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If we were directed to make a large amphibious landing anywhere in the world now or in the next few years, the one thing that the Navy and Marines can be sure of is that civilian-manned and civilian-owned ships will be a part of the force. It does not matter whether the troops to be landed constitute a Marine Amphibious Force (MAF) or a smaller Marine Amphibious Brigade (MAB) or whether maritime prepositioning ships will be included; civilian ships *will be* there. However, and this should be neither a secret nor a surprise to any of us, we are unprepared to put those ships to efficient use. The reason for this situation is that adequate planning procedures simply do not exist for the Commander Amphibious Task Force (CATF) to incorporate civilian ships as elements of his task force.

Some of the ships involved in amphibious operations will probably be manned and operated by the Navy's Military Sealift Command (MSC). Their crews will be more or less familiar with naval requirements and Navy ways. Moreover, they will have some of the equipment, such as radios, necessary to work within a naval force. While the other ships, those taken up from trade, will likely have few people or none familiar with the ways and needs of a naval force, and no compatible equipment to help them out. To keep our minds focused on the facts that these will be civilian mariners sailing in commercial or commercial-type ships, we will refer to them as civilian ships. To the extent any of them will be MSC mariners in MSC ships, that will be all to the good.

In the years since it became plain to us that we would have to depend, at least in part on civilian ships, the terms "assault echelon" (AE) and "assault follow-on echelon" (AFOE) have crept into our lexicon. For forward deployments in peacetime the situation has not been critical because we generally have had enough amphibious ships of the right types to satisfy our needs. And, because it was done slowly, even the introduction of Marine forces into Vietnam 20 years ago could be carried out totally in amphibious

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ships. Our discussion will focus on this available shipping and how the CATF must manage it in order to deal with five distinct activities in carrying out an amphibious operation—planning, embarking the force, rehearsing the men, moving the force to the objective, and making the assault.

But, let us look at the circumstances of today's amphibious commander, in which we will assume that both commercial and reserve ships will be made available to the CATF when he needs them.

Planning

The initiating directive will direct the CATF to conduct an amphibious operation—i.e., it will assign him a mission and provide him forces to accomplish that mission. It also will establish command relationships for the operation. Let us assume the landing force is a notional MAF of the following size:

Element	Assault Echelon (AE)	Assault Follow-on Echelon (AFOE)
Troops (includes Naval Support Element)	39,400	19,000
Cargo—Square (ft^2)	770,000	763,000
Cargo—Cube (ft^3)	1,750,000	5,507,000
Bulk POL (bbl)	packaged	1,179,000*

One can see that the AFOE contains roughly one-third of the personnel, one-half of the square and three-quarters of the cube of the landing force. The notional amphibious lift for the assault echelon of a force of this size would consist of 23 helicopter-capable ships, 13 well deck ships, 15 LSTs, and 4 cargo ships. Depending upon the mix of LHAs, and LPHs and LPDs, one can assume the presence of some dual-configuration ships, but these figures assume a best case availability. Correspondingly, it would take about 30 MSC ships including (for the best case example) 7 troopships, 1 aviation support ship (TAVB), 1 crane ship (TAC), 4 LASH, 9 container, and 4 each of roll-on/roll-off (RO/RO) ships and tankers to complete the lift of the landing force. In a crisis requiring a MAF-size landing, it is fair to assume that other theaters would be active and competing for resources so there probably would be no guarantee that a local amphibious commander could get the optimum force. Furthermore, the requirement for 9 containerships assumes the containerization of landing force supplies at 70 to 75 percent. Realistically, one can assume a ship mix that will include a combination of container and old-style breakbulk cargo ships.

*U.S. Navy Dept., *Marine Air-Ground Task Forces (MAGTF)*, NAVMC 2710 (Washington: 1982), p. 11. See also same document, 1983 ed., p. 11. See also G.D. Hendrickson, "Commercial Ships in the Amphibious

A more pressing consideration for the CATF than the breakbulk/containership mix is the available small troop lift in the U.S. commercial fleet. Aside from state maritime academy training ships, the United States has only 8 passenger and combination cargo/passenger ships, totaling 5,195 berths, in inventory. There are also 14 World War II vintage AP-class and 10 Victory-class troopships in the National Defense Reserve Fleet (NDRF), but the material condition of these vessels and their ability to sustain their designed speeds (19 and 16.5 knots) at their ages is questionable.* Each of these ships would also require from 30 to 90 days for reactivation.

The British experience in the Falkland Islands leads one to assume that, given the time, some or all of the operating passenger ships and passenger-cargo ships could be modified to increase their troop capacity by a factor of four. But such an improvement of berthing capacity alone, without corresponding improvements in tactical debarkation capability via helicopter or landing craft, would be of little value. The imposition of these restrictions would necessitate that the CATF expedite the establishment of an airhead in the amphibious objective area. Such an airhead should be capable of landing C-130 aircraft carrying AFOE personnel previously flown into the theater on strategic airlift. Correspondingly, until the Navy and Marine Corps have developed and fielded enough container offload and discharge systems, the urgent need for the CATF to secure a port for unloading containerships assumes an importance which is directly proportional to the number of containerships in the AFOE lift.

Mustering the Ships. Given the commitment of forces to more than one unified command operation plan, a large amphibious operation will involve swinging assets between Atlantic and Pacific Fleets. Who gives and who gets will depend upon the strategists in Washington. Just as the CATF must know the composition of the Assault Echelon to determine the optimum and limiting mixes of amphibious ships he needs to support the assault, he must know the composition of the AFOE so that he can acquire the best ships to do that job. Both the amphibious and civilian ships will be embarking personnel, equipment and supplies at numerous locations. The civilian ships will probably be loading at established ports, but such a limitation will not affect the amphibious ships. To ensure that the CATF does acquire the best combination of ships from MSC, he needs to know the landing force's vehicle square and cargo cube. He must also consider the capabilities of the various types of commercial shipping. Similarly, he must be familiar with some important differences between naval and commercial vessels and the philosophies for operating them.

*U.S. Navy Dept., Military Sealift Command, *Ship Register* (MSC P504) (Washington: 1985), pp. 18-37.

Merchant Ship Suitability. There are five broad types of commercial ships which can be employed in support of an amphibious operation: passenger; combination cargo/passenger; general purpose (breakbulk); intermodal (container, RO/RO, LASH); and tanker. Each type has its own qualities, and these influence its value to amphibious operations. The positive qualities to all, except for some tankers, are speed and endurance, while negative qualities common to all are poor communications, inadequate damage control, little or no ability to replenish underway, and in the case of LASH and Seabee ships, the need for barge tug support.

Merchant ships are designed to optimize their cargo-moving efficiency in point-to-point transits. Efficiency for such operations mandates design tradeoffs between speed and cost to optimize profit. A commercial operator's priorities recognize the ship's safety first, followed by the cargo's integrity, and finally the timeliness of its delivery. For these reasons it would be acceptable to the owner for one of his ships to go dead in the water to repair a casualty rather than to risk greater financial hazards by pressing on with a damaged ship. In contrast naval ships are designed to go in harm's way to survive damage up to a point, and carry on with the mission. A *Charleston*-class LKA, for example, might survive the flooding of two or three compartments. In contrast, a subsidized cargo ship need survive the flooding of only one compartment. Damage which penetrated a watertight bulkhead would probably result in the loss of such a ship.

Moreover, unlike amphibious ships, commercial vessels can transfer little cargo while at sea. Some can transfer none at all. This means that a ship damaged so she had to turn back might take away with her items essential to success of the operation. (An obvious solution to this problem, of course, is to spread key items among several ships.) Late changes to the mission could also affect the scheme of maneuver ashore if the essential cargo could not be shifted and reconstituted.

Because merchant ships have no cargo handling or hatch crew personnel, such people must come from the Naval Cargo Handling and Port Group (NAVCHAPGRU). But cargo ships have no berthing for such people either. So, NAVCHAPGRU personnel must be carried in other ships, live in other ships, or be flown to meet the merchant ships wherever their cargo must be worked. Merchant ships do not have medical facilities either, much less doctors, nurses, or corpsmen. Finally merchant ships cannot defend themselves.

Special Considerations. There are some critical issues that the CATF must address if he is to integrate civilian shipping effectively into his amphibious operations. I believe there are five that are of primary concern: mine countermeasures, convoy operations, troop embarkation and habitability, electrical matters, and the termination of operations. While this list may not be

inclusive, it includes in my judgment all those that, if ignored, could cause significant problems in the assault and subsequent operations afloat and ashore.

Until the Navy developed airborne mine countermeasures systems, the landing forces faced virtually no competition for helicopter-capable amphibious shipping. Now, given the number of CH-53-capable amphibious ships, the possible threat assessments, and the projected mine countermeasures (MCM) assets required under certain scenarios, the CATF may have to designate an MCM ship at the expense of embarking elements of the landing force. Since sweeping operations involve not only a helicopter deck but also a wet well deck, the addition of MCM forces can force the CATF to shift some equipment best carried in amphibious ships to civilian ships. For example, Naval Beach Group equipment normally requires embarkation in amphibious shipping to assist in offload of both the AE and AFOE. The CATF should consider, if necessary, shifting some of this equipment to a LASH ship since that is one of the two types which can preboat barges for subsequent tactical unloading ashore. He could also consider loading air mine countermeasure sweep equipment in literage which, upon approaching the amphibious operation area (AOA), could be tethered alongside MCM shipping not equipped with a well deck. The LASH also can lift up to 28 supplemental landing craft.

Early in his planning the CATF should make the decision whether to sail the civilian ships to the amphibious operating area in convoy with the amphibious shipping. When faced with the large number of civilian ships needed to lift the AFOE and knowing that ships in the assault echelon carry a substantial amount of supplies, the obvious, logical, and yet *incorrect* decision is to allow the AFOE shipping to proceed independently—providing that it arrives before the ships in the assault echelon run out of the necessary stores. Some elements of the AFOE may be required as early as D+1, but the CATF should not gamble on simultaneous arrival of both groups. Moreover, if en route cargo reconstitution is required, it will have to be a last minute evolution if the AFOE is not steaming with the ATF. Further, it may develop that subordinate landing force headquarters elements requiring early landing may have to be embarked in these ships.

The major advantages and disadvantages of convoy operations are well known. But not so well known is the implicitly higher total cargo value of any of today's large commercial ships compared to those of World War II convoys. The CATF must weigh carefully the potential impact upon the operation ashore should he lose even a single ship such as a large RO/RO vessel carrying a major portion of the landing force's equipment. It will be shown later that moving the civilian ships in the AFOE to the objective with the ships of his amphibious task force will provide the CATF a valuable opportunity to assess the capability of his civilian ships to operate tactically with the task force before the assault.

In making the convoy decision the planner must remember that the basic objective of a convoy is to maintain the combat effectiveness of naval forces and ensure the safe transit of the maximum tonnage. In considering the availability of escorts for this force the CATF must also weigh the available opportunities for merchant ships to defend themselves. The most obvious choices are either to embark elements of the landing force's forward antiair defense battery or to augment units embarked with Stinger missiles. During the Falkland Islands conflict, British troops embarked in transports mounted and fired machine guns from the decks. Their substantial volume of tracer fire reportedly had some deterrent effect on pilots attacking at low altitudes.

A major tactical disadvantage to the use of civilian shipping in amphibious operations is their lack of troop berthing. This separates sailors and marines from their equipment and drivers from their vehicles; it forces pre-H-hour transfers. Undesirable as this evolution is under any circumstances, it is further aggravated because merchant ships lack helicopter decks. Hence, the transfers must be made by landing craft. If it is at all possible, "quick fix" helo decks should be installed on civilian ships. Again, the British showed how rapidly this can be done.

Transfers by landing craft are naturally very sensitive to sea state conditions. Most cargo ships and vehicle transports presently in service have accommodations for 12 passengers. Though this small number could quickly be multiplied by four, that would still leave each ship grossly short of driver berthing capacity compared to the number of vehicles that she could lift. When coupled with the number of hatch crew and boom operators required from the NAVCHAPGRU, the berthing shortage becomes critical. While some actions can be taken to provide men with crude shelter, and might be lightly regarded as the work of resourceful marines making the best of a bad situation, the fact remains that it is a bad situation. Yet, there is no budget priority to equip even a few ships with troop berthing spaces. Containerized berthing systems have been investigated but there has been no major testing of such systems.

The CATF must also pay attention to medical matters, specifically three items. These are medical support for the civilian crews, hospital ship support for his amphibious operation, and combat fleet hospital support for his entire force. The first should be of significant concern during the movement to the objective area. It may be solved by marines of the landing force who will have organic medical support embarked with them. In the event that the very old mothballed transports in the NDRF are activated, at least notionally, each would be staffed by a doctor and nine hospital or Nurse Corps personnel. In any event, the CATF's staff should become familiar with the appropriate naval medical instructions concerning treatment of civilian ship crewmen.

A hospital ship supporting the amphibious task force must conduct its operations in accordance with the Law of Armed Conflict. The CATF must

make arrangements for his hospital ship's operations in relation to his overall scheme of maneuver, not only for legality under the Geneva Conventions but also to ensure that the ship's protected status is not endangered. In the Falklands the British and Argentines faced some interesting problems with their hospital ships and came up with some novel solutions.

Finally, fleet hospitals are bulky. For ease of loading, unit integrity and where there is no threat, each should be loaded in a single ship. In his planning the CATF should consider the en route threat and weigh the risk of losing an entire hospital against the efficiency of unit integrity.

It is as the end of his operation nears that the CATF must decide what to do with his civilian ships. It is possible, for example, that the operation could be ended and the amphibious shipping be directed to sail on to another one before the civilian ships are unloaded. In such a case he must decide which, if any, landing craft he will leave behind to continue the unloading. He will also have to decide on a boat haven for such craft. His Naval Beach Group and NAVCHAPGRU must remain until either the Marines' Force Service Support Group is fully operational ashore or the Army has taken over the beach and port operations. Lastly, the CATF may have to protect civilian ships as they depart or he may be directed to pass such responsibility to another commander.

Communications. The communication systems of commercial ships are primitive by Navy standards. In contrast, MSC nucleus fleet ships have good communications capability. Unfortunately, they are there chiefly to help provide underway replenishment. Be that as it may, the appropriate doctrinal and technical publications provide instructions on the specific radio nets and equipment to be operated by MSC ships in support of amphibious operations.

Nuclear, Biological, and Chemical Defense. While the Military Sealift Command provides for delivery of NBC defense equipment and medical supplies to ships in the Sealift Readiness Program (SRP), information on the subject is scarce. Since those ships would not be activated until others had been put to use, perhaps it is reasonable to assume that, if the threat assessment warranted it, the Sealift Command could provide NBC defense equipment for those ships supporting an amphibious operation. By itself, the equipment is useless, the CATF must be certain that the ship's crew are adequately trained in its use prior to sailing. If this is not possible, he must see that the training is conducted en route, either as part of rehearsals or during tactical operations while steaming.

Embarkation, Rehearsal, Movement, and Assault

Embarkation. While "gator sailors" and Marines have become very proficient at rapid embarkation in amphibious shipping, no CATF should expect his

civilian ships to do it equally well. For example, individual MSC and chartered ships have no loading characteristics handbooks. Notional handbooks are being introduced, but embarkation officers will not know the size of their task until their particular ship arrives at the pier. While appropriate publications address such individual tasks as welding padeyes, one should also be ready for the time- and labor-intensive task of making up lashing and cribbing from scratch. Further, while certain loading procedures and operations may be permissible on Navy ships, they could be prohibited on merchant vessels unless waived by the Coast Guard. In a practical sense, the degree of urgency would dictate the latitude taken in conducting what normally would be considered prohibited loading operations.

Rehearsals. Rehearsals serve four purposes: they test adequacy of the CATF's planning, the timing of his operations, the combat readiness of his force, and whether he and his units can communicate amongst themselves. Given the difference in communication capabilities of Navy and civilian ships, the CATF who fails to include the latter in his rehearsals does it at his own peril.

Movement to the Objective. For the landing force the movement to the objective is a period of final preparation of men and equipment—weapon test firing and final issuance of orders to subordinates. The amphibious task force may steam in a formation similar to that to be used in the assault or in one from which it can easily deploy into final formation for the assault. Since the task-organized force has been drawn from various sea service components, the individual ships may not previously have operated together. Therefore, it is useful for ships of the task force to perform tactical rehearsals that can be incorporated into their transit. Civilian ships steaming in convoy with the ATF can exercise and improve their abilities to operate during the assault.

Assault. The critical element in the amphibious assault is the rapid buildup of combat power ashore. Two operations in which civilian ships will participate are general unloading from the transport area or selective unloading from the sea echelon area. These ships must be ever alert to use what defensive measures are open to them, such as keeping their screws turning over slowly and veering and heaving around on anchor chains. If it is planned and executed properly, the unloading should be a fast paced but yet anticlimactic evolution for the CATF and his staff.

Implicit in this paper is the simple fact that the scale of amphibious operations has changed for the U.S. Navy. It would be naive for any sailor or marine to believe the days of a total haze gray ATF will ever be seen again except on the smallest scale. It therefore behooves all who participate in amphibious warfare to learn all they can and train as often as possible with civilian shipping in amphibious operations. It's the only game in town.