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HEADQUARTERS UNITED STATES MARINE CORPS
3000 MARINE CORPS PENTAGON
WASHINGTON, DC 20350-3000

IN REPLY REFER TO
5000
MROC

AUG 29 2007

MROC DECISION MEMORANDUM 67-2007

Subj: INITIAL CAPABILITIES DOCUMENT (ICD) FOR MARINE CORPS EXPEDITIONARY
RIFLE SQUAD (MERS)

Ref: (a) MROCSM 27-2007 of 25 July 2007

Encl: (1) MERS ICD Executive Summary undtd
(2) MERS ICD Draft Version 2.0 of 15 June 2007

1. Purpose. To obtain MROC approval of the proposed MERS ICD.
2. MROC Staffing Results. The MERS ICD was electronically staffed to the MROC via the reference. All MROC members concurred with the proposed ICD. Based on a MROC member comment, paragraph 7.4.2. was modified to note that DOTMLPF impacts are expected as the MERS capability matures and will be assessed with each follow-on Capabilities Development Document and Capabilities Production Document developed as a result of the MERS ICD.
3. Decision. The MROC approves the MERS ICD.


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Executive Summary

Major Brian Christmas



Marine Expeditionary Rifle Squad (MERS) Initial Capabilities Document (ICD)

Purpose. To obtain MROC approval of the MERS ICD.

Executive Summary.

This Initial Capabilities Document (ICD) identifies Marine rifle squad capability gaps for the Marine Expeditionary Rifle Squad (MERS) spectrum of conflict. It provides the basis for developing integrated, methodical means to balance and enhance the Marine rifle squad's ability to successfully respond across the ROMO. The intent of this ICD is to support a wide range of potential solutions and alternative approaches addressing Marine rifle squad capability shortfalls and provide solution guidelines that interface and integrate with the rest of the MAGTF. It is based on Functional Area Analyses (FAA) and Functional Needs Analyses (FNA) that identified the need to improve MERS capabilities to provide:

Lighter, Leaner, More Rapidly Deployable Forces

More Timely Planning and Execution Capability

Agile, Responsive, Effective Sustainment

Responsive, Well-Integrated Command and Control (C2)

MERS is a distinctive capability intended to significantly increase future Marine Air Ground Task Force's (MAGTF) ability to conduct squad level combat operations in an uncertain environment across the ROMO for the Joint Force. It must possess the ability to operate in both traditional and irregular warfare environments while retaining the ability to conduct forcible entry operations from the sea. Attributes of this capability are greater lethality, accurate identification and classification of targets, unencumbered mobility, secure, reliable, MAGTF integrated communications, ballistic and fragmentation protection, climate and terrain protection, and ability to administer low level medical aid. The capability will provide greater improvement to the current rifle squad's ability as a total package to engage the enemy across a wider range of operations with an increase in survivability and better access to support forces. MERS

focuses on the squad as a system and seeks capabilities across the squad instead of concentrating on the individual Marine.

This ICD lays the foundation for the MERS. It is the definitive source document underpinning the systemic integration of materiel modernization efforts needed to significantly increase Marine rifle squad capabilities in order to respond to the Joint Forces need for projecting force across the full ROMO.

This assessment identified the following potential approaches for mitigating the gaps:

Program of Record Improved (POR Improved) - POR plus systems not from LW such as foreign or other commercial systems.

Program of Record Land Warrior Enhanced (POR LW-Enhanced) -select LW programs that could be integrated into the USMC POR.

Land Warrior - adoption of LW in total. (Since the completion of the MERS' FSA, the U.S. Army has been evolving their LW program into the Soldier as a System (SaaS). SaaS breaks down into four concepts corresponding to various warfighting functions within the Army. For the purposes of this ICD, the term LW will be used to represent the advanced soldier systems described in these four SaaS concepts.)

These approaches were compared and prioritized. Priority ranking of these recommended approaches varied by functional gap and were highly affected by risk acceptable to leadership. Based on the findings of this ICD each recommended approach should be considered for more detailed analysis of each of the cited gaps and include robust technology assessment and maturity analyses.

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**INITIAL CAPABILITIES DOCUMENT
FOR
MARINE EXPEDITIONARY RIFLE SQUAD**

Draft Version 2.0

Potential ACAT: III

Validation Authority: Deputy Commandant, Combat Development and
Integration

Approval Authority: MROC

Milestone Decision Authority: Commander, Marine Corps Systems
Command

Designation: TBD

Current as of 15 June 2007

RELEASABILITY: Distribution authorized to Department of Defense
(DOD) and DOD contractors for administrative and operations use.
Other requests for this document shall be referred to: Deputy
Commandant, Combat Development and Integration, 3300 Russell Road,
Quantico VA 22134.

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73 Executive Summary

74 Marine expeditionary forces continue to be called upon to project force
75 across the full spectrum of the Range of Military Operations (ROMO) and
76 operate in a broad set of conditions. Threats will range from irregular
77 and asymmetric to conventional forces employing conventional weapon
78 systems capabilities as well as Chemical Biological Radiological Nuclear
79 and High Yield Explosives weapons (CBRNE) systems. The National
80 Security Strategy recognizes the ability of transformed maneuver and
81 expeditionary forces to deter threats against United States' (US) interests,
82 friends, and allies, and decisively defeat any adversary if deterrence fails.
83 Securing the United States from direct attack, securing strategic access,
84 and retaining global freedom of action require the capability to project
85 effective military power and supports the Joint Force's ability to deter
86 aggression and defeat adversaries. To attain these goals demands an
87 agile, expeditionary Joint Force with a principal operational capability of
88 projecting and sustaining US forces in distant anti-access, area-denial
89 environments with equal capability of operating in an environment over
90 extended distances.

91 Executing Marine Corps competencies across the ROMO requires
92 continued investment in the Marine rifle squad as a weapon system
93 capable of operating in both traditional and irregular warfare
94 environments. The current rifle squad's main purpose is to close with
95 and destroy the enemy by fire and maneuver or repel the enemy's assault
96 by fire and close combat and is principally designed for traditional
97 warfare. However, the current evolving irregular environment has
98 required expedient measures to address capability shortfalls articulated
99 in numerous Urgent Universal Need Statements (UUNS). These
100 expedient measures, although necessary at the time, have exhibited
101 many problems associated with non-integrated force and equipment
102 design. Additionally, as currently organized, trained, and equipped,
103 Marine rifle squads are becoming less capable on the modern battlefield
104 and cannot accomplish the tasks required in 2015 Ship-to-Objective
105 Maneuver (STOM) and in dispersed operations over extended distances.

106 This Initial Capabilities Document (ICD) identifies Marine rifle squad
107 capability gaps for the Marine Expeditionary Rifle Squad (MERS)
108 spectrum of conflict. It provides the basis for developing integrated,
109 methodical means to balance and enhance the Marine rifle squad's
110 ability to successfully respond across the ROMO. The intent of this ICD
111 is to support a wide range of potential solutions and alternative
112 approaches addressing Marine rifle squad capability shortfalls and
113 provide solution guidelines that interface and integrate with the rest of
114 the MAGTF. It is based on Functional Area Analyses (FAA) and

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115 Functional Needs Analyses (FNA) that identified the need to improve
116 MERS capabilities to provide:

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- 118 • Lighter, Leaner, More Rapidly Deployable Forces
- 119 • More Timely Planning and Execution Capability
- 120 • Agile, Responsive, Effective Sustainment
- 121 • Responsive, Well-Integrated Command and Control (C2)

122 MERS is a distinctive capability intended to significantly increase future
123 Marine Air Ground Task Force's (MAGTF) ability to conduct squad level
124 combat operations in an uncertain environment across the ROMO for the
125 Joint Force. It must possess the ability to operate in both traditional and
126 irregular warfare environments while retaining the ability to conduct
127 forcible entry operations from the sea. Attributes of this capability are
128 greater lethality, accurate identification and classification of targets,
129 unencumbered mobility, secure, reliable, MAGTF integrated
130 communications, ballistic and fragmentation protection, climate and
131 terrain protection, and ability to administer low level medical aid. The
132 capability will provide greater improvement to the current rifle squad's
133 ability as a total package to engage the enemy across a wider range of
134 operations with an increase in survivability and better access to support
135 forces. MERS focuses on the squad as a system and seeks capabilities
136 across the squad instead of concentrating on the individual Marine.

137 This ICD lays the foundation for the MERS. It is the definitive source
138 document underpinning the systemic integration of materiel
139 modernization efforts needed to significantly increase Marine rifle squad
140 capabilities in order to respond to the Joint Forces need for projecting
141 force across the full ROMO. This assessment identified the following
142 potential approaches for mitigating the gaps:

- 143 • Program of Record Improved (POR Improved) – POR plus systems not
144 from LW such as foreign or other commercial systems.
- 145 • Program of Record Land Warrior Enhanced (POR LW-Enhanced) -
146 select LW programs that could be integrated into the USMC POR.
- 147 • Land Warrior - adoption of LW in total. (Since the completion of the
148 MERS' FSA, the U.S. Army has been evolving their LW program into
149 the Soldier as a System (SaaS). SaaS breaks down into four
150 concepts corresponding to various warfighting functions within the
151 Army. For the purposes of this ICD, the term LW will be used to
152 represent the advanced soldier systems described in these four SaaS
153 concepts.)

154 These approaches were compared and prioritized. Priority ranking of
155 these recommended approaches varied by functional gap and were highly

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157 ICD each recommended approach should be considered for more detailed
158 analysis of each of the cited gaps and include robust technology
159 assessment and maturity analyses.

160 Background

161 Projecting forces able to defeat adversaries across the ROMO, requires a
162 balanced capability portfolio that responds to the needs of Major Combat
163 Operations (MCO), Stability Operations, and Irregular Warfare
164 supporting the Global War on Terror (GWOT). These forces must be
165 networked, modular, and capable of operating over extended distances.
166 They must be structured so they can rapidly alternate between massing
167 sufficient combat power for defeating adversaries swiftly and decisively,
168 and conducting dispersed independent operations over extended
169 distances. A critical need exists for improving infantry capabilities at the
170 lowest operational unit, the rifle squad, by integrating tactical and
171 communications systems with the rest of the MAGTF, lightening the
172 squad's load, and improving the squad's equipment and training. The
173 need focuses on the squad as a complete package and seeks squad
174 capability improvements as a system. The basis of this ICD lay in the
175 associated Joint Capabilities Integration and Development System
176 (JCIDS) FAA, FNA, Functional Solutions Analyses (FSA), and the Post
177 Independent Analyses (PIA) conducted with input from other services but
178 primarily the US Army.

179 1. Joint Functional Area

180 Force Application (FA) is the key Joint Functional Concept (JFC) that
181 drives the need to project effective forces with tactical agility, modular
182 design, and sufficient combat power in all terrain conditions including
183 the demanding complex urban environment. Continuous, responsive,
184 rapid force projection and sustainment capability is required to support
185 the requirements of the various expeditionary/amphibious concepts
186 across the full spectrum of the ROMO from now and beyond 2015.
187 MERS will provide the basic element for maneuver forces to project
188 integrated firepower, enable Situational Awareness (SA) through
189 persistent reconnaissance and surveillance and develop situations as the
190 force on the ground when and where it is needed. Planning must begin
191 immediately in order to assure this capability will exist in 2015 and
192 beyond to meet the gaps identified in Section 4 below.

193 2. Required Capability

194 2.1. General Background. Evolving Department of Defense (DOD)
195 visions and strategies required to meet traditional MCO and face new
196 asymmetrical world threats, such as the GWOT, call for the employment
197 of agile, scalable, distributed, and dispersed combat power from the sea,
198 thereby reducing the reliance on land based infrastructure and/or host
199 nation support. The capability to defeat anti-access and area denial
200 strategies and to project expeditionary forces ashore at a time and place

201 of choosing is a critical challenge for the Joint Force Commander. In
202 general terms, this challenge involves the application of forward deployed
203 assault forces to decisively defeat enemy forces. The required tasks,
204 standards and conditions under which the Commander will meet this
205 challenge were determined in a FAA in accordance with CJCSM
206 3170.01B referenced in Appendix D.

207 2.2. Joint Service Guidance. Four joint concept constructs provide
208 definition of the warfighter's need for MERS capabilities – the Capstone
209 Concept for Joint Operations (CCJO), the Joint Operating Concepts
210 (JOCs), Joint Functional Concepts (JFCs), and Joint Integrating
211 Concepts (JICs) documents. These documents echo strategic guidance
212 calling for rapidly deployable, employable, and sustainable expeditionary
213 forces throughout the global battlespace regardless of anti-access or area
214 denial environments.

215 2.2.1. CCJO. The CCJO heads the family of joint future concepts that
216 describe how joint forces are expected to operate across the ROMO
217 beyond 2015. The central idea describes what joint forces will need to do
218 to overcome future challenges. Supporting ideas provide more specificity
219 and include the need to project and sustain the force, act from multiple
220 directions in multiple domains concurrently, conduct integrated and
221 interdependent actions, act directly upon perceived key elements and
222 processes in the target system, and transition quickly and smoothly
223 among the various actions. MERS will provide forces to meet these
224 requirements by applying small units possessing most of the future joint
225 force's key characteristics. MERS concept calls for expeditionary,
226 adaptable, and tailorable infantry. The knowledge-empowered,
227 networked, and interoperable MERS will employ organic firepower and
228 enable non-organic firepower in order to be precise, agile and lethal.
229 MERS will become enduring and resilient through increased training and
230 improved manpower employment.

231 2.2.2. JOCs. Of the four JOCs, MCO and Stability Operations are most
232 relevant to MERS. MCO and Stability Operations cover projection and
233 sustainment of military power ashore from a Sea Base for the conduct of
234 preemptive battlespace shaping, seizing the initiative, and providing
235 seamless preparation for decisive operations.

236 MCO. In MCO, the Joint Force must possess capabilities-based,
237 expeditionary, modular, adaptive force packages capable of rapid
238 deployment, immediate employment, and worldwide sustainment. The
239 forces must be tactically integrated and networked and capable of
240 achieving assured access and forcible entry from the sea in support of
241 traditional and irregular operations. They also must be capable of
242 defeating enemy forces in urban terrain. MCO require early, multi-

243 dimensional integration of precision fires, maneuver, and tactical
244 assault. Joint assured access capabilities include expeditionary forcible
245 entry and rapid force maneuver and projection. In addition, forces must
246 be able to immediately redeploy for rapid transition to follow-on
247 operations. MCO JOC lists essential capabilities to “rapidly project
248 force...from operational distances,” to “provide multi-dimensional
249 precision engagement,” and to “conduct large scale, simultaneous and
250 distributed, multi-dimensional combat operations (including forcible-
251 entry operations) regardless of existing target area infrastructure and
252 environmental conditions.” MERS will be among the first forces deployed
253 providing that essential base for enabling these larger requirements of
254 multi-dimensional combat.

255 Stability Operations. During stability operations, MERS will be the
256 building block of the Joint Force supporting peace enforcement,
257 peacekeeping, and humanitarian and security assistance, through
258 missions such as raids, Non-combatant Evacuation Operations (NEO),
259 and providing relief and support. Additionally, MERS comes prepared to
260 conduct counterinsurgency operations, irregular warfare, and counter-
261 terrorists activities, as well as limited conventional operations as
262 required by Joint Forces in stability operations.

263 2.2.3. JFC. While the FA JFC was considered to be most relevant, each
264 of the remaining JFCs addressed some capability that has applicability to
265 the MERS.

266 Force Application. The FA JFC conveys the importance of its two
267 essential capabilities - Maneuver and Engagement. In order to provide
268 the Commander with the force needed to decisively defeat the enemy or
269 control unstable situations, the force must possess FA attributes. MERS
270 will contribute to the maneuver aspect of FA through its agile use of
271 many transportation assets to include dismounted mobility. A tailorable
272 MERS will bring a full range of lethality as the situation dictates, from
273 non-lethal through lethal weapons. Small unit leader decision making,
274 networking, and synchronization are keys to MERS agility, persistence,
275 and survivability. MERS supports tactical dominance.

276 Battlespace Awareness (BA). The BA JFC addresses the need for a
277 constellation of sensors that have persistent and redundant coverage.
278 MERS will possess several BA attributes which enable the Joint Force
279 the ability to better project and apply force. MERS, serving within the
280 constellation of sensors, will provide persistent, agile, secure, timely
281 information to the force that will enable the commander to better execute
282 his mission.

283 Protection. This JFC highlights the inherent capabilities pertinent to the
284 Joint Force including the ability to detect, assess, warn, defend, and
285 recover. MERS ability to act as a sensor during Distributed Operations
286 (DO) will provide protection to the joint force. Protection requires forces,
287 including MERS, to be endowed with the following attributes: Fully
288 Integrated, Networked, Persistent, and Effective.

289 Net Centric Environment (NCE). NCE JFC describes a framework for full
290 human and technical connectivity and interoperability. NCE attributes
291 of the force include Agile, Quality, Trustworthy, Assured, and Robust.
292 Within the NCE, MERS will be more capable of projecting organic power
293 and enabling the projection of non-organic firepower. The NCE will
294 enable MERS through greater SA and connectivity and, in turn, MERS
295 will act as a sensor to provide input to the force's Common Operating
296 Picture (COP).

297 Joint Command and Control (JC2). The C2 JFC begins to define
298 inherent capabilities for forces operating in a dispersed, networked and
299 joint force environment over extended distances. The force needs to
300 possess superior decision making, shared understanding and quality
301 information, flexible synchronization, simultaneous/dispersed C2,
302 responsive/tailorable organization, full spectrum integration, and robust
303 networking. A properly trained and equipped MERS exhibiting those
304 attributes will operate as a C2 node and contribute to the overall C2
305 environment of the force.

306 2.2.4. JIC. JICs describe "...how a Joint Force Commander 10-20 years
307 in the future will integrate capabilities to generate effects and achieve an
308 objective." Of the JICs currently under development by the Joint Staff,
309 Joint Forcible Entry Operations JIC is the most applicable to MERS. Sea
310 Basing and Global Strike JICs are also applicable. MERS is the basic
311 element of a joint force conducting forcible entry and sustained
312 operations ashore. MERS will very likely deploy from the Sea Base.
313 Seabasing will provide the opportunity for preemptive battlespace
314 shaping, seizing the initiative, and seamless preparation for decisive
315 operations in conjunction with rapid deployment, assembly, command,
316 projection, reconstitution, and re-employment of joint combat power from
317 the sea. Global Strike requires greater operational reach and
318 persistence. Global Strike requires the capability to find, fix, track, and
319 target moving targets. It also requires highly reliable forces capable of
320 achieving precise effects and minimizing collateral damage in complex
321 and urban terrain and the ability to execute operations without requiring
322 establishment of a large logistical footprint. Within emerging concepts,
323 such as DO, MERS will extend this reach and provide persistence to the
324 joint force.

325 2.3. Joint and Service Task Lists. The Universal Joint Task List (UJTL)
 326 and corresponding Marine Corps, Army, Navy, and Air Force Task Lists
 327 were assessed for Joint and Service tasks. These are discussed in detail
 328 in the FAA referenced in Appendix D.

329 2.4. Task, Conditions, and Standards. Strategic, Joint and Service
 330 guidance validated the need for the Joint Force Commander to project
 331 and employ expeditionary forces ashore at a time and place of his
 332 choosing. These forces must be rapidly deployable, employable and
 333 sustainable regardless of anti-access or area-denial environments and
 334 independent of existing infrastructure, and they must have the ability to
 335 decisively engage the enemy. The FAA Strategy to Service task list
 336 addressing these capabilities initially encompassed nearly 700 tasks.
 337 These tasks were synthesized into six warfighting functional areas
 338 (Command and Control, Intelligence/SA, Fires, Mobility, Protection, and
 339 Logistics) that best captured the overarching functionality of strategies in
 340 order to identify critical tasks for MERS across the range of its missions
 341 and tasks. Tasks/sub-tasks, conditions and standards are included in
 342 the FAA referenced in Appendix D.

343 2.4.1. Critical Tasks. Within the four mission areas (Movement, Offense,
 344 Defense, and Stability Ops), the FAA identified 26 critical tasks for
 345 MERS:

346 **Table 1 MERS Mission Areas**

<u>Movement</u>	<u>Offense</u>	<u>Defense</u>	<u>Security Ops</u>
Movement to Objective – foot	Attack Enemy Dismounted	Prepare defensive positions	Entry Control Point (ECP) Ops
Movement to Objective - ground vehicle / animal	Attack Enemy Mounted	Conduct Local Security / Surveillance	Vehicle Check Point (VCP) Ops
Movement to Objective – amphibious	Attack Fortified position	Employ weapons	Ops Conduct urban patrolling
Movement to Objective - air vehicle	Attack Built-Up area	Consolidation / Reorganization	React to Civil Disturbance
Conduct linkup / passage of lines / relief in place	Combat Patrol	Delay & withdrawal under pressure	Detainee / EPW Handling
Infiltration	Attack Dismounted with Mech/Armor		Cordon & Search Area

<u>Movement</u>	<u>Offense</u>	<u>Defense</u>	<u>Security Ops</u>
Security / Reconnaissance Patrol			Provide Convoy Escort
Counter Counter- mobility			

347 2.4.2. Conditions. The FAA mapped 93 conditions across 11 categories.
 348 The categories (and number of associated conditions) are as follows:
 349 Terrain (21), Mobility (12), Fire Support (12), Threat (18), Political (10),
 350 Temperature (3), Humidity (3), Visibility (3), Light (3), Wind (3), and
 351 Precipitation (5). Details are provided in the FAA referenced in Appendix
 352 D.

353 2.4.3. Standards. The standards for evaluating the tasks and sub-tasks
 354 were derived from the Joint/Service Task Lists, FAA strategy-to-task
 355 document search, JFC attributes, Office of the Secretary of Defense
 356 (OSD) Naval Forcible Entry Study, Service policy documents and subject
 357 matter experts. Standards for the 26 identified tasks are provided in the
 358 FAA referenced in Appendix D.

359 3. Concepts of Operations Summary

360 3.1. The capability to employ assault forces within the littoral
 361 battlespace is essential for accomplishing Unified Command Plan (UCP)
 362 missions which require JFCs to conduct expeditionary operations as part
 363 of “normal operations.” This may include employment within Defense
 364 Planning Scenarios MCO-1 and MCO-3. Future operational concepts,
 365 such as STOM and DO, make clear the need for assault forces with small
 366 units capable of conducting continuous and distributed operations
 367 across the full range of military operations throughout the joint
 368 battlespace. The desired operational outcome is to have forces engage
 369 the enemy decisively at a time and place of the JFC’s choosing and to
 370 maintain tempo during sustained operations. The capability to project
 371 and employ effective forces ashore enables that outcome. The capability
 372 described in this document is a key enabler for the Concepts of
 373 Operation in STOM, Seabasing and DO. Additionally, a Tactical
 374 Operating Concept has been developed for MERS referenced in Appendix
 375 D.

376 3.1.1. Ship-to-Objective Maneuver (STOM). STOM is the application of
 377 Expeditionary Maneuver Warfare (EMW) to amphibious operations
 378 through Operational Maneuver from the Sea (OMFTS). STOM projects
 379 forces ashore at multiple points, potentially from multiple directions, in
 380 fighting formation against a decisive objective. Forces rapidly

381 concentrate at the decisive place and time and in sufficient strength to
382 ensure success. STOM requires dispersed forces to have the ability to
383 coordinate maneuver, fire power, aviation assets, and logistics. These
384 forces need to operate in a non-linear, quick, hard-hitting battle over
385 large distances in a widely dispersed environment. The maneuver,
386 firepower and sustainment necessary to conduct an assault directly from
387 a sea base located over the horizon to the shore and into objectives deep
388 within the surface battlespace requires a level of speed, operational
389 tempo, and firepower applied against critical vulnerabilities that exceeds
390 the enemy's ability to react. Fires and Intelligence, Surveillance and
391 Reconnaissance (ISR) nodes are the principal operational effects provided
392 by MERS.

393 3.1.2. Seabasing CONOPS. Seabasing, the future sea borne operational
394 and sustainment 'platform' from which STOM will be executed and
395 sustained, consists of a set of capabilities that do not rely on a fixed port,
396 advanced naval base or host nation support. Assault forces, including
397 MERS, operating from a Sea Base provide JFCs with the naval
398 operational capabilities required to support assembly of scalable forces
399 and force projection. The Sea Base then supports sustainment of those
400 forces with a minimum logistics footprint ashore. Assault forces
401 operating from the Sea Base rely on key enablers including C2, logistics
402 and maneuver.

403 3.1.3. Distributed Operations (DO) CONOPS. DO is a force employment
404 option providing the JFC with the ability to conduct tactically
405 interdependent, small unit operations separated over a large geographic
406 objective area or in complex terrain found in urban environments. DO
407 emphasizes the rapid positioning and repositioning of small units in the
408 area of operations, such as mission configured MERS, to attack a fluid
409 enemy fighting as insurgents or to mass into larger units to attack an
410 organized enemy force. Under this concept, MERS will need the ability to
411 direct all forms of supporting arms, provide terminal guidance for rotary
412 wing and tilt-rotor aircraft, perform casualty evacuation, and maintain
413 access to high-level communications networks.

414 3.1.4. MERS Tactical Operating Concept. MERS will operate across the
415 ROMO, including MCO and Stability Operations. The Tactical Operating
416 Concept describes two operational situations (OpSits) under MCO
417 (airlifted and surface STOM), two OpSits under Military Operations Other
418 Than War (MOOTW) (opposed NEO and company raid) and one OpSit
419 under Stability Operations (security operations that include Entry
420 Control Point, Urban patrols, Vehicle Check Point, Reacting to Civil
421 Disturbance, Cordon and Search of an Area, Detainee/EPW Handling,
422 and Providing Convoy Escort). Each OpSit is composed of multiple
423 Tactical Situations (TacSits) that represent the 26 critical tasks found in

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424 Table 1 above. Forty-nine sub-tasks were portrayed and analyzed from
425 an operational perspective across the TacSits to develop concerns and
426 issues.

427 3.2. Joint Capability Areas (JCA). MERS applies to the following Tier 1
428 and Tier 2 JCA:

- 429 • Joint Force Generation
 - 430 ○ Equip
 - 431 ○ Organize
 - 432 ○ Develop Skills
- 433 • Joint Force Management
- 434 • Joint Battle Space Awareness
 - 435 ○ Dissemination and Integration
 - 436 ○ Evaluation and Feedback
- 437 • Joint Command and Control
 - 438 ○ Exercise Command Leadership
 - 439 ○ Develop and Maintain Shared Situational Awareness and
 - 440 Understanding
 - 441 ○ Communicate Commander's Intent and Guidance
 - 442 ○ Synchronize Execution Across All Domains
 - 443 ○ Monitor Execution, Assess Effects and Adapt Operations
- 444 • Joint Net-Centric Operations
 - 445 ○ Knowledge Sharing
- 446 • Joint Protection
 - 447 ○ Protect Against Conventional Weapons Fires
 - 448 ○ Protect Against Terrorist Threat
- 449 • Joint Logistics
 - 450 ○ Force Health Protection
- 451 • Joint Land Operations
 - 452 ○ Conduct Operational Movement and Maneuver
 - 453 ○ Provide and Employ Joint Fires
 - 454 ○ Conduct Decisive Maneuver
- 455 • Joint Access and Access Denial Operations
 - 456 ○ Forcible Entry
 - 457 ○ LOC Protection
 - 458 ○ Sea Basing
- 459 • Joint Maritime/Littoral Operations
 - 460 ○ Maritime/Littoral Expeditionary Operations
- 461 • Joint Special Operations and Irregular Operations
 - 462 ○ Special Reconnaissance
 - 463 ○ Direct Action
 - 464 ○ Counterterrorism
 - 465 ○ Unconventional Warfare
 - 466 ○ Foreign Internal Defense

- 467 • Joint Global Deterrence
- 468 o Force Protection
- 469 • Joint Shaping
- 470 o Security Cooperation
- 471 o Presence
- 472 • Joint Stability Operations
- 473 o Security
- 474 o Peace Operations

475 4. Capability Gaps

476 4.1. Methodology. The MERS is a ground combat weapon system
477 comprised of 13 individuals capable of performing the missions of
478 Movement, Offense, Defense, and Security Operations across the ROMO.
479 Within one or more of these missions, the MERS must be capable of
480 performing the 26 critical tasks described in Table 1 above. Analyzed in
481 the context of the MERS Tactical Operating Concept, these 26 critical
482 tasks were further defined by 49 sub-tasks or required capabilities.
483 Three-hundred forty-six Marine Corps, Army and Joint material
484 programs, fielded and in development as Programs of Record at that
485 time, were identified, mapped and evaluated against the 49 sub-tasks of
486 the MERS. Subject Matter Experts (SMEs) from the Marine Corps and
487 Army, representing program development and extensive field experience
488 in small unit ground combat requirements, were brought together to
489 conduct the evaluation. Using an electronic collaborative evaluation aid,
490 “Team Expert Choice” and a modified “Delphi” method, the SMEs
491 prioritized the sub-tasks and then captured and recorded each material
492 program’s percentage contribution to the sub-task(s) against which it
493 was mapped. By comparing the SME’s composite percentage evaluation
494 against the Threshold and Objective performance metrics for each sub-
495 task, capability gaps were identified and documented. The subsequent
496 Gap Analysis identified critical sub-tasks for which no current or
497 planned material program would enable the MERS to perform the sub-
498 task to threshold standards. These results were then assessed in the
499 context of three operating environments for the squad: Conventional
500 Operations, Less Than Conventional Operations and Security/Stability
501 Operations. Finally, the characteristics of each MERS capability gap
502 were described and recorded in terms of the CCJO key characteristics in
503 order to provide a framework for the Functional Solutions Analysis. The
504 detailed capability gap evaluation of each of the 49 sub-tasks is in the
505 FNA referenced in Appendix D.

506 4.2. Description of the Gaps. The rifle squad is assessed as being
507 unable to perform or unacceptably limited in the performance of 22 of
508 the 49 sub-tasks. These 22 sub-tasks were further grouped into six (6)
509 Capability Gaps. The six Capability Gaps discussed in terms of gap

510 description, gap characteristics, and the specific sub-tasks that led to
511 the gap. Linkages to applicable CCJO key characteristics are cited in
512 Capability Gap Summary table below.

513 Since the completion of the FSA, the need for a precision shooter within
514 the MERS has been identified by the Marine Corps. Through the UUNS
515 of August 2006 supported by the Urgent Statement of Need dated 12
516 December 2006, along with documentation contained in Marine Corps
517 Lessons Learned: Non-Kinetic / Counterinsurgency Operations, A Study
518 in Command, 11 August 2006, a high enough priority for a precision
519 shooter has been accorded for inclusion in this document.
520 Consequently, this need will be addressed under the sub-task “Engage
521 Threat with Squad Internal Fires” identified in the FNA, and grouped
522 under Gap 1 Target Acquisition.

523 4.2.1. Capability Gap 1: Target Acquisition

524 MERS must be able to recognize a potential military target as being a
525 particular target (such as a specific vehicle by type) and whether target is
526 friend, foe or neutral and categorize potential targets by the level of
527 danger they represent under all conditions at unobstructed ranges.

528 Gap 1 Description. The rifle squad cannot sufficiently identify and
529 classify targets in conditions of low visibility caused by weather,
530 obscurants or at night at the same ranges found during unobstructed,
531 daylight conditions without endangering neutrals or friendly units
532 thereby placing unacceptable constraints on their ability to fight. This
533 gap is one of sufficiency and proficiency.

534 Characteristics of Gap 1

- 535 • Limited ability to see through or around walls, obstacles, and
536 obscuration in order to detect targets inside a building or behind a
537 covered position.
- 538 • Limited ability to distinguish between friend, enemy, and neutral
539 in low-light situations, at night, and at greater range.
- 540 • Limited ability to categorize potential targets by the level of danger
541 they present in low-light, at night, and at greater range.
- 542 • Limited automatic ability to be identified as a friend and
543 distinguished from an enemy or neutral 24/7.
- 544 • Limited ability to engage targets at range with a high degree of
545 precision/accuracy not currently available in the squad.

546 Specific Sub-task Deficiencies that led to Gap 1

547 Identify Targets – Recognition of a potential military target as being a
548 particular target (such as a specific vehicle by type) & whether target is
549 friend, foe or neutral. Identify targets in day or night is below threshold
550 with existing systems, but can be well above threshold with the
551 introduction of future systems that are possible but not in the Program
552 of Record (POR). Improving the ability to identify targets at greater
553 ranges and at night would move this sub-task above threshold.

554 Classify Targets – Categorizing potential targets by the level of danger
555 they represent. This can be more difficult than identification.
556 Classifying targets in the day or night is just below threshold with
557 existing systems. Improving the ability to classify targets at greater
558 ranges and at night could move this sub-task above threshold.

559 Identification Friend or Foe (IFF) Transmission – The ability to be
560 identified as a friend and distinguished from an enemy or neutral. The
561 gap between the criteria of this sub-task and current or future programs
562 is the result of a technical mismatch between squad level combat
563 identification programs and IFF transmission cueing and receiving
564 capabilities in tactical air and those being refined in near term
565 generations of COP capabilities.

566 Engage Threat with Fires Internal to the Squad – Employ or direct squad
567 internal weapons against a threat with the intent of inflicting lethal
568 effects (destroy, neutralize, suppress enemy). This sub-task that was at
569 or near threshold due to the lack of integration of current and additive
570 systems now falls below threshold because of a recently identified need
571 for a direct fire, precision capability resident with the squad. This need
572 has also placed this sub-task at a higher priority than previously
573 assessed in the FNA.

574 4.2.2. Capability Gap 2: Move

575 MERS must be able to conduct foot mobile movement where the
576 possibility of threat engagement exists and be able to accomplish the
577 mission immediately after movement.

578 Gap 2 Description. The rifle squad cannot operate persistently and
579 effectively while dismounted due to being overburdened with heavy, non-
580 integrated equipment. This will impact the ability to move and fight in
581 rapidly changing environments and while conducting emerging concepts
582 like DO that require greater self-sufficiency for longer periods of time and
583 movement over longer distances. This gap is one of sufficiency and
584 proficiency.

585 Characteristics of Gap 2

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- 586 • Equipment weight and integration continues to be a factor.
- 587 • Limited ability to have clothing and equipment for a variety of
- 588 missions and environmental conditions unless carried.
- 589 • Numerous squad capabilities dependent on sustained electrical
- 590 power requiring heavy, short life batteries.
- 591 • Weight penalty for carrying more than one to two liters of water at
- 592 a time.
- 593 • The requirement to maintain weapons and equipment without
- 594 ready access beyond 1st echelon maintenance.

595 Specific Sub-task Deficiencies that led to Gap 2

596 Protect Against Environmental Conditions – Allow squad to operate in
597 any climate or terrain. Current and future programs contribute to
598 protecting the Squad against environmental conditions but taken
599 together, result in below threshold values. Lack of program integration
600 and poor environmental adaptability in uniform and equipment items
601 result in clothing and equipment fielded and issued to squad members
602 that require them to carry and stage many items that are only useful in
603 specific climatic and/or geographical situations.

604 Sustain and Manage Electric Power – Generate power for squad assets.
605 The sub-task can be met with at least threshold level performance if
606 squad training emphasizes power conservation and the squad’s resupply
607 system is well managed. A capability for the squad to regenerate their
608 many power sources using a variety of means would improve
609 performance of this sub-task and mitigate the risk of losing a number of
610 critical squad capabilities dependent on sustained electrical power. The
611 impact on the squad’s mobility is measured by the weight penalty from
612 the multiple, bulky, heavy power sources.

613 Hydrate the Squad - Means to keep the squad members properly
614 hydrated. The gap in this sub-task centers on the weight penalty for
615 carrying more than one to two liters of water at a time. Currently the gap
616 can only be mitigated with more frequent replenishments and an
617 individual water purification system that addresses a broad spectrum of
618 non-potable or contaminated fresh water in a short period of time. An
619 additive individual capability to desalinate salt water in a reasonable
620 period of time would also reduce the gap.

621 Maintain Equipment - Keep equipment operational without external
622 support. The gap in this sub-task centers on designed Reliability,
623 Maintainability, Supportability (RMS) of individual and squad weapons
624 and equipment. As currently designed around the 3-level maintenance

625 concept, the squad is limited to cleaning and simple, minor adjustments
626 to their equipment, and must rely on capabilities that are often miles of
627 land and/or water away from their area of operations. Taking
628 maintenance equipment on decentralized missions may negatively
629 impact mobility..

630 Move Dismounted in Tactical Situation - Foot mobile movement where
631 the possibility of threat engagement exists. This subtask is below
632 threshold. The primary issue is weight. Systems contributing to
633 dismounted movement (uniform items, cold weather equipment, load-
634 bearing equipment, and mobility assets) provide limited support to the
635 infantrymen who rely on physical effort to move without vehicles.
636 Reduction of the infantryman's load does not appear to be an integrated
637 effort.

638 Carry Supplies and Equipment - Means to carry essential supplies &
639 equipment (ammo, food, water, batteries, weapons, etc) sufficient to
640 sustain the squad for a period of time while on the move and
641 mounting/dismounting transportation systems. This subtask is rated
642 below threshold. The primary issues are weight, volume, and ergonomics
643 and the lack of integration of weapons and equipment that increases the
644 burden on the warfighter.

645 4.2.3. Capability Gap 3: Communicate

646 MERS must be able to communicate internally with its members and
647 externally to other tactical and fire support units.

648 Gap 3 Description - The rifle squad cannot communicate (voice & data)
649 effectively at the ranges required of future operating concepts in order to
650 maintain SA, control the unit and control external fire support with an
651 integrated communication system that does not overburden the squad.
652 Although individual tasks were assessed as minimally acceptable, the
653 capability gap exists from an overall systems perspective. Communicate
654 was separated into two areas (internal and external) during the FSA to
655 facilitate evaluation and identification of potential solutions. This gap is
656 one of sufficiency and proficiency.

657 Characteristics of Gap 3

- 658 • Unreliable internal squad communications capability in most
659 tactical scenarios
- 660 • Unprotected communications transmissions
- 661 • Limited reliable and effective communication capabilities added
662 externally to squad

- 663 • Weight penalty resulting from for having to carry numerous non-
664 integrated transmission platforms and power sources
- 665 • No translation capability exists that would allow the MERS to
666 communicate with non-English speakers
- 667 • Limited automatic ability to be identified as a friend and
668 distinguished from an enemy or neutral 24 hours/7 days a week

669 4.2.3.1. Capability Gap 3a: Communicate Internal

670 Specific Sub-task Deficiencies that led to Gap 3a

671 Control Fires Internal to the Squad - Employ and Direct squad fires,
672 including attached weapons, through a variety of communications
673 means. Current capability exists that allows adequate communication
674 within the squad. Implied in the task to control fires internal to the
675 squad are the mission essential/critical tasks to communicate internal to
676 the squad, maintain internal SA, and target location/designation. In
677 order to conduct DO across ROMO, the MERS requires a capability to
678 control squad internal fires greater than that currently fielded to Marine
679 rifle squads.

680 Tactical Control of the Unit - Control tactical movements, maneuver and
681 actions of squad under all conditions. Currently, the squad must rely on
682 the additive capabilities of existing equipment to tactically control the
683 MERS. These additive capabilities still only marginally meet the
684 threshold capability. In the kinds of operations characterized in the DO
685 concept, advantage over the enemy is created by deliberate use of
686 separation and coordinated, independent tactical actions enabled by
687 enhanced capabilities at the small unit level. The enhanced capabilities
688 required to provide the level of tactical control envisioned for the MERS
689 in DO are integrated SA and communications.

690 Maintain Situational Awareness Internal to Squad - Squad collective
691 knowledge about the squad and members of the squad as it applies to a
692 changing/developing situation/environment to include knowing own
693 location. There is adequate capability (near objective capability) to
694 maintain SA internal to the squad with current or soon-to-be available
695 equipment. In the near term SA will rely primarily on intra-squad
696 communications. However, in order to conduct DO across ROMO, the
697 MERS requires a capability greater than that currently fielded to Marine
698 rifle squads.

699 4.2.3.2. Capability Gap 3b: Communicate External

700 Specific Sub-task Deficiencies that led to Gap 3b

701 Control Fires External to the Squad - Control and Direct fires from
702 sources external to the squad through a variety of communications
703 means. Implied in the task to control fires external to the squad are the
704 mission essential/critical tasks to communicate external to the squad,
705 maintain external SA, and target location and designation. Current &
706 programmed systems exist to adequately control fires external to the
707 squad. However, this task requires multiple radio and other systems
708 that are weight prohibitive and normally not issued at the squad level.
709 Current interim, light weight solutions are not reliable in all tactical
710 scenarios.

711 Communicate with Indigenous Population or Foreign Forces -
712 Translation capability with non-English speakers. The squad does not
713 currently have a program to provide the MERS with adequate capability
714 to communicate with indigenous forces. Indigenous translators are
715 problematic and often unreliable. Until technology offers a more
716 satisfactory and comprehensive solution, the solution to this sub task
717 remains language, cultural and information operations training.

718 Maintain Situational Awareness about Forces External to the Squad -
719 Squad collective knowledge of friendly, enemy, neutral elements in the
720 area of operations as it applies to a changing/developing
721 situation/environment. The current suite of equipment that includes
722 communications, sensors, and optics cannot provide the necessary level
723 of SA about forces external to the squad. The ability to display known
724 friendly and known or suspected enemy locations is essential to tactical
725 success in an environment where units are increasingly dispersed across
726 the battlespace with the requirement to mass quickly to fix and defeat
727 enemy forces. In order to be successful in DO and maintain SA, the
728 squad leader of the MERS must be able to reliably and effectively
729 communicate externally to the squad while tactically controlling the
730 squad.

731 Identification Friend or Foe (IFF) Transmission - The ability to be
732 identified as a friend and distinguished from an enemy or neutral. The
733 gap between the criteria of this sub-task and current or future programs
734 is the result of a technical mismatch between squad level combat
735 identification programs and IFF transmission cueing and receiving
736 capabilities in tactical air and those being refined in near term
737 generations of COP capabilities.

738 4.2.4. Capability Gap 4: Survive the Effects of Fires

739 MERS must be able to operate while being protected from the effects of
740 ballistic and fragmentation devices.

741 Gap 4 Description - The rifle squad cannot move and fight effectively in
742 current and future operations while sustaining casualties from ballistic
743 and fragmentation weapons/munitions. This gap is one of sufficiency
744 and proficiency.

745 Characteristics of Gap 4

- 746 • Limited ability to provide ballistic and fragmentation protection
747 while maintaining full mobility.
- 748 • Weight penalty for head-to-toe protection coverage.
- 749 • Limited Improvised Explosive Device (IED) detection and
750 identification methods for use by MERS from safe ranges.
- 751 • Limited ability to avoid detection except through individual
752 movement, and use of cover and concealment once they know they
753 are acquired.
- 754 • While NIRO (glint detection) exists there are no system exists that
755 provide warning and detection prior to an opponent delivering fire.

756 Specific Sub-task Deficiencies that led to Gap 4

757 Protect Against Kinetic Projectiles - Provide ballistic and fragmentation
758 protection while maintaining full mobility. The gap reflects a near
759 threshold ability to protect Squad members from incapacitation by shock
760 and secondary fragmentation from kinetic projectiles. Full protection
761 along side torso and extremities as well as the weight penalty cause this
762 sub-task to be near threshold. Objective criteria, however, includes
763 protection from rifle rounds and is not met by any current program.

764 Protect Against Hidden Explosive Devices - Detect, locate, report, mark,
765 and tag mines, IEDs, unexploded ordnance and booby traps. The sub-
766 task includes four elements: detecting (prior to detonation), identifying,
767 marking (at least the correct position on a map) and reporting the hidden
768 explosive device. Of the four elements required to accomplish this sub-
769 task, 'detection' and 'identification' from safe ranges are the key
770 shortfalls which produce this gap. At the MERS level, there are limited
771 materiel programs to meet the criteria for protection (detecting,
772 identifying, marking and reporting) against hidden explosive devices.

773 Counter Target Acquisition - Warn, detect, locate, and avoid enemy target
774 acquisition devices. Closing or significantly mitigating this gap is
775 problematic at the squad level. The materiel capability of the MERS to
776 perform this sub-task is limited to daylight sights/optics which have
777 some magnification, night sights/optics which lack sufficient resolution
778 and operates in limited spectra, and individually employed smoke

779 generation round and grenades. Systems which can provide weapons
780 range warning and detection prior to an opponent delivering fire are
781 generally reliant on having some distinguishable electronic or heat
782 source on which to cue. They are generally larger, heavier and require
783 power sources that would not be practical for a foot mobile squad to
784 carry.

785 Avoid Detection - Actions and systems to reduce squad signature from
786 sound, thermal, radio frequency energy, visible light, etc in order to avoid
787 detection. The sub-task was assessed at below the Threshold (TH)
788 criteria when material program contributions were evaluated. It was
789 noted that elements of this sub-task are closely linked to those of Squad
790 SA and their ability to detect the enemy before the enemy detects the
791 squad. The current Marine Pattern (MARPAT) uniform is seen as a
792 contributor to this sub-task, but its effectiveness is highly situational
793 and environmentally dependent.

794 4.2.5. Capability Gap 5: Survive Environmental and CBRNE Effects

795 MERS must be able to operate in any climate or terrain without
796 sustaining environmental injuries (includes CBRN detection, protection,
797 & field decontamination).

798 Gap 5 Description - The rifle squad cannot move and fight effectively
799 while being protected against environmental conditions (to include
800 CBRN) especially in emerging concepts that require fighting and moving
801 over extended distances, primarily due to the bulk and lack of integration
802 of the various ensembles. This gap is one of sufficiency and proficiency.

803 Characteristics of Gap 5

- 804 • Inability of the squad to operate for an extended period of time in
805 an area contaminated from the effects of an CBRN weapon over
806 extended distances found in future concepts.
- 807 • Bulk and weight, poor integration and poor logistics distribution of
808 clothing and equipment that protects against a variety of
809 environmental conditions impedes movement and effectiveness
810 when moving and fighting over extended distances found in future
811 concepts.

812 Specific Sub-task Deficiencies that led to Gap 5

813 Detect and Protect Against CBRN Contamination - Provide detection &
814 protection against CBRN weapons effects including field
815 decontamination. The current CBRN ensemble has been shown to
816 protect an individual from the effects of chemical weapons but less so

817 from biological and radiological weapons effects. The lack of personal or
818 squad level detection and/or real-time early warning capability
819 contribute to principal capability shortcomings seen in this gap.

820 Protect Against Environmental Conditions - Allow squad to operate in
821 any climate or terrain. Current and future programs contribute to
822 protecting the Squad against environmental conditions but taken
823 together, result in below threshold values. Lack of program integration
824 and poor environmental adaptability in uniform and equipment items
825 result in clothing and equipment fielded and issued to squad members
826 that require them to carry and stage many items that are only useful in
827 specific climatic and/or geographical situations.

828 4.2.6. Capability Gap 6: Medical (Survive)

829 MERS must be able to administer low level medical aid to self or buddy
830 by the squad and provide aid, minimize the contraction or spread of
831 disease, minimize the effects of multiple stresses & conduct Casualty
832 Evacuation (CASEVAC) by field medical school trained squad members.

833 Gap 6 Description - The rifle squad cannot be assured of adequate
834 medical care when operating at extended ranges and in a more
835 autonomous manner over longer periods of time as depicted in future
836 operating concepts. This gap is one of sufficiency and proficiency.

837 Characteristics of Gap 6

- 838 • Limited advanced life-saving training provided to the squad.
- 839 • No focus on training beyond immediate first aid and equipment to
840 provide medical care while operating within the MERS Operating
841 Concept.
- 842 • Limited knowledge management capabilities exist that would
843 enable squad members to “call up” self-aid/buddy aid instructional
844 material from the netted suite of assets.
- 845 • Weight penalty for having to carry additional communications
846 equipment for “calling up” aid instruction.
- 847 • Limited training in CASEVAC procedures across the squad.

848 Specific Sub-task Deficiencies that led to Gap 6

849 Perform Self-Aid/Buddy Aid - The means to administer low level medical
850 aid to self or buddy for entire squad. Additional and more advanced life-
851 saving aid training would appreciably improve the Squad's capability to
852 perform this sub-task, perhaps accomplishing (TH) or above performance
853 criteria. At some point, more advanced training will have to be

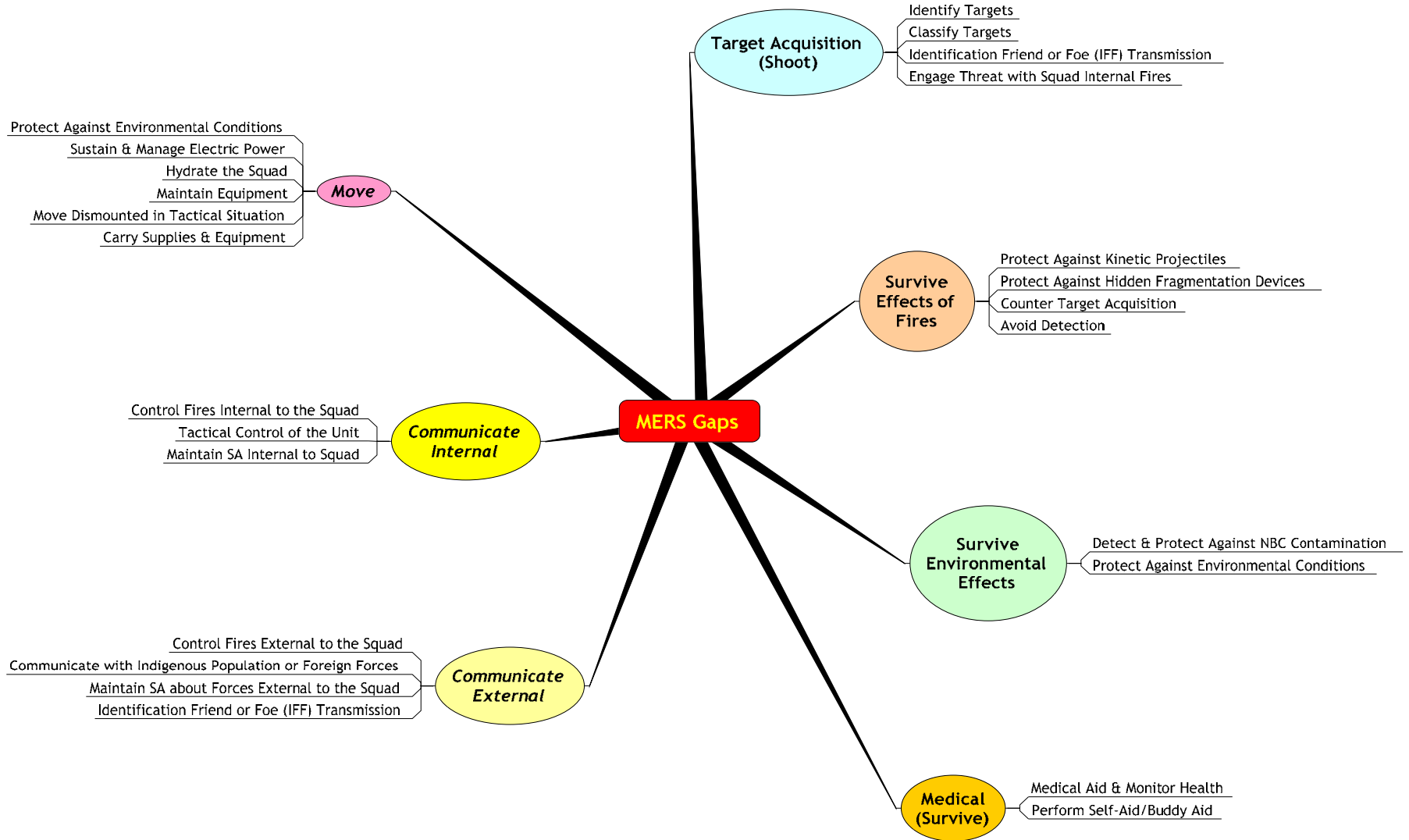
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854 accompanied by improved equipment and medical aid supplies
855 accompanying the squad.

856 Since the completion of the MERS FSA, the Marine Corps has issued and
857 incorporated a training program for each individual MAGTF Marine and
858 Sailor on the Individual First Aid Kit (IFAK). The IFAK replaces the old
859 first aid kit. The old first aid kit was designed to provide the warfighter
860 with a capability to protect wounds but only provided minimal lifesaving
861 capabilities. IFAK is designed to be more compact and have a greater life
862 saving capability that potentially saves lives for those that have
863 sustained severe bleeding wounds.

864 Medical Aid and Monitor Health - Provide means to maximize squad
865 member's effectiveness by providing aid, minimize the contraction or
866 spread of disease, & minimize the effects of multiple stresses to include
867 CASEVAC. Accomplishing the sub-task and closing or significantly
868 mitigating the capability gap is as much a function of training the Squad
869 as it is equipping the Squad. No USMC program evaluated significantly
870 contributes to the capability of training the Squad in providing medical
871 aid and health monitoring.

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Figure 1 Sub-task Gaps grouped into Capability Gaps

Table 2 Capability Gap Summary

Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
Gap 1: Target Acquisition (#1 Priority Gap)	<ul style="list-style-type: none"> • Joint Force Generation <ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills • Joint Force Management • Joint Battle Space Awareness <ul style="list-style-type: none"> ○ Dissemination and Integration ○ Evaluation and Feedback • Joint Command and Control <ul style="list-style-type: none"> ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding ○ Communicate Commander's Intent and Guidance ○ Synchronize 	Identify Targets	1	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Expeditionary • Enduring/Persistent • Precise • Fast 	% of the time a potential target is correctly identified	95%
		Classify Targets	16	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Precise • Fast • Agile 	% times multiple targets correctly classified by squad members	90%
		Identification Friend or Foe (IFF) Transmission	2	<ul style="list-style-type: none"> • Networked • Interoperable • Expeditionary • Precise • Resilient 	% of engagements where squad was correctly identified as friendly by joint and/or coalition forces	90%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> Execution Across all Domains <ul style="list-style-type: none"> ○ Monitor Execution, Assess Effects and Adapt Operations ● Joint Net-Centric Operations <ul style="list-style-type: none"> ○ Knowledge Sharing ● Joint Land Operations <ul style="list-style-type: none"> ○ Provide and Employ Joint Fires 	Engage Threat with Squad Internal Fires	Added post FSA with a higher priority given by MCCDC	<ul style="list-style-type: none"> ● Expeditionary ● Adaptable/Tailorable ● Enduring/Persistent ● Precise 	% of engagements that desired affect was achieved without collateral / friendly damage.	85%
Gap 2: Move (#3 Priority Gap)	<ul style="list-style-type: none"> ● Joint Force Generation <ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills ● Joint Force Management ● Joint Logistics ● Joint Land Operations <ul style="list-style-type: none"> ○ Conduct Operational Movement and Maneuver ○ Conduct Decisive Maneuver 	Protect against environmental conditions	5	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Expeditionary ● Adaptable/Tailorable ● Enduring/Persistent ● Resilient ● Agile 	% of squad members that can continue effective operations without becoming environmental casualties (heat/cold)	90%
		Sustain and Manage Electric Power	19	<ul style="list-style-type: none"> ● Expeditionary ● Adaptable/Tailorable ● Enduring/Persistent ● Resilient 	# days of independent operation without power resupply	15 Days
		Hydrate the	7	<ul style="list-style-type: none"> ● Expeditionary 	Gallons of	2 Gallons

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> • Joint Access and Access Denial Operations <ul style="list-style-type: none"> ○ Forcible Entry ○ LOC Protection ○ Sea Basing • Joint Special Operations and Irregular Operations <ul style="list-style-type: none"> ○ Special Reconnaissance ○ Direct Action ○ Counterterrorism ○ Unconventional Warfare ○ Foreign Internal Defense • Joint Shaping <ul style="list-style-type: none"> ○ Security Cooperation ○ Presence • Joint Stability Operations <ul style="list-style-type: none"> ○ Security ○ Peace Operations 	Squad		<ul style="list-style-type: none"> • Adaptable/Tailorable • Enduring/Persistent • Resilient 	water/man/day available to squad members during a 7-day patrol	
		Maintain individual and squad equipment	21	<ul style="list-style-type: none"> • Networked • Interoperable • Expeditionary • Enduring/Persistent • Resilient 	% of organic squad equipment that is maintained in full mission capable condition during a 7-day patrol mission	95%
		Move dismounted in tactical situations	9	<ul style="list-style-type: none"> • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Fast • Resilient • Agile 	% of instances where the squad is capable of accomplishing its mission immediately after movement	80%
		Carry Supplies and Equipment	14	<ul style="list-style-type: none"> • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Speed 	Weight of supplies and equipment less than or equal to a % of	Less than or equal to 50%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
				<ul style="list-style-type: none"> • Resilient • Agile 	average body weight	
Gap 3a: Communicate Internal (#4 Priority Gap)	<ul style="list-style-type: none"> • Joint Force Generation <ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills • Joint Force Management • Joint Battle Space Awareness <ul style="list-style-type: none"> ○ Dissemination and Integration ○ Evaluation and Feedback • Joint Command and Control <ul style="list-style-type: none"> ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding ○ Communicate Commander's Intent and Guidance ○ Synchronize 	Control Fires Internal to Squad	20	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Precise • Agile • Lethal 	% internal fires have desired effect on target	80%
		Tactical Control of the Unit	6	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Fast • Precise • Agile • Lethal 	% squad arrives at objective during a squad combat patrol	80%
		Maintain SA Internal to Squad	12	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Agile 	% squad that collectively knows key information about their situation	90%

Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<p>Execution Across all Domains</p> <ul style="list-style-type: none"> ○ Monitor Execution, Assess Effects and Adapt Operations ● Joint Net-Centric Operations <ul style="list-style-type: none"> ○ Knowledge Sharing ● Joint Land Operations <ul style="list-style-type: none"> ○ Conduct Operational Movement and Maneuver ○ Conduct Decisive Maneuver ● Joint Access and Access Denial Operations <ul style="list-style-type: none"> ○ Forcible Entry ● Joint Special Operations and Irregular Operations <ul style="list-style-type: none"> ○ Special Reconnaissance ○ Direct Action ○ Counterterrorism ○ Unconventional Warfare 					

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> ○ Foreign Internal Defense 					
Gap 3b: Communicate External (#2 Priority Gap)	<ul style="list-style-type: none"> ● Joint Force Generation <ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills ● Joint Force Management ● Joint Battle Space Awareness <ul style="list-style-type: none"> ○ Dissemination and Integration ○ Evaluation and Feedback ● Joint Command and Control <ul style="list-style-type: none"> ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding ○ Communicate Commander's Intent and Guidance 	Control Fires External to the Squad	3	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Interoperable ● Precise ● Agile ● Lethal 	% ability of squad to successfully control direct and indirect external fires (Arty, mortars, rockets, NGFS, CAS)	80%
		Communicate with indigenous populations or foreign forces	17	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Interoperable ● Expeditionary ● Adaptable/Tailorable ● Precise ● Fast ● Agile 	% of squad members' communications received and understood by recipients	50%
		Maintain SA about Forces External to the Squad	4	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Interoperable ● Agile 	% times squad knows critical information about friendly, enemy, or neutral forces	90%
		Identification Friend or Foe	2	<ul style="list-style-type: none"> ● Networked ● Interoperable 	% of engagements	90%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> ○ Synchronize Execution Across all Domains ○ Monitor Execution, Assess Effects and Adapt Operations ● Joint Net-Centric Operations <ul style="list-style-type: none"> ○ Knowledge Sharing ● Joint Shaping <ul style="list-style-type: none"> ○ Security Cooperation ○ Presence ● Joint Stability Operations <ul style="list-style-type: none"> ○ Security ○ Peace Operations ● Joint Land Operations <ul style="list-style-type: none"> ○ Provide and Employ Joint Fires 	(IFF) Transmission		<ul style="list-style-type: none"> ● Expeditionary ● Precise ● Resilient 	where squad was correctly identified as friendly by joint and/or coalition forces	
Gap 4: Survive Effects of Fires (#5 Priority Gap)	<ul style="list-style-type: none"> ● Joint Force Generation <ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills ● Joint Force Management 	Protect against Kinetic Projectiles	13	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Interoperable ● Adaptable/Tailorable ● Precise ● Resilient 	% squad members not incapacitated due to kinetic projectiles	95%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> • Joint Battle Space Awareness <ul style="list-style-type: none"> ○ Dissemination and Integration ○ Evaluation and Feedback • Joint Command and Control <ul style="list-style-type: none"> ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding • Joint Net-Centric Operations <ul style="list-style-type: none"> ○ Knowledge Sharing • Joint Protection <ul style="list-style-type: none"> ○ Protect against Conventional Weapons ○ Protect against Terrorist Threat 	Protect against hidden fragmentation devices	10	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Adaptable/Tailorable • Precise • Resilient 	% of IEDs, mines, unexploded ordnance and booby traps detected, identified, marked and reported	95%
		Counter Target Acquisition	22	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Precise • Fast • Resilient • Agile 	% of engagements where squad members avoided effects of hostile weapons by countering threat target acquisition systems	90%
		Avoid Detection	18	<ul style="list-style-type: none"> • Knowledge Empowered • Interoperable • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Agile 	% of engagements where squad was not previously detected	75%
Gap 5: Survive	<ul style="list-style-type: none"> • Joint Force Generation 	Detect and Protect	8	<ul style="list-style-type: none"> • Knowledge Empowered 	% of occurrences	95%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
Environmental Effects (#6 Priority Gap)	<ul style="list-style-type: none"> ○ Equip ○ Organize ○ Develop Skills ● Joint Force Management ● Joint Battle Space Awareness ○ Dissemination and Integration ○ Evaluation and Feedback ● Joint Command and Control ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding ● Joint Net-Centric Operations ○ Knowledge Sharing 	Against CBRN Contamination		<ul style="list-style-type: none"> ● Networked ● Interoperable ● Expeditionary ● Adaptable/Tailorable ● Enduring/Persistent ● Fast ● Resilient ● Agile 	that squad does not take casualties caused by CBRN attack	
		Protect against Environmental Conditions	5	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Interoperable ● Adaptable/Tailorable ● Precise ● Resilient 	% members are not environmental casualties (heat/cold)	90%
Gap 6: Medical (Survive) (#7 Priority Gap)	<ul style="list-style-type: none"> ● Joint Force Generation ○ Equip ○ Organize ○ Develop Skills 	Perform Self/Buddy Aid	15	<ul style="list-style-type: none"> ● Knowledge Empowered ● Networked ● Expeditionary ● Enduring/Persistent 	% of squad members that can perform life saving and low level aid to	95%

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Capability Gap	Joint Capability Areas	Sub-Task	Priority/ Key Indicator	CCJO Key Characteristics	Parameters	Minimum Value
	<ul style="list-style-type: none"> • Joint Force Management • Joint Battle Space Awareness <ul style="list-style-type: none"> ○ Dissemination and Integration ○ Evaluation and Feedback • Joint Command and Control <ul style="list-style-type: none"> ○ Exercise Command Leadership ○ Develop and Maintain Shared Situational Awareness and Understanding • Joint Net-Centric Operations <ul style="list-style-type: none"> ○ Knowledge Sharing • Joint Logistics <ul style="list-style-type: none"> ○ Force Health Protection 			<ul style="list-style-type: none"> • Resilient 	self or buddy according to Individual Training Standards	
		Medical Aid and Health Monitoring	11	<ul style="list-style-type: none"> • Knowledge Empowered • Networked • Interoperable • Expeditionary • Adaptable/Tailorable • Enduring/Persistent • Resilient 	% of squad members that can perform aid and health monitoring to Field Medical School training standard (near-Corpsman)	25%

876 5. Threat and Operational Environment

877 While the potential for conventional conflict remains, threats in the 21st
878 century will be unconventional, unforeseen, and unpredictable from
879 adversaries using asymmetric approaches and irregular warfare.
880 Potential adversaries will be adaptive, creative, and become increasingly
881 sophisticated using lessons learned from encounters with American
882 weapons and tactics. They will apply those lessons learned with
883 complexity, adaptability, and skill using non-linear, irregular activities.

884 5.1. Threat Capabilities. Potential adversaries will use both
885 conventional and irregular warfare and will possess an inventory of
886 increasingly sophisticated and overlapping sensors, command-and-
887 control systems, platforms, and weapons capable of inflicting casualties
888 on the MERS. Most adversaries do not have the sophistication or
889 firepower comparable to US forces. Consequently, potential adversaries
890 seek to draw the United States into arenas where its conventional
891 capabilities and technological edge are blunted. Asymmetric threats and
892 irregular warfare are among the primary threats to U.S. Marine forces.
893 In conjunction with asymmetric tactics, better technology makes threat
894 weapons easier to employ while making it more difficult for the MAGTF
895 commander to position expeditionary maneuver forces at optimal
896 locations and times, especially small units in DO. Threat capabilities for
897 asymmetric, multi-dimensional operations vary significantly and depend
898 on doctrine, strategy, equipment in use and its maintenance, and the
899 training level of military forces.

900 5.2. Threats to MERS. Threats to the MERS may range from irregular
901 and asymmetric to conventional forces employing conventional air and
902 land weapon systems as well as CBRNE systems. The potential combat
903 or disruptive power of adversaries may improve significantly with system
904 upgrades, transfers, or proliferation of weapon systems and technology.
905 Some more technically advanced adversaries pose a significant threat,
906 particularly to small units from directed energy weapons such as lasers
907 and radio-frequency devices, and may also attempt to isolate small units
908 from their higher commands through the use of information operations
909 such as jamming and computer network attacks. Additionally, low-
910 technology weapons continue to pose significant threat particularly to
911 dismounted infantry. The proliferation of small arms and Rocket
912 Propelled Grenades (RPG), along with innovative uses of mines and IEDs,
913 increases that threat, especially in the urban areas where terrorists and
914 insurgents continue to operate and small unit tactical missions must be
915 employed. The sniper capabilities of many countries will increase and
916 become a significant threat. Additionally, the use of armor-piercing
917 bullets against both materiel and human targets will become

918 commonplace by 2010. Because they perform most of their missions
919 dismounted without mobility support, all weapons on the modern
920 battlefield pose a serious threat to the Marines of the MERS.

921 5.3. Operational Environment. Events of today and projections of
922 tomorrow's world environment require U.S. forces to operate in hostile
923 regions across an extended battlefield. With limited and unpredictable
924 overseas access, and the political imperative to minimize the footprint of
925 expeditionary forces on the ground, U.S. leadership must increasingly
926 rely on smaller, highly capable and flexible units for quick response to
927 developing crises. Because of the increasingly joint character of warfare,
928 critical, interdependent littoral operations will take place simultaneously
929 in the air, in space, on the ground and at sea. Littoral operations require
930 forces capable of projecting from the joint sea base. They must be able to
931 operate distributed across an area of operations, with only dispersed
932 support and sustainment, and they must be able to do this in crisis
933 areas that present demanding challenges from restrictive features. The
934 Marines of the MERS face challenges posed by a range of environments
935 including deserts, mountains, and swamps, as well as neglected
936 infrastructure, such as poor roads and dilapidated urban structures. As
937 small unit expeditionary maneuver forces, the MERS engage in tactical
938 maneuver while conducting concurrent and subsequent counter-
939 irregular and stability operations in every climate and terrain.

940 5.4. Threat and Operational Environment Summary. US policy and
941 military operations continue to center on resolving regional conflicts,
942 peacekeeping, countering transnational terrorism and narcotics traffic,
943 counter-insurgency operations, and providing relief from natural
944 disasters. Weapon system technology will rise significantly during the
945 timeframe of MERS development. Proliferation of advanced conventional
946 weapons and weapons of mass destruction will increasingly threaten the
947 foot mobile MERS. Continued improvements to low technology weapons
948 such as crew-served weapons, RPGs, mines, and IEDs, will present ever
949 greater pervasive and serious threats to the MERS in every operating
950 environment. The face of the primary threats to the Marine Corps is
951 changing and the Marines must change with it.

952 5.5. Threat Documents. This analysis was made using the following
953 documents:

- 954 • Marine Corps Intelligence Activity (MCIA) Threat Assessment for
955 Marine Expeditionary Rifle Squad, 1 November 2005 (S//NF);
956 Marine Corps Intelligence Activity, Quantico, VA.
- 957 • Ground Soldier System (Land Warrior Block III) DRAFT, 22 June,
958 2004.

- 959 • MCI Marine Corps Midrange Threat Estimate: 2005-2015, 1 July
960 2005 (UNC/FOUO); Marine Corps Intelligence Activity, Quantico,
961 VA.

962 6. Functional Solution Analysis Summary

963 6.1. General Background. A Joint Doctrine, Organization, Training,
964 Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF)
965 analysis was conducted by the Commanding General, Marine Corps
966 Combat Development Command (CG MCCDC). A wide spectrum of
967 DOTMLPF approaches were analyzed for both individual and integrated
968 utility in mitigating the capability gaps.

969 6.2. Ideas for Non-Materiel Approaches (DOT_LPF) Analysis. Through a
970 series of reductions, duplication eliminations and combining similar
971 items a set of 17, high value non-materiel solutions were carried forward
972 out of 196 recommendations. This set included:

- 973 • (D) Enhance logistic train/trial in support
974 • (D) Incorporate more lessons learned into current doctrine
975 • (O) Incorporate advanced marksman billet into squad
976 • (O) Increase the number of HMMWVs to 2 per platoon
977 • (O) Increase C2 capabilities by adding C2 cell at the platoon
978 • (O) Incorporate unmanned air/ground systems into the squad
979 • (O) Single program manager to integrate/synergize all individual
980 combat equipment programs
981 • (O) Increase of Corpsman to 2 per squad
982 • (T) Train one squad member as a collateral duty C2 expert
983 • (T) Increase training in:
984 o Squad level first aid
985 o Target recognition
986 o C2 equipment
987 o Air CASEVAC
988 o Optimal protection/cover selection vs threats
989 o Operations in low light/obscured visibility environments
990 o Conduct of stabilization/evacuation procedures
991 o Proper protective gear utilization
992 o Mouflage kit employment

993 The analysis concluded that the capability shortfalls could not be met by
994 non-material solutions alone as indicated in the FSA referenced in
995 Appendix D.

996 6.2.1. Individual Non-Materiel Approaches. In the case of each gap
997 several DOT_LPF approaches were considered to provide some degree of
998 partial gap mitigation (i.e., mitigation relative to a subset or sub-elements

999 of the overarching capability gap). Individually, non-materiel DOT_LPF
1000 alternatives do not significantly address any of the six capability gaps.
1001 DOT_LPF solutions addressed the Medical Gap the best but fell short due
1002 to its inability to effectively address all elements of the comprehensive
1003 capability gaps.

1004 6.2.2. Integrated Non-Materiel Approaches. A subsequent analysis that
1005 integrated the most promising individual DOT_LPF approaches for each
1006 gap did not generate a significant degree of mitigation potential. Ten
1007 approaches were considered to provide some degree of partial gap
1008 mitigation in the areas of Doctrine, Organization and Training. Each
1009 provided a meaningful degree of mitigation potential, albeit narrowly
1010 focused. Integrating DOT_LPF solutions promoted greater process
1011 efficiency, refocused available manpower, materiel and financial
1012 resources toward respective gap mitigation, and increased overarching
1013 awareness and focus relative to the capability gaps. However, it did not
1014 appreciably address or compensate for the underlying technical
1015 shortcomings and capability limitations inherent in current or
1016 programmed systems and architectures.

1017 6.2.3. Summary Findings of Ideas for Non-Materiel Approaches. In the
1018 final analysis, there were no individual DOT_LPF approaches or
1019 combination of integrated approaches assessed to successfully satisfy the
1020 comprehensive capability gaps. As a result, it was recommended that the
1021 FSA continue with an evaluation of potential materiel solutions to
1022 mitigate capability gaps. However, the more valuable DOT_LPF
1023 approaches were considered in conjunction with the final materiel
1024 approach.

1025 Since the completion of the MERS FSA, the Marine Corps has instituted
1026 the Infantry Battalion Enhancement Period Program (IBEPP). The IBEPP
1027 is a comprehensive program that provides the means to coordinate the
1028 staffing and equipping of infantry battalions prior to the start of formal
1029 unit training as they prepare for service with combatant commands. The
1030 IBEPP focuses on small units and their leaders with the intent of
1031 providing a solid foundation for an infantry battalion to start unit pre-
1032 deployment training. The program seeks to mitigate organization,
1033 materiel, and personnel issues for deploying infantry battalions. This
1034 mitigation on its own marginally affects the broader capability gaps
1035 addressed in this ICD but should be a factor for consideration in future
1036 detailed analyses.

1037 6.3. Ideas for Materiel Approaches. The ideas for materiel approaches
1038 for each gap were identified using "Group Systems" software in a
1039 facilitated operational Integrated Product Team (IPT) in conjunction with
1040 the DOT_LPF Analysis. Raw data were synthesized by analysts, then

1041 assessed and analyzed by the Analysis of Materiel Approaches (AMA)
1042 Operational IPT. Ideas for Materiel Approaches (IMA) identified 86
1043 individual approaches (specific items). These approaches were then
1044 condensed into 27 (detailed and listed in the references) by eliminating
1045 duplication and combining like approaches. The 27 were then combined
1046 and mapped to 5 categories applicable to all capability gaps.

1047 6.4. Analysis of Materiel / Non-Materiel Approaches. The ideas for
1048 materiel approaches for each gap were assessed in an operational IPT
1049 forum and analyzed using a multi-step Analytical Hierarchy Process
1050 (AHP). Essential elements outlined in Chairman Joint Chiefs of Staff
1051 Instruction (CJCSI) 3170.01E were addressed in the AMA: gap
1052 mitigation, operational impact, technical risk, supportability, DOT_LPF
1053 impacts, and affordability. Each proposed materiel approach was judged
1054 on its contribution to, or performance towards, achieving a particular
1055 objective/criterion. This qualitative assessment was based on warfighter
1056 and subject matter expert judgment and captured using AHP software.
1057 Empirical data was integrated with the qualitative assessment whenever
1058 possible. Through a four-step process, the materiel approaches for each
1059 gap were reduced to those considered most feasible and capable of filling
1060 the gaps. The analysis product was a prioritized list of approaches for
1061 each gap. This analysis process is described below:

1062 6.4.1. Feasibility Assessment. The feasibility assessment screened for
1063 major shortcomings of each materiel approach that might make it
1064 automatically infeasible and eliminated two approaches. One approach
1065 that was found infeasible maintained the status quo and did not solve
1066 any of the identified gaps. The other was the development of a
1067 completely new system, which is not in keeping with Joint Staff guidance
1068 especially when considering the Army's Land Warrior (LW) approach
1069 (U.S. Army's POR for equipping individual soldiers in their future
1070 infantry forces). The three approaches that were evaluated are listed
1071 below:

- 1072 • Program of Record Improved (POR Improved) – POR plus systems not
- 1073 from LW such as foreign or other commercial systems.
- 1074 • Program of Record Land Warrior Enhanced (POR LW-Enhanced) -
- 1075 select LW programs that could be integrated into the USMC POR.
- 1076 • Land Warrior - adoption of LW in total.

1077 Since the completion of the MERS' FSA, the U.S. Army has been evolving
1078 their LW program into the Soldier as a System (SaaS). SaaS breaks
1079 down into four concepts: Core Soldier, Air Soldier, Mounted Soldier, and
1080 Ground Soldier. LW will become Ground Soldier that includes all
1081 elements of Core Soldier. For the purposes of this ICD, the term Land

1082 Warrior will be used to represent the advanced soldier systems described
1083 in these four SaaS concepts.

1084 6.4.2. Non-Materiel Approaches for Consideration. Ten non-materiel
1085 approaches, grouped under Doctrine, Organization, and Training,
1086 provide a meaningful degree of mitigation potential when integrated with
1087 the materiel approaches identified above. These non-materiel
1088 approaches have similar applicability across all three materiel
1089 approaches and were evaluated as an integrated package with the
1090 materiel approaches.

1091 6.4.3. Analytical Hierarchy Assessment. Assessment criteria were
1092 weighted by the operational IPT and incorporated into the rating matrix.
1093 Criteria values were then applied to the assessments.

1094 6.4.4. Gap Mitigation Assessment. Within each gap, the IPT assessed the
1095 materiel approaches against the performance evaluation criteria (e.g.
1096 Identify Targets, Classify Targets, etc) to quantitatively rate how well the
1097 approach enhanced and/or supported the attribute in the context of the
1098 gap.

1099 6.4.5. Risk/Impact Assessment. Within each gap, the IPT assessed the
1100 materiel approaches against the risk/impact criteria (Operational Impact,
1101 Technical Risk, Supportability, DOT_LPF/policy impact, and
1102 Affordability) to quantitatively rate how well the approach enhanced
1103 and/or supported the attribute in the context of the gap.

1104 6.4.6. Prioritized List of Materiel Approaches. The AMA produced a
1105 prioritized list of materiel approaches for each gap and across all the
1106 gaps for an overall assessment based on criteria for Gap Fill and
1107 Risk/Impact.

1108 6.4.7. Summary Findings of Analysis of Materiel Approaches. Based on
1109 an analysis of the performance attributes, risk, and relative cost, LW
1110 scored highest (best) for filling the gap but scored lowest on affordability.
1111 POR LW-Enhanced approach ranked 2 for filling the gap and affordability
1112 and 3 for risk. This low (worse) ranking for risk was based on the
1113 significant integration issues that would be involved in using some LW
1114 systems with the USMC POR since LW is being developed as an
1115 integrated system of systems. POR Improved ranked last (worse) in
1116 filling the gap but first (best) in risk and affordability. See Figure 2.

Ratings Total Across All Gaps - Normalized

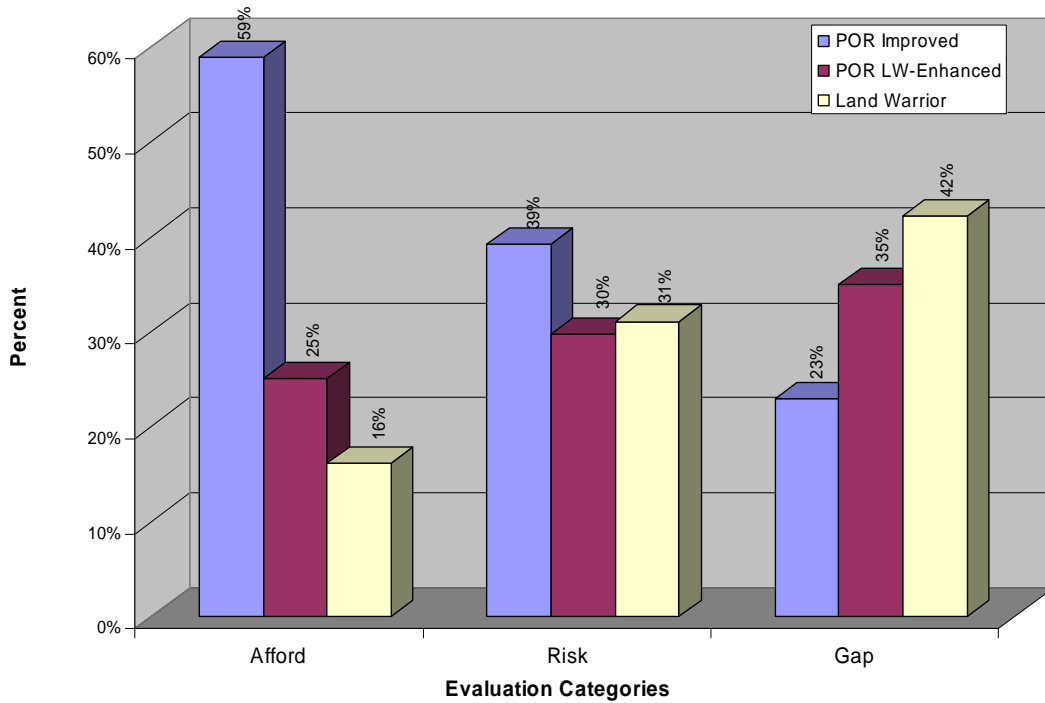


Figure 2 AMA Workshop Results

1117 All approaches scored poorly in the gap categories of *MOVE* and *SURVIVE*
 1118 *THE EFFECTS OF FIRES* relative to the other gaps. The combined results
 1119 (gap fill, risk, and affordability) LW favored by a 10.5% margin, followed
 1120 by POR LW-Enhanced, then POR Improved.

1121 7. Final Recommendations

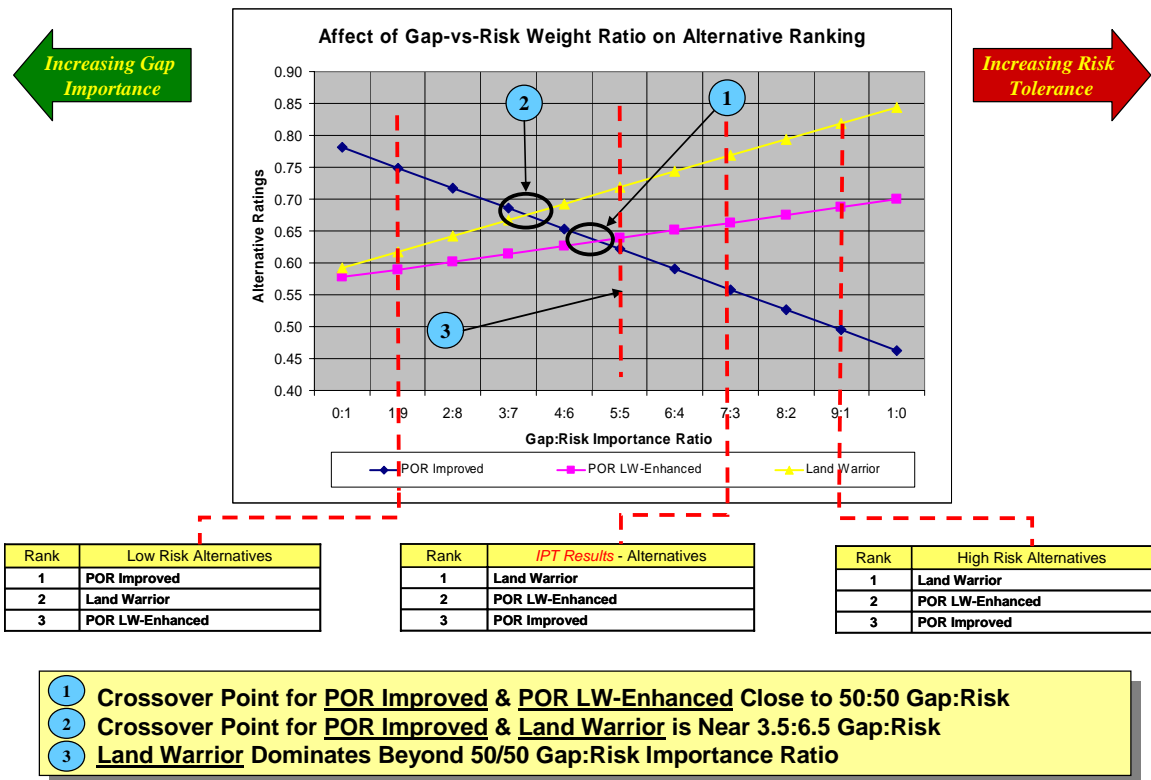
1122 7.1. General Background. The following recommendations reviewed by
 1123 an independent body composed of analysts and subject matter experts
 1124 and approved in a Post Independent Analyses (PIAs) are as follows.

1125 7.2. Non-Materiel Recommendations. All approaches included non-
 1126 materiel recommendations when evaluated. Some of these
 1127 recommendations afforded a meaningful degree of mitigation potential,
 1128 especially in the areas of Doctrine, Organization and Training, when
 1129 combined with the materiel approaches identified in the AMA. However,
 1130 no joint/cross-service associated non-materiel approaches were
 1131 considered feasible for implementation to completely meet the capability.

1132 7.3. Materiel Recommendations. Based on an analysis of the
 1133 performance attributes, risk, and relative cost, the IPT results favored
 1134 LW. LW scored highest for filling the gap, however, scored lowest on

1135 affordability. The decision to pursue LW depends heavily on the amount
 1136 of risk decision-makers are willing to accept. The assessment of LW
 1137 systems' ability to meet the gaps was made based on the assumption
 1138 that the systems would perform as advertised and be available when
 1139 scheduled at the estimated cost and integration with Marine Corps
 1140 architecture. With very high risk tolerance (i.e. performance is the main
 1141 objective regardless of the risk), LW is a preferred approach. With a very
 1142 low risk tolerance (i.e. risk aversion is the main objective regardless of
 1143 performance) POR Improved is the preferred approach. POR LW-
 1144 Enhanced approach is a more balanced approach that maximizes
 1145 performance given an acceptable amount of risk. All approaches scored
 1146 poorly in the gap categories of *MOVE* and *SURVIVE THE EFFECTS OF*
 1147 *FIRES* compared to the other gaps.

1148 Figure 3 below illustrates the affect that risk acceptance has on the
 1149 preferred alternative materiel approach. As one moves from the left of
 1150 the chart (risk averse) to the right of the chart (risk acceptance) the
 1151 preferred alternative materiel approach changes from LW to POR
 1152 Improved. The least affected FCS Enabled MAGTF materiel approach
 1153 maintains a steady ranking from one extreme to the other.



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Figure 3 Gap vs. Risk Analysis

1156 7.4. Material Approaches Recommended for Further Analysis. Based
1157 on these findings, both POR LW-Enhanced and LW approaches should
1158 be considered for more detailed analysis.

1159 7.4.1. Key Boundary Conditions. The key boundary conditions within
1160 which the MERS Analysis of Alternatives (AOA) should be performed to
1161 enable the most informed material approach decision include the
1162 following:

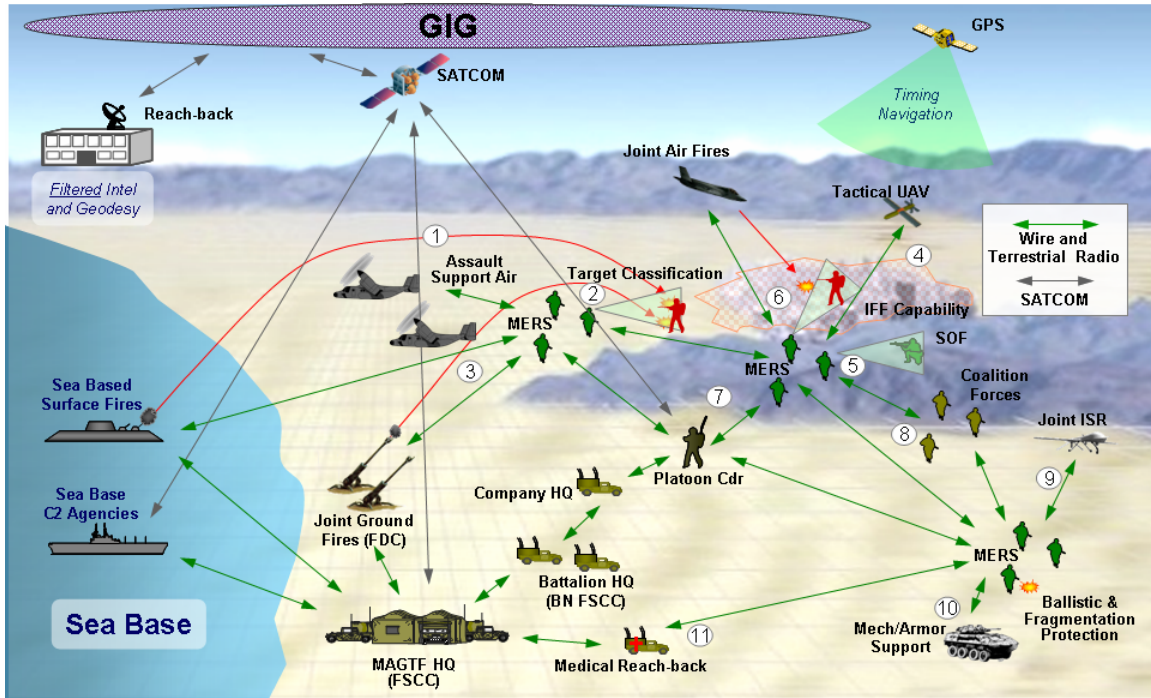
- 1163 • Conduct assessment using more stressful scenarios where a squad
1164 is operating autonomously during DO in widely dispersed areas as
1165 well as in complex urban terrain.
- 1166 • The AoA should focus on achieving maximum performance in three
1167 main areas as described by the gap characteristics:
 - 1168 ➤ Target Acquisition (Shoot)
 - 1169 ➤ Communicate
 - 1170 ➤ Move

1171 7.4.2. DOTMLPF Impacts. Some DOTMLPF impacts are expected.
1172 Doctrine (Tactics, Techniques, and Procedures (TTP)) may need to be
1173 revised to address new capabilities especially if LW is the preferred
1174 approach. Significant organizational changes will be required if LW is
1175 chosen. Training, both operator and maintainer will occur as for any
1176 new system, but will be significant if LW is the preferred system. The LW
1177 approach will impact Leadership and Personnel domains as there will be
1178 philosophical changes in the way the Marine Corps would fight.
1179 Organizational changes are expected if certain non-materiel
1180 recommendations are adopted. New or expanded current Facilities may
1181 be required to accommodate new systems.

1182 7.4.3. Acquisition Strategy. The MERS AOA should provide additional
1183 analysis upon which a recommendation can be based.

Appendix A Integrated Architecture Products

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1. MERS conducts vertical assault.
2. IDs and classifies targets.
3. Requests and conducts terminal control of artillery and Naval Surface fires.
4. Controls tactical reconnaissance UAVs.
5. IDs friendly forces operating in the same area.
6. Requests and terminally controls CAS.
7. Communicates and coordinates with higher headquarters.
8. Communicates and coordinates with coalition forces.
9. Receives images and information from Joint ISR platforms.
10. Conducts coordinated operations with mechanized and armor forces.
11. Request and coordinates CASEVAC.

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- 1216 Appendix B References
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1218 11 May 2005
- 1219 2. Chairman Joint Chiefs of Staff Manual, CJCSM 3170.01B, dated 11
1220 May 2005
- 1221 3. The National Security Strategy of the United States, President
1222 George W. Bush, September 2002
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1224 Strategy for Today; A Vision for Tomorrow, May 2004
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- 1226 6. National Defense Strategy (OSD) 01 March 2005
- 1227 7. Defense Planning Guidance, Fiscal Years 2003-2007
- 1228 8. Transformation Planning Guidance, Secretary of Defense, April 2003
- 1229 9. Capstone Concept for Joint Operations (CCJO), August 2005
- 1230 10. Joint Operations Concepts, Secretary of Defense, November 2003
- 1231 11. Major Combat Operations Joint Operating Concept, September 2004
- 1232 12. Stability Operations Joint Operating Concept (Draft), September
1233 2004
- 1234 13. Strategic Deterrence Joint Operating Concept (Draft), February 2004
- 1235 14. Homeland Security Joint Operating Concept (Draft), February 2004
- 1236 15. Protection Joint Functional Concept, June 2004
- 1237 16. Joint Command and Control Functional Concept, February 2004
- 1238 17. Functional Concept for Battlespace Awareness, 31 December 2003
- 1239 18. Force Application Functional Concept, March 2004
- 1240 19. Net Centric Environment Joint Functional Concept, April 2005
- 1241 20. Focused Logistics Joint Functional Concept, December 2003
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1250 Naval Operations / Commandant of the Marine Corps, 22
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	Appendix C	<u>Acronym List</u>
1318		
1319	AMA	Analysis of Material Approaches
1320	CASEVAC	Casualty Evacuation
1321	CBRNE	Chemical Biological Radiological Nuclear and High
1322		Yield Explosive Weapons
1323	CCJO	Capstone Concept for Joint Operations
1324	CG MCCDC	Commanding General, Marine Corps Combat
1325		Development Command
1326	CJCSI	Chairman Joint Chief of Staff Instruction
1327	COIN	Counter Insurgency
1328	CONOP	Concept of Operations
1329	DO	Distributed Operations
1330	DOD	Department of Defense
1331	DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership
1332		and Education, Personnel, and Facilities
1333	DOT_LPF	Doctrine, Organization, Training, Leadership and
1334		Education, Personnel, and Facilities
1335	ECP	Entry Control Point
1336	EMW	Expeditionary Maneuver Warfare
1337	EPW	Enemy Prisoner of War
1338	FA	Force Application
1339	FAA	Functional Area Analysis
1340	FNA	Functional Needs Analysis
1341	FSA	Functional Solution Analysis
1342	GIG	Global Information Grid
1343	GWOT	Global War of Terrorism
1344	HHQ	Higher Headquarters
1345	IED	Improvised Explosive Device
1346	IFAK	Individual First Aid Kit
1347	IFF	Identification Friend or Foe
1348	IMA	Ideas for Material Approaches
1349	IPT	Integrated Project Team
1350	IR	Infrared
1351	JC2	Joint Command and Control
1352	JCA	Joint Capabilities Area
1353	JFC	Joint Functional Concept
1354	JFC	Joint Force Commander
1355	JIC	Joint Integrating Concept
1356	JOC	Joint Operating Concept
1357	LBE	Load Bearing Equipment
1358	LW	Land Warrior
1359	MAGTF	Marine Air Ground Task Force
1360	MCO	Major Combat Operations
1361	MERS	Marine Expeditionary Rifle Squad

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1362	MOOTW	Military Operations Other Than War
1363	NCE	Net Centric Environment
1364	NEO	Non-combatant Evacuation Operation
1365	OMFTS	Operational Maneuver from the Sea
1366	OpSit	Operational Situation
1367	OSD	Office of the Secretary of Defense
1368	PIA	Post Independent Analysis
1369	POR	Program of Record
1370	RF	Radio Frequency
1371	RMS	Reliability, Maintainability, Supportability
1372	ROMO	Range of Military Operations
1373	RPG	Rocket Propelled Grenade
1374	SASO	Security and Stability Operations
1375	SME	Subject Matter Expert
1376	STOM	Ship to Objective Maneuver
1377	UCP	Unified Command Plan
1378	UJTL	Universal Joint Task List
1379	VCP	Vehicle Control Point

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1380 Appendix D List of Analytical Documents

1381 The following supporting analytical documents are maintained at Marine
1382 Corps Combat Development Command:

1383

1384 1. Marine Expeditionary Rifle Squad Functional Area Analysis

1385 a. MERS-FAA.xls

1386 2. Marine Expeditionary Rifle Squad Functional Needs Analysis

1387 3. Marine Expeditionary Rifle Squad Functional Solutions Analysis

1388 4. Marine Expeditionary Rifle Squad Analysis of Material Approaches

1389 5. Marine Expeditionary Rifle Squad Tactical Operating Concept

1390