ADVANCED AMPHIBIOUS ASSAULT (AAA) PROGRAM: AN EARLY CONSIDERATION OF REQUIRED TRAINING SYSTEMS

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ABSTRACT

A recurrent criticism of most major weapon system acquisition programs has been that training system requirements have been an afterthought. The result has often been catch-up, shotgun approaches to training development, which often do not respond to the total training requirement. Extensive support funding is often expended on the use of actual equipment for training and many key operator and maintenance tasks are never thoroughly trained. As part of a more timely attention to training matters, this paper presents an initial view of the future training requirements for the Advanced Amphibious Assault (AAA) Program. Since the program is in the Concept Exploration Phase, it is clear that the training system requirement will evolve and be further refined. However, the intent of this paper is to start the training requirements definition process early enough to involve both government and industry in the design of efficient and cost-effective solutions to the future AAA training challenge.

INTRODUCTION

The purpose of this paper is to describe initial training challenges arising from the evolution of early advanced amphibious assault (AAA) design concepts. In order to fully understand the training issues associated with the AAA, some key aspects of the overall program must be reviewed and developed. Hence, this paper is organized into two parts. First, the over-the-horizon (OTH) challenge will be addressed since this challenge forces most of the design parameters of the proposed weapon system, which in turn dictates the skills that must be trained. Secondly, the training system/simulation requirements that are known at this early stage will be presented.

OVER-THE-HORIZON CHALLENGE AND DESIGN PERFORMANCE PARAMETERS

The OTH concept is complex and involved. However, the comments in this paper are limited to the essential information required for an overview. The emphasis on maritime strategy and power projection from the sea will continue to focus the Marine Corps on maintaining expeditionary, quick-hitting forces capable of conducting amphibious operations at all levels of conflict. The requirement to maintain a forcible entry assault capability is vital in maritime power projection. During the 2019-2020 time period, the amphibious assault will remain the principal means of power projection onto a hostile shore.

The evolution of OTH amphibious operation results from the Navy's realization that its ships can be extremely vulnerable to modern surface-to-surface and air-to-surface weapons systems and mines. Off-load of the landing force within visual range of the beach not only exposes the surface waves to increasingly lethal fire, but decreases the maneuver space and reaction time critical for the Amphibious Task Force (ATF) to defend itself from sophisticated air, surface, and subsurface threat systems.

Extending ship operating areas beyond the visual horizon improves the survivability of the ships and increases the opportunity for tactical surprise. The mobility inherent in the amphibious ships, combined with the expanded standoff distance, enables the ATF to threaten an expanded coastline, thereby diluting the enemy defense by creating uncertainty about the intentions of the landing force. The capability to assault this expanded coastline resides in the speed of the Landing Craft Air Cushion (LCAC), Helo-aircraft, and the AAA in delivering the assault elements of the landing force against a widely dispersed mobile defense. In this case, the standoff distance of the ATF enhances the survivability of the ships, while the speed of the ship-to-shore movements exploits the threat's inability to adequately defend every potential landing site.

Forcible entry by surface and helo-borne means will be required. Successful amphibious entry assault will depend on the speed and self-protection features of the ship-to-shore systems in order for the assault elements to survive the indirect/direct fire and mines which may be encountered at the beach and beyond. Utilizing a maneuver style of warfare, operations will be mounted against "objectives" defined in terms of threat capabilities which may reside in systems or units. However, the prerequisite of a secure beach that facilitates the logistical buildup for the assault on a physical objective will not be necessary. The mobility and firepower of tactical systems will enable the landing force to converge on its objectives; i.e., threat capabilities, along multiple axes by air and surface means. This will compound the threat's acquisition and targeting problems and deny him the opportunity to attack immobile forces.

Just as amphibious warfare is at the threshold of achieving a major change in the form of OTH assault tactics, so has the amphibious vehicle, as we know it today, reached a significant crossroad in relation to its past.

Up to now, amphibious tactics had not radically changed since World War II; however, the current requirements that the OTH doctrine represents is a distinct challenge. Unlike tanks and artillery, where changes in technology and employment have proceeded in a steady and measured pace over the past 45 years, the new amphibious requirement pushes the application of current technology. The current OTH doctrine embodies both substantial sea and land requirements which include providing high-speed transport of Marine assault forces from amphibious ships located OTH to inland objectives, and providing armor protected, land mobility, and direct fire support to Marine infantry during combat operations ashore. These requirements translate into the following operational characteristics to support the OTH mission:

1. Water speed greater than 20 miles per hour.
2. Capacity to carry reinforced rifle squad (17-18 Marines).
3. Armor protection against heavy automatic weapons, antipersonnel mines, and artillery fragments.
4. Offensive firepower to defeat all light armored vehicles of the timeframe.

THE ADVANCED AMPHIBIOUS ASSAULT VEHICLE (AAAV) AND INITIAL TRAINING DEVICE REQUIREMENTS

The best way to describe the AAA program is "a search for," and the evaluation of potential solution(s) which will resolve the deficiencies in our current system (AAV7A1) to meet the above listed operational characteristics. A variety of potential solutions have been identified and are being studied. Some examples of potential solutions include: non-amphibious vehicles carried ashore via high-speed crafts/sled; self-deploying, high-water speed amphibious vehicles (both old and new); and other methods of ship-to-shore movement (such as landing the entire force by air).

These candidate solutions are undergoing initial evaluation based on operational suitability, technological feasibility, and common sense. This multifaceted effort is coordinated by Direct Reporting Program Manager - Advanced Amphibious Assault with technical assistance provided by the Center for Naval Analyses and selected Naval laboratories. The preferred system/solution will then be formally presented to the Defense Acquisition Board (DAB) review at Milestone 1. Figure 1 indicates the current AAA program schedule.

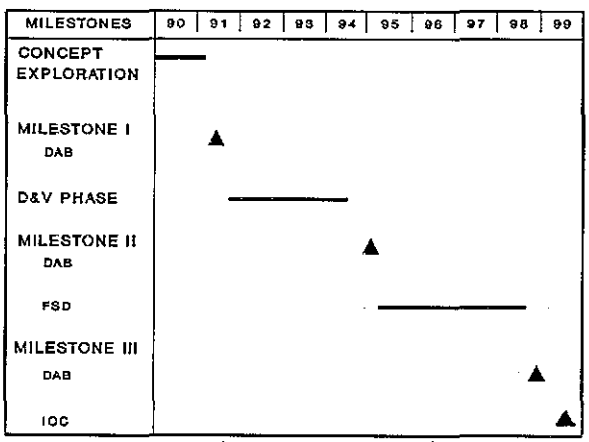

FIGURE 1. AAA PROGRAM SCHEDULE

Of all the potential solutions being considered for the OTH challenge, the one which has generated the most interest, both inside and outside the Marine Corps, is the self-deploying, high-speed amphibious vehicle option. This specific project within the AAA program, commonly referred to as the Advanced Amphibious Assault Vehicle (AAV), is arguably the highest payoff

candidate system being considered. It is certainly one of the more technically challenging options and the one that has, comparatively speaking, the least amount of empirical data readily at hand. It also provides some of the greatest training system opportunities.

Even at this early stage in the AAAV program, it is possible to discern, at a macro level, the requirements for several types of training devices which have not been required for previous amphibious vehicles.

Initial Training Device Requirements

The AAAV crew of the twenty-first century will drive a high powered, fast water vehicle with the aerodynamics of an airplane. The interaction of speed, wind, current, waves, and sea spray will push the capabilities of the driver and crew. Accurate communication and navigation updates will be required within each vehicle, formation, and tactical group (i.e., ship, AAA, LCAC, infantry ashore). Once ashore, AAA crew/infantry coordination must support fast moving battle plans. The bottom line is there will be a minimal margin for error. Split second responses and on-going corrections will be a necessary ingredient for a successful mission. It should be obvious to anyone that these factors promote specific questions regarding the use of the advanced simulation and training systems in the training concept. At present, there are indications of some key training challenges which are emerging concurrent with the analysis of alternative weapon system design concepts. The following is a listing of the known areas that will probably require simulation as part of an overall training concept.

Emergency Evacuation and Procedures

Emergency evacuation and emergency procedures will be a key challenge. A worse case scenario must include the probability of an emergency evacuation from a sinking vehicle. The training requirement and appropriate training device would probably mix approaches used by aircraft, submarine, and off-shore drilling training programs. An initial design and training device mix issue is: What will support emergency evacuation and emergency procedures training for both the crew and the embarked infantry?

Crew Operations in Night Environment

Night operations provide a key hazard for both operations and training. The night environment will amplify the stress on driver and crew. Because of the danger involved, it is not feasible to train night operations with inexperienced personnel. It is clear that some type of simulation mix will have to be developed to prepare both driver and crew for the danger and confusion associated with night operations. The problem will mix both navigation and communication problems because the crew will need to safely transit the ocean for 25-50 miles at night in some type of formation to a predetermined landing site.

Weapon System Training

A preliminary review of amphibious operations indicates that turret operation procedures are among the "highest drivers" in regard to operator workload. Crew coordination training in the weapons area is one of the most difficult areas to train and to sustain. This problem is intensified by the deployment aspect of amphibious operations. It is clear that some type of simulation solution will be required for initial and sustainment training. The requirement will be for crew coordination training at sea and crew/infantry coordination on land. Given the early indication of this requirement, it is hoped that industry will give considerable thought to simulation solutions that are effective, affordable, and have update capabilities.

Emergency Maintenance Procedures Training

Emergency return to readiness is an issue which will provide the AAA team the margin to successfully complete its mission. The Program Manager's Office will be working on an AAA design which can be rapidly repaired by the crew in emergency situations. The Marine Corps will need to know what type of training mix and training approach will enable a deployed crew to retain this submarine type "damage control" capability.

Emergency Medical Training

The following is not pleasant to contemplate, but it is a real concern. What happens to an amphibious operation if the crew and embarked infantry become seasick? This issue is being addressed concurrently with the development of the AAAV design concept. Some approach will need to be developed to ensure that the drill and practice associated with emergency medical training is not just a once-a-year aspect of a checkoff sheet. Additionally, all that is known about motion sickness and simulator sickness must be brought to bear on training for this contingency.

Mission and Tactical Planning Training

The Marine Corps is a manpower vice equipment intensive organization. This means that the success of any amphibious operation can not be dependent on supplementary equipment. Just like any athletic team, success is often based on how well the team is drilled in the basics. In this regard, tactical planning will be an emphasis area. As part of this problem, the vehicle commander must have a keen understanding of mission and load planning--what he needs to take with him to accomplish his mission depending on the tactical situation.

Embedded Training and Automated Job Performance Aids

Manpower reductions will hit the Marine Corps the hardest in the higher mental categories. The need for embedded training and automated job performance aids to supplement human factors design is clear. An overriding human factors and training concept, similar to that used in the aviation community, needs to be developed to ensure that the operator can organize environmental inputs under extreme pressure and follow the procedures necessary to accomplish his job.

Maintenance Training

For each AAA design concept, the feasibility of the following items are being considered: eliminating intermediate maintenance test equipment, intermediate maintenance technicians, and limiting the number of tools. These will eliminate or decrease the intermediate maintenance requirement, and increase the operator maintenance requirement. An accompanying training strategy will need to be developed to ensure that the operator is trained efficiently at the school and that the required skills are sustained at the Fleet Marine Force Reserve duty stations.

Specialized Training

There are specialized training areas where the training resources are almost never available because of coordination and scheduling requirements. For instance, Navy ships have to be scheduled for embarkation/debarkation training and ranges have to be scheduled for gunnery training. We are not suggesting eliminating the actual training, but some type of simulation solution should be studied to ensure regularity of the drill and practice required to retain essential crew skills.

Simulation Scenarios/War Gaming

The Marine Corps will have an increasing problem in the retention of experienced personnel. This is not to suggest development of a sophisticated A-1 based program to substitute for the experienced instructor. However, the Marine Corps may need development or adaptation of already developed war gaming scenarios to provide the experience of battle gaming for our applied crew/infantry training.

SUMMARY

In summary, the above presents the current AAA program in the context of OTH operations. It is clear that a number of training system challenges are identifiable even at this early stage. Some of these challenges are formidable and effect the overall risk of the program and ultimately the AAA mission. The Marine Corps solicits your best effort in helping to meet these challenges.

ABOUT THE AUTHORS

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