deficiencies in students' learning environments. This orientation contributes to their excellent student retention record and their leadership among HBCU/MIs in providing baccalaureate engineers and scientists. Furthermore, these institutions provide the educational foundations and enthusiasm for later participation in post-graduate study. In short, these "emerging opportunity" institutions have a vital role in maintaining and feeding the educational "pipeline," helping to meet the future demand for qualified S&E personnel needed by the Army and the DoD.

Thus, this "human development" and pipeline "feeder" function performed by the emerging opportunity schools, is critical to the well-being of the future Army as well as the nation at large. But excellent as their record is, these institutions and their teaching personnel work under tremendous handicaps. To increase the output of needed S&Es in the future, explicit recognition of and support for the important function fulfilled by the educational activities of

emerging opportunity institutions is needed. These institutions should not change their mission in an attempt to obtain Army funding for research. Yet, the current orientation of Army initiatives to assist HBCU/MIs is focused on their capability to support "Army-related research." This orientation forces some HBCU/MIs to reach for often inappropriate research goals to qualify for Army support. Because the dual functions, research and education, are critical to the Army, Army HBCU/MI program goals should explicitly embrace two aims: to support quality research activities and foster excellent undergraduate teaching programs.

Each of the HBCU/MIs identified either as an existing opportunity or as an emerging opportunity institution needs infrastructure support. Some will need more support than others. Infrastructure includes, but is not limited to, support for personnel (staff), research facilities and equipment, maintenance, buildings and building renovations, software systems, telecommunication systems, fellowship and scholarship support, library support, post-doctoral support, proposal preparation, faculty exchange programs, grant and contract management, effective teaching and curriculum development and outreach (pipeline).

Conclusions

The education, training, research, infrastructure environment typified by several HBCU/MIs, is a fertile one on which to build. The Army will increase its benefit from these available resources only through an aggressive, well-funded and dynamically led program to bring these particular HBCUs into full partnership with the Army R&D agenda.

In a revised form, Army programs for HBCU/MIs can help support and maintain the key functions--R&D, and undergraduate education and training in S&E within the broad academic community.

Recommendations

It is strongly urged that the previously recommended centralized Army program office greatly enhance its share of valuable resources in the HBCU/MIs by developing and implementing a vigorous effort to improve HBCU/MI infrastructure at carefully selected HBCU/MIs. Firm criteria on which basic infrastructure support is to be provided by the Army should be developed more fully. Funding for infrastructure enhancement should be related to any activity on a HBCU/MI campus which is directly relevant to Army interests or programs per research education, and/or technology transfer.

Army programs to support and enhance HBCU/MI development should explicitly recognize multiple goals: (a) research; (b) infrastructural, institutional development; and, (c) educational, human development. Policies and programs which support one of these goals are not necessarily appropriate for others. Programs appropriate for supporting educational or human resource development goals must support activities (teaching, student stipends, summer research, etc.) through post-doctoral study. Such programs should recognize and support the lengthy "pipeline" role which HBCU/MIs have in producing good S&Es. Programs aimed at assisting educational support should focus both on the individual student as well as the institution. Institutional infrastructural support should focus on the institution as much as on

research, to insure that the institution has the capability, both structural and administrative--to support an on-going body of excellent science and engineering research into the future.

To underscore the important "feeder" function, educational program support to the emerging opportunity institutions ought to be awarded and evaluated on institutional performance based on increased capacity to graduate S&Es, and growth in the number of HBCU/MI graduates who enter into post-graduate programs in S&E-related disciplines.

SECTION IV

FUTURE ARMY - HBCU/MI EFFORTS: MAKE IT A PROGRAM

In this report we have discussed what the Army is now doing with its HBCU/MI efforts, and believe that these efforts can help form the basis of new and improved relationships. In terms of funding commitments, the Army is doing much to further the goals of Congress and the Administration; goals founded on growing concern about America's ability to compete, to perform innovative research, and to meet the growing demand for well-trained S&Es. It is believed that what is needed between the Army and HBCU/MIs is a type of partnership involving long-term codependence.

Findings

The gist of our findings and recommendations to this point have underscored the existence of many ad hoc activities undertaken by Army labs and centers: Lack of clarity and understanding in the purpose and content of the 5% goal; the need for more unified and visible leadership, individual working-level champions, and management focus specifically tailored to the HBCU/MIs; funding incentives which respect the differing missions and capabilities of HBCU/MIs--S&E graduates pipeline and research. These summarize the findings so far. What is needed for a research partnership is a coherent, unified program.

Site visits to the HBCU/MIs clearly indicated that the faculty and staff were not aware of the Army's research planning/management process, the Army Technology Base Master Plan (ATBMP), or the key emerging technologies list. To a lesser degree, but certainly significant, most HBCU/MI faculty and staff lacked knowledge concerning the general scope of Army R&D aims and technical personnel skill needs. This situation illustrates a not-too-surprising disconnect between awareness of the Army's research needs and HBCU/MI interests, capabilities and educational programs. But these institutions will need significant assistance to shape their institutional development goals/processes toward working in partnership with the Army. An Army research partnership, with HBCU/MIs, which is both productive in terms of useful research and the generation of new S&Es, will require that the HBCU/MIs understand Army needs in detail. It will also require an effective working environment in which legitimate research collaboration can flourish. Most HBCU/MIs will need hands-on mentoring support and technical assistance--lab to lab, technical personnel to technical personnel--to enable them to pursue opportunities with the Army. They need support both from Army personnel, more experienced and developed academic institutions, and industry.

The Army has several important research initiatives which are being administered by ARO and which provide useful background and beginning models for future programmatic efforts which address partnerships. These initiatives are all the product of comprehensive competitive procurements. The University Research Initiative (URI) program is a major institution program in which some of the nation's top research schools were given the opportunity to form multiple school consortia to perform basic research focused on Army needs.

ARO serves as the Army's clearinghouse in presenting needs to the schools involved in the consortia. The URI program is producing useful 6.1 research results.

The Army High Performance Computing Research Center (AHPCRC), involving HBCU/MIs and non-HBCU/MIs, was observed as a program with several desirable features. This center is led by a majority institution with the HBCU/MIs playing key support roles as well as being the custodians of major portions of the Center's computing equipment. The majority institution's experience in research management and execution is being used to assist and train the HBCU/MI personnel. Based on these findings, the following conclusions are apparent.

Conclusions

1. Serious, intense, and consistent dialogue/interaction between the Army R&D community and their counterparts in HBCU/MIs is needed and would advance both parties.
2. An effective mechanism to achieve research partnership objectives between the Army R&D community and HBCU/MIs is the establishment of a formal program which utilizes a tailored research center approach focusing on critical HBCU/MI resources and deficiencies, and reflecting a research agenda closely tied to the Army's key emerging technologies list.

Some discussion about a tailored research center approach is warranted. The two research and educational initiatives cited earlier have established the merit and practicality of multiple-institution consortia specifically created to address Army needs. The panel believes that this approach can be expanded to provide a type of research center which would (at equilibrium) get HBCU/MIs actively involved and productive in the Army's research agenda while also significantly increasing the number of available minority S&Es.

The proposed research center approach is based upon the consortium concept but with a major HBCU/MI which has an established S&E graduate and undergraduate curriculum leading a "cluster" comprised of smaller satellite HBCU/MIs. The satellite schools provide undergraduate pre-S&E curricula and feeder students to S&E programs at the lead school. It is envisioned that large research activities would be centered at the lead school, but also some supporting research would be performed at the satellite undergraduate schools.

If these centers are to become influential research partners, several other ingredients are critical. Most importantly, center research activities must have active proponency from, and involvement with, corresponding Army research staff--this is the essence of a true partnership. It is recognized that this level of co-dependence will likely take years to fully establish. Also, if these centers are to become credible research contributors, and if the Army seeks to maximize the capture of new minority S&E graduates, the program must effectively integrate participation of majority educational institutions and industry into the consortium as well.

It should also be recognized that the proposed research center concept is basically an up-front investment with long-term benefits. The Army must be committed, consistent, and patient to be able to pass through the learning curve associated with this national concept. There is clearly no quick and easy solution to achieving real research partnership with HBCU/MIs. The AHSG believes, however, that this concept is achievable if the Army puts its corporate resolve fully to the task. In this spirit, the following recommendations are offered.

Recommendations

1. This ASB AHSG strongly recommends that the Army establish several research centers where each center would be based on an Army key emerging technology coupled to an academic discipline (i.e., materials science, computational mechanics, electro-optics, propulsion, environmental science, etc.). The essential (required) participants in each center include:

- a. HBCU/MIs
 - (1) one lead HBCU/MI
 - (2) four to five feeder HBCU/MIs
- b. non-HBCU/MIs
- c. Army R&D units
- d. Industry
- e. DoD agencies
- f. Non-DoD federal agencies

Each center is to be serviced by the proposed centralized Army program office.

The lead HBCU/MI would play the role of directing the main body of research, education, and technology transfer of the center. The nucleus of research faculty, staff, students, and facilities would be located on the campus of the lead HBCU/MI. Financial management and all reporting for the center would be the responsibility of the lead HBCU/MI. Foremost, the critical research ideas and intellectual stimulation are expected to be generated by the lead HBCU/MI. Lead HBCU/MI personnel exchanges are defined by the first row in the matrix presented in Table 5.

The feeder HBCU/MIs would be from the emerging opportunity institutions. Faculty and staff from the feeder institutions would participate in the center's research activities during sabbaticals and summer research internships. Students from the feeder institutions would participate in both education and research activities of the center during the academic year and summer. Faculty, staff, and student exchange between feeder institutions and the lead institution and the non-HBCU/MI members of the center is strongly encouraged and is expected to be

intense, effective, efficient, and continuous. See Table 5 for a detailed matrix of possible personnel exchanges within the center.

The non-HBCU/MI members of the center would play a complementary role in the research, education, and technology transfer activities of the center. Primarily through collegial interaction with the lead HBCU/MI, the majority institution members would be a valuable resource as active researchers and teachers, critics, and synthesists. See Table 5 for an indication of majority institution member personnel exchanges.

The Army R&D unit would play the major role of representing and advocating the specific technical (R&D), manpower, and technology transfer interests of the Army. Army professional technical staff are expected to be active participants in the research, education, and technology transfer activities of the center. Army professional technical staff are expected to be much more than contract monitors. See Table 5 for a presentation of Army technical personnel involvement in the center.

Professional technical staff from the industry partner, DoD agencies, and non-DoD federal agencies would play a supplementary role in the research, education, and technology transfer activities of the center. Joint authorship of research papers and textbooks in which technical personnel from industry, DoD agencies, non-DoD federal agencies and other members of the center are strongly encouraged and expected. The bottom three rows in the matrix on Table 5 indicate exchange modes for professional technical staff from industry, DoD, and non-DoD federal agencies.

2. It is further recommended that each established center be funded at \$2.0M the first year and \$3.0M for the second year, followed by inflationary increases beyond the second year. Funding beyond the first year is to be based on performance. Not more than one-half of a fiscal year appropriation to a center can be allocated to the lead HBCU/MI. Each HBCU/MI, non-HBCU/MI, and participating Army R&D unit is to obtain annual allocations from the total appropriations for the center. Financial aid for students, faculty release-time, educational outreach, and grant/contract management support are required components of each research center as is peer review of research performance.

The \$2.0M funding base is derived by considering the details of the NSF Minority Research Centers of Excellence Program. These NSF centers are smaller than the proposed Army supported centers (and are funded at a \$1.0M per year minimum). Our proposed Army supported centers with active participation by lead, feeder, and majority institutions and Army R&D units would require a larger base of funding to build and maintain the desired intense interaction in research, education, and technology transfer. The AHSG wishes to state that the \$2.0M per year of base funding per center is to be allocated for research, education and technology transfer operating expenses. Additional support may be required to assist the HBCU/MIs with site preparation, grant or contract management, and proposal preparation.

To make it a program, a true partnership is strongly recommended. Accountability for sufficiently funded research, education, and technology transfer activities at each center is an absolute requirement. The proposed centralized Army program office with counsel from a blue ribbon advisory board is expected to monitor the progress of each center. Authority to terminate

or to augment a center's funding should reside in the proposed centralized Army program office. In addition to accountability, matters related to effective and efficient communications between the HBCU/MI centers and the Army, policy (long term needs), and a working mentorship where the Army is the mentor and the HBCU/MI unit is the mentee are proposed to be within the charge of the recommended centralized Army program office.

3. Additional legislative initiatives and/or regulatory changes are not required to effect the ASB AHSG's recommendations.

SECTION V

ACKNOWLEDGEMENTS

The AHSG expresses its sincere appreciation to each speaker associated with the numerous meetings. The AHSG also would like to express its sincere appreciation to the various faculty, students, support staff, and administrators who made our many campus visits a useful and stimulating experience. The information received through briefings, discussions, and campus visits provided the basis for this review.

The AHSG acknowledges the excellent support provided by Dr. Gerald R. Andersen, ARO, and Mr. John Nelson, SADBU, which was essential to the effective completion of this study. A special thank-you is appropriate for the professional manner in which the many administrative assistants, who work with individual AHSG members, aided this study.

SECTION VI

REFERENCES

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2. Changing America: The New Face of Science and Engineering, Final Report. The Task Force on Women, Minorities, and the Handicapped in Science and Technology, December 1989.
3. Science and Engineering Indicators - 1989, National Science Board, Washington, DC, 1989.
4. Women and Minorities in Science and Engineering, National Science Foundation, NSF 90-301, Washington, DC, January 1990.

SECTION VII

TABLE 1

DEMOGRAPHICS

<u>GROUP</u>	<u>% OF ALL EMPLOYED S/E</u>		<u>% OF TOTAL U.S. EMPLOYMENT</u>
	<u>1978</u>	<u>1988</u>	<u>1988</u>
Women	9	16	45
Blacks	1.8	2.6	10
Hispanics	---	1.8	7
Asians	---	5	2

SOURCE: Women and Minorities in Science and Engineering. National Science Foundation, NSF 90-301, January 1990.

SECTION VII

TABLE 2

TOP INSTITUTIONS IN THE PRODUCTION OF BLACK AND HISPANIC
BACHELOR DEGREES IN ENGINEERING -- 1990

<u>TOP</u>	<u>BLACKS</u>		<u>HISPANICS</u>	
	<u>Degrees</u>	<u>Percent</u>	<u>Degrees</u>	<u>Percent</u>
1	105	5.1	516	22.6
5	454	22.0	777	34.1
10	746	36.2	1020	44.8
15	885	42.9	1195	52.4
20	994	48.2	1328	58.3
25	1088	52.8	1443	63.3
30	1173	56.9	1544	67.7
50	1459	70.8	1811	79.5
All Schools	2062	100.0	2279	100.0

SOURCE: Engineering and Technology Degrees, 1990,
Engineering Manpower Commission

SECTION VII

TABLE 3

TOP 15 INSTITUTIONS IN THE PRODUCTION OF BLACK AND HISPANIC
BACHELOR DEGREES IN ENGINEERING -- 1990

<u>RANK</u>	<u>BLACKS</u>		<u>HISPANICS</u>	
	<u>Institution</u>	<u>Degrees</u>	<u>Institutions</u>	<u>Degrees</u>
1	Howard	105	U. Puerto Rico	516
2	NCA&T	100	Florida Intl. U.	83
3	CCNY	85	U. Texas-El Paso	63
4	Tuskegee	84	*Texas A&M	58
5	Prairie View	80	*U. Florida	57
6	*Georgia Tech.	68	*MIT	53
7	Southern	62	*Texas A&I	50
8	Pratt	55	*U. Texas-Austin	49
9	*NC State	54	Cal State-LB	46
10	Tennessee State	53	*UNM	45
11	MIT	30	Cal Poly-SLO	42
12	*Purdue	30	*U. Miami	36
13	*Miss State	27	CCNY	35
14	*U. So. Carolina	27	NJIT	31
15	*GMI	25	U. Cal-LA	31

SOURCE: Engineering and Technology Degrees, 1990,
Engineering Manpower Commission

*non-HBCU/MI engineering school

SECTION VII

TABLE 4

EXAMPLES OF ARMY RELEVANT RESEARCH AT HBCU/MI

- Nonlinear optics
- Nonlinear optical materials
- Solution crystal growth
- Melt materials
- Materials characterization
- Thermal modeling
- Remote sensing
- Electronic, electro-optic materials and devices
- Materials fabrication
- Materials characterization
- Computational mechanics
- Nonlinear dynamics
- Simulation modeling

SECTION VII

TABLE 5

CENTER PERSONNEL EXCHANGE MATRIX

Host	Lead HBCU/MI	Feeder HBCU/MI	Non HBCU/MI	Army R&D Ctr.	Industry	DoD Agencies	Other Federal Agencies
Visitor							
Lead HBCU/MI		F, S, T	F, S	F, S	F, S	F, S	F, S
Feeder HBCU/MI	F, S, T		F, S	F, S	F, S	F, S	F, S
Non HBCU/MI	F, S	F		F		F	
Army R&D Ctr.	T	T	T			T	
Industry	T	T		T		T	
DoD Agencies	T	T		T			
Other Federal Agencies	T	T		T			

KEY: F - Faculty S - Students T - Professional technical staff

APPENDIX A

ARMY SCIENCE BOARD TASKING LETTER



APPENDIX A
DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103
14 JAN 1991



Dr. Duane A. Adams
Chair, Army Science Board
Associate Dean
School of Computer Science
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Dear Dr. Adams:

You are requested to appoint a panel of seven to nine Army Science Board (ASB) Members to conduct a study on "Initiatives to Improve the Participation of Historically Black Colleges and Universities (HBCU) and other Minority Institutions (MI) in Army Research, Development and Acquisition Activities to Strengthen Their Infrastructure." The study should address, as a minimum, the Terms of Reference (TOR) described below. However, the panel should consider the TOR as guidelines and not be restrained from considering other issues that the members may deem important. Modifications to the TOR must be coordinated with the ASB office.

I. Background

1. Institutions: There are approximately 150 institutions of higher education with predominantly minority enrollment in this country. They include private and public institutions with 2-year and 4-year programs, a few graduate schools, and some professional institutes. Of these institutions, 106 are officially recognized as Historically Black Colleges and Universities (HBCU), the rest are classified as Minority Institutions (MI). The National Association for Equal Opportunity in Higher Education (NAFEO), which represents 117 of the above institutions, prepared a "Concept Paper" for the Department of the Army; the references cited hereafter are from the appendices of this paper and will be provided to the panel members.

2. Research Capabilities: The 39 HBCU/MI's offering graduate programs are the ones with any notable research capabilities (Tab B, p. 21). In reality, only about two dozen of all HBCU/MI's have active research projects in science and technology (Tab B, p. 13), and/or are linked with other institutions or corporations having substantial research facilities and interests (Tab B, p. 26).

3. Current R&D Program: In 1989-1990 17 HBCU/MI's received R&D contracts from the Department of Defense (DoD). The Army Funding for the majority of these contracts falls into the Single Investigator program. In these cases, an individual researcher is funded for a specific task. These R&D contracts by and large do not offer opportunities to build institutional infrastructure, and under the current contract provisions, their utility to advance educational opportunities on a broad front is very limited.

4. Infrastructure Opportunities: Beginning in FY89, DoD directed and funded the Research Initiation Program (RIP) as continuation to the University Research Initiative (URI). This program was initially open for competition to all universities and consortia which had less than \$10M total for all Federal grants and contracts in FY88. This program made special allowance for the acquisition of large instruments and/or research facilities in connection with a research proposal. This program is continuing, and new legislation has restricted the participation by "wealthier" institutions even further.

5. DoD Declared Goals:

a. Public Law 99-383 established the Task Force on Women, Minorities, and the Handicapped in Science and Technology. The final report was published in December 1989.

b. The DoD Task Force on Human Resource Management in Science and Technology published its final report in July 1989. On 30 March 1990, Secretary Cheney endorsed its recommendations for implementation by the Services.

II. Terms of Reference

a. What initiatives can be developed to improve the participation of HBCU/MI's in Army research, development, and acquisition activities with the explicit goal to strengthen their infrastructure?

b. Which of the programs run by the Military Services, DoD agencies, or other Government Departments supporting the education of minority students in science and technology could be adopted by the Army?

c. How can the educational programs for science and engineering be substantially strengthened at all or most HBCU/MI Institutions?

d. What can be done by the Army to enable more HBCU/MI's to increase their output of science and engineering graduates and improve their employment, competitiveness and prospects?

e. What legislative initiatives and/or regulatory changes are needed to effect the ASB panel's recommendations?

Mr. George T. Singley, III, Deputy Assistant Secretary for Research and Technology, SARD-ZT, will sponsor the study. Dr. Daphne Kamely, Director, Research and Laboratory Management, SARD-TR, will be the Cognizant Deputy on the study. The HQDA Staff Assistant will be Dr. William Sander, Telephone: 703-695-0781.

The panel should begin work immediately and conclude the effort by 31 March 1991. As a first step, the Panel Chairman should prepare a study plan and present that plan to the Executive Secretary and to the study sponsor.

It is not expected that the inquiry will go into any "particular matters" within the meaning of Section 208, Title 18, of the United States Code.

Sincerely,



Stephen K. Conner
Assistant Secretary of the Army
(Research, Development and Acquisition)

APPENDIX B

MEMBERSHIP OF ASB AD HOC SUBGROUP

Participants List

Study Chair

Dr. Wesley L. Harris
Vice President and Chief Administrative Officer
The University of Tennessee Space Institute
B. H. Goethert Parkway
Tullahoma, TN 37388-8897

Mr. Dean C. Borgman
General Manager, MDX Program
McDonnell Douglas Helicopter co.
5000 E. McDowell Rd.
Mesa, AZ 85205

Dr. Crystal C. Campbell
Pres., Padanaram Assoc.
441 Elm Street
S. Dartmouth, MA 02748

Dr. Meredith C. Gourdine
Pres., Energy Innovations, Inc.
8709 Knight Road
Houston, TX 77054

Dr. William R. Hamel
Head, Telerobotic Systems Sec.
Fuel Recycle Division
Oak Ridge National Laboratory
Building 7601, P. O. Box 2008
Oak Ridge, TN 37831-6304

Dr. Elizabeth J. Rock
Prof. of Chemistry
Department of Chemistry
Wellesley College
Wellesley, MA 02181

Dr. Judith P. Swazey
President, The Acadia Institute
118 West Street
Bar Harbor, ME 04609

SPONSOR

Mr. George T. Singley III
Deputy Assistant Secretary
for Research & Technology
OASA (RDA) (SARD-ZT)
Pentagon, Room 3E374
Washington, DC 20310-0103

Cognizant Deputy

Dr. Daphne Kamely
Dir. Research & Laboratory Mgmt.
OASA (RDA) (SARD-TR)
Pentagon, Room 3E510
Washington, DC 20310-0103

HODA STAFF ASSISTANT

Dr. Gerald Andersen
Associate Director
Mathematics & Comp. Sci. Division
Army Research Office
P. O. Box 12211
Research Triangle Park, NC 27709

APPENDIX C

RELEVANT CONGRESSIONAL, EXECUTIVE, OSD, DA LANGUAGE

Legislative and Policy Supporting
HBCU/MI Research and Education

DoD Authorization Act of FY 87, P.L. 99-661

Section 1207 established an objective of awarding a combined total of five percent of the total contract dollars each of fiscal years 1987 and 89 to historically Black colleges and universities, minority institutions, and to small disadvantaged business concerns. The section also provides for technical assistance to these entities to facilitate their participation in the procurement process.

DoD Federal Acquisition Regulation Supplement

Subpart 226.70 - Contracting with Historically Black Colleges and Universities on Minority Institutions. Established DOD policy for achievement of Section 1207 of P.L. 99-661, which includes enhanced use of outreach efforts, technical assistance programs, and total set-aside for HBCUs and Mis.

Executive Order 12677, April 28, 1989

Provides for the Secretary of Education, with the advice of a board of residentially appointed advisors, to supervise a federal program to achieve an increase in the participation by HBCUs in federally sponsored programs.

Public Law 99-383

Section 8 established a task force to examine and make recommendations regarding the status of women, minorities, and the handicapped in science and engineering positions in the national work force.

DoD Authorization Act of FY 90, P.L. 101-189

Section 831 extended the objective and authorities of Section 1207, P.L. 99-661, through FY 93.

Section 843 required the Secretary of Defense to submit a report to Congress on current, expanded and proposed programs to preserve and perpetuate an effective scientific and engineering work force for the United States of the future.

DoD Authorization Act of FY 91, P.L. 101-510

Section 247 required the Secretary of Defense to establish and conduct programs to improve education in the scientific, mathematics, and engineering skills. The program may include student grants (emphasis on members of minority groups and women), education partnership agreements between defense laboratories and education institutions, and cooperative education programs.

Section 832 amends Section 1207 of P.L. 99-661 to authorize infrastructure assistance to HBCUs/Mis. Such assistance may include science and engineering undergraduate, graduate, and doctoral programs scholarships, fellowships, faculty development, and laboratory equipment renovation.



DEPARTMENT OF THE ARMY
HEADQUARTERS, U. S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001



AMCLD-D (78-55a)

7 December 1988

MEMORANDUM FOR: SEE DISTRIBUTION


SUBJECT: New Initiative

1. The Assistant Secretary of the Army (Research, Development and Acquisition) has directed the implementation of a new initiative to increase the level of participation by Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) in Army academic research investment. This effort will make Army policy and practice more responsive to Congressional intent, Executive Order and Office of the Secretary of Defense guidance.

2. In response to this initiative, the Army Research Office (ARO) has modified its Broad Agency Announcement (BAA) to provide for a total set-aside to HBCUs and MIs. The set-aside represents three percent of our FY88 BH57 research program or \$1.8 million. The closing date for submission of proposals is 31 March 1989. The BAA will be further revised for FY89 and FY90 to increase set-aside ratios to four percent and five percent, respectively.

3. In addition to the ARO response, all other Army Materiel Command Laboratories and Research, Development, and Engineering Centers are directed to pursue approaches enhancing their own HBCU and MI outreach programs. ARO has been heavily involved with this initiative and may be of assistance in furnishing information on the HBCUs and MIs.

4. I wish to emphasize my commitment to this program and expect you to play an active role to assure that all qualified institutions are afforded the maximum opportunity to participate.


LOUIS C. WAGNER, JR.
General, USA
Commanding



UNITED STATES ARMY

THE CHIEF OF STAFF

March 3, 1989



MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Historically Black Colleges and Universities
and Minority Institutions Program

In response to previous Executive Orders, Congressional direction (P.L. 99-661) and Secretary of Defense direction, the Army has steadily increased its support and relationship with historically Black colleges and universities and minority institutions (HBCUs/MIs). With their predominant input, our career program intern intake of minorities in FY 88 was 26%. Over 75% of our black officers continue to come from these institutions. In FY 88, 5.3% of our contractual outlays to higher education institutions went to HBCUs/MIs, surpassing the congressional goal of 5%. I am sure the Army is making gains in other areas less publicized.

While we can take pride in our record, we can do more. One of the areas we have targeted for increased effort is research. Last year 2.2% of the Army's basic research money obligated to higher education institutions went to HBCUs/MIs. To improve in this area, the Assistant Secretary of the Army (Research, Development and Acquisition) has requested that the commanders of major research organizations set-aside a portion of their programmed money for funding more research proposals from HBCUs/MIs.

Other areas for your consideration and with the potential for including the largest number of HBCUs/MIs are mission services, training and base support. Some universities are currently providing contractual support in these areas.

Mr. Daniel R. Gill, Director, Office of Small and Disadvantaged Business Utilization; Office, Secretary of the Army, has Army oversight for this program and is available to assist you in these efforts.

I know I can count on you to achieve a level of accomplishment consistent with the Army's historical tradition.

Carl E. Vuono
General, United States Army
Chief of Staff

DISTRIBUTION:

**OFFICE, SECRETARY OF THE ARMY
COMMANDER IN CHIEF
US ARMY EUROPE AND SEVENTH ARMY
COMMANDERS
US ARMY CRIMINAL INVESTIGATION COMMAND
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US FORCES COMMAND
US ARMY FOREIGN SCIENCE & TECHNOLOGY CENTER
US ARMY HEALTH SERVICES COMMAND
US ARMY INFORMATION SYSTEMS COMMAND
US ARMY INTELLIGENCE & SECURITY COMMAND
US ARMY JAPAN/IX CORPS
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DEPARTMENT OF THE ARMY
HEADQUARTERS, U. S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001




ANCSB (715jj)

*CTR to
CAD for my
Sign* - 28 March 1989

MEMORANDUM FOR Major General Billy M. Thomas, Commander, U.S. Army
Communications-Electronics Command, Ft. Monmouth, NJ
07703-5000

SUBJECT: Historically Black Colleges and Universities and Minority
Institutions Program

1. Most recently General Carl E. Vuono, United States Army, Chief of Staff, provided some insight and guidance in regard to increasing our emphasis on doing business with Historically Black Colleges and Universities, and Minority Institutions.
2. As background, Historically Black Colleges and Universities and Minority Institutions (HBCUs/MIs) provide prominent input into our career intern programs and our black officers within the Army.
3. During 1988, 5.3% Army contractual outlays to higher education institutions went to HBCUs/MIs which surpassed the 5% congressional mandated goal. We can take pride in these efforts and accomplishments. There is an area that must be explored to enhance the potential for HBCUs/MIs participation in our programs, and that is Army's basic research. To enhance this area, the Assistant Secretary of the Army (Research, Development and Acquisition) has requested that the commanders of major research organizations set aside a portion of their programmed money for funding more research proposals from HBCUs/MIs.
4. Along these lines other areas for consideration that offer a potential for HBCUs/MIs participation in our acquisition programs are mission services, training and base support.
5. I know that I can count on your continued support of the Small and Disadvantaged Business Utilization Programs and to place emphasis on including HBCUs/MIs in our acquisition program.


LOUIS C. WAGNER JR.
General, USA
Commanding

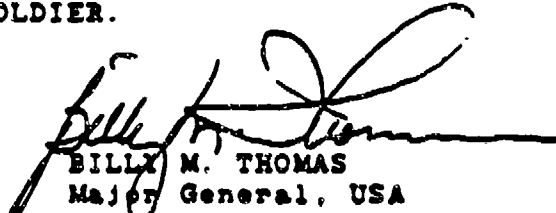
25 APR 1989

AMSEL-SB (AMCSB/28 Mar 89) (715jj) 1st End Mr. Meschler/bh/X24511
SUBJECT: Historically Black Colleges and Universities and Minority
Institutions Program

CDR, US Army Communications-Electronics Command, ATTN: AMSEL-SB,
Fort Monmouth, New Jersey 07703

FOR SEE DISTRIBUTION

1. The Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) Program was mandated by Public Laws 99-661 and 100-180. The laws established an objective for the Department of Defense of awarding a combined total of 5% of its total contract dollars to HBCUs, MIs, and small disadvantaged businesses during fiscal years 1987 through 1990 and maximizing the number of such entities participating in Defense prime contracts and subcontracts. Department of Army, the Army Materiel Command and this Command fully support this effort to increase HBCU/MI participation in our Procurement Programs.
2. The CECOM Center for Research, Development and Engineering has sent a survey to each of the HBCUs/MIs identified by the Department of Education. The results of the survey will be utilized to identify the areas of their R&D expertise and to assist CECOM with the preparation of source lists for future Broad Agency Announcements and in making decisions on the set-aside of basic research requirements exclusively for HBCU/MI participation. The results of the survey will be available for use by elements of the Command.
3. General Wagner is counting on our continued support of the Small and Disadvantaged Business Utilization Programs and asking us to emphasize inclusion of HBCUs/MIs in our acquisition program. The capabilities of these institutions should be utilized to the fullest extent to develop the modern technology and products to support our soldiers.
4. CECOM Bottom Line: THE SOLDIER.


BILLY M. THOMAS
Major General, USA
Commanding

Presidential Documents

Executive Order 12677 of April 28, 1989

Historically Black Colleges and Universities

By the authority vested in me as President by the Constitution and laws of the United States of America, in order to advance the development of human potential, to strengthen the capacity of historically Black colleges and universities to provide quality education, and to increase opportunities to participate in and benefit from Federal programs, it is hereby ordered as follows:

Section 1. There shall be established in the Department of Education, an Advisory Commission, the President's Board of Advisors on Historically Black Colleges and Universities. The members of the Board shall be appointed by the President. The Secretary of Education, with the advice of the Board of Advisors, shall supervise the annual development of a Federal program designed to achieve an increase in the participation by historically Black colleges and universities in federally sponsored programs. The Board of Advisors will also provide advice on how to increase the private sector role in strengthening historically Black colleges and universities. Particular emphasis shall be given to facilitating technical, planning, and development advice to historically Black colleges and universities, with the goal of ensuring the long-term viability of these institutions.

Sec. 2. The Board of Advisors shall include appropriate representatives of historically Black colleges and universities, of other institutions of higher education, of business and finance, of private foundations, and of secondary education.

Sec. 3. The White House Initiative on Historically Black Colleges and Universities, housed in the Department of Education, shall provide the staff, resources, and assistance for the Board of Advisors on Historically Black Colleges and Universities; shall assist the Secretary of Education in the role of liaison between the Executive branch and historically Black colleges and universities; and shall serve the Secretary of Education in carrying out his responsibilities under this order.

Sec. 4. Each Executive department and those Executive agencies designated by the Secretary of Education shall establish an annual plan to increase the ability of historically Black colleges and universities to participate in federally sponsored programs. These plans shall describe measurable objectives for proposed agency actions to fulfill this order and shall be submitted at such time and in such form as the Secretary of Education shall designate. In consultation with participating Executive agencies, the Secretary of Education shall review these plans and develop an integrated Annual Federal Plan for Assistance to Historically Black Colleges and Universities for consideration by the President.

Sec. 5. The Secretary of Education shall ensure that each president of a historically Black college or university is given the opportunity to comment on the proposed Annual Federal Plan prior to its consideration by the President.

Sec. 6. Each participating agency shall submit to the Secretary of Education a midyear progress report and at the end of the year an Annual Performance Report that shall specify agency performance against its measurable objectives.

Sec. 7. Every third year, the Secretary of Education shall oversee a special review by every designated Executive department and agency of its programs

to determine the extent to which historically Black colleges and universities are given an equal opportunity to participate in federally sponsored programs. This review will examine unintended regulatory barriers, determine the adequacy of announcements of program opportunities of interest to these institutions, and identify ways of eliminating inequalities and disadvantages.

Sec. 8. The Board of Advisors, working through the White House Initiative, shall provide advice on how historically Black colleges and universities can achieve greater financial security through the use of improved business accounting, management, and development techniques. To the maximum extent possible, the Board of Advisors shall enlist the resources and experience of the private sector in providing the assistance. To this end, historically Black colleges and universities shall be given high priority within the White House Office of National Service.

Sec. 9. The White House Office of National Service, along with other Federal offices, shall work to encourage the private sector to assist historically Black colleges and universities through increased use of such devices and activities as: (1) private sector matching funds to support increased endowments, (2) private sector task forces for institutions in need of assistance, and (3) private sector expertise to facilitate the development of more effective ways to manage finances, improve information management, strengthen faculties, and improve course offerings. These steps will be taken with the goals of enhancing the career prospects of their graduates and increasing the number of those with careers in science and technology.

Sec. 10. In all its endeavors the Board of Advisors shall emphasize ways to support the long-term development plans of each historically Black college and university. The Secretary of Education, with the advice of the Board of Advisors, shall develop alternative sources of faculty talent, particularly in the fields of science and technology, including faculty exchanges and referrals from other institutions of higher education, private sector retirees, Federal employees and retirees, and emeritus faculty members at other institutions of higher education.

Sec. 11. The Director of the Office of Personnel Management, in consultation with the Secretary of Education and the Secretary of Labor, shall develop a program to improve recruitment and participation of graduates and undergraduate students of historically Black colleges and universities in part-time and summer positions in the Federal Government.

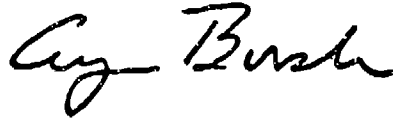
Sec. 12. Each year the Board of Advisors shall report to the President on the progress achieved in enhancing the role and capabilities of historically Black colleges and universities, including an Annual Performance Report on Executive Agency Actions to Assist Historically Black Colleges and Universities that appraises agency actions during the preceding year. The Secretary of Education shall disseminate the annual report to appropriate members of the Executive branch and make every effort to ensure that findings of the Board of Advisors are taken into account in the policies and actions of every Executive agency, including any appropriate recommendations for improving the Federal response directed by this order.

Sec. 13. Participating Executive agencies shall submit their annual plans to the Secretary of Education not later than January 15 of each year. The Annual Federal Plans for Assistance to Historically Black Colleges and Universities developed by the Secretary of Education shall be ready for consideration by the President not later than April 30 of each year.

Sec. 14. The Secretary of Education is directed to establish an Advisory Commission entitled the President's Board of Advisors on Historically Black Colleges and Universities. Notwithstanding the provisions of any other Executive order, the responsibilities of the President under the Federal Advisory Committee Act, as amended (5 U.S.C. App. 2), which are applicable to the Advisory Commission to be established by this order, shall be performed by

the Secretary of Education, in accordance with the guidelines and procedures established by the Administrator of General Services.

Sec. 15. Executive Order No. 12320 of September 15, 1981, is revoked.



THE WHITE HOUSE.

April 28, 1989.

: Doc. 89-10390
ed 8-1-89; 11:06 am]
ing. code 5185-01-M

Editorial note: For the President's remarks of Apr. 28 on signing Executive Order 12877, see the *Weekly Compilation of Presidential Documents* (vol. 25, no. 17).



SECRETARY OF THE ARMY
WASHINGTON

23 February 1990



MEMORANDUM FOR OSA PRINCIPAL OFFICIALS AND MACOM
COMMANDERS

SUBJECT: Small and Disadvantaged Business Utilization
(SADBU) and Historically Black Colleges and
Universities/Minority Institutions (HBCUs/
MIs) Programs

The Army Policy Council has been briefed by Mr. Daniel R. Gill, Director, Office of Small and Disadvantaged Business Utilization, on the results of the SADBU and HBCUs/MIs programs to date. While we have instituted some good initiatives and achieved satisfactory results in certain areas, I am convinced that more can and should be done to improve our present record. I have been involved in some of the critical and sensitive contract issues related to these programs and understand the importance of providing personal leadership to eliminate any remaining barriers and impediments to greater participation of small business and HBCUs/MIs. Accordingly, I request that special attention be given to the following:

The SADBU and HBCUs/MIs programs are mandated by law and are considered mission essential. They must not be singled out for reduction of resources.

As I emphasized in my letter of 16 February 1989, particular attention should be given to guaranteeing that acquisition plans for major systems, complex acquisitions, and major research programs reflect efforts to maximize participation of small and disadvantaged businesses and HBCUs/MIs. Program Executive Officers can and should play a major role in this area. These programs will continue to be reviewed at this level as a part of our total quality management commitment to ensure effective implementation.

It is critical that we increase the use of set-asides to significantly improve the rate of participation of HBCUs/MIs in our research, education and training programs, and other services normally acquired from higher education institutions. To involve the institutions in our major long-term research centers and training programs, I request each addressee who funds programs or procures services from higher education institutions to establish a funding set-aside of 4% for FY 90 and 5% for FYs 91-93.

I am personally committed and dedicated to ensuring that the Army continues to build on its fine record. I have asked Mr. Gill to keep me advised of our progress.

I know I can count on your support.

M. P. W. Stone

M. P. W. Stone



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF
WASHINGTON, DC 20310-0200




20 MAR 1990

DACS-ZD

MEMORANDUM FOR ARMY STAFF PRINCIPALS

SUBJECT: Small and Disadvantaged Business Utilization (SADBU) and Historically Black Colleges and Universities and Minority Institutions (HBCUs/MIs) Program

1. The Secretary of the Army has stated his personal commitment to improving Army's performance in the subject programs. The Chief of Staff and I solicit your support for these programs to eliminate any remaining barriers and impediments to greater participation of small business and HBCUs/MIs.
2. We are aware that some of you are actively engaged in the program; nevertheless, there are some improvements that can be made. I am requesting that you insure the involvement of HBCUs/MIs in all appropriate programs pertinent to your areas of responsibility and to make this an area of interest as you make your routine visits to military installations. Please keep us informed about the "success stories."
3. Mr Daniel R. Gill, Director, Office of Small and Disadvantaged Business Utilization, is available to assist you in this effort.


ELLIS D. PARKER
Lieutenant General, GS
Director of the Army Staff

APPENDIX D

AD HOC SUBGROUP ACTIVITIES DURING STUDY

AD HOC SUBGROUP ACTIVITIES

March 1991

The initial meetings of the Panel were held on 7 and 8 March 1991 in room 3E385 of the Pentagon. The purpose of these meeting was to provide the Panel with information on the HBCU/MI initiatives of DoD organizations. Representatives for ONR, AFOSR, ARI, DARPA, COE, USAMRDC, ARO, AIRMICS, HEL, OSD and the Army's SADBUs office gave briefings on their programs. Mr. George T. Singley III, Deputy Assistant Secretary for Research and Technology also briefed the Panel.

The second pair of meetings of the Panel took place on 25 and 26 March. Here the briefers came primarily, from federal non-DoD activities. Briefings on programs for HBCU/MI institutions were given by representatives from NIH, NSF, NASA, DOE, White House Initiatives Office on HBCU and the ISC.

April 1991

On 24 April, the Army High Performance Computer Research Center (AHPCRC), University of Minnesota was visited (subcontracts with Howard University and Jackson State University).

The Panel met in the Pentagon on 30 April. The purpose of this meeting was to extend their information base to industry HBCU/MI programs. Briefings were received from representatives of IBM, Hughes Aircraft, Honeywell Corporation, the Historically Black Research Foundation and the President of NAFEO.

May 1991

On May 1, 1991, the Panel visited Howard University. This was the first of six site visits to HBCU/MI's. The Panel received briefings on the capabilities and needs of the University in the areas of science, engineering, mathematics and computer science. The meeting was hosted by Dr. M. Lucius Walker, Jr., Dean of Engineering. Briefings were given by members of the science and engineering faculty of Howard.

July 1991

The Panel visited Clark-Atlanta University and Spelman college on 22 July and Alabama A&M University on 23 July. On the afternoon of July 23, the Panel also visited Redstone arsenal and received briefings from the technical director and staff of the MICOM on their programs and plans involving HBCU/MI's.

August 1991

St. Paul's College in Lawrenceville, Virginia was the site of a visit on the morning of 6 August. During the afternoon, the Panel traveled to ARO in order to meet with the Tech Director of the Aviation Command and the Associate Tech Director of CECOM. The Tech Directors explained their command's plans and initiatives with HBCU/MI's.

September 1991

On 16 September, the Panel met with the President, Vice President and Science, Engineering, Mathematics Department Heads at the New Mexico Highlands University in Las Vegas, New Mexico.

October 1991

On 15-16 October the panel met in the Pentagon to prepare the first draft of the study.

On 16 October, the Panel met with the Director, Washington, DC Office, Hispanic Association of Colleges and Universities (HACU), in Washington, DC.

Ad Hoc Subgroup Chair briefed ASB Annual Meeting, 24 October 1991, Ft. Stewart, Georgia.

November 1991

On 8 November the first draft report of the study was mailed to all panel members and to the study sponsor for review and comment.

On 11 November, a second visit to Howard University was made. The Howard University National Science Foundation Materials Science Research Center of Excellence and the Howard University Computational Science and Engineering Research Center were reviewed.

December 1991

On 17-19 December the panel met in the Pentagon to prepare the second draft of the study.

APPENDIX E

CURRENT ARMY POLICY

CURRENT ARMY POLICY

On March 26, 1992 Mr. Stephen Conner, ASA(RDA), announced that ARO is the lead organization to conduct the Army competition and award for HBCU/MI funding to integrate Army, Navy and Air Force Programs into a single activity. This \$15M program was awarded to the Army as a result of the outstanding performance of ARO in developing useful and successful programs with HBCU/MIs. A copy of this memo is at page E2.

On April 3, 1992 Mr. Conner provided explicit guidance to Commanding General, U.S. Army Materiel Command; Chief of Engineers; Deputy Chief of Staff for Personnel; Commanding General, U.S. Army Strategic Defense Command; Commanding General, U.S. Army Information Systems Command; and Commanding General, U.S. Army Medical Research and Development Command, on the Army's HBCU/MI Strategy. These six explicit directives are consistent with the recommendations of this AHSG. A copy of this memo is at page E4.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103

26 MAR 1992



SARD-ZT

MEMORANDUM THRU UNDER SECRETARY OF THE ARMY *5/22/92*
FOR DIRECTOR, DEFENSE RESEARCH AND ENGINEERING, OUSD(A)
SUBJECT: HBCU/MI Funding

Per your request of March 10, 1992, subject as above, the Army welcomes the opportunity to participate in this program. We have identified within the Army Secretariat the Deputy Assistant Secretary for Research and Technology to take the lead for the Army portion of this initiative with the Army Research Office (ARO) as the organization to conduct the Army competition and award process. Once the funds are provided by OSD to HQ Department of the Army, we will provide them to the ARO which will fund the successful Army HBCU/MI competitors. Because the Army has more than one-half of the total program fund of \$15M, and since we have a strong, successful track record in strengthening the HBCU/MI infrastructure, we would be pleased to accept responsibility for integrating the Army, Navy, and Air Force programs into a single program announcement brochure to include separate Service approaches therein. The ARO has an excellent track record in this type of endeavor.

The Army has given this effort considerable thought and has developed the approach outlined in the attached plan. We would welcome your review and comment on this plan as well as designation of the Army to integrate the Tri-Service program announcement brochure.

Stephen K. Conner
Assistant Secretary of the Army
(Research, Development and Acquisition)

Attachment

CF:
Mr. Shannon
GEN Ross
Ms. Livingstone
Mr. Gill
Mr. Crouch
Dr. Berlincourt

**FY1992 ARMY HISTORICALLY BLACK COLLEGES AND
UNIVERSITIES/MINORITY INSTITUTIONS (HBCU/MI)
INFRASTRUCTURE SUPPORT PROGRAM**

1. The Army Research Office (ARO), in close cooperation with the Office of Naval Research and the Air Force Office of Scientific Research, will prepare a single Broad Agency Announcement (BAA) which will include work statements from all three Services and a single procurement section. The single announcement is to avoid diffusion and confusion that might ensue from multiple BAAs and slightly differing award conditions.
2. Funds go directly from ARO to successful HBCU/MI bidders.
3. The Army portion of the BAA work statements will include the following three components:
 - a. Scholarships and fellowship programs planned and managed by the HBCUs and MIs - The individual awards will be for science and engineering graduate students at the HBCU/MIs.
 - b. Funds will be provided to HBCU/MIs to conduct cooperative research programs between HBCU/MIs and Army labs, RDECs and/or the Army Institute for Advanced Technology (IAT) FFRDC. Awards to successful HBCU/MI bidders may include funds for: Faculty salaries; equipment; student tuition and stipends; and travel to the lab/RDEC and/or IAT. The BAA will provide descriptions of major thrusts of the labs and RDECs.
 - c. Funds will be provided to the successful HBCU/MI bidders for cooperative research programs with established Army Centers of Excellence and/or with major universities in collaboration with Army laboratories, RDECs and/or the ARO. Funds will be provided to the HBCU/MIs only.
4. Each Service will evaluate HBCU/MI proposals in response to their portion of the tri-Service BAA, and each Service will negotiate and consummate its own awards. The Army evaluators will include representatives from: ARO, the Army Research Laboratory, RDECs and the Corps of Engineers.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103



03 APR 1992

SARD-ZT

MEMORANDUM FOR COMMANDING GENERAL, U. S. ARMY MATERIEL
COMMAND
CHIEF OF ENGINEERS
DEPUTY CHIEF OF STAFF FOR PERSONNEL
COMMANDING GENERAL, U. S. ARMY STRATEGIC
DEFENSE COMMAND
COMMANDING GENERAL, U. S. ARMY
INFORMATION SYSTEMS COMMAND
COMMANDING GENERAL, U. S. ARMY MEDICAL
RESEARCH AND DEVELOPMENT COMMAND

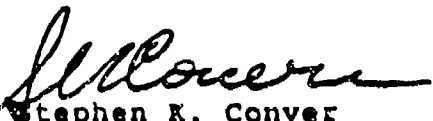
SUBJECT: Army Historically Black Colleges and
Universities/Minority Institutions (HBCU/MI)

The Army is widely recognized for its strong HBCU/MI program. In particular, the Army Research Office initiatives to strengthen the ties between Army researchers and HBCU/MIs have been outstanding. Unfortunately, our non-technology base leveraging of HBCU/MIs by PEOs and RDECs has lagged.

A recent National Science Foundation study indicates that approximately 70% of the adults entering the work force between now and the 21st century will be women and/or minorities, two groups historically under-represented in science and engineering. HBCU/MI institutions have been major producers of minority scientists and engineers. Because the Army must rely on its technological supremacy to maintain our winning edge, we must attract the best and brightest scientists and engineers within our laboratory/RDEC system, academia and the supporting industrial base. To this end, I am issuing the attached Army research, development and acquisition policy.

Request your organization provide the Deputy Assistant Secretary for Research and Technology (ATTN: SARD-ZT) your FY1992 and 1993 plan for complying

with the attached policy within 60 days from the date of this memorandum.


Stephen K. Conner
Assistant Secretary of the Army
(Research, Development and Acquisition)

Attachment

CF:
USA
VCSA
ASA(IL&E)
SACBU
DDR&E

**ARMY HISTORICALLY BLACK COLLEGE AND UNIVERSITY/MINORITY
INSTITUTION (HBCU/MI) STRATEGY**

1. It is our goal that at least 5% of all Army RDA annual funding going to higher education institutions be awarded to HBCUs or MIs. This is not limited solely to the Army Research Office (ARO) extramural research program. It shall be adhered to by all Army FEOs, RDECs, laboratories and the Army Research Institute contracting with higher education institutions.
2. The ARO will issue a Broad Agency Announcement soliciting proposals from HBCU/MIs to join existing Army Centers of Excellence and to significantly participate in the conduct of research within the terms of the contract/grant for that Center of Excellence.
3. All new Army Centers of Excellence will have an HBCU/MI member.
4. The Army will establish competitively in FY92 two new Centers of Excellence headed by HBCUs: Information Sciences and Training Research.
5. Each RDEC and laboratory shall pursue an agreement with an appropriate HBCU/MI for it to be associated with that RDEC. The intent of this effort is to improve the linkage between HBCU/MIs and Army RDECs/labs and to foster mentor/protege relationships.
6. Each Army Center of Excellence shall have a proponent Army laboratory or RDEC which will provide the Executive Advisory Board (EAB) Chairman. The EAB will oversee the Center of Excellence to include its compliance with the above HBCU/MI policy. The ARO Army Small and Disadvantaged Business Office and Director of Research and Laboratory Management shall be invited Advisors to EAB meetings.

APPENDIX F

GLOSSARY

GLOSSARY

AFOSR	Air Force Office of Scientific Research
AHPCRC	Army High Performance Computer Research Center
AHSG	Ad Hoc Subgroup
AMC	Army Materiel Command
ARO	Army Research Office
AROSR	Air Force Office of Scientific Research
ASB	Army Science Board
ATBMP	Army Technology Base Master Plan
COE	Code of Ethics
DA	Department of the Army
DoD	Department of Defense
DoE	Department of Energy
HBCU/MIs	Historically Black Colleges and Universities/Minority Institutions
HRMST	Human Resource Management in Science and Technology
NASA	National Aeronautics and Space Administration
NIH	National Institute of Health
NSF	National Science Foundation
OASA(RDA)	Office of the Assistant Secretary Army, (Research, Development and Acquisition)
ONR	Office of Naval Research
OTSG	Office of the Surgeon General
R&D	Research and Development
RDA	Research, Development and Acquisition
S&E	Science and Engineering
SA	Secretary of the Army
SADBU	Small and Disadvantaged Business Utilization
SARD-ZT	Deputy Assistant Secretary for Research and Technology
TOR	Terms of Reference
URI	University Research Initiative

APPENDIX G

DISTRIBUTION

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Naval Research Advisory Committee, 800 N. Quincy St., Arlington, VA 22217	1

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Assistant Secretary of the Army (I,L&E), Pentagon, Washington, DC 20310	1
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Director, Plans and Projects, OSA, SAAA-PP, Pentagon, 3E741, Washington, DC 20310	1
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Deputy for Program Evaluation, SARD-ZE, Pentagon, Washington, DC 20310-0103	1
Director, AMC-Field Assistance in Science & Technology, AMC-FAST, Fort Belvoir, VA 22060-5606	1
Department of the Army Office of the Surgeon General, DASG-ZA, Skyline 6, 5109 Leesburg Pike, Falls Church, VA 22041-3258	1
Deputy Chief of Staff for Personnel (DA DCSPER), HQ DA, DAPE-ZXO, Pentagon, Washington, DC 20310	1
Chief, MANPRINT Policy Office, Research & Studies Division, ODCSPER, Pentagon, Washington, DC 20310	1
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Commander, US Army Medical Research and Development Command, SGRD-PLR, Fort Detrick, MD 21701	1
Commander, US Army Materiel Command, AMCSCI, 5001 Eisenhower Avenue, Alexandria, VA 22333	10
Commander, US Army TRADOC, ATCG-S, (Dr. Berenson), Fort Monroe, VA 23651	5
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Commander, US Army Communications Command, Fort Huachuca, AZ 85613	1
Science Advisor to the Commander, HQ USA FORSCOM, FCSJ-SA (Dr. Suider) Bldg., 200, Fort McPherson, GA 6000	1
Deputy Commander, HQ AMC, Format Readiness, US Army Materiel Command, 5001 Eisenhower Ave, Alexandria, VA 22333	1
Commander, US Army Laboratory Command, AMSLC-CT (Corporate Technology), 2800 Powdermill Road, Adelphi, MD 20783-1145	1
Commander, US Army Tank Automotive Command, AMSTA-CG, Warren, MI 48397-5000	1
Technical Director, US Army Research Institute for the Behavioral and Social Sciences 5001 Eisenhower Ave, Alexandria, VA 22303-5600	1
Technical Director, US Army Operational Test and Evaluation Agency, 4501 Ford Ave, Alexandria, VA 22302-1458	1
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Director, US Army Materiel Systems Analysis Agency, Aberdeen Proving Ground, MD 21010-5071	2
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Commander, US Army T&E Command, Aberdeen Proving Ground, MD 21005-5055	1
Technical Director, US Army Test & Evaluation Command, Aberdeen Proving Ground, MD 21005-5055	1
US Army Communications-Electronics Command, Director RDT&E Center, AMSEL-RD Fort Monmouth, NJ 07703-5000	1
HQ AMC, Physical Science Administrator, AMC DRA-ES (Dr. Hagan), 5001 Eisenhower Ave, Alexandria, VA 22333	1
USASDC, CSSD-OP, PO Box 15280, Arlington, VA 22215-0180	1
Commander, US Army Operational T&E Agency, Park Center IV, 4501 Ford Avenue, Alexandria, VA 22302-1458	1
Commander, Department of the Army, US Army Armament Research, Development & Engineering Center, Picatinny Arsenal, NJ 07806-5000	1
Commander, US Army Depot Systems Command, Chambersburg, PA 17201	1
Commander, West Com, APSA (Science Advisor), Fort Shafter, HI 96858	1
<u>Other</u>	
Director, CIA, Washington, DC 20505	1
Executive Director, Board on Science & Technology (BAST), 2101 Constitutional Ave HA292B, Washington, DC 20418	1
US Army Materiels Technology Lab, SLCMT-DA, Watertown, MA 02172-0001	1
Chairman, Defense Science Board, Pentagon, 3D1020, Washington, DC 20301	1
Science Advisor to the CDR, HQ USFK/EUSA-SJS, CS-SO, APO San Francisco 96301	1
Director, R&D Office, CERDZ-A, Office Chief of Engineers, 20 Massachusetts Ave, NW Washington, DC 20314	1