CAPABILITY DEVELOPMENT DOCUMENT

FOR

SHORT RANGE ANTI-TANK WEAPON (SRAW)

Increment: 1
ACAT: II
Validation Authority: USMC
Approval Authority: JROC
Milestone Decision Authority: ASN (RDA)
Designation: Joint Impact
Prepared for Milestone B Decision
30 Nov 2004

Executive Summary: A functional needs analysis has determined that there is an operational requirement for an improved anti-armor weapon to provide higher hit probability and greater lethality than that possessed by the current light anti-armor weapon systems. The Short Range Anti-Tank Weapon (SRAW) will significantly enhance the firepower of units issued the weapon. It primarily will be the weapon of the infantry antitank missileman. A possible future improvement to the SRAW may be a bunker-busting munition to eventually replace the SMAW. The introduction of the SRAW will affect Mission Area (MA) 23, Close Combat. MA 23 addresses those capabilities and support elements related to the use of tactical combat power to locate, close with, and destroy the enemy by fire and maneuver. It includes those efforts of ground and amphibious forces to destroy armored vehicles. Initial Capabilities Document 1.11, dated 20 October 2003, summarizes the results of the DOTMLPF-P analysis and recommends how the SRAW will provide for the desired joint capability. It further includes a description of the operational capability, capability gap, summarizes the threat and details the shortcomings of existing systems.

Revision History: CDD Baseline: 30 Nov 2004

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1. Capability Discussion: Marine forces of the future can expect to be employed at all levels of warfare in geographical areas exhibiting extremes of physical environment and climatic conditions. Although large scale armored and mechanized operations are not typical of the environment in which MAGTFs will most likely be employed, they are integral components of combined arms warfare and cannot be ignored. Those Third World nations whose geography supports the use of tanks and mechanized forces usually have a credible armored and mechanized capability. Determining the optimum mix of tanks and anti-armor weapons in an expeditionary force, which must be ready for employment across the

entire operational continuum, is a critical task. With the increasing importance of the city in both developed and developing nations, a growing segment of military planners has come to agree that future weapons must be assessed to ensure the achievement of tactical goals not only on the conventional battlefield, but also in the urban environment. The SRAW will be integrated into the anti-armor plan, with other anti-armor assets. Its effectiveness is maximized through a coordinated employment plan and well trained gunners. The combat qualities of the SRAW will permit its use as an anti-armor weapon at the Company Team level on all battlefields, including Military Operations in Urban Terrain (MOUT). With its soft launch capability, enabling a gunner to fire from an enclosed space without endangering himself from the back blast, the SRAW provides an added dimension to fighting in an urban environment. The SRAW can be employed by company assaultmen and battalion anti-armor missilemen as an expendable munition.

2. Analysis Summary:

DOTMLPF-P analysis. Several modifications to doctrine organization, training, leadership and education, personnel and facilities have been investigated. No modifications to the above were found to be satisfactory and only a new material solution will provide for the required capability.

Ideas for Materiel Approaches. Several different possible materiel solutions were investigated to include, directed energy weapons, hypersonic missile and shoulder fired tube launched missile and a fixed fired tube launched missile.

Analysis of Materiel Approaches (AMA). The candidates materiel solutions were evaluated and based upon this analysis the directed energy and hypersonic missile were evaluated as not being at the required technology level to support the development time line.

3. CONOPS Summary: Omitted for training purposes.

4. Threat Summary:

a. Potential enemy threats confronting the United States in the near to long-range period are fully developed in the Marine Corps Intelligence Activity System Threat Assessment prepared for the SRAW on 25 April 2001 and updated by a Written Intelligence Report on 22 July 2004.

b. Marine Corps forces could face a variety of threats throughout the world and must be prepared to fight in all climates and terrain. The most probable areas are the Middle East/Southwest Asia, Europe, and Latin America. Potential adversaries would use former Soviet Bloc or Free World equipment and former Soviet organizational and doctrinal concepts, albeit on a smaller scale.

c. Potential threat forces will attempt to locate U.S. forces using an array of active and passive acquisition systems. Radio Electronic Combat is the most likely method of locating USMC forces. Once located, threat forces will attempt to defeat Marine Corps units by fire and maneuver.

d. Threat forces may be expected to use Nuclear, Biological, and Chemical warfare as well as radio electronic means in support of combat operations. Threat equipment includes: rifles, light and heavy machine guns, antitank guided missiles, tank guns and rockets, mines, aircraft delivered ordnance, large caliber mortars, multiple rocket launchers, artillery fire, and possibly directed energy weapons.

e. Key to the threat forces' military doctrine is the mobility, firepower, and protection offered by tanks and armored infantry fighting vehicles that provide them with a decisive means of conducting high

intensity maneuver warfare. This capability has been greatly enhanced by the introduction of the T-80 and T-90 series of Future Threat Tanks II and III with their improved armor protection, power plants, armament, and fire control systems.

f. The capabilities of these weapons, their number, and the manner in which they will be employed could present a serious disparity in combat power relative to the Marine Air Ground Task Force (MAGTF).

5. Program Summary:

The program will be initiated with a Milestone B Decision scheduled for 15 Jan 2005. Following a 3 year SDD phase, operational test and evaluation is projected for Q2 of FY 2008, with IOC scheduled for Q1 FY09. The acquisition objective for the SRAW is 21,012 over 5 years. This includes Pre-positioned War Reserve (PWR) and training allowances, and fields the weapon in the anti-armor platoon of the infantry battalion with the capability of proliferation to all units in a heavy threat environment.

a. Projected weapon quantity requirements: Infantry Battalions - 2 per gunner 24 gunners (regular & reserve)
b. Schools of Infantry - 150
c. The Basic School - 10 PWR - 10,876
d. Training - 952 per year

6. Development KPPs, KSAs, and additional performance attributes:

a. The SRAW must be designed for use by the 5th to the 95th percentile Marine. It must be man portable, operable by one Marine while wearing all field protective equipment such as the helmet, body armor, Mission Oriented Protective Posture IV gear, cold weather equipment, and laser eye protection.

b. The SRAW will be capable of limiting the gunner's exposure time to fire the weapon, once in the ready-to fire position, to not exceed 10 sec (threshold) 5 sec (objective). The weapon will be designed to minimize gunner exposure during operations (including noise and movement requirements) in all firing positions.

c. The system must have a soft launch capability, minimizing the back-blast associated with firing a missile. This should be a clearly observable advantage over current systems. It is required that the weapon permit employment, with single ear protection, from enclosed positions such as masonry rooms that measure 4.57m X 3.66m X 2.1m, possess 1.86 square meters of ventilation, and fighting positions with front and rear vent area of 1.4 square meters each. Firing noise, with single ear protection, must meet the requirements of MIL-STD 1474B.

d. The SRAW must conform with noise limit requirements of MIL-STD 1474B, Y curve, when fired in the open, and Z curve when fired from enclosures.

e. The SRAW must meet all threshold accuracy requirements through gunner engagement angles from 30 degree depression to 30 degree elevation, and when fired with an initial roll angle of up to 15 degrees. The warhead must be capable of meeting the target defeat threshold against targets with up to 10 degrees of obliquity.

f. Waterproofing and dustproofing of the weapon must be optimized to:

(1) Preclude sand and dust contamination of interior surfaces and operating mechanisms.
(2) Ensure an operable and safe system after immersion in salt or fresh water at a depth of 1 meter for a duration of 2 hours.

g. It is desired that the system be of modular design to enhance future preplanned product improvements that could include improved guidance, warhead improvements (including greater anti-armor lethality or other warheads to defeat field fortifications or urban targets), and sighting and propulsion improvements to increase accuracy or range. It is also desired that the modular design provide for future warhead variants, e.g., "bunker buster" and direct attack.

h. The arming device must be reversible. Reversibility is having the capability to revert a ready-to-fire system back to a safe mode.

i. The SRAW will consist of a launcher and missile as a singular unit for issue. The launcher will be considered a disposable item upon firing of the missile.

j. The SRAW must be capable of transport by all methods currently available to the Marine Corps, to include: amphibious shipping, rail, infantry wheeled transports, armored vehicles, helicopters (present and future), the medium lift replacement aircraft, and cargo aircraft.

k. No preventive or scheduled maintenance is necessary as the SRAW is a round of ammunition.

l. The system must meet the safety and environmental requirements of the USMC/USN for Service approval to include current MIL-STD for fuze, environment, warhead, explosives, and propellants.

m. Nuclear hardening is not required for this weapon system. The weapon will be constructed of materials that will not render it inoperable in a chemical and biological environment.

n. The SRAW must be capable of operating properly in all battlefield environments, with its only limitation being the capabilities of the current crew-served night vision sights.

o. Maintenance Planning. The SRAW must be ready for use without field assembly. The SRAW is designed to require no maintenance. The only maintenance anticipated will consist of a visual inspection to determine if handling damage has occurred or exterior cleaning is required to remove contaminants that may affect firing performance (i.e., first echelon, field maintenance).

p. Support Equipment. There will be no support equipment required. This system is a round of munition, consisting of a launcher and a missile; when fired, the launcher is discarded.

q. Human Systems Integration:

(1) The operation of the SRAW will rely as much as possible upon the infantry skills learned in employing the current anti-armor weapons and must not involve the application of skills unusual to the assaultman. It must not involve any unique support requirements. Training devices completely simulating the launch effects and the gunner's engagement tasks are required. Future training must be augmented by using a Multiple Integrated Laser Engagement System (MILES) compatible field tactical trainer and a simulated marksmanship trainer.

(2) The SRAW will not require any increase in manning or structure.

(3) The training will involve the operator being taught system description, design characteristics, operating features, hardware configuration, target engagement skills, isolation of malfunctions, and any safety issues related to handling and firing of the system.

r. Transportation and Basing:

(1) The SRAW must satisfy current Department of the Navy requirements applicable to shipboard handling and storage to include the use of qualified bulk explosives and propellants, IM policy, and protection from HERO.

(2) The system must meet the safety and environmental requirements of the USMC/USN for Service approval to include all MIL-STD for the fuze, environment, warhead, and explosives and propellant.

(3) There will be no unique basing requirements anticipated for the SRAW.

(4) Existing ranges are adequate for local training.

Key Performance Parameters	Development Threshold	Development Objective
Minimum range	17 Meters	17 Meters
Maximum range	$\geq$ 600 Meters	$\geq$ 800 Meters
Probability of hit (stationary target)	.5 (400 meters)	.7 (400 Meters)
Probability of hit (crossing target)	.5 (200 Meters) .45 (250 Meters)	.6 (200 Meters) .55 (250 Meters)
Operational Availability	.95	.95
Warhead Defeat capability	T-80 MBT w/ explosive reactive armor	T-80 MBT w/ explosive reactive armor

Key System Attributes	Development Threshold	Development Objective
Reliability	.95	.95

Additional Attributes	Development Threshold	Development Objective
Transition Time: Carry to Fire	20 seconds	15 seconds

7. SoS Synchronization: …….

8. Spectrum Requirements:…….

9. Intelligence Supportability:……

10. Weapon Safety Assurance:…….

11. Technology Readiness Assessment:……..

12 Assets required to achieve IOC: 48 operational units and 24 training rounds

13. IOC and FOC Schedule Definitions:. An Initial Operational Capability (IOC) date of 1st Quarter Fiscal Year (FY) 09 is required. A Full Operational Capability (FOC) date of 3rd Quarter FY 13 is required. IOC will be considered complete when the first battalion receives its initial issue and completes gunner training.

14. DOTMLPF-P Considerations…….

15. Other System attributes: None

16. Program affordability: ……