GAO

United States
General Accounting Office
Washington, D.C. 20548

159683

National Security and
International Affairs Division

B-278813

December 18, 1997

The Honorable William S. Cohen
The Secretary of Defense

Subject: <u>Distance Learning: Opportunities Exist for DOD to Capitalize on Services'</u>
<u>Efforts</u>

Dear Mr. Secretary:

We reviewed the Department of Defense's (DOD) distance learning initiatives
because of their importance in making training readily available to all military
personnel regardless of location. Distance learning is structured training that can
take place almost anywhere and anytime without the physical presence of an
instructor because of the technological advances that facilitate the instruction.
Specifically, we (1) analyzed the status of the services' efforts to integrate distance
learning into their training plans and strategies, (2) identified funding issues related
to distance learning, and (3) reviewed the Office of the Secretary of Defense's
(OSD) efforts to promote interservice efficiencies for distance learning. This letter
contains questions to you regarding the direction of DOD's distance learning efforts.

BACKGROUND

Today's military needs to be ready to engage in a wide range of missions that are
not limited to traditional war-fighting requirements. DOD participates in diverse
contingency operations, including drug interdiction, disaster relief, and
counterterrorism. These missions often require rapid, unplanned preparations.
Between fiscal years 1992 and 1995, DOD participated in several contingency
deployments in locations such as Haiti, Rwanda, Somalia, and the former
Yugoslavia. The increased rate of such deployments highlighted the need for the
services to be able to provide training on demand to soldiers and units deployed
worldwide.

Access to training opportunities is particularly important for the reserve
components, which make up about 40 percent of the total force. Although the
services are increasingly depending on these forces, training is not always readily
available to them. An Institute for Defense Analysis study reported that 39 percent
of Army reserve component soldiers in 1995 could not demonstrate that they were

qualified for their jobs.[1] The Institute reported that this situation was partly due to the lack of funds for troops to travel for training. In operations for which the reserve call-up is large, such as the Gulf War, a high percentage of personnel who are not fully trained for their mission can adversely affect readiness. Distance learning is a way for DOD to increase force readiness by providing geographically dispersed personnel better access to training.

Distance learning can also increase the cost-effectiveness of training delivery systems. Even though DOD's training workload has decreased, the cost of traditional training methods is continuing to increase. In 1996, we reported that the cost of formal military training and education per student increased significantly, from $53,194 in 1987 to $72,546 in 1995.[2] Formal military training and education generally occurs at centralized training facilities and lasts weeks or months.

Industry, academia, and state and federal governments are increasing their use of distance learning as a cost-effective way to educate students and employees. Many major corporations, such as Hewlett-Packard, save millions of dollars each year by using distance learning to train employees more effectively and efficiently than with conventional methods. Another major corporation, Ford Motor Company, established over 6,000 satellite sites in North America to provide technical and professional development training to its geographically dispersed employees. Distance learning in academia allows students to take undergraduate and graduate courses in offices, at community colleges, and at various other sites via satellite, audiotape, or on-line computer. States with governments that are increasing their use of distance learning include (1) Georgia, which connected 375 distance learning sites across the state to provide distance learning opportunities to public colleges, universities, and the state's medical community, and (2) Iowa, which along with federal initiatives connected over 450 classrooms to a statewide fiber-optic system used for education, government, and emergency management.

RESULTS IN BRIEF

The services have begun incorporating distance learning technologies into their training activities. These technologies include simulators and simulation exercises, correspondence courses, interactive computer courseware, video and audiotapes, and real-time interactive audio and video classrooms. Although it is difficult at this time to identify the full scope of the services' planned distance learning activities, OSD officials estimated in August 1997 that the services would obligate at least $100 million in fiscal year 1998 and as much as $2 billion over the next 10 years for such activities.

---

[1]Distance Learning and the Reserve Components, Institute for Defense Analysis, December 1996.

[2]DOD Training: Opportunities Exist to Reduce the Training Infrastructure (GAO/NSIAD-96-93, Mar. 29, 1996).

The Army is the only service that has a formally documented distance learning plan, which has been endorsed by the Deputy Secretary of Defense as a model for developing and implementing distance learning. The plan establishes critical milestones and funding requirements for both active and reserve forces. The other services' plans for distance learning are not as well developed. The Air Force and the Marine Corps intend to develop distance learning plans that encompass active and reserve requirements. The Navy has developed a training assessment document that includes technology requirements for distance learning, but it does not address Naval reserve force requirements. All of the services are planning to establish distance learning facilities and are evaluating software that analyzes the mediums and costs for converting traditional courses to distance learning. However, none of the services have selected all of the courses that can be effectively taught through distance learning or determined the most cost-effective use of distance learning technologies.

We identified several funding issues that warrant consideration. First, the services will need to initially commit a substantial investment for courseware conversion and communication infrastructure. The total amount of this initial investment is not known, but the Army estimated that it will need about $840 million through 2010 to implement its distance learning plan, including expenditures for these purposes. Second, OSD has not yet fully determined the savings that might be achieved through the increased use of distance learning, although OSD officials believe most savings will be in military personnel costs, such as student overhead. Third, the services have not identified how distance learning will impact the current training infrastructure in terms of requirements for course instructors, developers, and equipment, among other things. Last, the services have not determined how to budget for the long-term use of distance learning. Past training budgets have been based on the number of resident students who took courses at military training facilities. However, distance learning focuses on training nonresident students in a multitude of locations through the use of technology, and this delivery mechanism will require a different cost estimating approach. Resolution of these issues will require sustained top-level management commitment for distance learning initiatives.

OSD has facilitated the coordination of the services' distance learning plans and activities by sponsoring working groups to facilitate the increased use of distance learning and publishing specifications and guidance for military training products. Although OSD has actively promoted collaboration among the services, it has not yet developed a departmentwide strategy to focus service efforts. As a result, each of the services is pursuing its own distance learning strategy. Service officials noted that having a departmentwide strategy could help prevent duplicative efforts, inadequate sharing of resources, and inadequate attention to the needs of both active and reserve forces. The December 1996 Institute for Defense Analysis study stated the position that a stronger OSD direction might help the services develop and implement distance learning plans in the most efficient and cost-effective manner.

SERVICES' PLANS TO INTEGRATE
DISTANCE LEARNING VARY

The Deputy Secretary of Defense endorsed the Army's distance learning plan as a model for developing and implementing distance learning. In April 1996, the Chief of Staff of the Army approved this plan, which includes requirements for the active and reserve forces. The plan establishes specific goals, objectives, and responsibilities for implementing distance learning along with critical milestones and funding requirements for meeting them. Distance learning became a major acquisition program in March 1997, which will afford the program visibility with top-level DOD management.

The other services are in the process of developing their plans for distance learning. The Air Force and the Marine Corps' plans are expected to address both active and reserve requirements. The Air Force established a distance learning office at Maxwell Air Force Base, Alabama, in 1995 and plans to engage a contractor to develop its distance learning plan. The Marine Corps has developed a mission needs statement for distance learning to use in developing a distance learning plan. Elements of the Navy's training plan, approved in April 1997, include distance learning initiatives, such as developing interactive courseware and internet training.

The implementation of distance learning requires that existing courseware be redesigned. Because the services must review about 10,000 courses to determine whether they can be taught partially or totally through distance learning technologies, those courses that will benefit the services most in terms of readiness and return on investment must receive priority. The Army has over 2,000 courses in its current inventory and, based on available resources, has selected about 525 traditional courses to convert to distance learning. The Air Force must review about 4,000 courses, about 1,500 of which are frequently offered. Air Force distance learning officials have no definitive data indicating how many of these 1,500 courses have been reviewed for their distance learning potential, but the officials estimate that one-third to one-half of the courses have been reviewed. The Air Force intends to complete its course review in the summer of 1998. The Navy is in the process of reviewing about 4,000 courses for distance learning applications, and Marine Corps officials said that they would review about 250 courses.

In addition to determining the number of courses that can be taught through distance learning, training developers must determine the best and most cost-effective mediums for delivering distance learning courses. According to service officials, the process of studying different delivery methods can be very time-consuming and expensive and, without adequate planning, could result in duplicative efforts and inadequate sharing of resources and attention to the needs of both active and reserve forces. From 1989 to 1994, the Army conducted pilot studies to determine the effectiveness of training with five distance learning technologies: video teletraining, computer conferencing, computer-based instruction, voice-based computer-based instruction, and desktop video production. The results

of these pilot studies showed that the instructional delivery medium does not significantly affect training effectiveness compared with traditional face-to-face instruction and that distance learning has the potential to significantly decrease the time a soldier is absent from his home station, reducing travel and per diem costs.

The services must also establish distance learning facilities and acquire the necessary communications equipment to transmit their distance learning courses. All of the services either have in place or plan to establish an infrastructure to receive distance learning courses. For example, the Army is planning to establish 745 distance learning classrooms that will be linked through a terrestrial based, commercial telecommunications network.

The Air Force has used a satellite broadcast network for distance learning since 1992. The Air Force has increased the amount of network broadcast hours from less than 500 in 1992 to 2,000 in 1996, and it projects that it will use 4,500 by 1999. Today, the network reaches every base in the United States through one of four broadcast sites. The Air Force plans to have air bases in Europe connected to the network in early 1998 and air bases in the Pacific connected by the end of 1998 if it becomes cost-effective.

The Air Force Reserve leases its satellite network equipment from the Army and uses the Army's television network system.[3] The Air Force Reserve has 46 Army video teletraining sites that are capable of both two-way video and audio. The Reserve also has five Air Force network sites that receive programs from the active Air Force satellite broadcast network. The Air Force Reserve system broadcasted 2,800 hours in fiscal year 1996. The Air National Guard uses the same satellite broadcast system as the active Air Force and maintains 202 of its own sites that can receive broadcasted courses.

The Navy has a video teletraining network that is used for both distance learning and teleconferencing. The system uses satellites to broadcast to ships at sea and telecommunication lines to deliver courses on shore. The system, which consists of 19 sites and 25 classrooms, is available 24 hours every day and is used an average of 10 hours per day, 5 days a week. In 1997, the Navy offered 52 courses through its network.

RESOLUTION OF FUNDING
ISSUES COULD HELP ADVANCE SERVICES' PLANS

Resolution of funding and budgeting issues would benefit the services distance learning initiatives. These issues are the (1) extent of investment that will be

---

[3]The Army has 100 television network sites, 46 of which are used exclusively by the Air Force Reserve and 1 by the Navy. During fiscal year 1996, the Army network delivered 30,000 hours of training to at least 100,000 Army, Air Force, Navy, Marine Corps, and civilian students.

needed to convert selected courses and communication infrastructures; (2) dollar savings that can be realized; (3) impact on the current training infrastructure, in terms of requirements for instructors, training developers, training equipment, course maintenance, and training facility operations, and (4) process for budgeting for the long-term use of distance learning.

A substantial investment is required to implement a distance learning program. OSD officials estimated that DOD would need to invest about $2 billion for distance learning over the next 10 years; however, this estimate does not reflect specific service requirements. The Army plans to invest about $840 million from 1998 to 2010, $352 million of which will be used for establishing its distance learning facilities. The Army plans to spend about $38 million in fiscal year 1998 to establish the first 63 classrooms and install the associated communications equipment. To purchase satellite and studio equipment for its broadcast network, the Air Force increased its funding from $2.4 million in fiscal year 1992 to approximately $6.4 million in fiscal year 1996. It estimated that operating costs for the network were about $3.2 million in fiscal year 1997. The Navy's assessment calls for a $161.2 million investment in distance learning technologies from fiscal years 1997 through 2003.

Service officials said that the conversion of a traditional course to a distance learning course is expensive and may take a number of years. The Army estimated that it would cost about $20 million in fiscal year 1998 to convert 31 of the 525 distance learning courses and that it would take over 10 years to convert all 525 courses due to the amount of work involved and funding constraints. DOD officials said that the cost of converting a traditional course to a distance learning course could range from $500, to as high as $20,000 per hour of the course. The Marine Corps plans to spend almost $600,000 to convert 38 hours of training courses to interactive multimedia courseware.

Estimated savings through the increased use of distance learning is an important factor in justifying the outlays that will be required to implement the services' plans for distance learning. However, OSD has not yet estimated these potential savings, and OSD officials stated that the services have not developed a method to quantify total savings. Although distance learning is expected to generate operation and maintenance savings,[4] OSD officials believe that the primary payoff will be in the military personnel accounts because the number of days students will have to spend in traditional military training facilities will decrease. Further, the reduced amount of time that personnel would have to spend away from their home units is an important factor that can increase productivity, produce efficiencies in the training infrastructure (i.e., requirements for instructors, training developers, training equipment, course maintenance, and facility operations), and generate reductions in the personnel overhead accounts that pay for student time. Savings in military pay

---

[4]For example, the Army estimates that it will achieve over $900 million in Operation and Maintenance savings and cost avoidances from 1998 to 2010.

accounts, including student overhead, can be either measured in dollar savings or used for additional military personnel to meet force structure needs.

A March 1997 OSD report to the House Committee on Appropriations stated that one of OSD's objectives is to use distance learning to streamline the military's overall training infrastructure.[5] Distance learning infrastructure includes instructors, training developers, training equipment, course maintenance, and training facility operations. However, the services have not fully examined the potential to consolidate or close some of their resident schools as they increase their use of distance learning. Officials at the Army Training Support Command reported that some of the Army's training facility commanders are concerned that distance learning will reduce their resources because of the decrease in the number of students traveling to schools and the amount of time students spend at schools. Furthermore, the acting program manager for the Army's distance learning plan reported that potential infrastructure savings will be outside the scope of the economic analysis conducted to justify the Army's plan.

Finally, the services have not determined how to budget for the long-term use of distance learning. In the traditional classroom setting, military training facilities receive resources based partly on the number of training hours instructors provide to students face-to-face. However, students will not be in traditional classrooms with distance learning. Even though the services have considered several alternatives for budgeting for distance learning, they have not identified and adopted a specific methodology.

DEPARTMENTWIDE GUIDANCE
WOULD BENEFIT SERVICES' EFFORTS

OSD has not yet developed a comprehensive defensewide plan that would unify and blend the services' distance learning efforts so that distance learning technologies are developed, managed, and used in the most efficient and cost-effective manner. OSD stated in its March 1997 report that the Deputy Secretary of Defense had directed the Under Secretary of Defense for Personnel and Readiness to report by September 1, 1997, on how to proceed in defining the total investment to build and maintain the infrastructure for distance learning and the benefits and savings associated with this investment. The steps to be outlined in the OSD plan were expected to further define the key decision items that require top-level support to successfully implement distance learning initiatives across DOD. An OSD official informed us that as a foundation to meeting that end, DOD and the White House Office of Science and Technology Policy began a collaborative effort in November 1997 with other federal agencies, academia, and the private sector to explore distance learning on a broader scale. This group agreed to undertake the "advanced

---

[5]Distance Learning in the Department of Defense, Office of the Under Secretary of Defense for Personnel and Readiness, March 1997.

distributed learning initiative" which will address distance learning requirements for both the private and public sector.

Service officials stated that the services have reached the point at which departmentwide guidance is needed to better focus their initiatives. The December 1996 report by the Institute for Defense Analysis recommended that DOD prepare a defensewide action plan for distance learning that fully capitalizes on the opportunities provided by distance learning technologies. This report recommended that OSD, the Joint Staff, the military services, and other defense agencies examine distance learning as it pertains to the total DOD force context–all military services, defense components, and civilian organizations. The report further recommended that the examination should encompass all costs associated with distance learning and improvements in training and readiness. Such information will also be critical if DOD is to effectively put in place management reforms needed to comply with the Government Performance and Results Act (GPRA) of 1993. GPRA requires federal agencies to implement results-oriented management reforms such as strategic planning, performance planning, and performance measurement and reporting.

OSD has sponsored joint service working groups on distance learning and published performance specifications in 1996 for military training products. However, Army training developers said that these specifications and related guidance will not necessarily result in training products that can be used interchangeably among the services. That requirement is essential because many military training courses contain elements that are applicable to every service. For example, some of the information in the Army's action officer's course might be applicable to Navy and Air Force action officers. Navy and Air Force training developers could extract portions of the data from the Army course, if the same or compatible software were employed, to use in developing their own training materials, thus reducing the overall costs and time required for course development. Because the services are not required to use the same or compatible software in early stages of course development, opportunities for the services to share training data might be missed.

QUESTIONS

OSD has opportunities to guide the services' distance learning efforts and could encourage greater sharing of successful approaches, wider consideration of opportunities to share facilities and consolidate infrastructure, and more consistency in determining funding requirements. In addition, greater coordination of distance learning activities throughout DOD would enhance its role in the new advanced distributed learning initiative with the Office of Science and Technology Policy. Therefore, we are asking that you or your designee respond to the following questions concerning the direction of DOD's distance learning efforts within 30 days of the date of this letter:

1. Besides endorsing the Army's distance learning plan as a model for developing and implementing distance learning, does OSD plan to provide additional guidance to the services for developing their respective plans? Will OSD establish a target date by which the other services are expected to have their respective plans completed? What is the relationship between the recently announced advanced distributed learning initiative and the services' efforts to develop individual distance learning plans?

2. Does OSD plan to develop an overarching strategy and plan for implementing distance learning to better focus the services efforts? If so, will the plan include performance measurements and reporting requirements?

3. Does OSD plan to provide the services with guidance to assist them in estimating and documenting the savings that can be expected through the expanded use of distance learning?

4. Does OSD plan to develop guidance on a consistent way for the services to estimate funding requirements for distance learning?

SCOPE AND METHODOLOGY

To determine the status of the services' efforts to develop plans to integrate distance learning into their training plans and strategies, we met with service officials responsible for distance learning planning. We also obtained services' training plans and documents that outlined current and future distance learning activities.

To determine the funding issues related to distance learning, we reviewed the available service plans for implementing distance learning and budget documents. We obtained information on the Army's new account to uniformly identify, track, and manage distance learning funding. The Air Force, the Navy, and the Marine Corps currently do not have such an account; therefore, we were unable to obtain comparable funding data from these services. We discussed funding issues with officials from OSD and each of the services, including active and reserve components, who are responsible for implementing distance learning activities.

To determine what OSD has done to promote interservice efficiencies for distance learning, we reviewed OSD specifications and guidance for training products and data regarding the establishment of working groups to coordinate and facilitate distance learning programs. We discussed this information with officials from OSD and the services. We reviewed information on the internet related to the advance distributed learning initiative. We also reviewed prior studies on distance learning.

We discussed plans for increasing the services' use of distance learning with officials in Washington, D.C., from the Offices of the Deputy Under Secretary of Defense for Personnel and Readiness; the Assistant Secretary for Reserve Affairs;

Army Headquarters; Office of the Chief, Army Reserve; Office of the Air Force Reserve; and Office of Training Technology, Chief of Naval Operations in Washington, D.C. Additionally, we talked with officials from the Army Training and Doctrine Command, Fort Monroe, Virginia; Army Reserve Command, Georgia; Headquarters, Army Forces Command, Georgia; Iowa Army National Guard, Camp Dodge, Iowa; Chief of Naval Education and Training, Naval Air Station, Florida; Headquarters, Naval Reserve, New Orleans, Louisiana; Air Force Distance Learning Office, Maxwell Air Force Base, Alabama; Headquarters, Second Air Force, Keesler Air Force Base, Mississippi; Air National Guard Readiness Center, Andrews Air Force Base, Maryland; Marine Corps Combat Development Command, Quantico, Virginia; and Headquarters, Marine Forces Reserve, New Orleans, Louisiana.

– – – –

We did not obtain written agency comments on this letter. However, we provided a draft of this letter to DOD officials, and they generally agreed with the facts as presented.

We are providing copies of this letter to appropriate congressional committees, the Secretaries of the Air Force, the Army, and the Navy; and the Director of the Office of Management and Budget. This letter and your response will also be provided to others on request.

If you have any questions about this letter, please contact me at (202) 512-5140. Major contributors to this letter are listed in enclosure 1.

Sincerely yours,

Mark E. Gebicke
Director, Military Operations
  and Capabilities Issues

MAJOR CONTRIBUTORS TO THIS LETTER

NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, WASHINGTON, D.C.

Carol R. Schuster
Brenda S. Farrell

ATLANTA FIELD OFFICE

Lorelei H. Hill
Harry F. Jobes
Stacey E. Keisling

(703213)

Ordering Information

The first copy of each GAO report and testimony is free.
Additional copies are $2 each. Orders should be sent to the
following address, accompanied by a check or money order
made out to the Superintendent of Documents, when
necessary. VISA and MasterCard credit cards are accepted, also.
Orders for 100 or more copies to be mailed to a single address
are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 37050
Washington, DC 20013

or visit:

Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000
or by using fax number (202) 512-6061, or TDD (202) 512-2537.

Each day, GAO issues a list of newly available reports and
testimony. To receive facsimile copies of the daily list or any
list from the past 30 days, please call (202) 512-6000 using a
touchtone phone. A recorded menu will provide information on
how to obtain these lists.

For information on how to access GAO reports on the INTERNET,
send an e-mail message with "info" in the body to:

info@www.gao.gov

or visit GAO's World Wide Web Home Page at:

http://www.gao.gov

United States
General Accounting Office
Washington, D.C. 20548-0001