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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

LOGISTICS AND COMMUNICATIONS
DIVISION

DEC 1 1980



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The Honorable Robert B. Pirie, Jr.
Assistant Secretary of Defense
(Manpower, Reserve Affairs, and Logistics)

Dear Mr. Secretary:

Subject: Slow Progress in [Developing the Capability
To Supply Troops Adequately If Fixed Ports
Are Not Available] For Modern Transport Ships
and Tankers (LCD-81-15),

We have reviewed DOD efforts to develop a capability to supply and sustain military forces by offloading sealift cargo over the shore if overseas port facilities were inadequate or denied. Although a requirement for such a capability was recognized as early as 1970, progress toward its development has been exceedingly slow. If presently required, only a very limited capability, using mostly test equipment could be deployed.

Both the Army and Navy are addressing the serious ship offload problems which would be encountered if ports were not available, but not all the problems have been solved yet. Despite the lack of easy answers, we believe DOD could better address these problems if requirements for alternative off-loading methods were quantified.

We directed this review to assessing DOD's progress in developing off-shore cargo discharge systems for modern cargo ships and tankers. We interviewed officials involved in research, testing, and development efforts; and officials commanding existing cargo handling units. We discussed the programs with officials in Army, Navy, and DOD headquarters. We compared current capability with anticipated support requirements if U.S. forces were committed to the European Theater or Persian Gulf Area.

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BACKGROUND

The military has often been faced with having to unload its ships without being able to come alongside piers or docks. They needed this capability during the Vietnam and Korean conflicts and in each of the World Wars. The ships used during these confrontations, however, were equipped with cargo cranes and thus they were more adapted to offshore unloading than are the ships in our present merchant fleet. Although the process was slow and required substantial manpower, it could be done.

Today the situation is different. Modern shipping methods have increased efficiency but have also increased dependence on port facilities to be able to unload cargo. Major ocean carriers have modernized their fleets and have largely abandoned self-sustaining break-bulk ships in favor of non-self-sustaining, and more economical, containerships. ^{1/} The 20- to 40-foot cargo containers carried on the new ships offer numerous advantages compared with the smaller boxes and palletized cargo units used in prior shipping methods, but the new containerships are totally dependent on heavy cranes installed at fixed port facilities for loading and offloading their containers.

Roll-on/roll-off ships have become attractive to the military because wheeled and tracked military vehicles can be driven on and off such ships easily and quickly via the side and stern ramps of the vessel. Because of these features, the DOD plans to use ships of this type for the newly conceived Rapid Deployment Force. However most of these ships, as currently configured, require a pier and ramps for loading and offloading since they do not have cranes onboard to unload cargo over the side of the vessel.

About 200 U.S. tankers in the current merchant fleet are well suited for military use, and their drafts range from 32 to 45 feet. Because of their size, these tankers require greater standoff distances from shore than did the smaller Navy tankers used in the past. They also require

^{1/} Self-sustaining break-bulk ships are equipped with cranes and winches capable of lifting cargo to and from the ship and positioning the cargo in the holds of the ship. Non-self-sustaining containerships do not have shipboard cranes or cargo handling equipment and are totally reliant on port services to unload and load.

either sheltered water or a large, single buoy mooring for offshore cargo discharge. The latter would permit the tanker to adjust its position in response to weather and sea conditions while anchored offshore.

A DOD project to develop a container distribution system was initiated in 1971 under the guidance of a Logistics Systems Policy Committee which was assisted by the Joint Container Steering Group consisting of general officers representing logistic support areas in each military service and the Defense Supply Agency (now Defense Logistics Agency). The Steering Group is chaired by the Director for Transportation and Warehousing policy within the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics). In 1975 the Steering Group was assigned overall coordination responsibility for the Container Oriented Distribution System including the development of logistics over-the-shore operations. A Container Systems Standardization/Coordination Group was established under the Steering Group to provide technical assistance. Work under a 1973 Project Master Plan for a container distribution system continued under these groups. In December 1977, GAO reported that only one of seven projects outlined in the Project Master Plan as necessary for the successful development of a logistics over-the-shore capability was complete. Progress, therefore, was far short of the 1971 expectation that all logistics over-the-shore components would be developed and tested by 1978. In 1977 the target date for the development of a system was extended to 1980.

Since 1977, the seven projects have been redefined into a larger number with more specific goals. Target dates were extended again to various completion expectation dates through 1983. Funding problems have been cited by service project managers as the principal reason delays occur.

CURRENT CAPABILITY CAN MEET ONLY A
SMALL PART OF TOTAL SEALIFT THROUGHPUT
REQUIREMENTS IF OVERSEAS PORTS ARE DENIED

Neither DOD nor JCS has quantified or prioritized the need, but lack of ports would severely limit cargo movement capability. The lack of ports could result from hostile action, or simply from the nonexistence of adequate facilities in certain areas.

The slowdown in cargo movement inherent in an over-the-shore environment is compounded by the fact that the only existing capability is test equipment in the hands of a few organizations.

In May 1979, the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics) requested wartime requirements data for containership discharge. The Office of Joint Chiefs of Staff (OJCS) responded that they support a logistics over-the-shore capability but they did not quantify the need. The Office of the Assistant Secretary of Defense (Program Analysis) also recognized a need but did not specify a desired level of capability. They suggested working with the requestor's staff to develop tentative program goals which could be stated in the DOD Consolidated Guidance for fiscal years 1982-86.

Unloading Containerships In A Non-Port Environment

We examined logistic plans and studies for major scenarios in Europe and the Persian Gulf, and compared the projected resupply requirements with demonstrated over-the-shore capability. We found that requirements were so far greater than existing capability under even the best conditions that over-the-shore discharge of containerships could satisfy only a small part of daily resupply tonnage requirements.

Over-the-shore unloading methods are much slower than unloading containerships at a fully equipped port. Modern ships at pierside can load and unload 1,000 containers a day whereas over-the-shore methods can unload less than 300 containers a day. In tests during 1977, the Army demonstrated a capability to offload 265 containers a day over the shore. The Navy, using mobile cranes on the decks of containerships, attained a 250-container-per-day capability. This over-the-shore capability represents the best results attained in near-perfect weather conditions. Furthermore, since backup equipment is not available, the services must assume that all equipment is successfully deployed, operationally ready, and not damaged during operations. The services must also assume calm weather conditions, relatively calm seas, and no hostile action.

We should note that even the limited over-the-shore capability would still be over three times faster than unloading the old style break-bulk ships under similar conditions and would require only one-third the manpower.

Unloading Tankers In A Non-Port Environment

With regard to offshore discharge of bulk fuel, neither the Navy nor the Army can discharge the larger tankers, but the Navy is progressing toward a solution. The Navy is developing an offshore fuel system designed to alleviate the problems of

unloading larger tankers as well as transferring and storing greater amounts of fuel. This system, which is scheduled to be operational by fiscal year 1984, will utilize a single buoy mooring system that will permit tankers to discharge fuel even in fairly rough seas.

Currently the Army has a limited capability for offshore fuel discharge of 864,000 gallons a day but cannot accommodate the larger deep draft tankers. Preliminary estimates of fuel requirements for the Rapid Deployment Force run as high as 4.1 million gallons a day. The requirement for this recently emphasized force has not been validated, but the estimates provide a clear indication that the Army's offshore discharge capability would not meet current and future demands.

Unloading Roll-on/Roll-off Ships In A Non-Port Environment

The anticipated advantages of roll-on/roll-off ships would be lost if deep draft berths were not available for offloading. Neither the Army nor Navy has capability to offload these ships over the shore. The Navy hopes to develop such a capability using a dual approach. One method would employ military bridging sections to connect the ships with causeway sections and allow vehicles to be driven off. This approach has been judged by the Navy to be possible only in calm waters such as sheltered harbors. The second approach would use cranes to lift vehicles and other cargo off the ship in a manner similar to the procedures under study for non-self-sustaining containerships.

Programed research for the roll-on/roll-off offloading system has been delayed for lack of funding, according to Navy officials, and testing of the concepts discussed above have not yet occurred. Until a system is developed, DOD lacks assurance that the roll-on/roll-off ships slated to be used by the Rapid Deployment Force or in follow-on resupply operations will be able to unload efficiently off shore. The Military Sealift Command has three of these ships under charter; two are already loaded and are positioned to support the Rapid Deployment Force. In addition, the Command operates two such Navy ships. The U.S. flag fleet includes 20 of this type ship. We do not question that these ships possess many military advantages, but the lack of a system to offload them if ports are not available makes their usefulness uncertain.

ARMY AND NAVY COULD BETTER
COORDINATE THEIR DEVELOPMENT FOR
UNLOADING CONTAINERSHIPS IN NON-
PORT ENVIRONMENT

The Army and Navy have coordinated over-the-shore discharge of containerships in many aspects of testing and study as evidenced by the previously cited joint tests. Some efforts, however, have been unilateral. For example, both the Army and Navy have been developing an offshore system for unloading non-self-sustaining container ships.

The Navy has developed an offshore discharge system consisting of causeway sections that can be used in both the Navy and Army operations. Causeway sections can best be described as floating barges which can be lashed together forming roadways. Part of this system involves elevating the causeway to form a fixed pier which can support a crane capable of lifting vehicles and containers from literage type vessels or floating causeways. Other causeway sections and barges could be used to bring the cargo directly to the shore where it would be unloaded by forklift vehicles. The Navy envisions transferring containers from the ships to the floating causeway sections by use of cranes temporarily mounted on another ship which would anchor and operate alongside the containership. This system, if tested and approved, would replace an alternative system which envisions the use of mobile cranes placed on the deck of the containerships. Causeway sections may be deployed to a theatre by Navy LST ships or they can be carried on commercial barge carrying ships.

The offshore unloading system developed by the Army employs a large crane secured on a barge anchored alongside the ship to transfer containers from the ship to an air cushioned vehicle or amphibious literage craft which then ferries cargo to the shore. The Army has already initiated procurement of air cushioned vehicles (LACV-30) which can carry one or two 20-foot containers at a time, depending on container weight.

The Army system is not easily deployable. In fact only three ships with U.S. flag registry are capable of transporting the barge and crane used in the system. The ships--Lykes Brothers, Seabee ships--are large barge carrying vessels with a stern elevator. Since they are active in commercial trade, their immediate availability cannot always be assured.

The Navy program appears to present a preferable system which is easier to deploy and is more stable. Very recently, the services have begun discussion of adopting a single off-loading system for containers, and joint planning between the Army and the Navy is currently underway to expand the Navy program to include Army needs. Such coordination and planning offers considerable advantages.

If the Army followed the Navy in an over-the-shore discharge of containership operation, it would be advantageous to use and build on the system already in place rather than deploy and set up another method of operation. Such a concept would require the additional assets for the Navy to be able to leave its system in place for Army use while possibly deploying to another location to set up another system.

The Navy system would not require use of the air cushioned vehicles the Army is buying nor would it require the Army crane-on-barge operation which is difficult to deploy. If the Army were to adopt the Navy methods of providing over-the-shore discharge of container ships, the Army could then begin operations at an earlier date and could build and improve upon the Navy structures as operations continue.

GAO recommended that the Army not commit procurement funds for the air cushioned lighterage vehicle (LACV-30). ^{1/} We reported that the Army had not done a cost and benefit analysis between the vehicle and an amphibious craft (LARC-LX), to determine if on-hand assets could meet amphibian watercraft requirements. We questioned the procurement because the Army did not know firm requirements and did not know the true performance of the air cushioned vehicle.

A contractor charged with evaluating the joint tests also noted, in a January 1979 report, major concerns which created questions as to the air cushion vehicles' viability. Their report questioned:

--load limitations less than the rated 30-ton capacity.
Heaviest loads carried during the joint tests were between 22 and 23 short tons.

^{1/} GAO Report "Better Planning and Management of Army Watercraft Could Improve Mission Capability While Reducing Excess Number and Costs (LCD 79-419, August 2, 1979).

--fuel consumption average of 130 gallons per hour, which is about five times as much fuel as that required for conventional lighters.

--adverse effects of blowing sand, dust, and salt water on personnel and equipment.

Since neither the Army nor the Navy yet have adequate capability for sustained over-the-shore container operations (existing capability is mostly limited to test equipment), now would be a good time to promote greater sharing of equipment between the systems proposed by the Army and Navy. The result would be an interservice logistics over-the-shore system which could be faster to deploy and easier to expand.

CONCLUSIONS AND RECOMMENDATIONS

Defense efforts to alleviate the serious shortfalls which would result if overseas ports are denied face considerable--and not easily solvable--problems. We believe, however, that clearer guidance by DOD and JCS would assist Army and Navy development efforts. Without quantified time phased requirements, the Army and Navy efforts are open-ended. Further, without specific goals, Army and Navy planners cannot readily determine if their planned systems can hope to meet foreseeable needs, or whether entirely different approaches are required.

If the Army mission in fact follows the Navy mission in DOD and JCS planning, then it would seem logical that planned Army methods should make use of Navy facilities. Greater coordination in planning and procurement could help make the Army and Navy systems more compatible.

We recommend that you enhance Army and Navy coordination by providing additional guidance for logistics over the shore in the Consolidated Guidance on Defense. You should

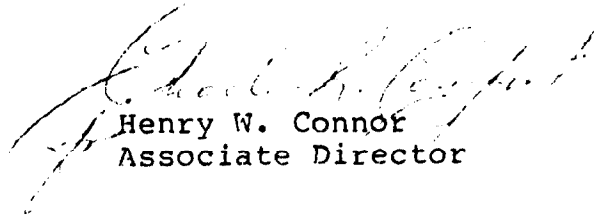
--review time phased requirements for the major scenarios to determine needs;

--prioritize requirements if overseas ports are denied, and quantify those requirements for containers, roll-on/roll-off cargo, and bulk fuels; and

--use the above information to set specific goals for Army and Navy development efforts, including the desired degree of interoperability between their systems.

Please advise us of any thoughts on the matters discussed and of any actions taken or planned in response to our recommendation. We would be glad to further discuss this report with you or your staff.

Sincerely yours,



Henry W. Connor
Associate Director