AD-A171 043 REQUIRED OPERATIONAL CAPABILITY (ROC) NO 021314 FOR THE 1/2
COMBAT EXCAVATOR(U) MARINE CORPS WASHINGTON DC
30 JUL 86 USMC-ROC-0215.1.4

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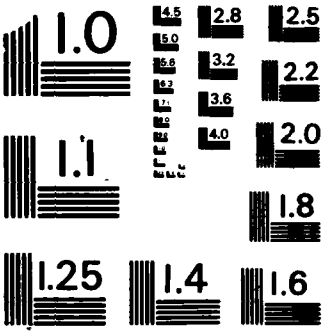

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DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO
3900
RDD24-07-01
30 JUL 1986

From: Commandant of the Marine Corps

Subj: REQUIRED OPERATIONAL CAPABILITY (ROC) NO. 0215.1.4 FOR THE COMBAT EXCAVATOR

Ref: (a) MCO 3900.4C

Encl: (1) ROC No. 0215.1.4 for the Combat Excavator

1. In accordance with the procedures set forth in the reference, the ROC for the combat excavator (0215.1.4) is hereby established and promulgated.

2. The Commanding General, Marine Corps Development and Education Command (Director, Development Center), Quantico, Virginia 22134 is the Marine Corps point of contact for any questions pertaining to this ROC and any development efforts pertaining thereto.

F. X. Chambers, Jr.

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F X. CHAMBERS, JR.
Colonel U. S. Marine Corps
Acting Deputy Chief of Staff for RD&S

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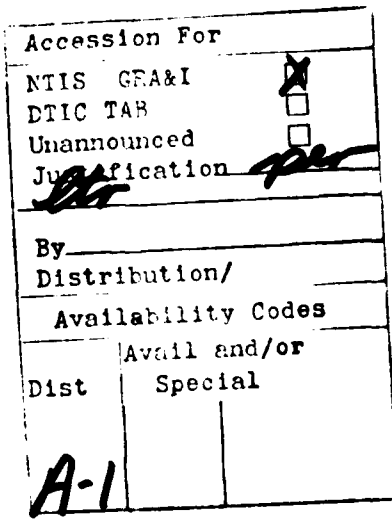

Required Operational Capability (ROC No. 0215.1.4) for Combat Excavator

1. STATEMENT OF REQUIREMENT

a. The Marine Corps has an urgent requirement for a highly mobile combat excavator (CE) which can provide Marine air ground task force (MAGTF) elements in the zone of action/sector with with integral mechanized combat engineer support.

b. The CE will provide supported elements with versatile and effective mechanized engineer support. It will possess the ability to rapidly move itself overland and be capable of crossing inland water obstacles. Additionally, it will provide a measure of crew protection from hostile fires not currently available in Marine Corps engineer excavation equipment.

c. The CE will provide significant improvements to survivability by rapidly excavating armored vehicle and gun pits for defensive positions and rapidly creating other protective and fighting positions for weapons, equipment, material, and personnel. It will provide effective countermobility through the preparation of obstacles and firing of remote demolitions. It will enhance mobility by possessing the ability to breach obstacles such as antitank ditches, escarpments, and mine barriers. It will provide aviation units with capabilities for rapid runway repair and clearance of unexploded antipersonnel submunitions from runways/taxiways without crew exposure.

d. The CE will be assigned to the Marine division, force service support group (FSSG) and Marine aircraft wing and will be employed within the combat engineer battalion, artillery regiment, engineer support battalion, and Marine wing support squadron. An initial operational capability (IOC) of FY90 is required. Desired date of full operational capability (FOC) is FY93.

2. THREAT AND/OR OPERATIONAL DEFICIENCY

a. Statement of Threat

(1) Potential and enemy threats confronting the United States in the near-to-long range periods are outlined in the Marine Corps Long Range Plan (MLRP) of 2 June 1982 and the Marine Corps Midrange Objectives Plan (MMROP) of 8 November 1984. Threat forces possess mobile, versatile, and survivable engineer capabilities which can significantly impede MAGTF mobility, survivability, and countermobility. Aspects of the modern battlefield require increased engineering support to maintain

high-speed offensive operations; support the dispersion of personnel, vehicles, equipment, and aircraft; and provide protection from conventional and tactical nuclear weapons.

(2) Threat engineer, target acquisition, surveillance, and increasing weapons accuracy, coupled with decreasing response times, require the Marine Corps to adequately provide for survivability enhancement, obstacle-creating, and excavation capabilities.

b. Operational Deficiency

(1) The Marine Corps currently does not possess an armored, cross-country, high-speed, rapid combat excavation capability that can operate under the threat of hostile artillery and small arms fire. Elements of a MAGTF operating in the zone of action must rely upon vulnerable, slow-moving, trailer-transported, commercial bulldozers for the development of hull defilade and fighting positions, as well as for creating hasty protection from conventional or nuclear blasts. Most of the nearly 500 combat vehicles, artillery pieces, and tactical vehicles in a Marine division will require protective positions at some phase of combat operations.

(2) No nonexplosive countermobility method exists to slow, canalize, or stop advancing mechanized forces. Antitank ditches and escarpments cannot be rapidly excavated. Finally, no mobile and survivable tactical earthmoving capability currently exists with which to rapidly create pioneer combat trails and to quickly backfill explosively created road craters.

(3) The M60A1 tank dozer, while capable of limited excavation functions or breaching antitank ditches and accompanying escarpments, is not designed for extensive excavation operations. Trailer-transported bulldozers cannot accompany assault elements due to deficiencies in speed, cross-country mobility, and vulnerability to small arms fire. Combat excavator vehicles will provide the MAGTF commander the capability to quickly prepare necessary protective and fighting positions and nonexplosively created countermobility obstacles; and enable rapid movement on the battlefield without relying on tractors and trailers or other means of transport.

(4) The threat to Marine Corps air support installations and facilities includes the use of airfield attack weapons and other munitions which penetrate runway surfaces, causing maximum damage. Antipersonnel submunitions will also be employed and will impede clearing and repair operations. STANAG 2929-ADR establishes criteria which require the repair and resumption of air operations within 4 hours of attack. No item of engineer or other equipment is presently organic to aviation units which can provide armored crew protection and the capability to clear rubble, remove or replace crater debris, and clear submunitions. A combat excavator vehicle will provide for the rapid removal

or replacement of blast rubble and debris, assist in clearing antipersonnel submunitions, assist in other ordnance-clearing efforts, and provide for crew protection and vehicle survivability.

3. OPERATIONAL AND ORGANIZATIONAL CONCEPT

a. Operational Concept. Combat excavator vehicles will be employed by units attached to, or in direct support of, non-mechanized or mechanized elements of a MAGTF and will principally provide survivability enhancement, countermobility, and mobility enhancement support in the zone of action/sector. The CE must also be capable of improving and repairing roads, preparing and improving VTOL sites, as well as creating deliberate protective positions for vehicles; personnel; and command, control, and communication (C^3) facilities. In addition, the CE will be employed by artillery units to provide firing positions and ammunition storage areas, as well as by the engineer support battalion so that the CSS engineers can assume the combat support mission when augmenting CS units. Within the Marine aircraft wing, the CE will enable engineers to prepare aircraft revetments and ammunition storage areas, provide rapid runway repair, and assist in the clearance of unexploded antipersonnel submunitions. The mission profile of the CE is:

Earthmoving	60%
Travel	25%
Misc. (e.g., swimming, towing, winching, lifting, and removing obstacles)	15%

b. Organizational Concept. The requirements for CE vehicles are:

(1) Estimated Combat Excavator Requirements

	Allowance	Total
Marine division	15/CEB	45
	10/artillery regiment	30
Marine aircraft wing	2/fixed wing MWSS	12
FSSG	5/ESB	15
Reserve division	15 CEB	15
	10/artillery regiment	10
Reserve aircraft wing	2/fixed wing MWSS	4
Reserve FSSG	5/ESB	5
Maritime prepositioned ships (MPS)	13/squadron	39
GEO prepositioning program	13	13
MCES	18	18
Prepositioned war reserves (PWR) (60 days)	CARF CALC	39
Maintenance float (MF)	2/division	8
	1/wing	4
Total		257

(2) Maintenance. Organizational level maintenance will be accomplished by the using unit. Intermediate level maintenance not authorized at the using unit (limited third echelon) will be accomplished by maintenance battalion, FSSG. Both organizational and intermediate level maintenance will be conducted by engineer equipment mechanics (MOS 1341). Vehicle subsystems; e.g., radios, will be maintained in the same fashion by appropriate technicians. Appropriate equipment trade-offs will be accomplished to ensure no increase in current structure maintenance personnel.

(3) Logistic Support. Logistic support for the CE will be similar to that required for present engineer earthmoving equipment and the assault amphibian vehicle (AAV).

4. ESSENTIAL CHARACTERISTICS. The essential characteristics listed below pertain to the CE and are intended to enhance the conduct of MAGTF combat operations, including the support of a mechanized force:

a. Performance Characteristics

(1) Speed. The CE will be capable of a speed of 30 mph (required) on normal, dry, level terrain and will be capable of pacing with the cross-country movement of ground vehicular MAGTF elements (15 mph desired).

(2) Range. The CE will have sufficient fuel capability for travel consistent with the operating range of the main battle tank (MBT), assault amphibian vehicle (AAV), and the light armored vehicle (LAV) on secondary roads over rolling terrain.

(3) Excavation. The CE will:

(a) Exert a drawbar pull of at least 24,000 pounds (32,000 pounds desired) when moving at 1.5 mph on normal, dry, level terrain.

(b) Be capable of a baseline excavation rate in clay/sandy soil of 200 bank cubic yards per hour carried and/or pushed over a distance of 100 yards.

(4) Mobility. The CE will:

(a) Be capable of fording to a required depth of 48 inches (60 inches desired) without prior preparation.

(b) Not exert a ground pressure of more than 12 lbs psi (less than 8 lbs psi desired).

(c) Be capable of climbing, unassisted, a 60 percent grade.

(5) Armor. The CE will provide the operators lateral and overhead protection from small arms fire and shell fragments. Equivalent protection of engine, power train, radiator, hydraulics, and fuel tanks is desired. The minimum performance characteristics are as follows:

(a) Protection from 7.62 mm armor piercing (AP) ammunition at 300 meters and 0 degrees obliquity.

(b) Overhead protection against 155 mm (HE) shell fragments detonated at 50 ft above the equipment.

(c) Protection of personnel from antipersonnel mines (blast and fragment types) similar to M-14 and M-16 antipersonnel mines.

(6) Environmental. The CE will:

(a) Be capable of efficient operation and maintenance in temperatures ranging from 0 to 125 degrees Fahrenheit, and be capable of operating in temperatures to -25 degrees Fahrenheit with the use of kits or with minor modification. References for these and other climatic requirements are specified in MIL-STD-210A and described under climatic categories 1 through 6 as contained in paragraphs 2-7 through 2-12 of AR 70-38.

(b) Require no more than 30 minutes reaction time in ambient temperatures ranging from 0 to 125 degrees Fahrenheit for the operator to check and start the combat excavator. Reaction time for temperatures 0 to -25 degrees Fahrenheit shall be no more than one hour utilizing a cold weather kit.

(7) Biological/Chemical. Allow the operator(s) to continue to operate in a biological and/or chemical environment with minimal degradation.

(8) Nuclear. The CE must be at least as survivable in a nuclear environment as the crew.

(9) Reliability, Availability, Maintainability, and Durability (RAM-D)

(a) Reliability. Have an 80 percent minimum acceptable value (MAV) probability of completing a 10-hour mission similar to that in paragraph 3a above. This MAV equates to a mean-time-between failure (MTBF) of 45 hours. The best operational capability (BOC) will be an 88 percent probability of completing a 10-hour mission. This BOC equates to an MTBF of 78 hours. These reliability calculations assume an exponential life distribution.

(b) Availability. Achieved availability (A_a) equals operating hours divided by the sum of operating hours, total unscheduled maintenance time, and total scheduled maintenance

time. The CE must demonstrate an A_a of .82 (based on an average number of personnel per maintenance action of 1.85).

(c) Maintainability. Maintenance ratio (MR) equals total maintenance man-hours divided by operating hours. The demonstrated MR for scheduled and unscheduled maintenance (exclusive of daily operator services and inspections, and man-hours for off-system repairs of replaced components) must not exceed an average of .40 maintenance man-hours per hour of operation.

(d) Durability. The CE will have a 50 percent probability of completing 600 hours of operation without a major component durability failure. The major components are the engine, transmission, transfer case, steering unit, and final drive(s). The tracks (excluding pads), sprockets, and roadwheels shall each have a 95 percent probability of completing 250 hours without a durability failure. A durability failure is a malfunction requiring repair of a major component beyond the capability of intermediate level maintenance or replacement of the assembly.

(e) The CE will require no more than 45 minutes overall turnaround time (required) to check and service the combat excavator for recommitment (30 minutes desired).

(10) Preplanned Product Improvements (P^3I). The CE will have a preplanned product improvement program which includes, but is not limited to, the combat excavator's power train, steering, suspension, environmental systems, tracks, and increased ballistic protection (hardening), and which can provide for increased combat support and utility through the attachment of a dozer blade, track-width mine plow, ripper attachment, multipurpose bucket, trencher, and weapons mount for the standard USMC medium machine gun.

(11) Other. The CE will:

(a) Have an instant smoke obscurant capability comparable to that employed by other tracked and wheeled vehicles operating in the forward battle area.

(b) Be capable of employing the USMC M58A1 trailer-mounted line charge for mine breaching operations.

(c) Be capable of onboard firing of remotely emplaced demolitions.

(d) Be capable of operating on standard Army and Navy/Marine Corps fuels and lubricants.

(e) Be designed for minimization interference of radio communications in accordance with current military standards (MIL-STD-461B Class I Group II).

b. Physical Characteristics

(1) Size

(a) Dimensions will not exceed 120 inches in width, height reducible to 102 inches, and length not to exceed 300 inches.

(b) Gross vehicle weight not to exceed 40,000 lbs. (desired).

(2) Transportability. The CE will:

(a) Meet the criteria contained in the current edition of Air Force Systems Command (AFSC) Design Handbook 1-11 for transport in C-5 (required), C130, and C141 aircraft (desired).

(b) Be capable of transportation by rail shipment.

(c) Be equipped with lifting and tie-down devices for air, rail, and water shipment in accordance with Army Regulation (AR) 70-47 and MIL-STD-209.

(3) Amphibious Compatibility. The CE will be compatible with U.S. amphibious ships and landing craft.

(4) Ancillary Capabilities. The CE will:

(a) Be capable of accepting suitable Marine Corps night vision devices compatible with other mechanized vehicles and allow for the use of personal night vision devices.

(b) Be provided with a winch with 15,000 (required) lbs pull and 100 feet of cable.

(c) Be provided with adequate connection to be towed and to tow standard military trailers.

(d) Have provisions for mounting camouflage under field conditions.

(5) Swimming Capabilities (Desired).

(a) Be capable of a speed in still/calm waters of at least three knots.

(b) Be capable of swimming in SS1 (Beaufort's scale/international sea state).

c. Maintenance Characteristics. The CE shall.

(1) Be designed to require a minimum number of:

(a) Maintenance tasks such as calibration, adjustment, and inspection.

(b) Skills and man-hours to accomplish the required maintenance tasks.

(c) Tools and test equipment necessary to perform the required maintenance.

(2) Be designed for maximum possible accessibility in all systems, components, and equipment requiring maintenance, inspection, removal, or replacement. Particular emphasis should be placed on high mortality parts requiring frequent inspection, servicing, or maintenance.

(3) Have maintenance concepts which will be developed using appropriate maintenance allocation documents based on skills and tools available at each level of maintenance.

(4) Be designed to allow:

(a) An average time for diagnosing failures of:

1/2 Organizational level maintenance - .5 hours
1/2 Intermediate level maintenance - 1 hour

(b) A mean-time-to-repair (MTTR) of:

1/2 Organizational level maintenance - 2 hours
1/2 Intermediate level maintenance - 6 hours

(c) Maximum corrective time for making repairs of:

1/2 Organizational level maintenance - 4 hours
1/2 Intermediate level maintenance - 12 hours

(d) A minimum of 50 hours between scheduled preventive maintenance service.

(5) Be designed to minimize special tests, tools, and diagnostic equipment not currently available in the Fleet Marine Force (FMF).

d. Human Engineering Characteristics. The CE will be designed to conform to human factors engineering principles including:

(1) Human space requirements for ease of operation and maintenance. It will accommodate operators wearing or carrying cold weather clothing and individual protective equipment.

(2) Control-display relationships designed for readability and ease of operations.

(3) Minimum environmental hazards such as temperature, dust, noise, vibration, and noxious fumes while "buttoned up."

(4) Safety in operation and maintenance.

e. Priority of Essential Characteristics

(1) Performance

(2) Physical

(3) Maintenance

(4) Human engineering

5. INTER/INTRAOPERABILITY AND STANDARDIZATION REQUIREMENTS. Not applicable.

6. RELATED EFFORTS

a. M9 Armored Combat Earthmover (ACE). The Army has developed the M9 ACE to fulfill its requirements. The ACE is an armored, high-speed, air-transportable earthmover and excavator which can swim. The ACE is presently being type-classified and considered for procurement by the Army.

b. Combat Engineer Tractor (CET). The CET is the United Kingdom's combat excavator. The CET is an armored, high-speed, air-transportable earthmover and excavator which can swim. Additionally, it possesses a bucket and is capable of employing a crane attachment and a self-recovery anchor. This CET has been in production since 1977 and is a fielded system.

c. AAVE7A1 Mobility Enhancement Vehicle (MEV). The MEV, if successfully developed, will provide the MAGTF with an amphibious vehicle which is equipped to breach nonexplosive obstacles in the surf and beach area by creating lanes and establishing routes of egress. An analysis will be conducted to determine the MEV's ability to conduct mobility, countermobility, and survivability tasks. IOC for the AAVE7A1 is undetermined.

7. TECHNICAL FEASIBILITY AND ENERGY/ENVIRONMENTAL IMPACTS

a. Technical Feasibility. Because there are candidate systems already in existence, there is low technical risk in developing a combat excavator.

b. Energy/Environmental Impacts. There are no adverse energy/environmental impacts associated with the development or introduction into the FMF of a CE.

8. LIFE CYCLE COST/FORECAST. The life cycle cost estimate is provided in annex A.

9. MANPOWER REQUIREMENTS. The CE will be employed by Marines with MOS 1371 within engineer and aviation units and is intended to be a mechanized extension of combat engineering skills on the battlefield. Within artillery units, the CE will be employed by Marines with MOS 1345. The CE will be maintained by Marines with MOS 1341. There will be no increase in the authorized structure ceilings for MOS's 1371, 1345, and 1341. The CE will reduce major end items of engineer equipment by accomplishing several combat engineer tasks currently performed by separate items of engineer equipment. There will be no change to overall manpower structure requirements. However, to ensure that necessary planning and programming manpower, personnel, and training (MPT) requirements are identified in the system acquisition process for the CE, a Military/Hardware Integration (HARDMAN) program analysis will be conducted. HARDMAN will project MPT resource requirements and allow for appropriate trade-offs.

10. TRAINING. Operator and maintenance training for the CE will be incorporated into existing courses of instruction at the Marine Corps Engineer School (MCES), Marine Corps Base, Camp Lejeune, North Carolina. Based on a preliminary training estimate, no changes to entry level skills/requirements for MOS's 1341 and 1371 are anticipated; however, basic and journeyman courses of instruction for these MOS's will each be lengthened. Specific times required to lengthen existing courses of instruction, as well as the need for additional instructor personnel, will require additional analysis.

11. Amphibious/Strategic Lift Impact. The introduction of the CE will make available additional square feet within the assault echelon (AE) by reducing the overall number of engineer items of equipment required to support MAGTF operations. Types and varieties of equipment and appropriate trade-offs will be conducted prior to approval for service use.

Major System: COMBAT EXCAVATOR

Date: 03-26-1986

LIFE CYCLE COST FORECAST

FUNDING PROFILE
In Thousands of FY87 Constant Budget Dollars
(FYDP Dollars in Parentheses)
(1 Oct 85 Escalators)

20 YEAR LIFE CYCLE

	PRIOR YEARS	CURRENT YEAR	BUDGET YEAR	FY88	FY89	FY90	FY91	FY92	TO COMPL'N	TOTAL PROGRAM
Major System										
RDT&E	980	2,444	0	0	0	0	0	0	0	3,424
FYDP Dollars		(2,349)	(0)	(0)	(- 0)	(0)	(0)	(0)		
PMC	0	0	0	21,559	73,662	82,594	80,930	46,039	-0	304,784
FYDP Dollars		(0)	(0)	(22,547)	(80,473)	(94,218)	(96,401)	(57,264)		
QTYS FUNDED	0	0	0	17	62	68	68	42	0	257
Support										
Support PMC	0	0	0	0	0	120	450	835	22,044	23,449
FYDP Dollars		(0)	(0)	(0)	(0)	(136)	(536)	(1,038)		
MILCON	0	0	0	0	0	0	0	0	0	0
FYDP Dollars		(0)	(0)	(0)	(0)	(0)	(0)	(0)		
O&MMC	0	0	0	0	0	702	1,438	1,976	107,357	111,472
FYDP Dollars		(0)	(0)	(0)	(0)	(760)	(1,598)	(2,253)		
O&MMCR	0	0	0	0	0	0	0	33	5,435	5,468
FYDP Dollars		(0)	(0)	(0)	(0)	(0)	(0)	(38)		
MPMC	0	0	0	0	0	136	512	950	19,643	21,241
FYDP Dollars		(0)	(0)	(0)	(0)	(137)	(519)	(967)		
RPMC	0	0	0	0	0	0	0	0	1,034	1,034
FYDP Dollars		(0)	(0)	(0)	(0)	(0)	(0)	(0)		
NAVY PROC	0	0	0	0	0	0	0	0	0	0
TOTAL PROGRAM	980	2,444	0	21,559	73,662	83,551	83,330	49,831	155,514	470,872
FYDP Dollars		(2,349)	(0)	(22,547)	(80,473)	(95,252)	(99,054)	(61,560)		

*APPROXIMATELY 35% OF COSTS OR $164041.15K IS NOT INCREMENTAL TO THE DECISION BUT ONGOING

APPENDIX A

Major System: COMBAT EXCAVATOR Date: 03-26-1986

LIFE CYCLE COST ESTIMATE
(In Thousands of FY87 Constant Budget Dollars)
(1 Oct 85 Escalators)

20 YEAR LIFE CYCLE

PHASE/CATEGORY		SUBCATEGORY	CATEGORY	PHASE
I.	RDT&E PHASE			3,424
II.	INVESTMENT PHASE			309,849
	1. SYSTEM PRODUCTION/PROCUREMENT		306,496	
	A. Major End Item (Contractor)	256,358		
	B. Initial Provisioning/Spares, Repair Parts	25,596		
	C. Government Furnished/Added Equipment	2,552		
	D. Other Direct System Costs	21,990		
	2. SUPPORT EQUIPMENT PROCUREMENT		3,353	
	A. Ammunition	3,353		
	B. Weapons and Tracked Combat Vehicles	0		
	C. Guided Missiles	0		
	D. Comm-Elec Equipment	0		
	E. Support Vehicles	0		
	F. Engineer and Other Equipment	0		
	3. MILITARY CONSTRUCTION		0	
III.	OPERATIONS AND SUPPORT PHASE			157,599
	1. OPERATIONS		25,500	
	A. Operator Personnel/Training	16,701		
	B. Material Consumption	279		
	C. Energy Consumption	8,520		
	2. MAINTENANCE		128,202	
	A. Organizational Maintenance	14,335		
	1) Personnel/Training	3,039		
	2) Maintenance Material	2,109		
	3) Repair Material	9,047		
	4) Other	139		
	B. Intermediate Maintenance	14,718		
	1) Personnel/Training	519		
	2) Maintenance Material	0		
	3) Repair Material	14,059		
	4) Other	139		
	C. Depot Repair	0		
	D. Depot Overhaul	79,193		
	E. Unprogrammed Losses	19,957		
	F. Software Maintenance	0		
	3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS		3,897	
	A. Base Operations	1,506		
	B. Other Overhead Costs	2,391		
	4. SUPPORT EQUIPMENT O&S		0	
TOTAL LIFE CYCLE COSTS				470,872

*ANTICIPATED THAT ALL REPAIRS WILL BE ACCOMPLISHED AT 4TH ECHELON OR BELOW OR AT SCHEDULED REBUILD

O&S PHASE—Reserves				10,572
1. OPERATIONS			1,184	
A. Operator Personnel/Training		775		
B. Material Consumption		13		
C. Energy Consumption		396		
2. MAINTENANCE			9,089	
A. Organizational Maintenance		666		
1) Personnel/Training	141			
2) Maintenance Material	98			
3) Repair Material	420			
4) Other	6			
B. Intermediate Maintenance		683		
1) Personnel/Training	24			
2) Maintenance Material	0			
3) Repair Material	653			
4) Other	6			
C. Depot Repair		0		
D. Depot Overhaul		3,677		
E. Unprogrammed Losses		4,063		
F. Software Maintenance		0		
3. INDIRECT SUPT, BASE OPS & MAINT, OTHER O/H COSTS			298	
A. Base Operations		187		
B. Other Overhead Costs		111		
4. SUPPORT EQUIPMENT O&S			0	

END

DTIC

9-86

AD-A171 043 REQUIRED OPERATIONAL CAPABILITY (ROC) NO 021514 FOR THE 1/2
COMBAT EXCAVATOR(U) MARINE CORPS WASHINGTON DC
30 JUL 86 USMC-ROC-0215.1.4

UNCLASSIFIED F/G 15/5 NL

SUPPLEMENTARY

INFORMATION

UNITED STATES MARINE CORPS
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5001

IN REPLY REFER TO
3900
C 441
0 9 MAR 1993

From: Commanding General, Marine Corps Development Command, 2042 Broadway Street, Suite 3, Quantico, Virginia 22134-5021 (C 441)

Subj: REQUIRED OPERATIONAL CAPABILITY (ROC) FOR THE COMBAT EXCAVATOR (NO. LOG 215.1.4); CHANGE 1

Ref: (a) MCO 3900.4D

1. Purpose. To transmit changes to the basic ROC. Per the reference, the following changes to ROC NO. LOG 215.1.4 for the Combat Excavator have been approved.

2. Action

a. Change the title from "Combat Excavator" to "Armored Combat Earthmover (ACE)".

b. Paragraph 1c, Statement of Requirement, replace the third sentence with the following: "It will enhance mobility with the ability to breach obstacles such as antitank ditches and escarpments."

c. Paragraph 2a(1), Statement of Threat, replace with the following:

"(1) Potential threats confronting the United States in the near-to-long term are fully developed in the Marine Corps Mid Range Threat, 1992-2002, Part II, May 1992; the Defense Intelligence Agency (DIA) Landmine Capabilities (Current and Projected) Foreign, published September 1982; the DIA publication General Engineering Support Capabilities, Trends and Projections, DST-1150S-076-87; the Annual Land Warfare Technology Information Conference (ALWTIC) publications Engineer Systems/Munitions - Rest of World; and ALWTIC Combat Engineer Systems/Munitions - Former Soviet and Eastern Europe.

Threat engineers can be expected to employ all standard obstacles, such as abatis, antitank ditches, cratering, demolitions, barbed wire, dragons teeth, tangle foot, and booby traps, etc. They will probably rely on locally available materials for obstacles and simple, cheap mines (both anti-personnel and antitank) as well as decoy mines. Offensively, the mines and obstacles are used to protect an open flank during a breakthrough or meeting engagement, as an economy of force measure, or to blunt and enemy counterattack. Defensively, mines and obstacles are used to canalize, delay and disrupt the enemy, reduce enemy mobility, block penetrations, increase the

effectiveness of friendly fire, deny enemy withdrawal, prevent enemy reinforcement, protect friendly flanks, and assist in destroying or disabling personnel and/or vehicles."

d. Paragraph 3a, Operational and Organizational Concept, after "In addition, the ACE..." replace "will..." with "can".

e. Paragraph 3b(1), Operational and Organizational Concept, replace the Estimated Combat Excavator Requirements with the following:

UNIT	QUANTITY
Arty Regt, 1st MarDiv	4
Arty Regt, 2nd MarDiv	4
Arty Regt, 3rd MarDiv	2
Arty Regt, MARRESFOR	4
CbtEngrBn, 1st MarDiv	15
CbtEngrBn, 2nd MarDiv	15
CbtEngrBn, 3rd MarDiv	5
CbtEngrBn, MARRESFOR	15
EngrSptBn, 1st FSSG	5
EngrSptBn, 2nd FSSG	5
EngrSptBn, 3rd FSSG	5
EngrSptBn, MARRESFOR	5
MCES	6
EAP, 29 Palms	6
EngrSptCo, CbtEngrBn, MPS-1	5
EngrSptCo, CbtEngrBn, MPS-2	5
EngrSptCo, CbtEngrBn, MPS-3	5
EngrSptCo, CbtEngrBn, Norway Prepo	5
ORF, 1st FSSG	2
ORF, 2nd FSSG	2
ORF, 3rd FSSG	2
ORF, MARRESFOR	2
PWR	12
MCLB Barstow	4
MCLB Albany	4
TOTAL	144

f. Paragraph 4a(2), Range, replace with the following: "The ACE will have a fuel capability to allow an operating range of 200 miles (required) and 400 miles (desired)".

3. Filing Instructions. This change transmittal will be filed immediately following the signature page of the basic ROC.

JAMES P. O'DONNELL
By direction

Distribution:
See attached