

SECTION 4: FIRE SUPPORT



INTRODUCTION

In 2007, the “Major Combat Operations Analysis for Fiscal Years 2014 to 2024” study scrutinized the in-service organic fire support of the Marine Air-Ground Task Force (MAGTF) to determine the adequacy, integration, and modernization requirements for ground, aviation, and naval surface fires. The Marine Corps also performed a supplemental historical study using *Operation Iraqi Freedom* data to examine MAGTF fires in the full spectrum of warfare. These studies reconfirmed our development of complementary systems of ground indirect fires.

Ground indirect fires require a medium-caliber cannon artillery capability, an extended-range ground-based rocket capability, and a capability with greater lethality than current mortars but greater tactical mobility than in-service artillery systems. This provides a balanced, expeditionary, ground-based fires capability that is responsive, complementary, redundant, and within the range and lethality requirements of the targets the Marine Corps will face across the full range of military operations.

The foundation of ground indirect fires is the M777A2 Lightweight 155mm howitzer that, through design innovation, navigation and positioning aides, and digital fire control offers significant improvements in lethality, survivability, mobility, and durability compared to the M198 howitzer. The High-Mobility Artillery Rocket System (HIMARS) fills a critical range and volume gap in Marine Corps fire-support assets. HIMARS provides an extended-range precision capability to Marine forces. The third “leg” of Marine Corps ground indirect fires is the Expeditionary Fire Support System (EFSS), a towed 120mm mortar. EFSS will be the principal indirect fire support system for helicopter- and tiltrotor-borne forces executing ship-to-objective-maneuver as part of a MAGTF. When paired with an Internally Transportable Vehicle, EFSS can be transported on board MV-22 and CH-53E/K aircraft. EFSS-equipped units will have immediately responsive, organic indirect fires at ranges beyond current infantry battalion mortars.

Several additional innovative systems related to fire support significantly enhance the warfighting efficiency and effectiveness of the MAGTF, including the Advanced Field Artillery Tactical Data System, and the Target Location, Designation and Handoff system. In addition, the development of precision guided munitions, such as Excalibur, Guided Multiple-Launch Rocket System and the Precision Extended Range Munition, has shown lethality on the battlefield while minimizing collateral damage.

HIGH MOBILITY ARTILLERY ROCKET SYSTEM (HIMARS)



DESCRIPTION

HIMARS is a C-130 aircraft-transportable, wheeled, indirect-fire, rocket/missile system capable of firing all rockets and missiles in the in-service and future Multiple-Launch Rocket System Family of Munitions (MFOM). The HIMARS launcher consists of a fire-control system, carrier (automotive platform), and launcher-loader module that will perform all operations necessary to complete a fire mission. The basic system is defined as one launcher, two resupply vehicles, and two resupply trailers and munitions.

OPERATIONAL IMPACT

HIMARS addresses an identified, critical warfighting deficiency in Marine Corps fire support. HIMARS primarily employs the guided MLRS rocket to provide precision fires in support of maneuver forces. HIMARS is a transformational responsive, general-support/general support-reinforcing, precision, indirect fire weapon system that accurately engages targets at long ranges (greater than 40 miles) with high volumes of lethal fire under all weather conditions and throughout all phases of combat operations ashore.

PROGRAM STATUS

The HIMARS program is in the operations and support phase. HIMARS achieved Initial Operational

Capability in the fourth quarter of FY 2008 and Full Operational Capability in FY 2010. In early 2012, HIMARS was fielded to two additional battalions (one active and one Reserve) in the Marine Corps. The program continues to procure munitions in support of operations and sustainment.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:

Launcher and MFOM: Lockheed Martin Corporation, Missiles and Fire Control Division, Dallas, Texas

LIGHTWEIGHT 155MM HOWITZER (LW155)



DESCRIPTION

The LW155 is a joint Marine Corps/Army program whose mission is to develop, produce, field and sustain a towed 155mm howitzer. Designated the M777A2, the LW155 replaces the M198 Howitzer providing direct, reinforcing and general support fires for both services.

The LW155 incorporates innovative design technologies to reduce the system weight to less than 10,000 pounds while providing increased mobility, survivability, deployability and sustainability in expeditionary operations throughout the world. It is the first ground combat system whose major structures

are made of high-strength titanium alloy resulting in a weight savings of more than 7,000 pounds when compared to the M198 system. The system makes extensive use of hydraulics to operate the breech, loading tray, and suspension system reducing crew size and fatigue. The M777A2 provides significant improvements in displacement and emplacement, capable of being emplaced in less than 3 minutes and displaced in 2-3 minutes. A primer feed mechanism supports firing a maximum of four rounds per minute, with sustained firing of two rounds per minute. The M777A2 is capable of firing unassisted high-explosive projectiles using conventional and modular propellants to a range of 15 miles and rocket-assisted projectiles to approximately 19 miles.

The M777A2 is a pre-planned upgrade to the initial M777 design that adds a Digital Fire Control System (DFCS) improving pointing accuracy to 1 mil. The DFCS uses a global positioning system, an inertial navigation unit, and a vehicle motion sensor to accurately locate and orient the weapon to deliver greater accuracy and responsiveness. The system integrates radios for voice and digital communications and a chief of section display that can be mounted into the cab of the prime mover for use as a navigation aid during towing. The systems mission computer processes fire missions and outputs pointing information to on-board gunners and chief of section displays. A planned software upgrade will support on-board ballistic computations commencing in the fall of 2013.

OPERATIONAL IMPACT

The LW155 provides significantly greater combat capability to troops. The weight reduction improves transportability and mobility without impacting range and accuracy. The M777A2 is towed by the USMC Medium Tactical Vehicle Replacement and can be airlifted by the CH-53E/K, CH47D and the MV-22B Osprey into remote high-altitude locations inaccessible by ground transportation.

The M777A2 can fire the precision guided Excalibur munitions up to 24 miles with sufficient accuracy, for example, to target commensurate portions of a building, reducing the chance of non-combatant casualties and enabling supporting fire to be delivered much closer to friendly troops. The M777A2 has proven it is battle worthy and reliable, achieving an operational availability greater than 90% supporting Operation Enduring Freedom for USMC, Army and Canadian forces.

PROGRAM STATUS

The LW155 has been in-service with the U.S. Marine Corps and Army since 2005 and is deployed in current operations. The Marine Corps has procured its full approved acquisition objective of 511 M777A2 howitzers while the Army has purchased 488 systems. Both services will take final deliveries during 2013. The Canadian army purchased 37 base-model M777s under a foreign military sale contract while the Australian army has purchased 54 M777A2s to date. The Government of India has also expressed interest in purchasing the M777A2 submitting a Letter of Request for 145 systems in Nov 2012.

Developer/Manufacturer:

The M777A2 prime contractor is BAE Systems located in Barrow in Furness in the United Kingdom. BAE Systems manages a supply chain consisting of both US and UK vendors who deliver components for final integration at BAE systems integration facility in Hattiesburg, MS. The Program Manager -Towed Artillery Systems also supplies a number of Government Furnished Equipment items, including the Cannon Assembly manufactured by Watervliet Arsenal. Final acceptance testing occurs at Yuma Proving Grounds.

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM (AFATDS) FAMILY OF SYSTEMS



DESCRIPTION

The GYK-60 AFATDS is an automated fire-support Command and Control system that provides the Marine Air Ground Task Force (MAGTF) the ability to rapidly integrate

all fire-support assets into maneuver plans via digital data communications links. AFATDS supports the timely exchange of fire-support information and target processing essential to survival on the modern battlefield through the integration of all fire support assets, including artillery, rockets, mortars, naval surface fire support, and close air support. Additionally, the PYG-1 Back-Up Computer System (BUCS) and Mobile Tactical Shelter (MTS) are subsystems of the AFATDS program that fulfill requirements identified in the USMC AFATDS Operational and Organizational Concept.



The AN/PYG-1 BUCS is a hand-held computer system that resides on a Ruggedized Personal Digital Assistant designed to provide a back-up capability for computing ballistic firing solutions, as well as survey and meteorological functions, in support of field artillery cannon systems. The BUCS hosts the following three software applications:

- Centaur, the Light-Weight Technical Fire Direction System application for computing safety parameters and artillery technical firing solutions
- Field Artillery Survey Program software to compute artillery survey data
- The meteorological software application to convert raw meteorological Plot Balloon readings into bal-



listic and computer meteorological messages

The TSQ-17 MTS is a modified U.S. Army-purchased shelter mounted on a High-Mobility Multiple Wheeled Vehicle employed by the battery Fire Direction Center (FDC), Battery Operations Center, and Fire Support Teams. It provides environmental protection for the AFATDS, its associated peripherals, and the AFATDS operators. The MTS is designed to protect against wind driven sand, dust, and rain. It will also permit FDC and liaison sections to perform required tasks at night without compromising light discipline. The MTS provides environmental protection at the battery level, while the Combat Operations Center provides environmental protection for AFATDS at the battalion and above.

OPERATIONAL IMPACT

AFATDS will be the primary Commanders Fire Support Coordination System employed from Marine Expeditionary Force to battery-level operations. AFATDS will be used to provide the commander with the ability to rapidly employ all fire-support assets at his disposal. This will allow him the flexibility to determine what weapon systems to employ in shaping and dominating his battle space. AFATDS will greatly enhance the interchange of tactical data between all MAGTF tactical command and control systems through the use of graphics, common operating applications, and communications.

PROGRAM STATUS

The AFATDS program is an Evolutionary Acquisition program, designated an Acquisition Category II for the Army. The AFATDS is a multiple service program and the Army is the Executive Service. The AFATDS program is in Sustainment. MTS achieved Initial Operational Capability in first quarter FY 2012. Full Operational Capability will be achieved in second quarter FY 2013.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:

AFATDS: Raytheon, Ft Wayne, IN

BUCS: Fire Support Engineering Division, Army

MTS: SPAWAR, Charleston, SC

FAMILY OF TARGET ACQUISITION SYSTEMS (FTAS)

DESCRIPTION

The FTAS is the Ground Combat Element's indirect-fire acquisition capability. The FTAS comprises the TPQ-46 Firefinder Ground Weapons Locating Radar (GWLR), the TPQ-48 Lightweight Counter Mortar Radar (LCMR), and the TSQ-267 Target Processing Set (TPS).

OPERATIONAL IMPACT

The AN/TPQ-46 Firefinder has the ability to locate indirect-fire weapons — which include mortars, artillery, and rockets — within a 1,600 mil search sector from ranges of 0.75 to 24 kilometers. It is the primary indirect fire-detection system in the Marine Corps. The TPQ-48 LCMR provides a 6,400 mil mortar-detection capability at ranges of 1 to 5 kilometers, short-range detection coverage, and slewing/cueing intelligence to the TPQ-46 via the TSQ-267.

The TSQ-267 TPS is the command and control node of the FTAS capability, providing radar deployment orders, support functions, and target data to the counter-fire/countermeasure-servicing agent. The TPS uses the Advanced Field Artillery Tactical Data System as its primary communication, and Command and Control tool. As a program within Program Manager Radar Systems, the capability is being fielded under an Abbreviated Acquisition Program (AAP).

PROGRAM STATUS

The FTAS Program Office is supporting the warfighter with all three systems. The Firefinder and LCMR are deployed to Afghanistan supporting operations associated with *Operation Enduring Freedom*. The Marine Corps recently procured and fielded an additional 22 Firefinder radar systems to support expanded requirements. These procurements supported an increased Approved Acquisition Objective (AAO) for the Firefinder from 22 to 44 systems. The LCMR was procured and fielded under an AAP as a solution for an approved Urgent Universal Needs Statement, with an AAO of 46 systems. Procurements for both the Firefinder and LCMR were funded using Overseas Contingency Operations supplemental procurement funding. The AAO for the TPS is seven sets, two for each active-duty artillery regiment and one for the Reserve Component. Full Operational Capability for the TPS occurred in September 2011.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:

AFATDS: Raytheon, Ft Wayne, IN

ESCALATION OF FORCE-MISSION MODULE (EoF-MM)

DESCRIPTION

The Escalation of Force-Mission Module (EoF-MM) consists of multifunctional, non-lethal systems and force protection equipment needed to minimize friendly and civilian casualties. The EoF-MM is the replacement of the in-service Non-Lethal Capability Sets (NLCS) and Force Protection Capability Sets (FPCS) procured in the 1990s and 2000s.

The EoF-MM consists of selected equipment that is used during escalation of force situations. The equipment and supplies contained in the EoF-MM allow the Marine to accomplish several different tasks in direct support of defined Marine Corps missions.

The EoF-MM consists of commercial-off-the-shelf (COTS) and government-off-the shelf (GOTS) equipment. The COTS/GOTS equipment is configured into capability groups, capability modules, and equipment sets. The groupings and modules define the location of the COTS/GOTS within the containers. The grouping and module structure will facilitate easier transport by tailoring to the mission demands and replacing and adding of new technologies.

The EoF-MM consists of three capability groups, ten capability modules. Each module consists of specific equipment necessary to support that module's capability mission. The modules are configured to fit within four Quadcon containers.

OPERATIONAL IMPACT

The EoF-MM provides the appropriate equipment to employ a variety of non-lethal tactics and conduct a range of non-lethal operations. The fielding of the EoF-MM to the operating forces is intended to augment and complement existing lethal capabilities.

Capability Groups	Capability Modules
Checkpoint Group	Vehicle Check Point
	Entry Control Point
	Urban Patrol
	Establish and Secure Perimeter
	Convoy Security
	Clear Facilities
Crowd Control Group	Conduct Cordon
	Crowd Control
	Detain Personnel and Conduct Search
Training Group	Training

PROGRAM STATUS

The EoF-MM program is currently in the Operation and Support phase. However, due to the operational need for additional systems, the program will return to the Production and Deployment phase in order to procure an additional 40 systems. The award of a contact should occur in the third quarter of FY 2012.

Procurement Profile:	FY 13	FY 14
Quantity:	20	20

Developer/Manufacturer: TBD



SECTION 5: COMMAND AND CONTROL/ SITUATIONAL AWARENESS (C2/SA)



INTRODUCTION

The Marine Corps Command and Control (C2) Initial Capabilities Document (ICD), approved by the Joint Requirements Oversight Council in February 2008, and the Marine Corps Functional Concept for C2, approved in 2009, incorporate joint integrating concepts and C2 mandates. Together, they articulate our goal of delivering end-to-end, fully integrated, cross-functional capability, including forward-deployed and reach-back functions. They emphasize that C2 must be leader-centric and network-enabled, and that individual Marines must understand their commander's intent and be able to carry out complex operations. The C2 ICD, Functional Concept, and the Marine Corps Information Enterprise strategy described in this section will enable Marine Air Ground Task Force (MAGTF) commanders to exercise effective C2 and bring together all warfighting functions into an effective fighting force. In addition, these programs support the ability of the MAGTFs to function in an integrated naval environment and participate in or lead joint and multinational operations.

AVIATION COMMAND AND CONTROL (AC2) FAMILY OF SYSTEMS (FOS) AND MARINE AIR COMMAND AND CONTROL SYSTEM (MACCS) FOS SUSTAINMENT

DESCRIPTION

The AC2 FoS and the MACCS FoS sustainment efforts support the systems employed by Marine Air Command and Control System tactical agencies and operational facilities. Each MACCS agency performs different functions and tasks and using different equipment suites fielded and supported by squadrons within the Marine Air Control Group (MACG) in support of the Aviation Combat Element. The tactical agencies are the Tactical Air Command Center (TACC), the Tactical Air Operations Center (TAOC), and the Direct Air Support Center (DASC).

The core future AC2 FoS consists of the following systems:

- Common Aviation Command and Control System (CAC2S), which achieved IOC in FY 2012 for phase 1
- Ground/Air Task Oriented Radar (G/ATOR), which will achieve IOC in FY 2016
- Composite Tracking Network, which achieved IOC in FY 2011)
- AN/TPS-59 radar, which is already fielded

The current MACCS FoS is in the operations and support life cycle phase and will be replaced by CAC2S phase 2:

- TYQ-23(V)4 Tactical Air Operations Module (TAOM)
- TSQ-269 Mobile TAOM (MTAOM)
- TYQ-101 Communications Data Link System (CDLS)
- MRQ-12(V)4 Communications Interface System (CIS)
- TYQ-87(V)2 Sector Anti Air Warfare Facility (SAAWF)
- UYQ-3B Direct Air Support Center/Airborne System (DASC/AS)

- MSQ-124 Air Defense Communications Platform (ADCP)
- URC-107(V)10 Joint Tactical Information Distribution System (JTIDS) Terminal

In addition to the core MACCS FoS, the FoS Sustainment Project Office has management responsibilities for the following equipment that will not be replaced by CAC2S:

- Link Management System Multi-Tactical Data Link (LMS-MT)
- GRC-171B(V)4 Ultra High Frequency (UHF) Radio
- USQ-140(V)11(C) Multifunctional Information Distribution System (MIDS) Low Volume Terminal (LVT),
- TYQ-145 Beyond Line of Sight Gateway (BLOS-GW)
- GRC-256 High Frequency Radio

The MACCS FoS is responsible for one program that is in the deployment (as well as the O&S) phase. The TSQ-269 MTAOM achieved Initial Operational Capability in November 2011, with fielding continuing throughout FY 2012.

OPERATIONAL IMPACT

The MACCS FoS Sustainment Project Office ensures these systems, supporting the TACC, TAOC, and DASC, remain ready, relevant, and capable until Full Operational Capability of CAC2S is achieved in 2018. This is accomplished through selected engineering initiatives, software sustainment, and maintenance of the appropriate logistics resources.

PROGRAM STATUS

The re-baselined CAC2S program schedule has impacted all projected MACCS FoS support requirements and program funding. The MACCS FoS item-exit dates have been extended. Currently, the MACCS FoS will remain fielded through the end of calendar year 2018.

GLOBAL COMMAND AND CONTROL SYSTEM-TACTICAL COMBAT OPERATIONS (GCCS-TCO) SYSTEM



DESCRIPTION

The GCCS uses joint system-of-record software to provide select command-and-control capabilities throughout the Marine Corps. These capabilities facilitate the planning, execution, and management of operations, including unit readiness reporting of personnel, equipment, and training. Planning, executing, and managing operations is done via the Joint Operations Planning and Execution System, and unit readiness reporting is done via the Global Status of Resources and Training System (GSORTS). GCCS is fielded at the regiment and above echelons of command. TCO is the principle tool within the Marine Air-Ground Task Force for generating situational awareness through the distribution of the Common Tactical Picture (CTP). TCO also is the primary entry point for the joint-level Common Operational Picture (COP). TCO provides commanders at all echelons with the ability to map and display friendly and enemy locations, as well as plan, develop, display, and transmit overlays of intended movement. TCO also provides commanders the ability to receive, fuse, store, develop, transmit, and display commander's critical information requirements.

OPERATIONAL IMPACT

GCCS is the joint command and control system that provides commanders with the information and capability to plan, execute, and manage operations, as well as the capability to report unit readiness. TCO provides the access and ability to contribute to the situational awareness provided by the CTP and COP, both internally to the Marine Corps and within the joint community.

PROGRAM STATUS

The GCCS program has reached the Approved Acquisition Object of 194 servers and 320 clients. GCCS is in the sustainment phase of its acquisition lifecycle. GCCS capabilities will be combined with the Joint Tactical Common Operational Picture Workstation in FY14, and the GCCS program will merge with TCO.

TCO is in the sustainment phase of its acquisition lifecycle, having reached Full Operational Capability in 1996. TCO will continue to sustain software upgrades across the Future Year Defense Plan as well as Marine Corps-wide hardware upgrade of both the Tactical Common Operational Picture Server and the Intelligence Operations Workstation Version 1 client in FY 2013.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:
Defense Information Systems Agency (DISA),
Falls Church, VA

COMMON AVIATION COMMAND AND CONTROL SYSTEM (CAC2S)



DESCRIPTION

CAC2S will provide a complete and coordinated modernization of Marine Air Command and Control System (MACCS) equipment. CAC2S will replace current dissimilar systems and provide the Marine Air-Ground Task Force Aviation Combat Element (MAGTF ACE) with the necessary hardware, software, and facilities to effectively command, control, and coordinate air operations integrated with naval, joint, and combined command and control units. CAC2S will be comprised of standardized modular and scalable tactical facilities, hardware, and software that will significantly increase battlefield mobility and reduce the physical size and logistical footprint of the MACCS.

OPERATIONAL IMPACT

CAC2S is an Acquisition Category IAC, Major Automated Information System program. It has been restructured with a revised acquisition strategy to ensure the CAC2S program fields' ready and proven technologies at the earliest opportunity. To achieve this goal, Increment I requirements will be achieved in two phases.

Phase 1 accommodates rapid fielding of operationally relevant capabilities, including mobility, situational awareness, tactical communications, information dissemination, and operational flexibility that will establish the baseline CAC2S capabilities. This phase will upgrade fielded MACCS equipment with mature,

ready technologies and will establish an initial product baseline Processing and Display Subsystem (PDS) and Communications Subsystem (CS). Naval Surface Warfare Center, Crane, Indiana, will oversee the integration and upgrades of the previously developed and fielded systems (e.g., AN/TSQ-239 COC and AN/MRQ-12) into CAC2S PDS and CS.

Phase 2 has been structured to accommodate the integration of technologies necessary for the CAC2S Sensor Data Subsystem (SDS) to meet remaining ACE battle management and command and control requirements. This phase will build upon the capabilities of the Phase 1 product baseline by integrating the SDS with the Phase 1 PDS into a single subsystem (Aviation Command & Control Subsystem (AC2S) and with the CS, thereby fully meeting CAC2S Increment I requirements.

PROGRAM STATUS

CAC2S requirements were originally documented in an Operational Requirements Document in February 2003. The CAC2S requirements were further refined in a Capability Production Document and approved by the Joint Requirements Oversight Council in September 2007.

The program was designated a MAIS program on December 26, 2007, and elevated to an ACAT IAC. CAC2S Phase 1 successfully completed its Initial Operational Test and Evaluation in the third quarter of FY 2011. Subsequently, Phase 1 received its Full Deployment Decision in the fourth quarter of FY 2011 and Limited Deployment Capability (LDC) in February 2012. Phase 2 is currently in the Engineering and Manufacturing Development (EMD) phase with a Milestone C decision anticipated in the fourth quarter of FY 2014. The AAO for CAC2S Increment I is 50 AC2S, and 75 CS. Initial Operational Capability (IOC) for Phase 1 commenced 17 January 2012 with the first operational unit (MASS-3) at Camp Pendleton, CA, followed by 2d Marine Aircraft Wing (2d MAW), Cherry Point, NC, in August 2012.

THEATER BATTLE MANAGEMENT CORE SYSTEMS (TBMCS)

DESCRIPTION

TBMCS is an air war-planning tool mandated by the Chairman of the Joint Chiefs of Staff for the generation, dissemination, and execution of the Air Tasking Order/Airspace Control Order (ATO/ACO). The host system resides with the Aviation Command Element in the Tactical Air Command Center (TACC) with remote systems located throughout the Marine Air-Ground Task Force to enable dynamic mission updates.

OPERATIONAL IMPACT

TBMCS is the principal aviation command and control tool within Marine aviation C2 systems and the Theater Air Ground System for the development and execution of the ATO. It is a key system that supports ATO planning and development and provides the automated tools necessary to generate, disseminate, and execute the ATO/ACO in joint, coalition, and Marine Corps-only contingencies.

PROGRAM STATUS

The USAF placed TBMCS into sustainment in 2007 following the release of version 1.1.3 which is now fielded throughout the operating forces and the joint community. The USAF Program Office (PO), in conjunction with the USN, USA and USMC Program Offices continue to sustain version 1.1.3 while planning for the eventual transition to a new system of record which the USAF PO is currently working on with the joint community. The Marine Corps PO has fielded TBMCS Maintenance Release (MR) 1/Service Pack (SP) 27, which provides key assault support enhancements for both planning and execution, and is in the final process of testing and approval for release of TBMCS MR2/SP1 which will provide USMC users with operating system and hardware upgrades.

COMBAT OPERATIONS CENTER (COC)



DESCRIPTION

The COC is a deployable, self-contained, centralized facility that provides shared command and control and situational awareness functionalities in a collaborative environment. The system is designed to enhance the tactical common operational picture for all levels of the Marine Air Ground Task Force (MAGTF). It is a commercial-off-the-shelf, total turn-key, integrated hardware solution using unit-provided radios, legacy and re-hosted tactical data applications, and prime movers to provide mobility, modularity, and scalability for each assigned mission. From 1996 to 2011 there were three COC system variants (V) in production — the (V)2, (V)3, and (V)4 — scaled to the major subordinate command, the regiment/group, and the battalion/squadron, respectively. COC supports the MAGTF throughout the full range of military operations and enables critical warfighting functions: Command and Control (C2), intelligence, maneuver, fires, force protection, and logistics.

The COC program office is upgrading the existing COCs to introduce an enhanced, integrated software baseline supporting warfighter needs, the COC C2 Software Package. Based on service oriented architecture principles, this baseline will enable existing Tactical Data Systems (TDS) to share their data, producing an identical common tactical picture. To support such a robust software capability, the COC program will field a major hardware refresh in FY 2013 and FY 2014.

This hardware upgrade will be provided to support virtualization of COC software and the fielding of the COC C2 Software Package in FY 2012. The COC C2 Software Package is derived from the Tactical Service Oriented Architecture (TSOA), which is a set of reusable software components that can be used anywhere in the Marine Corps. These components are built to a newly defined MAGTF C2 Software Architecture that establishes the foundation for C2. The processes, patterns, practices used to develop components for the TSOA are described by the Expeditionary Software Development System. The deployment of Rapid Response Integration Teams to units in the fleet will directly support tailored, rapid application development.

OPERATIONAL IMPACT

COCs have been deployed to *Operation Iraqi Freedom* and *Operation Enduring Freedom*, as well as many other operational exercises and missions around the globe. COCs provide capabilities to present, display, and communicate the commander’s intent and required information in support of expeditionary maneuver warfare and all aspects of mid-intensity warfare. COC’s integration of commercial- and government-off-the-shelf technologies shorten the decision making cycle by providing intelligence and information on friendly and enemy locations and activities in a consolidated, easily recognizable video display viewed simultaneously by all staff functions within the COC complex.

PROGRAM STATUS

The current Approved Acquisition Objective for all COC Variants is 309. The AN/TSQ-239 (V) 2, 3, and 4 reached Full Operational Capability in December 2011. (V) 2-4 are post-full-rate production and are in the operations and support phase of the acquisition life cycle. The COC program will continue to incorporate engineering changes and equipment technical refresh and insertion in order to address operational requirements for improved technical capabilities and new system in-

terface requirements.

The COC (V)1, Marine Expeditionary Force level variant, is a new start Abbreviated Acquisition Program currently in production and uses the Deployable Joint Command and Control system as a baseline for the materiel solution. Three systems are allocated for procurement, one for each MEF. Initial Operational Capability will occur in FY 2014.

Procurement Profile:	FY 13	FY 14
Quantity:		
(V)1:	3	0

Developer/Manufacturer:

(V)2/3/4: General Dynamics C4 Systems, Scottsdale, AZ

(V)1: Naval Surface Warfare Center, Panama City Division, FL

GROUND-BASED OPERATIONAL SURVEILLANCE SYSTEM EXPEDITIONARY (G-BOSS(E))

DESCRIPTION

The G-BOSS(E) provides organic, around-the-clock persistent surveillance capabilities through the use of multi-spectral sensors and ground-surveillance radars configured on three distinct, mobile and flexible (heavy, medium, and light) platforms supporting an array of missions. All three variants can be employed by any size Marine Air-Ground Task Force, or elements within the MAGTF, in order to expand a commander’s view of the battlespace. Sensor-derived information can be shared internally between sensor nodes and relayed to the Combat Operations Center (COC) for further analysis and sharing across the Global Information Grid. Information can be forwarded to intelligence, operations, and fire-support agencies or used organically as real-time actionable intelligence.

OPERATIONAL IMPACT

This will be a Marine Expeditionary Force (MEF)-level asset to be employed by the lower echelon units based on the assigned mission. The system allows for operation at permanent installations, forward operating bases (FOBs), combat outposts, and temporary tactical locations to observe the perimeter, avenues of approach, and/or areas of interest. Larger long-term FOBs and combat outposts will rely upon the heavy variant for long-range and close-in surveillance to observe areas and avenues of potential enemy approach. The medium (light trailer transportable) and light (man-transportable) variants will provide company-size maneuver elements with surveillance and detection capabilities at smaller, short-term tactical locations.

PROGRAM STATUS

The G-BOSS family of systems is employed by the Marine Corps in *Operation Enduring Freedom*, based upon numerous Urgent Universal Need Statements. The G-BOSS Program Office is procuring and delivering G-BOSS Tower, G-BOSS Lite, and Cerberus Lite systems to theater while continuing to move forward on the transition to the G-BOSS(E) Acquisition Program that will consist of a mix of the heavy, medium, and light variants. The G-BOSS(E) Initial Operational Capability is scheduled for FY 2015 and Full Operational Capability is scheduled for FY 2019.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:
 NSWC Crane Division, Crane, IN
 DRS Technologies, Parsippany, NJ
 Argon ST, Fairfax, VA
 MTEQ, Kilmarnock, VA
 FLIR Systems Inc., Wilsonville, OR

SECTION 6: EXPEDITIONARY ENERGY



INTRODUCTION

“The current and future operating environment requires an expeditionary mindset geared toward increased efficiency and reduced consumption, which will make our forces lighter and faster.”

*Gen James F. Amos
Commandant, U.S. Marine Corps*

In 2011 the Commandant called on the Marine Corps to change the way we think about energy as we man, train, and equip our expeditionary force. As a Corps, we recognize that over the last ten years of combat, we have become more lethal, but have become critically dependent on fuel and batteries, putting our expeditionary capabilities and Marines at risk. Yet, the current and future security environment demands a “middle weight force,” flexible to respond to a host of threats at a moment’s notice, and able to sustain itself for significant periods, at a time and place of its choosing. *Modernizing our capabilities in expeditionary energy is critical to maintaining operational capabilities and readiness of the Force, for today’s fight and tomorrow’s conflicts.*

In March 2011 the Commandant issued the *Marine Corps Expeditionary Energy Strategy and Implementation Plan (Strategy)* with the goal of increasing our combat effectiveness through ethos, efficiency and renewable energy—from “Bases to Battlefield.” The goal of the Strategy is simple: a lighter, faster and more lethal force, which goes farther and stays longer on every gallon of fuel, every kilowatt of energy it requires. Specifically, the Strategy directs the Marine Corps, by 2025, to create a Marine Air Ground Task Force (MAGTF) capable of maneuvering from the sea, and only requiring liquid fuel for mobility systems once ashore. This means C4I and life support systems will be powered by alternative and renewable energy and our vehicles will power larger ground systems when required. Recognizing that to achieve this bold vision would require institutional change, the Marine Corps put in place a framework to guide our efforts: the *Strategy, the Expeditionary Energy, Water, and Waste Capabilities Based Assessment and Initial Capabilities Document (E2W2 CBA/ICD)*, together with the 2012 Marine Corps Science and Technology Strategic Plan provide an investment plan to drive modernization in expeditionary energy.

EXPEDITIONARY ENERGY: FROM BASES TO BATTLEFIELD



THE FUTURE FORCE

One of the Commandant's six critical pillars of modernization for the Corps, Marine Corps investments in energy efficient equipment and renewable energy are essential to building a lighter, more capable MAGTF. Translating into greater military capability, these investments mean increased tactical and operational tempo, and reduced vulnerabilities during resupply. In short, they can mean the difference between reaching "Baghdad" or waiting for resupply. They save Marines time, with more focus on the enemy and less time spent planning and executing sustainment missions. Most importantly, by investing in training Marines we are reinforcing our expeditionary mindset, teaching Marines that resource efficiency is a force multiplier that increases combat effectiveness.

REQUIREMENTS

In September 2011, the Assistant Commandant of the Marine Corps signed a comprehensive requirements document to guide our investments in our equipment and our people: the E2W2 CBA/ICD. This document provides the analytical framework for developing the solutions to build the future force. The E2W2 CBA/ICD identifies 152 gaps, including materiel and non-materiel gaps, and together with the Strategy, provides a prioritized roadmap that the Marine Corps

is using to systematically focus investments and drive combat development.

Catalyzing the next generation of capabilities, the Marine Corps 2012 Science and Technology Strategic Plan is the third element of our framework. It identifies six priority areas to lead turn the S&T enterprise: (1) expeditionary energy harvesting; (2) temperature-independent electronics; (3) expeditionary water harvesting; (4) energy-efficient, combat-effective mobility; (5) optimized personnel performance; and (6) energy storage other than liquid.

EXPERIMENTAL FORWARD OPERATING BASE

In November 2009, the Deputy Commandant for Combat Development and Integration established the Experimental Forward Operating Base (ExFOB) to identify, evaluate, and accelerate the Marine Corps materiel solutions to achieve the mission of the Strategy. ExFOB brings together stakeholders from across the Marine Corps requirements, acquisitions, and science and technology-development communities to systematically focus on capability gaps identified in the E2W2 CBA/ICD. A semi-annual event, ExFOB invites industry to demonstrate off-the-shelf technologies with potential to address Marine Corps needs. Promising technologies are put into the hands of Marines for extended user evaluation under combat and training conditions. Qualitative and quantitative data collected during ExFOB inform requirements, reduce investment risk, and build Marines' confidence in new capabilities.

ExFOB has taken new capabilities "from concept to combat" in less than a year—twice. In 2010 ExFOB sourced commercial and Marine Corps technologies, trained an infantry company with renewable energy systems, and deployed them to Afghanistan in winter 2010. Marines learned that these capabilities could reduce risk and increase effectiveness at the forward operating edge, such as enabling a foot patrol to operate for three weeks without battery resupply, operating

patrol bases entirely on renewable energy, and dramatically reducing fuel demand at a company outpost. In summer 2011, Marines evaluated ExFOB's hybrid power solutions and efficient air conditioners at Patrol Base Boldak in Afghanistan. This effort tackled our largest ground power user — command and control operations — and enabled a leap forward in our understanding of the military requirement for hybrid power. In 2012, the Marine Corps put this knowledge to work in preparing the Analysis of Alternatives for hybrid energy systems, a critical benchmark in accelerating the acquisition of an entirely new means of powering the force.

Since 2010 ExFOB has:

- Reviewed over 280 technologies
- Evaluated over 75 technologies at ExFOB demonstrations
- Purchased and deployed 11 different technologies to combat in Afghanistan
- Transitioned 4 Technologies to Programs of Record
- Led the requirements development of battlefield hybrid power
- Collaborated with industry to develop high efficiency flexible solar
- Collaborated with industry to develop small unit water purification systems
- Integrated and evaluated fuel saving auxiliary power units for combat logistics vehicles
- Informed \$352M in USMC investment and interests within HQMC processes and within the Expeditionary Force Development System.

BASES TO BATTLEFIELD

The Strategy recognized that because Marines live, train, and fight as an expeditionary force, it is essential to foster energy efficient habits at our bases that Marines will translate to the battlefield. At installations, the Marine Corps has made real progress in harness-

ing renewable energy resources and building more efficient buildings and systems to drive down energy costs. To achieve the Commandant's vision of an energy-efficient, combat effective Marine Corps, every unit and every Marine at our bases and stations, including our civilian Marines and our family members, must make energy a priority. A culture that values resources and increases energy efficiency at our installations will strengthen the readiness and capability of our force.

THE EXPEDITIONARY ENERGY OFFICE (E²O)

Established in October 2009, the USMC Expeditionary Energy Office (E2O) is responsible for analyzing, developing, and directing Marine Corps energy strategy “in order to optimize expeditionary capabilities across all warfighting functions.” E2O, a Director-level office within Headquarters Marine Corps (HQMC) reporting to the Assistant Commandant, works closely with the combat and technology development communities. E2O serves as the Proponent for Expeditionary Energy in the force development process. Additionally, E2O is tasked with advising the Marine Requirements Oversight Council (MROC) on all energy and resource-related requirements, acquisitions, and programmatic decisions. And, in accordance with the National Defense Authorization Act for Fiscal Year 2009, the Secretary of the Navy assigned the E2O responsibilities as the Marine Corps Senior Official for Operational Energy.

PROGRAM INVESTMENTS

Our investments are focused on supporting Marines in combat today, but also on increasing the combat effectiveness of the future force. We are driving energy performance considerations into the acquisition and requirements processes, improving new and legacy systems as well as future upgrades.

We calculate our “Return on Investment” in terms of military capability gained through dramatic savings

in weight and fuel transported. For example, within the FYDP, we expect our investments to improve the energy effectiveness of our Marine Expeditionary Brigades (MEB) by about 9 percent. We estimate that the future MEB, over a 365 day operation, will be able to operate one month longer on the same amount of fuel that it demands today. It will need 208 fewer fuel trucks, thereby saving seven million pounds of fuel per year.

Initial investments in current programs and new areas put us on track to achieve the mission of the Strategy by 2025. They include:

- Accelerating expeditionary energy systems — Solar Portable Alternative Communications Energy System (SPACES) and Ground Renewable Expeditionary Energy Network Systems (GREENS) — to Afghanistan (complete in March 2012), and the Fleet Forces
- Implementing mobile electric power sources to achieve ~22 percent fuel efficiency across the fleet of systems (Army funded development and USMC funded procurement)
- Fielding Enhanced Efficiency Environmental Control Units (E3CU) to achieve ~15-25 percent improved fuel efficiency beginning in 2012, with the next-generation family of ECUs entering service in 2014
- Developing fuel economy improvements for Medium Tactical Vehicle Replacement (MTVR) vehicles, anticipating 15 percent increased efficiency
- Executing ExFOB demonstrations twice a year
- Exercising and training renewable energy systems at events including Steel Knight 2012, Weapons Tactics Instructors Course, and Enhanced Mohave Viper
- Improving expeditionary energy modeling and simulation capability to guide future program investments across the MAGTF
- Training in expeditionary energy ethos for entry-level Marines; developing improved training and education that includes ethos, energy planning, management, production, distribution and storage concepts and practices
- Supporting a Naval Postgraduate School multi-disciplinary student research program in expeditionary energy, beginning fall of 2012

These and future efforts are guided by formal requirements, which include:

- *USMC E2W2 CBA/ICD*
- *Urgent Statement of Needs for Energy-Efficient Lighting for Expeditionary Shelter System*
- *Urgent Statement of Needs for Expeditionary Shelter System Energy-Efficient Insulating Liner*
- *Urgent Statement of Needs for the Solar Portable Alternative Communications Energy System and Ground Renewable Expeditionary Energy Network Systems*
- Energy Efficiency Key Performance Parameter included in Ground-Based Optical Surveillance System (Expeditionary) Capability Development Document
- *MAGTF Expeditionary Hybrid Power System (MEHPS) Analysis of Alternatives*

“Transforming the way we use energy is essential to rebalance our Corps and prepare it for the future.”

*Gen James F. Amos
Commandant, U.S. Marine Corps*



SECTION 7: MARINE CORPS INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE ENTERPRISE (MCISRE)



INTRODUCTION

Marine Corps Intelligence is more than support to operations — it is continuous operations, oriented on global, dynamic threats as well as security cooperation engagements necessary to enable prudent action in pursuit of national interests. The MCISRE is an innovative, operational approach to the intelligence warfighting function, providing timely, reliable, and understandable intelligence information that forms the basis of Marine Corps planning and operations. The multi-domain, collaborative, worldwide construct of the MCISRE provides the crucial operational edge required for Marine Corps forces.

The MCISRE is not driven by the crisis of the moment. Rather, it is a “24/7/365” predictive analysis process with the global reach of operational Marine Expeditionary Force (MEF) Intelligence Centers (MICs) backed by the Marine Corps Intelligence Activity (MCIA) and its connectivity to the Combat Support Agencies (CSAs) and National Intelligence Community (IC). To ensure its viability, Marine Corps Intelligence will continue to evolve and maintain vigilance over a complex, technically sophisticated threat environment by seizing technological opportunities to increase MCISRE capabilities and capacities.

TODAY

The MCISRE supports the Marine Corps intelligence unity of effort across the air, ground, maritime, and cyberspace domains. This strategy synchronizes current USMC intelligence programs, units, and personnel at every echelon across the operating forces and supporting establishment to enable collaboration and sharing of all information and federated intelligence in support of the Marine Air Ground Task Force (MAGTF).

To date, the MCISRE strategy continues implementing an enterprise solution in which all ISR functions, sources, and methods across the total force are leveraged and shared for operational success. A major milestone has been the creation of MICs that enable MEF units to train as they fight by providing analytical and intelligence production support from garrison locations to deployed forces, supporting the Commandant’s “Lighten the MAGTF” initiative as well as reducing the required number of forward-deployed personnel. Other major advances include the creation of the Headquarters, Marine Corps Intelligence Department Technology Innovation Division led by the Enterprise Chief Technology Officer, a comprehensive intelligence professionalization program across the Enterprise, and advanced analytic training, methods, and tools

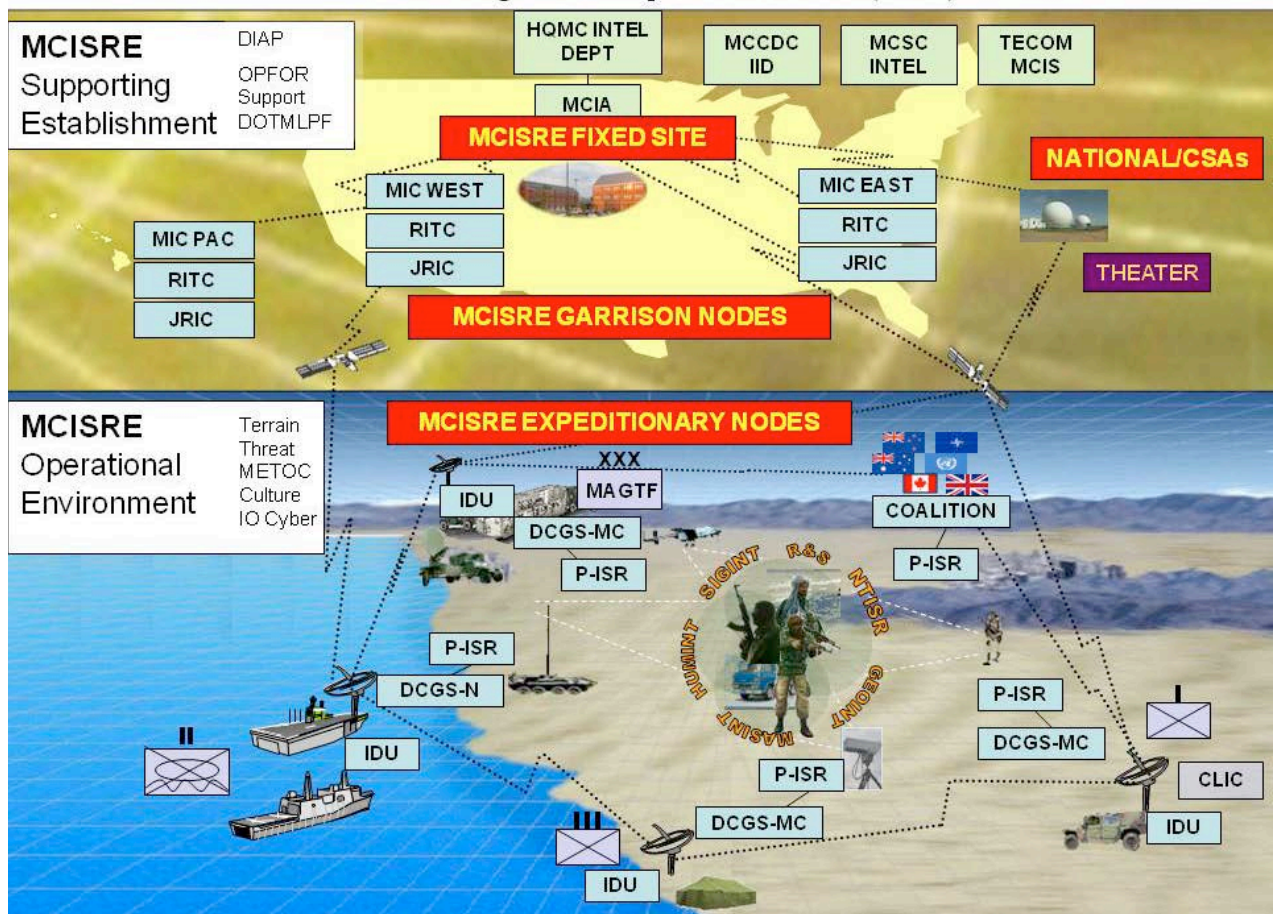
that enable standardized, collaborative predictive analysis across the Enterprise.

These recent advances place ISR capability and capacity at all echelons throughout the total force integrating intelligence information to respond to and reduce uncertainty within complex threat environments. As budgets decrease and global threats multiply, the MCISRE embraces operational flexibility through adaptive responses in operating concepts, doctrine, training, and equipment.

TOMORROW

When fully implemented, the MCISRE will provide each component element access to shared knowledge, data, resources, and expertise from across the enterprise, as well as joint, national, and contributing partner agencies. The ability to “See,” “Understand,” and “Act” enables a highly trained, networked, and analytically astute intelligence force to enhance decision-making at all echelons, while meeting intelligence quality and information-sharing standards required by Department of Defense (DoD) and National Intelligence Directives.

MCISRE HIGH-LEVEL OPERATIONAL VIEW (OV-1)



MCISRE CONSTRUCT

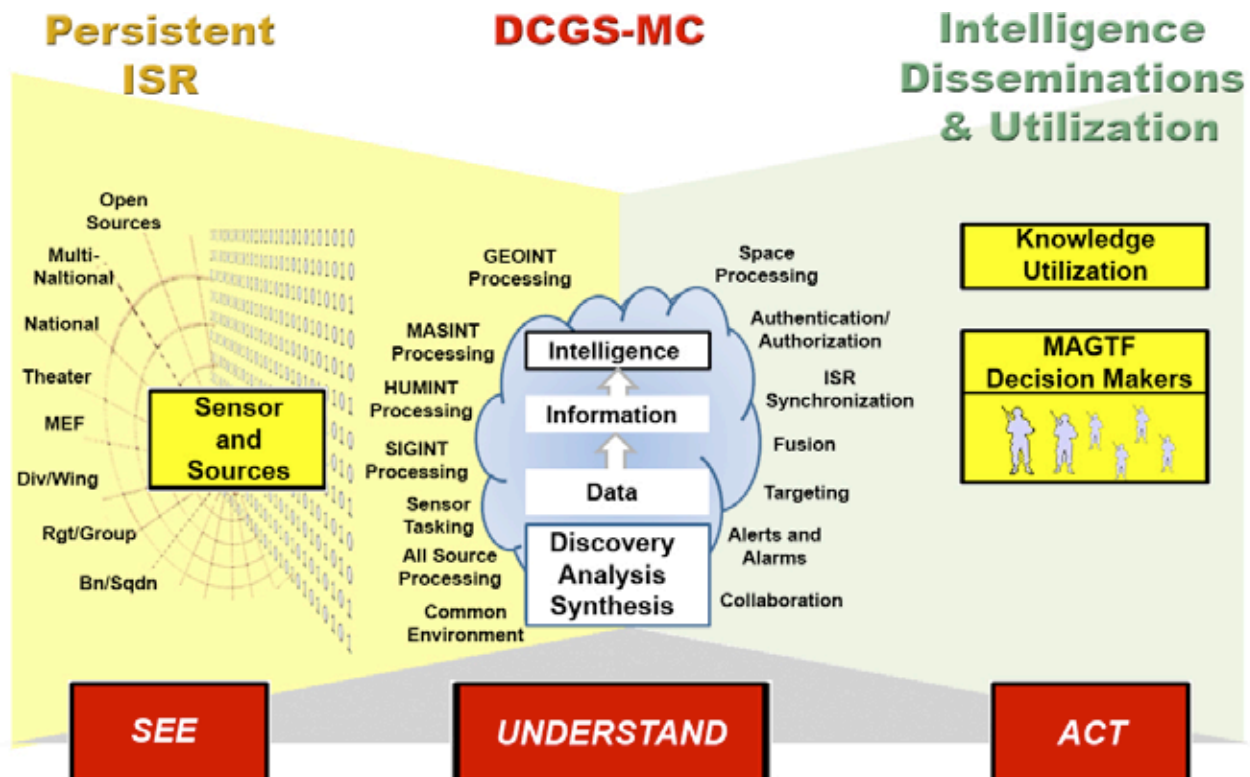
Fixed Site: The MCISRE Fixed Site is managed by the MCIA in Quantico, Virginia. It serves as the Marine Corps principal connection to national agencies and exposes all USMC ISR data to the IC. The fixed site is the primary enterprise data storage and archival site and serves as the primary reach-back site for Garrison Nodes.

Garrison Nodes: MICs are operationalizing garrison capacity in support of operational forces worldwide. They serve as critical reach-back nodes for expeditionary forces. The MICs conduct intelligence planning, analysis, and production in collaboration with MCIA, expeditionary forces, or designated joint force elements. These reach-back sites are located at each of the three MEFs and are capable of supporting forward operations from garrison or deploying to augment tactical, expeditionary nodes.

Expeditionary Nodes: Expeditionary nodes are deployed with the MAGTF. They are scalable, aligned to the mission, and provide intelligence planning, direction, collection, analysis, production, and dissemination of intelligence and combat information to the MAGTF and joint forces.

OPERATIONAL OVERVIEW

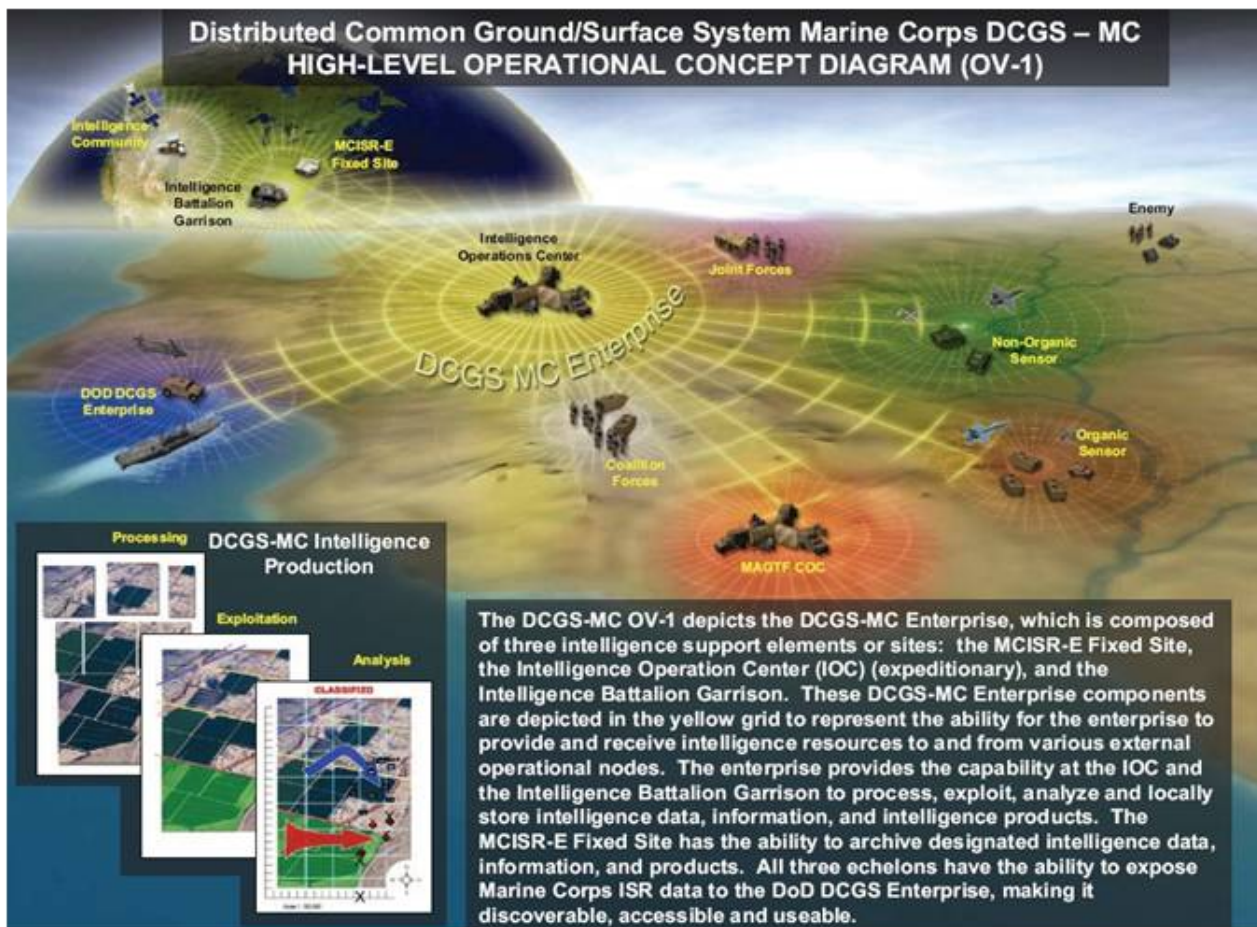
The MCISRE is built on three core pillars to support MAGTF intelligence requirements in both garrison and deployed environments: (1) Persistent ISR (P-ISR) enables the MAGTF to “See”; (2) Distributed Common Ground System–Marine Corps Enterprise (DCGS-MC) enables intelligence professionals to “Understand”; and (3) Intelligence, Dissemination, and Utilization (IDU) enables the MAGTF to “Act.” Individual components of these pillars are further described under Chapter 3, Pillar 5, Section 6: Intelligence, Surveillance, and Reconnaissance Systems and Equipment.





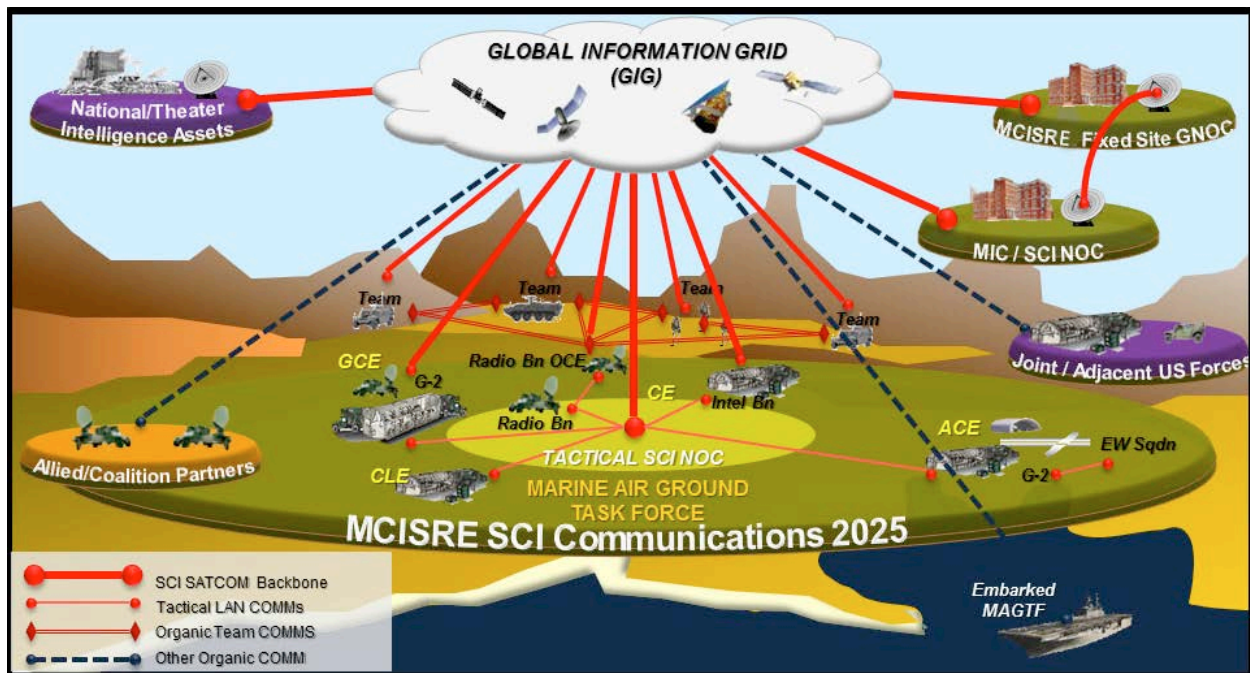
“See” with Persistent-ISR: P-ISR provides the means for intelligence planning, directing, and collecting. Through P-ISR, the Marine Corps is building a holistic intelligence-collection strategy that leverages joint and national ISR assets to augment organic battlefield sensors. The P-ISR strategy synchronizes organic MAGTF ISR collection assets with support from joint and CSA resources to provide leaders at all echelons the ability to use intelligence and combat information.

“Understand” with Distributed Common Ground System–Marine Corps Enterprise (DCGS-MC) Enterprise: DCGS-MC provides the foundation to expose and discover data from a multitude of geospatial intelligence (GEOINT), human intelligence (HUMINT), signals intelligence (SIGINT), and



other sources to provide all-source intelligence production. DCGS-MC is the USMC component of the DoD DCGS Enterprise that performs all aspects of MCISRE data processing, exploitation, exposure, discovery, analysis, and production. DCGS-MC consists of a family of systems that is scalable, modular, and tactically deployable. The DCGS-MC Enterprise comprises the DCGS-MC program of record and several other programs. This critical capability increases the amount and precision of information and intelligence made available to operators, decision-makers and intelligence professionals across and at all echelons of the MAGTF.

“Act” with IDU: The Intelligence Dissemination and Utilization (IDU) concept strives not only to deliver intelligence, but also to integrate it with operations and planning. IDU includes the systems, people, and processes associated with dissemination, integration, use, and evaluation of intelligence. The IDU concept enables precise action and the prudent re-tasking of P-ISR capabilities. IDU is the act of identifying and conveying relevant combat information and intelligence to satisfy MAGTF intelligence requirements. IDU incorporates continuous feedback to ensure the right combat information and intelligence is delivered to the right consumer at the right time. IDU comprises those capabilities associated with the dissemination, integration, evaluation, and feedback steps of the Marine Corps intelligence process.



SECTION 8: EXPEDITIONARY LOGISTICS



INTRODUCTION

Logistics is a fundamental element of MAGTF expeditionary operations. The MAGTF expeditionary logistics capability supports a balanced, multi-capable force that is integral to the strategic direction described in Marine Corps Vision and Strategy 2025. Marine expeditionary forces are self-contained and self-sustained forces that have everything necessary to accomplish the mission – from individual equipment to expeditionary airfields and medical treatment facilities. These forces are structured to meet a wide range of contingency operations and possess the logistics capabilities needed to initiate an operation, sustain forces, and reconstitute for follow-on missions.

MAGTF Expeditionary Logistics includes the information systems, equipment, and processes to train, deploy, employ, and sustain Marine forces across the range of military operations. Enablers include:

- Electronic Maintenance Support System
- Family of Combat Field Feeding Systems
- Family of Field Medical Equipment
- Family of Power and Environmental Control Equipment

These are key for continuous MAGTF operations on a distributed battlefield. The Marine Corps vision of the future requires fundamental changes in the way we provide logistics support to our MAGTFs.

ELECTRONIC MAINTENANCE SUPPORT SYSTEM (EMSS)

DESCRIPTION

The Electronic Maintenance Support System (EMSS) is a key Marine Corps maintenance aid designed to enhance combat service support to Marine Air-Ground Task Forces while deployed or in garrison. EMSS consists of an electronic maintenance device (EMD) and server backbone. The EMD consists of a rugged, lightweight, one-man portable maintenance device that the maintainer can employ at the point of repair to interface with the equipment/system undergoing repair, view technical data, and document maintenance actions.

The EMD is capable of supporting multiple platforms and systems across maintenance communities and provides the necessary technical conduit to enable maintainers to gain access to the Global Information Grid via the EMSS server backbone. EMSS provides a means to archive and download maintenance data collected from the EMD, host maintenance applications, and provides easy access to authoritative technical data with automatic updates as changes occur. EMSS can operate in a connected, disconnected, and wireless mode and provide access to subject matter experts over USMC networks.

Additionally, EMSS provides reach back capability to SME/Program Office personnel to enhance and assist in maintenance of weapon systems and support equipment. EMSS is a critical enabler of logistic modernization efforts (Item Unique Identification and Condition Based Maintenance).

OPERATIONAL IMPACT

EMSS provides ground maintenance personnel with an electronic decision support tool capable of wireless connectivity and access to web-based applications and technical data via Global Command Support System – Marine Corps, interactive electronic technical manuals, computer-based training, forms, and files. EMSS will reduce no-evidence of failure, lower

cost of maintenance, eliminate paper publications and assist the maintainer in becoming more effective and efficient by providing networked tools and electronic information, enabling sustained performance and readiness of Marine Corps weapon systems anywhere on the battlefield.

PROGRAM STATUS

EMSS has received a full fielding decision for 2141, 2147 and 3521 military occupational specialties (MOSs). Fielding is 100 percent complete. Future efforts will field EMSS to the 11xx, 13xx, 28xx, 59xx MOSs.

Procurement Profile:	FY 13	FY 14
Quantity:	2,000	2,000

Developer/Manufacturer:

Developer/Manufacturer: Special Projects Engineering and Research (SPEAR) Team, Naval Surface Warfare Center, Crane, IN (systems integrator)

FAMILY OF FIELD MEDICAL EQUIPMENT (FFME)

DESCRIPTION

The FFME consists of medical capability sets known as Authorized Medical Allowance Lists (AMALs), Authorized Dental Allowance Lists (ADALs), and medical kits. These sets provide the Marine Air-Ground Task Force commander with the health-care capabilities required to maintain the combat effectiveness of the force and safely stabilize and evacuate casualties from the battlefield. There are 30 different AMALs/ADAL and four medical kits fielded to Marine Corps units. AMALs, ADALs, and medical kits provide Medical Battalions, Dental Battalions, unit medical personnel, and individual Marines and Sailors with the equipment, consumables, and medicine required to treat patients in a field or combat environment.

OPERATIONAL IMPACT

The type of FFME that supports the MAGTF includes forward resuscitative care, shock trauma, and first-responder capability sets that provide life-saving care as far forward on the battlefield as possible. In addition, FFME also includes preventive medicine capability sets designed to prevent the spread of disease. Loss of any of these capabilities would adversely affect health-care management throughout the Marine Corps and potentially result in the loss of life.

Each AMAL, ADAL, and medical kit is modeled by the Naval Health Research Center (NHRC), verified by subject matter experts, and stocked to reflect current casualty rates and protocols. Planned enhancements to FFME capability sets to improve the quality of health care provided to the warfighter include a Portable Patient Transport Life Support System, Infrascanner for the early detection of subdural hematomas, and the Mobile Anesthesia Delivery Module. Other efforts include joint research and development efforts for tourniquets and hematology analyzers.

PROGRAM STATUS

A review with NHRC, HQMC, CD&I, MCSC, and subject matter experts is conducted on each AMAL, ADAL, and medical kit every four years. The AMAL/ADAL or medical kit is then updated with the latest state-of-the-art medical technology and reconfigured based on current casualty rates and protocols. New or updated equipment added to the AMAL, ADAL, or medical kit is fielded the year following a review with obsolete equipment being disposed of properly.

MARINE CORPS FAMILY OF POWER AND ENVIRONMENTAL CONTROL EQUIPMENT

DESCRIPTION

The Marine Corps Family of Power Equipment encompasses a portfolio program to procure, update, and replenish continuously more than 30,000 items of power equipment, including skid-mounted and trailer-mounted diesel generators, floodlights, power distribution sets, electrician toolkits, power supplies, radio power adaptors, battery chargers, renewable energy systems, and on-board vehicle power systems. The Marine Corps Family of Environmental Control Equipment continuously procures, updates, and replenishes more than 8,000 items that include tactically hardened Environmental Control Units, refrigerated containers, and refrigeration tool kits. Both families of equipment are used to support all command, ground combat, aviation, and logistics elements throughout the Marine Corps that require tactical power and environmental control in support of air control, communication/information systems, life support systems, and general power/heating-ventilation-air conditioning requirements. Paramount in each family is fielding Environmental Protection Agency-compliant equipment to meet stringent air quality and zero-ozone depleting standards, while maintaining military compatibility, energy efficiency, transportability, durability, and simplicity of operation.

OPERATIONAL IMPACT

Procurement of these systems will ensure that the Command Element, Aviation Combat Element, Ground Combat Element, and Logistics Combat Element entities have the ability to support all requirements of the Marine Air Ground Task Force with deployable and energy efficient equipment.

PROGRAM STATUS

Within the families of power equipment and environmental control equipment, various items are replaced as determined appropriate by the life cycle manager, Product Manager, Expeditionary Power Systems. All items are managed as acquisition or abbreviated-acquisition programs, with multiple acquisition programs in progress at any point in time.

Procurement Profile:	FY 13	FY 14
Quantity:	5,400	5,250

Developer/Manufacturer:

Environmental Control Units: Hunter Defense, Geneva, OH

Current Tactical Generators: Dewey Electronics, Oakland, NJ; DRS-Fermont, Bridgeport, CT;

AMMPS Tactical Generators: ONAN Cummins, Minneapolis, MN

Battery Chargers: Bren-tronics Inc., Commack, NY

Battery Managers and Analyzers: PulseTech Corporation, Waco, TX

Refrigerated Containers: SeaBox Inc., East Rutherford, NJ

Cargo Containers: SeaBox Inc., East Rutherford, NJ; CMCI, Charleston, SC; and Garrett Container Company, Accident, MD

Radio Power Adaptors: IRIS Technology, Irvine CA and Graywacke, Mansfield, OH

Power Supplies: AMETEK, San Diego, CA

Renewable Energy Systems: IRIS Technology, Irvine, CA; UEC Electronics, Hanahan, SC; and LM Engineering, Youngstown, OH

Power Distribution: LEX Products, Shelton, CT

Floodlights: Magnum Products, Berlin, WI

Integrated Trailer, ECU and Generator: Magnum Products, Berlin, WI

On-Board Vehicle Power System: Oshkosh Corp., Oshkosh, WI and DRS, Huntsville, AL

FAMILY OF COMBAT FIELD FEEDING SYSTEMS

DESCRIPTION

The CFFS team provides material solutions that give the Operating Forces the capability of feeding Marines and Sailors in an expeditionary environment.

The Expeditionary Field Kitchen (EFK) is a rapidly deployable, mobile, and fully self-sustaining kitchen capable of preparing a minimum of 500 meals up to three times per day. The EFK is configured within an 8-by-8 by 20-foot. International Organization for Standardization (ISO) container for transportation and is compatible with current and project Marine Corps transport assets (Medium Tactical Vehicle Replacement (MTVR) with MCC20 container trailer). The kitchen includes an array of food-serving equipment assembled in the expandable ISO container. The transition from shipment mode to operational mode includes placing mobile appliance units into a food preparation and sanitation configuration.

OPERATIONAL IMPACT

The EFK provides a mid-level feeding system to support expeditionary field mess operations as far forward as possible on the battlefield in support of the scheme of maneuver and logistical requirements of the Marine Air-Ground Task Force.

PROGRAM STATUS

The EFK is being fielded in FY 2013 and FY 2014 with expected Full Operational Capability scheduled during FY 2016.

Procurement Profile:	FY 13	FY 14
Quantity:		
EFK	72	34

Developer/Manufacturer:

Sotera Defense Solutions, Easton, MD



SECTION 9: PREPARING FOR TOMORROW'S FIGHT



INTRODUCTION

We are preparing for tomorrow's fight in three critical areas: cyber warfare; special operations; and security cooperation. Modern armed forces cannot conduct high-tempo, effective operations without reliable information and communications networks and assured access to cyberspace and space. The Marine Corps Forces Cyberspace Command is the focus of our organic cyber capabilities and capacities needed to retain speed, precision, and lethality. The Marine Corps Special Operations Command is the Corps contribution to the U.S. Special Operations Command and maintains a shared heritage and strong bond with its parent service as "soldiers from the sea." The Marine Corps Security Cooperation Group capitalizes on our theater security cooperation and partnership activities with allies and partners, providing our leaders with strategic options to shape outcomes, prevent conflicts, strengthen "at-risk" states, and deny enemy safe-havens.

MARINE CORPS SECURITY COOPERATION GROUP (MCSCG)

The Marine Corps Security Cooperation Group (MCSCG) achieved full operational capability in October 2012 as a unique command that consolidates all facets of security cooperation (SC) to include advisor skills, training and assessment expertise, and security assistance program management. MCSCG is commanded by a Marine colonel and has a total of 203 personnel organized into a headquarters staff, instructor group, and regionally aligned coordination, liaison, and assessment teams (CLATs). The command is assigned as a subordinate element of Marine Forces Command (MARFORCOM).

The MCSCG mission is to execute and enable security cooperation programs, training, planning, and activities in order to ensure unity of effort in support of USMC and Regional Marine Component Command (MARFOR) objectives and in coordination with operating forces and MAGTFs. These include assessments, planning support, SC related education and training, and advisory support to ensure the accomplishment of USMC and Regional Marine Force (MARFORs) Component Command SC objectives. MCSCG achieves

this by concentrating on these three SC focus areas: Build relationships, facilitate access and building partner capacity (BPC).

MCSCG accomplishes its mission through six principal lines of effort in order to provide integrated security cooperation solutions:

1. Security Assistance/International Programs: Coordinate and manage Security Assistance education and training programs.
2. Foreign Security Force – Capability Based Assessments: Conduct detailed and comprehensive assessments that inform the SC Planning Cycle.
3. Security Cooperation Engagement Plans: Develop long term and enduring Security Cooperation Engagement Plans with our partners and provide deployable planning support elements to the regional MARFORs.
4. Education: Provide resident and deployable instruction to Marine Corps personnel assigned to manage SC activities.
5. Training: Provide SC training to Marines tasked to conduct SC missions.
6. Unity of Effort: SC coordination across USMC and Maritime services.



BUILDING PARTNER CAPACITY (BPC)

- Security Force Assistance (SFA)
- Security Assistance (SA)



BUILDING RELATIONSHIPS

- Key Leader Engagements
- Mil to Mil Talks
- Exchange Programs

FACILITATE ACCESS

- Routine Visits
- Basing / Over Flight



PILLAR 3:
CAPABILITY & CAPACITY TO MEET DOD
STRATEGIC REQUIREMENTS



SECTION 1: AMPHIBIOUS AND PRE-POSITIONING SHIPS



NAVAL EXPEDITIONARY CAPABILITY IN THE 21ST CENTURY

The United States is a Global Maritime Nation. It remains the world's largest economy, critically dependant on the global commons for our livelihood. Over 90% of the world's commerce travels by sea. Global populations continue to shift to the littoral regions along the oceans' coastlines; 21 of the world's 28 mega-cities lie within 62 miles of a coastline. Protecting our citizens, allies and interests in this global system is necessary for both our prosperity and security.

The sea provides the primary global common through which American power is projected. Marines (an inherently naval force) and the amphibious warships which carry them, use the oceans as maneuver space in order to influence potential crises from the sea without forcing escalation or aggravating sovereignty. Amphibious forces are designed to provide a wide range of capabilities from the sea. They can loiter unseen over the horizon or provide a visible deterrent. Our presence equals access, which creates options and decision space for our Nation's leaders. With modern aviation and surface connectors, Marine forces can provide kinetic strike or responsive maneuver from hundreds of miles out to sea.

MARITIME SUPPORT TO EXPEDITIONARY OPERATIONS

During the 1920s and 1930s, the Navy and Marine Corps began experimenting with new concepts and techniques that would change the way they conducted expeditionary operations. The Navy experimented with aircraft carrier operations using a converted coal ship and two partially completed battle cruisers. The Marine Corps experimented with amphibious tractors, close-air support, and combined arms to develop doctrine, concepts of operations, and training for amphibious operations. The inter-war years of experimentation and concept development resulted in a Navy and Marine Corps team that won the war in the Pacific during World War II.

Today, we are at a similar point in the evolution of new expeditionary capabilities, and a similar commitment to experimentation and concept development is shaping the Marine Corps and Navy for the 21st Century. The concept of sea basing is maturing and becoming a reality as new platforms and technologies that allow us to operate more effectively from a sea base are delivered. Until recently, Marines have been able to conduct sea-based operations only from amphibious shipping, because today's prepositioned materiel and equipment can be employed only once forces are assembled ashore. Additionally, our prepositioned equipment has been perceived as a "break glass in time of war" capability. It is no longer primarily reserved for major combat operations.

Meeting the demands of today's security environment means that our amphibious and prepositioning assets must be more integrated to better support steady-state operational requirements. We also must eliminate the false perception that amphibious and pre-positioning capabilities are separate and distinct. Amphibious and prepositioning capabilities are complementary and in the future will become more interoperable and mutually supportive across the range of military operations. Both capabilities must evolve to provide greater utility, particularly in irregular war-

fare and other low to mid-intensity operations, while retaining the capability to fully support major combat operations. In particular, our Maritime Prepositioning Force (MPF) must develop a full at-sea arrival and assembly capability to better support maneuver operations ashore.

EXPEDITIONARY NAVAL FORCES IN SUPPORT OF NATIONAL STRATEGY

The tri-Service *A Cooperative Strategy for 21st Century Seapower* states that forward-deployed and globally engaged Marine Corps expeditionary forces, with the Navy and Coast Guard, "...act across the full range of military operations to secure the United States from direct attack; secure strategic access and retain global freedom of action; strengthen existing and emerging alliances and partnerships; and establish favorable security conditions." Most significantly, these "persistently present and combat-ready" maritime forces also "provide the Nation's primary forcible-entry option in an era of declining access."

The Marine Corps amphibious and prepositioning capabilities contribute to the Joint Force's expeditionary capability and fulfill the Nation's maritime strategic imperatives as follows:

- Limiting regional conflict with forward-deployed, decisive maritime power
- Deterring major-power war
- Winning our Nation's wars
- Contributing to homeland defense in depth
- Fostering and sustaining cooperative relationships with more international powers, and
- Preventing or containing local disruptions before they impact the global system

Operating in concert with the Navy and the Coast Guard, Marine Corps expeditionary forces can be employed from a sea base to complement other joint means of projecting influence and power. These forces leverage the advantages afforded by our command of the seas and ability to dominate the maritime domain to conduct operations in the littorals. The Marine

Corps core competencies are the foundation for our expeditionary forces' significant contributions to the Nation's security.

OPERATIONAL ROLE OF MARINE CORPS EXPEDITIONARY FORCES

Our strategies and concepts address the following requirements: the ability to maintain open and secure sea lines of communication for our maritime nation; the ability to maneuver across and project power from the sea; the ability to work with partner nations and allies to conduct humanitarian relief or noncombatant evacuation operations; and the ability to conduct persistent and sustained littoral operations along any coastline in the world.

Marine Corps expeditionary forces provide a balanced and scalable set of capabilities to counter irregular threats, respond to emerging crises, and conduct major combat operations. In this era of strategic uncertainty, a forward deployed expeditionary force, consistently engaged and postured for rapid response, is critical for national security in the future as it is today. The Marine Corps expeditionary capability is enabled by the complementary employment of amphibious shipping and prepositioned equipment. Together they provide responsive and scalable options to project influence and power and provide support across the full spectrum of operations to include engagement operations and crisis response.

The deployment of the 22d and 24th Marine Expeditionary Units (MEUs) on board amphibious shipping and the prepositioning ship USNS *1st Lt. Jack Lummus* to support humanitarian and disaster-relief operations in Haiti in 2010 is an example of the Marine Corps capability to rapidly respond to crisis. These forces provide a similar capability to respond at the high end of the military operations spectrum to create littoral maneuver space for the Joint Force. The expeditionary character, versatility, and agility of Marine Corps expeditionary forces provide the Nation with the asymmetric advantage of seamlessly adjusting

the size of its military footprint to match the changing situation ashore.

TODAY'S AMPHIBIOUS CAPABILITY

Among the many capabilities provided by integration of combat-ready Marine Air Ground Task Forces (MAGTFs) with multi-mission amphibious ships, three are of critical importance:

- Forward presence to support engagement and theater security cooperation
- A ready force to immediately respond to emergent crises
- A credible and sustainable forcible-entry capability

Forward-deployed amphibious forces are unique in that they are postured to immediately respond to crises while conducting persistent forward engagement to prevent and deter threats, particularly in the areas of instability in the littorals. Often the mere presence of an amphibious force capable of delivering a powerful amphibious blow at a point and time of its own choosing is enough to stabilize an escalating crisis. The inherent versatility and flexibility of amphibious forces — exemplified by their ability to conduct missions across the range of military operations — achieves advantages disproportionate to the resources employed.

An amphibious capability creates four strategic benefits for a nation that depends on its ability to exploit its command of the seas to project influence and power, as follows:

- **Increased Freedom of Action:** Amphibious forces can use the maritime domain as a base from which to conduct operations. They can loiter indefinitely in international waters and maneuver ashore at the time and place of their choosing.
- **Deterrence:** While a standoff strike is sometimes an adequate response, other situations require the rapid insertion of sustainable combat forces — “boots on the ground” — to underscore the Nation's commitment to an ally or friend.
- **Assured Access:** Amphibious forces contribute

unique and essential capabilities toward the Nation's ability to take advantage of the freedom of the high seas to enter a region without regard to access constraints and impediments and to sustain sea-based operations almost indefinitely without need for in-theater host-government support.

- **Uncertainty for Adversaries:** A credible forcible-entry capability compels potential adversaries to invest in a broad range of systems and spread their defenses over larger areas of concern.

The lengthy experience of the Marine Corps in conducting forward engagement and security cooperation operations in the littorals has dispelled the misperception that forcible entry is the only yardstick by which the requirement for amphibious capability and capacity is measured. More relevant metrics in today's security environment, as underscored in the *2010 Quadrennial Defense Review*, are the capability to conduct persistent forward engagement activities and provide a crisis-response force while retaining the capability to respond to major contingencies.

The importance of amphibious forces is highlighted by the increased employment of Marine Corps expeditionary forces since the end of the Cold War. From 1946 through 1989, amphibious forces were employed on average 2.5 times per year; since 1990, the rate has increased to about 5.5 times per year. The demand for amphibious forces to support steady-state operations is projected to increase even more in the coming years as combatant commanders place greater emphasis on conducting sea-based persistent forward-engagement activities throughout their areas of responsibility. Viewed another way, combatant commanders' global demand for amphibious ready groups and MEUs has increased 86 percent and 53 percent for independent amphibious ships during the FY 2007 to FY 2011 period.

The ability to meet the demand for amphibious ships with the programmed amphibious fleet is a critical concern. When forward-presence requirements are factored in with the 2.0 Marine Expeditionary Brigade (MEB) assault-echelon lift needs, the requirement calls for 38 amphibious ships, 11 of which must be

aviation-capable large-deck warships. Because of fiscal constraints, however, the FY 2012 programmed force level calls for 32 ships. The increased demand for amphibious forces thus has placed a strain on amphibious shipping as the employment of amphibious forces has increased while the inventory of amphibious ships has declined. Newly delivered amphibious ships, such as the *San Antonio* (LPD 17)-class landing platform dock ships, are more capable than the ships they replace. However, a ship can be in only one place at a time. Although the fleet retains a responsive surge capability, the constrained number of in-service ships precludes fully supporting the growing demand for rotational MEU and Global Fleet Station deployments and other requirements. The Marine Corps amphibious ship and associated ship-to-shore connector requirements are highlighted in the following pages.

AMPHIBIOUS WARSHIPS

Amphibious warfare ships are the centerpieces of the Navy-Marine Corps presence, forcible-entry, and sea-basing capabilities continue to play essential roles in global operations. These ships are equipped with aviation- and surface-assault capabilities that, when coupled with their inherent survivability and self-defense systems, support a broad range of mission requirements. They provide the most formidable expeditionary forcible-entry capability in the world, the development and maintenance of which is the responsibility of the Marine Corps under U.S. Code Title 10.

The Marine Corps operational requirement is for two Marine Expeditionary Brigade Assault Echelons (MEB AE) of forcible-entry capability reinforced with two additional MEBs from the Maritime Prepositioning Force. The two-MEB AE forcible-entry capability requires 34 amphibious warfare ships (17 ships per MEB). When forward-presence requirements are considered with the 2.0 MEB lift requirement, the AE requirements total 38 ships. Of these 38 ships, 11 must be aviation-capable large-deck ships — Landing

Helicopter Assault (LHA), Landing Helicopter Dock (LHD), or Landing Helicopter Assault (Replacement) LHA(R) — to accommodate the MEB's Aviation Combat Element.

Nine large-deck ships (eight *Wasp*-class LHDs and one *Tarawa*-class LHA) are in service in 2013. The eighth *Wasp*-class multi-purpose amphibious assault ship, the USS *Makin Island* (LHD 8), was delivered in 2009. LHD 8 is similar to LHD 1 through LHD 7, but is powered by gas turbine engines and has all-electric auxiliaries.

AMPHIBIOUS ASSAULT SHIP REPLACEMENT (LHA(R))



The amphibious fleet is organized for persistent forward presence as the foundation for other critical roles, missions, and tasks. It includes nine amphibious ready groups (ARGs), each consisting of three amphibious ships. The centerpiece of the ARG is a *Wasp* (LHD 1)-class or *Tarawa* (LHA 1)-class amphibious assault ship. The sole *Tarawa*-class amphibious assault ship will be decommissioned in FY 2014. The first of two transitional LHA Replacement (LHA(R)) ships, the USS *America* (LHA 6), began construction in 2008. LHA 6 design modifications enhance aviation support for MV-22B Osprey and F-35B Joint Strike Fighter operations. Removal of the well deck provides for an extended hangar deck with two wider high-bay areas, each fitted with an overhead crane for aircraft maintenance. Other enhancements include a reconfigurable

command and control complex, a hospital facility, and extensive support activities. Efforts are underway to incorporate a well deck into the FY 2016 LHA(R) platform and to incorporate changes in the basic ship design to ensure optimized aviation and surface operations and service life.

SAN ANTONIO-CLASS (LPD 17) AMPHIBIOUS TRANSPORT DOCK SHIP



The LPD 17 *San Antonio*-class amphibious warfare ship represents the Department of the Navy's commitment to a modern expeditionary fleet. The first five ships of the class — the USS *San Antonio* (LPD 17), USS *New Orleans* (LPD 18), USS *Mesa Verde* (LPD 19), USS *Green Bay* (LPD 20), and USS *New York* (LPD 21) — have been commissioned. The *San Antonio*-class LPDs are replacing the remaining ships of the *Austin* (LPD 4) class.

The LPD 17's unique design expands force coverage and decreases the reaction times of forward-deployed MEUs. In forcible-entry operations, the LPD17 helps maintain a robust surface assault and rapid off-load capability for the MAGTF well into the future. The *San Antonio* class warships incorporate advanced characteristics for amphibious ships. Each ship has 699 enhanced berths for embarked Marines, plus a surge capacity of another 101 berths. Each also has a vehicle-stowage capacity of 24,600 square feet, cargo-stowage capacity of more than 33,000 cubic feet, and a well deck sized for two landing craft air cushions (LCAC) or one

landing craft utility (LCU). Flight decks can support operations by two CH-53E/K Super Stallions, two MV-22B Osprey tilt-rotor aircraft, four CH-46E Sea Knight helicopters, or a mix of H-1 attack/utility helicopters. The ships in this class also are outfitted with two Rolling Airframe Missile launchers for self-defense and incorporate design features that significantly reduce their radar cross-sections when compared to previous amphibious ships.

Developer/Manufacturer:

Huntington Ingalls Industries (formerly Northrop Grumman Ship Systems), Pascagoula, Mississippi

LANDING CRAFT AIR CUSHION (LCAC) / SHIP-TO-SHORE CONNECTOR (SSC)



The LCAC is a high-speed, fully amphibious craft with a design payload of 60 tons at speeds in excess of 40 knots and a nominal range of 200 nautical miles. The LCAC's ability to ride on a cushion of air allows it to operate directly from the well decks of amphibious warships and to access more than 70 percent of the world's beaches, compared to 17 percent for conventional landing craft. A service life extension program (SLEP) began in late 2000 for the 72 active LCACs, which provides major refurbishment that will extend craft life to 30 years. The goal is to carry out five LCAC SLEPs per year. During SLEP, LCACs receive a system upgrade that includes

new command, control, communication, and navigation equipment; buoyancy box and rotating machinery refurbishment; enhanced engines; and upgrades of the current skirt system with an improved deep skirt, thereby increasing the performance envelope.

The Ship-to-Shore Connector (SSC) program is developing a replacement for the in-service LCACs and the LCAC service-life extension program (SLEP) as these craft reach the ends of their service lives. In 2007 the Navy Resources, Requirements Review board selected the 74 Short-Ton Air-Cushion Vehicle concept in an approved Initial Capabilities Development Document as the LCAC replacement platform.

The Joint Requirements Oversight Council approved the Capability Development Document in 2010. The contract for the detail, design, and construction of a SSC test and training craft was awarded to Textron, Inc. in 2012.

EVOLUTION OF MARITIME PREPOSITIONING



The Marine Corps prepositioning programs consist of the Maritime Prepositioning Force (MPF) Program and the Marine Corps Prepositioning Program – Norway (MCPN). The MPF Program provides equipment and supplies to enable the rapid deployment and employment of two Marine Expeditionary Brigades (MEBs) from afloat prepositioned shipping. MCPN provides equipment and supplies for a cri-

sis response Marine Air Ground Task Force (MAGTF) and three theater security engagement MAGTFs from a shore-based prepositioning site. The MPF program will continue to evolve to meet the challenges of a constrained fiscal environment as well as a strategic environment with greater anti-access challenges.

Maritime Prepositioning Ship Squadron-One (MPSRON-1) was eliminated and its ships were either transferred to the U.S. Transportation Command's Strategic Sealift Fleet or reassigned to MPSRON-2 or -3. The Marine Corps and Navy collaborated extensively to enhance the capabilities of the two remaining MPSRONS, to include the addition of a legacy MPF ship to each MPSRON. This enhancement attained a higher lift capacity of the MEB requirement per MPSRON, retained critical sea-basing enabling capabilities within each MPSRON, and maintained the Maritime Prepositioning Force's ability to support geographic combatant commander requirements. In addition, Marine Corps afloat and ashore prepositioning programs are programmed for other significant changes through 2025 and beyond. Changes will occur in the afloat program, where the capability to conduct sustained sea-based operations with limited host-nation infrastructure in the Joint Operating Area (JOA) will provide a greatly expanded set of options for the combatant commanders. A detailed integration plan has been developed to ensure the new capabilities are seamlessly incorporated into the existing program.

The first stages of this plan have already been realized. Each MPSRON has increased organic ship-to-shore movement capability with the fielding of the Improved Navy Lighterage System (INLS). The INLS provides operability in higher sea states and greater throughput capacity than the legacy lighterage it replaces. The MPF also has been recapitalized with Military Sealift Command (MSC) either purchasing or terminating the program's leased ships.

Another major enhancement is the integration of four Large Medium-Speed Roll-On/Roll-Off (LMSR) ships which provide more stowage space to accommo-

date the larger and more numerous equipment of the MEB. Three LMSRs are already in service with the program; the fourth will be integrated in February 2013.

While the prepositioning program provides significant capability to the combatant commanders, it is limited in some areas, especially the ability to conduct sea-based operations. The closure of forces requires a secure airfield and a secure port or beach landing site in the JOA — a significant constraint to some operations. In-service MPF platforms can embark limited personnel pierside, at anchor, or while in transit. However, the platforms lack the billeting and support services to facilitate a sea-based force. Additionally, equipment and supplies are administratively stowed to maximize all available space. This administrative “dense packing” of the ships precludes the conduct of assembly operations aboard MPF ships. In-service MPF platforms can support the limited employment of forces from a sea base, but this requires significant planning prior to back-loading the ships during the preceding MPF maintenance cycle. Also, since there are no maintenance facilities aboard in-service MPF vessels, all reconstitution must be done ashore before back loading any of the equipment or supplies.

Between 2013 and 2015, additional ships will be integrated into the MPSRONS. Each new platform will incrementally transform the existing MPSRONS and provide an immediate operational benefit to combatant commanders. Dry cargo/ammunition ships enable selective access to and the offload of supplies, allowing the building of tailored sustainment packages for forces operating ashore. Mobile Landing Platforms will provide the capability to conduct at-sea, sea state-3 selective offload and vehicle/cargo transfer from an LMSR to ship-to-shore connector craft. During this transition period, training and exercises will focus on the development of new tactics, techniques, and procedures as well as doctrinal and organizational changes to fully realize the enhanced ability and operational utility of afloat prepositioning.

JOINT HIGH SPEED VESSEL (JHSV)



The JHSV will provide the critical intra-theater, surface connector capability that will enable the joint force commander to project forces and sustainment at high speeds over operational distances. The JHSV will be capable of self-deploying to the theater of operations and, once in theater, provide the high-speed

means to move forces and supplies within that theater. Specifically, the JHSV will provide the capability to deliver equipment, personnel, and supplies over the intra-theater ranges to shallow, austere, and degraded ports. It will provide support to seabasing and will bridge the gap between low-speed sealift and high-speed airlift.

The JHSV lead ship — USNS *Spearhead* (JHSV 1) — completed acceptance trials in 2012 with three additional ships in various stages of construction at Austal USA in Mobile, AL. The current contract is for 10 ships. Two high-speed commercial ferries, renamed the USNS *Guam* and USNS *Puerto Rico* have also been purchased. In the interim, high-speed vessels will continue to be leased in the Pacific Command area of responsibility to satisfy compelling requirements.



PILLAR 4: INFRASTRUCTURE SUSTAINMENT



SECTION 1: PROVIDING CAPABLE BASES AND STATIONS



INTRODUCTION

Logistics is a fundamental element of Marine Air Ground Task Force (MAGTF) expeditionary operations. The MAGTF expeditionary logistics capability supports a balanced, multi-capable force that is integral to the strategic direction described in Marine Corps Vision and Strategy 2025. Marine expeditionary forces are self-contained and self-sustained forces that have everything necessary to accomplish the mission — from individual equipment to expeditionary airfields and medical treatment facilities. These forces are structured to meet a wide range of contingency operations and possess the logistics capabilities needed to initiate an operation, sustain forces, and reconstitute for follow-on missions.

MAGTF Expeditionary Logistics includes the information systems, equipment, and processes to train, deploy, employ, and sustain Marine forces across the range of military operations. Enablers include:

- Electronic Maintenance Support System
- Family of Combat Field Feeding Systems
- Family of Field Medical Equipment
- Family of Power and Environmental Control Equipment

These are key for continuous MAGTF operations on a distributed battlefield. The Marine Corps vision of the future requires fundamental changes in the way we provide logistics support to our MAGTFs.

INSTALLATIONS AND MILITARY CONSTRUCTION

Marine Corps bases and stations represent an irreplaceable national asset today and as far into the future as we can project. They are fundamental to combat readiness, particularly the pre-deployment training, launching, sustaining, and reconstituting of Marine operating forces. In 2025, Marine Corps installations will provide an even higher quality training environment directly supporting the Total Force in Readiness through acquisition and maintenance of essential training facilities. Additionally, those bases and stations are and will continue to be integral to the quality of life of Marines, Sailors, and their families through provision of a range of support facilities and related infrastructure.

The operation and maintenance of these installations, as well as their future development and use, require planning, wise investment, and sound execution. Numerous Corps-wide efforts are underway to ensure Marine Corps installations are ready, responsive, and capable of meeting current and future support requirements.

The Marine Corps has more than \$58 billion and 133 million square feet worth of facilities that are used to train, house, and provide excellent quality of life for Marines and their families. Examples of these facilities are barracks, runways, sewage treatment plants, roads, and electrical lines. These facilities are used to perform mission-essential tasks and must be appropriately maintained. Adequately sustaining facilities is the highest facilities management priority.

The Marine Corps has a multi-faceted Military Construction program that is addressing: baseline infrastructure improvements, operational and quality of life projects at existing installations, and the Defense Posture Review Initiative to move Marines to Guam. The FY 2013 proposal of \$741 million is critical to maintaining and improving installations and providing adequate facilities both in the continental United States and overseas.

INFRASTRUCTURE SUSTAINMENT

Facilities sustainment supports the Marine Corps mission by ensuring facilities are maintained and repaired so that they can effectively be used for their designated purposes. As resources overall and Military Construction funds in particular, become more constrained, the Marine Corps will continue to rely on the sound stewardship of existing facilities and infrastructure to support mission requirements. In FY 2013, the Marine Corps has programmed facilities sustainment funding at 90 percent of the Department of Defense (DoD) Facilities Sustainment Model, resulting in a facilities sustainment budget of \$653 million. Even this relatively strong commitment could result in some facility degradation according to the DoD model. Since FY 2004, the Marine Corps has been able to execute more than 90 percent of the Office of the Secretary of Defense Sustainment Model each year, and it is possible that such opportunities to exceed our initial programming objectives for facilities sustainment will again arise in FY 2013.

INSTALLATIONS ENERGY



The Marine Corps recognizes the operational imperative to address an energy strategy at all levels of leadership and in all theaters of operation, from our “Bases to the Battlefields.” Critical to this is a shared

“ethos” within our force that efficient use of vital resources increases combat effectiveness. We must educate and inform everyone who lives, trains, and works on our installations — energy users — about their daily impact on the energy footprint and then provide them with tools to manage and improve their energy and water use. Awareness starts with an understanding of the value of energy, at home and deployed, and ends with accountability. In the end, we increase installation energy security while reducing the cost of purchased utilities.

The USMC Expeditionary Energy Strategy provides additional guidance and specific actions to implement the strategy. There are five key enabling concepts to implementation: awareness and accountability; measuring and improving performance; energy efficiency as a component of planning; proactive employment of new technologies; and energy security and environmental stewardship. These actions will enable the Marine Corps to implement the Deputies Management Advisory Group strategies to: invest in energy efficiency; develop an energy ethos; and reduce conventional energy dependence.

FACILITIES ENERGY INVESTMENTS

Our investments support enabling concepts by putting metering and meter data management systems in place to make energy usage information available to Marine units on our bases as well as to our facilities managers. We are also making significant investments in basic facilities infrastructure to improve the efficiency of our existing buildings and the energy consuming systems in them. New construction is efficient and cost effective to meet requirements for energy efficiency and sustainability. Installation Commanders will make operational improvements as appropriate using improved information on energy use. These efforts will provide a comprehensive approach for achieving energy efficiency standards and goals.

We are partnering with private companies to provide secure, cost effective, renewable power taking ad-

vantage of incentives available to our private partners, which allows us to meet renewable energy mandates. Where practical, these efforts will improve energy security for our installations and the country by reducing reliance on foreign energy sources.

GARRISON MOBILE EQUIPMENT (GME)

GME provides commercially available equipment supporting installation transportation requirements such as transportation, firefighting, rescue, construction, and material handling. The fleet includes over 14,000 vehicles.

The Marine Corps has an aggressive program for petroleum fuel reduction and conservation in the GME fleet. The Service repeatedly exceeds the requirements of the Energy Policy Act of 1992 Alternative Fuel Vehicle acquisition requirements and has been a leader in the Department of Defense and other Federal agencies in the adoption of efficient vehicle technologies and the use of alternative fuels, including electricity, E85, compressed natural gas, hybrids, biodiesel, and hydrogen.

RANGE MODERNIZATION/ TRANSFORMATION (RM/T)

DESCRIPTION

The RM/T program modernizes major Marine Corps live training ranges with a dynamic training system capable of real-time and post-mission battle tracking, data collection, and the delivery of value-added after-action reviews. Interface with installation command and control training centers — including the Battle Staff Training Facility, Combined Arms Staff Trainer, and Battle Staff Simulation Center — will facilitate the production of multiple scenario events that deliver relevant and realistic training. Integrating live and simulated training technologies, the fielded capabilities actively enhance live-fire, force-on-target, and force-on-force training through extensive after-action

reviews with ground-truth feedback, realistic representation of opposing forces, and enhanced range and exercise control capabilities.

OPERATIONAL IMPACT

RM/T aligns Marine Corps live training with the tenets of Training Transformation–Joint National Training Capability and Joint Assessment and Evaluation Capability. Instrumentation allows service and joint virtual and constructive forces to interact with Marine Corps live training forces from distributed locations. Eventually expanded to incorporate coalition forces, Marine Air Ground Task Force (MAGTF) live training in open and urban terrain is enhanced by providing capabilities to conduct realistic training. This will exercise all battlefield operating systems, and allow continuous assessment of performance, interoperability and identification of emerging requirements.

PROGRAM STATUS

Sponsored by the Range and Training Area Management Division, Training and Education Command, and managed by Program Manager Training Systems, Marine Corps Systems Command, RM/T is the final integrated design of live training programs of record that upgrade Marine Corps training capabilities in an incremental manner. Development and production efforts are under way for urban training environments, ground position location systems, instrumented tactical engagement simulation systems, opposing force threat systems (including targets), and data collection systems to instrument the live training environment at multiple Marine Corps bases and stations.

A parallel effort is enhancing the RM/T Data Collection System (Marine Corps-Instrumented Training System) to provide interface of Improvised Explosive Device and Joint Counter Radio controlled Improvised Explosive Device Electronic Warfare System surrogate devices with live training audiences and to extend the R/MT Data Collection System functions from exercise design through playback and after-action review.

HOUSING

BACHELOR ENLISTED QUARTERS (BEQ)

Bachelor housing is one of the Commandant's top Military Construction priorities. The Commandant's BEQ Initiative, initiated in 2006, provided more than \$2.7 billion in construction funds to correct barracks space shortfalls, implement renovations, and provide collateral equipment. These initiatives will eliminate existing BEQ space deficiencies and inadequate barracks and achieve the Marine Corps desired "2+0" assignment standard by FY 2014.

The new BEQs will be highly modern living facilities for Marines and Sailors and will include rooms with improved aesthetics and bathroom configurations, enhanced recreation and laundry areas and will be designed to optimize climate control and energy efficiency.

FAMILY HOUSING

By September 2007, the Marine Corps had privatized all family housing units where it was economically advantageous and authorized (for example, military housing legislative authorities prohibit housing privatization at overseas locations). Privatization of housing was done to provide better quality homes, community support facilities, and maintenance services that were not possible through the Military Construction, and Operations and Maintenance processes of the past. In early 2011, there are more than 22,000 units of housing privatized and less than 1,000 Marine Corps-owned and -managed units remaining.

The Marine Corps has leveraged private financing to government investment at a ratio of approximately 4 to 1. This has enabled the Marine Corps to quickly and significantly upgrade family housing infrastructure and improve housing management. As a defining metric, the family housing occupant satisfaction levels continue to be much higher than when the housing units were owned by the Service. Housing referral, the process of assisting military families to find housing, is still retained by the government.

Constructing deficit housing will continue through 2014, principally at Camp Pendleton, CA; Camp Lejeune, NC; and Marine Corps Air Ground Combat Center, Twentynine Palms, CA. New units constructed at these facilities will be modern and energy efficient, and will continue to improve the quality of life of Marines, Sailors, and their families.

ENVIRONMENTAL, NATURAL, AND CULTURAL RESOURCES STEWARDSHIP

The Marine Corps serves as custodian and steward of approximately 2.3 million acres of some of the most environmentally sensitive and diverse areas of the country and the world, including large portions of the Mojave and Sonoran Deserts, some of the last remaining sub-tropical rain forest in Asia, and numerous fresh and saltwater waters and wetlands. These lands provide areas where our Marines live and train as well as habitat for an abundance of wildlife species, including 59 federally listed threatened and endangered plant and animal species. These same lands contain a diversity of cultural resources, including archaeological sites; historic buildings, structures, and objects; cultural landscapes and resources of traditional, religious, or cultural significance to Native American tribes or Native Hawaiian organizations. These resources reflect thousands of years of human activity, including

important developments in our Nation's history and the role of the military in that history, and embody our shared historical experiences. Many of our installations are also located in areas with regional air and water quality issues that require the Marine Corps to meet stringent requirements to ensure environmental protection and improvement and mission success.

Effective environmental management of these resources ensures mission readiness by allowing the Marine Corps to sustain and enhance these lands, while protecting the health of our citizens, Marines, and the valuable resources entrusted to us by our Nation. Land is a finite, valuable commodity. Unless properly managed, Marine Corps lands can become damaged to the point where realistic training can no longer take place. Marine Corps use of land must be sustainable so the Marine Corps may use its lands frequently and repeatedly. In addition, the American people have placed intrinsic values on stewardship of natural and cultural resources. These values have been translated into laws requiring the Marine Corps to protect and preserve human health and the environment. In most instances, Federal and state laws and regulations apply to the Marine Corps in the same way they do to our civilian counterparts. Failure to comply with these laws can lead to fines, penalties, and judicial, legislative, and executive decisions denying the Marine Corps access to land for training.

PILLAR 5: EQUIPMENT MODERNIZATION



SECTION 1: EQUIPPING THE MARINE



FOLLOW-ON TO SHOULDER LAUNCHED MULTI-PURPOSE ASSAULT WEAPON (FOTS)



DESCRIPTION

The Shoulder Launched Multi-Purpose Assault Weapon (SMAW) II is the materiel solution to the FOTS capability requirement defined in a Capability Development Document. The SMAW II system will consist of a new launcher to replace the existing SMAW Mk153 Mod 0 launcher, and the multi-purpose, fire-from-enclosure (FFE), encased round. The SMAW II launcher will be functionally and physically compatible with existing SMAW legacy rounds.

OPERATIONAL IMPACT

The SMAW II provides the Marine Corps Assault Team the ability to engage targets from inside an enclosure or in a confined space (e.g. alleyway), which significantly improves the team's tactical flexibility and survivability. The system provides a lighter, more maintainable, and more reliable launcher, which incorporates state-of-the-art technology not resident in legacy system.

PROGRAM STATUS

The Launcher will reach Initial Operational Capability (IOC) in FY 2013 and Full Operational Capabil-

ity (FOC) in FY 2016. The Rocket (FFE Round) will reach IOC in FY2014 and FOC in FY 2017.

Procurement Profile:	FY 13	FY 14
Quantity:		
Launchers	0	0
FFE Rounds	0	0

Developer/Manufacturer:

FFE Round: Nammo Talley, Incorporated, Mesa, AZ

Launcher: Raytheon Missiles Systems, Tucson, AZ

MARINE ENHANCEMENT PROGRAM (MEP)



DESCRIPTION

The Marine Corps stood up the MEP in 1989 in response to congressional guidance for the Corps to establish programs dedicated to improving the "lethality, comfort and survivability" of the individual Marine. The primary focus of the program is on low-cost, low-visibility materiel solutions that can be rapidly fielded and that typically do not compete well against larger, high-profile items in the Department of the Navy's budget.

The MEP thus ensures improvements for the individual Infantryman are identified and quickly transitioned into practical solutions. This goal is achieved through an accelerated acquisition process that takes advantage of commercially available technologies to provide lighter, more improved "infantry items" to the

Marines as quickly as possible. Depending upon when the item is needed, its complexity, risk and cost, it can take from 90 days to two years to test, modify as appropriate, procure and field the item to the Marine.

OPERATIONAL IMPACT

Items procured and fielded under the MEP seek to reduce the load, increase the survivability, enhance the safety and improve the lethality of the individual Marine Infantryman across the spectrum of operational environments. MEP systems are intended primarily for the Marine Infantryman within the Ground Combat Element (GCE). When applicable, MEP items have also transitioned to support other Military Occupational Specialties within the GCE (e.g., Combat Engineers and Artilleryman) and across the Marine Air Ground Task Force (e.g., Supply, Maintenance, Administration and Ordnance). In recent years, the MEP has funded several critical programs, including: Field Tarp, Flame-Resistant Organizational Gear, Modular Tactical Vest, Multi-Purpose Bayonet, Rifle Combat Optic, Individual Water Purification Block I (Miox Pen), Tactical Handbook, Unit Leaders, Small, Grip Pod for the M16 and M203, Handheld Flashlight, Three Season Sleep System, Pocket Laser Range Finder, Marine Corps Pack, Hearing Armour (hearing protection), Solar Portable Power System, the Vehicle Mounted Battery Charger, Patrol Planning Tool and the Improved Helmet Suspension/Retention System.

PROGRAM STATUS

The MEP Working Group includes core representatives from Plans, Policies and Operations, Marine Corps Combat Development and Integration, and Marine Corps Systems Command. Nominations for the MEP initiatives come from Marines via the website, email and the Advocate, or through review of the U.S. Army's Soldiers Enhancement Program for capabilities matching a Marine Corps need. Nominated capabilities must focus on Commercial-Off-The-Shelf or Non-Develop-

mental Items that can be executed quickly. The potential MEP initiatives for 2013 include: Small Arms Collimator, Modular/Scalable Protection System and Enhanced Hearing Protection.

FAMILY OF IMPROVED LOAD BEARING EQUIPMENT (FILBE)



DESCRIPTION

The FILBE comprises load-carrying systems and components. It is designed to provide a stable platform for carrying equipment and supplies needed across the spectrum of individual and unit operations. The FILBE includes the load carriage system for the USMC (USMC Pack system), the holster for the service pistols (USMC Holster), the Corpsman Assault System (CAS), Individual Water Purification System (IWPS), sub-belt, body armor pouch suite, and the USMC Chest Rig.

The USMC Pack system incorporates an external composite frame and is designed to better integrate with body armor systems. The USMC Pack system will be fielded as a system consisting of a main pack, an assault pack, a hydration carrier, and five sustainment pouches of differing sizes.

The USMC Holster is an integrated system using a modular composite holster that is replacing the fielded M-12 holster. The USMC Holster will provide three mounting platforms: the belt platform for garrison duty; the drop-leg platform to support combat dismounted use; and the Pocket Attachment Ladders System (PALS) platform to support a chest-mounted position for tactical operations.

The CAS is a modular four-bag system that will provide rapid access to medical equipment and consumables. It supports first-responder capabilities tailored to the duration and casualty expectations of a full range of combat and non-combat operations. The CAS will integrate with the different USMC body armor systems and will be compatible with the USMC Pack system.

The IWPS is a critical element of the Marine's individual load. It is intended to provide the warfighter with the capability to produce microbiologically safe water from any freshwater source while operating in austere environments. It will reduce waterborne pathogens (viruses, bacteria, and protozoan cysts), sediment, and bad taste and odor. IWPS includes an oxidant and ultra-filter device (pump or in-line filter).

The Sub-Belt provides for attachment of the USMC Holster and pouches via PALS to optimize load distribution and an alternative placement of pouches to the chest rig and body armor systems.

The ILBE pouches are a series of robust, specialized pouches capable of carrying the basic ammunition load required to support and sustain the individual Marine during combat operations. The pouch suite will be a collection of individual pouches geared toward the Marine's load carriage requirements.

The USMC Chest Rig provides the individual Marine the means to carry the fighting load in a modular system. It allows for rapid reconfiguration of the fighting load between fielded Personal Protection Equipment (PPE) or employed in a stand-alone configuration.

OPERATIONAL IMPACT

The FILBE program provides Marines improved scalability, modularity, and integration with other fielded body armor and individual equipment. It allows Marines to efficiently carry mission loads across the full-spectrum of combat and non-combat operations. The USMC Holster allows Marines better weapons carriage and the ability to rapidly engage

targets from the holster implementing current combat marksmanship techniques. The CAS will enhance first responder capabilities by providing the Corpsman a smaller, lighter, and efficient pack system responsive to the different mission requirements.

PROGRAM STATUS

The USMC Pack system reached Initial Operational Capability (IOC) in FY 2012 and will reach Full Operational Capability (FOC) in FY 2013. The USMC Holster IOC and FOC were reached in FY 2012.

Procurement Profile:	FY 13	FY 14
Quantity:		
USMC Pack	36,071	0
CAS	10,000	0
IWPS	130,100	14,456
SUB-BELT	269,662	0
POUCH SUITE	TBD	TBD

Developer/Manufacturer:

USMC Pack/Sub-belt: Eagle Industries, Fenton, MO

Propper International, Mayaguez, Puerto Rico

CAS: TBD

IWPS: TBD

Pouch Suite: TBD

FAMILY OF INDIVIDUAL WARFIGHTER EQUIPMENT (IWE) DESCRIPTION

The IWE consists of multiple programs that provide increased warfighter capability, protection, and sustainment in combat environments. There are more than 100 IWE projects within the Family of IWE. Many of these programs were the result of Universal Needs Statement (UNS) requirements or requests from Marine Corps operating forces. The Family of IWE programs include:

Multipurpose Compact Attachable Light (MCAL);



Night Vision Goggle Compatible Light; Enhanced Bed Net System; Handheld Flashlight; High Intensity Miniature Illumination System; Multi-Purpose Bayonet; Mechanical Breachers Kit; Martial Arts Kit; Chaplain's Kit; Field Tarp; ILBE Waterproof Bags; Marine Corps Wire Cutter; Marine Corps Strap Cutter; Entrenching Tools; Collapsible Waterbag; and Engineer Tools

OPERATIONAL IMPACT

The IWE provides Marines individually issued items that enhance their combat capabilities, have reduced weight, increase energy efficiency and provide a unique capability to the operating forces.

PROGRAM STATUS

IWE programs are in various phases of the acquisitions process ranging from the Engineering and Manufacturing Development phase to Operations and Support phase.

Procurement Profile:	FY 13	FY 14
Quantity:		
MCAL	9,204	14,336

Developer/Manufacturer:
Streamlight Eagleville, PA



SECTION 2: GROUND COMBAT TACTICAL VEHICLES



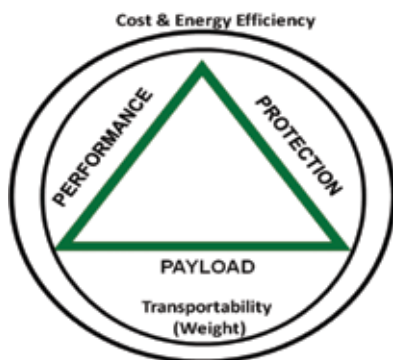
MOBILITY FOR THE 21ST CENTURY

As the middleweight force, we are light enough to the point of friction quickly, heavy enough to carry the day upon arrival, and capable of operating independent of local infrastructure. Initiated in 2008, the Marine Corps founded the Ground Combat and Tactical Vehicle Strategy. It provides a basis for planning, programming, and budgeting the ground maneuver and mobility capabilities and needs for the Marine Corps as America's Expeditionary Force in Readiness – a balanced, air-ground logistics team. We are forward-deployed and forward-engaged: shaping, training, deterring, and responding to all manner of crises and contingencies. This Strategy guides planning for the right mix of vehicles capable of supporting the spectrum of operations.

GROUND COMBAT AND TACTICAL VEHICLE STRATEGY (GCTVS)

DESCRIPTION

The objective of the Ground Combat Vehicle Strategy is to field a ground combat vehicle portfolio, structured to support three balanced Marine Expeditionary Forces (MEFs). One MEF will be capable of a two-Marine Expeditionary Brigade (MEB) sea-based, assured-access operation with one MEB in Assault Follow On Reserve; all MEFs will be capable of conducting irregular warfare and sustained operations ashore across the range of military operations. Vehicles within the GCTV portfolio will have the balance of performance, protection, payload, transportability, and fuel efficiency to support rapid concentration and dispersion of Marine Air-Ground Task Force (MAGTF) combat power, support strategic deployment concepts, and meet and sustain worldwide Marine Corps commitments.



Four pre-planned Marine Requirements Oversight Council decision points control execution of the strategy to meet the GCTV objective. Future decision points will guide planning to inform Program Objective Memoranda (POMs) 2013, 2014, and 2016 decisions regarding ground mobility investments. The information supporting each decision point will provide cost, effectiveness, and risk information on alternative courses of action relevant to the issues challenging successful fielding of the future fleet.

OPERATIONAL IMPACT

The Marine Corps requires the ability to maneuver and sustain combat power across the range of military operations and in various environments, from the Arctic to the desert. The combat and tactical vehicles required to achieve this must provide appropriate force-level maneuver capabilities, including compatibility with rotary-wing and surface assets, sustainability, and complementary to enhance tactical flexibility and minimize risk.

The GCTV strategy manages the future inventory in heavy, medium, and light vehicle categories that are further divided into combat and tactical vehicle types. Combat vehicles facilitate maneuver of combat teams while tactical vehicles facilitate the distribution of sustainment material and services by logistics teams. The three combat vehicle and three tactical vehicle categories are correlated to the range of military operations and operating environments to meet performance, protection, payload, and transportability characteristics. The entire portfolio of vehicles will have these characteristics to achieve the following objectives:

- Support rapid transition between concentration and dispersion of MAGTF combat power by fielding vehicles with modular and adaptable armor in multiple capability categories
- Support strategic deployment concepts by closely managing transport weights and prepositioning objectives
- Provide capacity to meet and sustain simultaneous Marine Corps commitments worldwide by maintaining operational availability and optimizing mix and distribution across the enterprise

Combat Vehicles

The Expeditionary Armored Forces Initial Capability Document (EAF ICD) is a USMC capability-based assessment (CBA) focused on the mounted components of the Ground Combat Element that informed the development of the combat vehicle categories to support the range of military operations. The EAF ICD and the

GCTV Strategy define a triad of heavy, medium, and light combat vehicles to create a balanced force capable of achieving desired ends in the irregular spectrum of conflict while retaining core competencies against traditional threats.

Tactical Vehicles

The Ground Combat Forces Light Tactical Mobility Initial Capability Document (GCFLTM ICD) is one of several service and joint CBAs and requirements documents that informed development of tactical vehicle categories to support military operations. To minimize the risk associated with unprotected legacy tactical vehicles operating in asymmetric environments, the GCFLTM ICD and the GCTV Strategy define a future fleet of tactical vehicles designed with adaptable armor and improved protection accomplished through the procurement of current armoring solutions.

PROGRAM STATUS

The GCTV Strategy is currently in its third phase of implementation. Decision Point 1 already has informed POM 2010 investments, and Decision Point 2 did the same for POM 2012 investments. A key output of Decision Point 2 analysis is a planned 10,000 vehicle approved acquisition objective (AAO) reduction by the fourth quarter of calendar year 2013. Fiscal implementation of that reduction will inform POM 2013. The POM 2012 endgame will set the course for key Requests For Information to be addressed during Decision Points 3a and 3b, which will inform POM 2013 and POM 2014 investments, respectively.

The Marine Corps will continue to take a holistic approach to its GCTV Strategy. Actions occurring during FY 2012 included:

- Invested in Assault Amphibious Vehicle upgrades in order to improve seamless ship to shore transition
- Initiated the Amphibious Combat Vehicle program based on a revised set of requirements, key performance parameters, and key system attributes

- Assessed the weight, payload, protection, and cost of the Marine Corps light vehicle fleet and determine the appropriate future mix of Joint Light Tactical Vehicles, High Mobility Multi-purpose Wheeled Vehicles (HMMWV) and inform HMMWV recapitalization and reconstitution efforts
- Examined HMMWV survivability upgrade program to leverage on-hand vehicles

ASSAULT AMPHIBIOUS VEHICLE (AAV7A1) FAMILY OF VEHICLES UPGRADE



DESCRIPTION

Initially fielded in 1972, the Assault Amphibious Vehicle (AAV) remains the primary general-support armor personnel carrier (APC) for Marine infantry. The AAV family of vehicles consists of the AAVP7A1 Reliability, Availability, Maintainability/Rebuild to Standard (RAM/RS) APC and two supporting mission-role variants: AAVC7A1 RAM/RS Command and AAVR7A1 RAM/RS Recovery. The AAV7A1 RAM/RS family of vehicles provides ship-to-shore-to-objective mobility as well as direct fire-support with organic weapons.

Programmed to be replaced by a new amphibious combat vehicle, the AAV7A1 RAM/RS family of vehicles will continue to serve the Marine Corps until at least 2030. The AAV7A1 RAM/RS family of vehicles

previously underwent a series of capability enhancements to improve mobility and reliability and to extend the platforms' service lives.

The AAV Upgrade Program will further improve survivability and land and water mobility of the AAV, serving as a capability bridge to fielding and replacement by a new amphibious combat vehicle. This initiative will improve force protection and platform survivability by integrating technically mature upgrades into the existing hull. These upgrades are slated for approximately 392 AAVP7A1 RAM/RS with potential select upgrades applied to the Command and Recovery variants.

OPERATIONAL IMPACT

The upgraded AAV will provide significant survivability improvements through increased protection against current and future threats. Through improvements in physical armor systems and supporting subsystems within the hull of the AAV, the upgraded vehicles will increase protection to embarked Marines and crew.

PROGRAM STATUS

The AAV Upgrade Program will enter the acquisition life cycle at Milestone B during FY 2013 and begin the engineering, manufacturing and development phase. Developmental Testing is planned for late FY 2014 followed by Live Fire Testing in FY 2015. Milestone C, authorizing entrance into the Production and Deployment Phase, is scheduled for late FY 2015 and IOC in late FY 2017.

JOINT LIGHT TACTICAL VEHICLE (JLTV) FAMILY OF VEHICLES (FOV)

DESCRIPTION

The JLTV FOV is a joint Army/Marine Corps program to procure the next generation of light tactical vehicles and companion trailers. JLTV objectives are to improve the mobility and payload of the light tactical vehicle fleet, while providing increased survivability through modular protection within the weight constraints of the expeditionary force. The JLTV program will also strive to minimize operations and maintenance costs by maximizing vehicle commonality, increased reliability, and better fuel efficiency, while garnering additional procurement savings through effective competition throughout program execution. JLTVs can be configured to support multiple mission packages, derived from two base vehicle configurations, the 4-door Combat Tactical Vehicle and 2-door Combat Support Vehicle. The commonality of components, maintenance procedures, and training among all configurations will minimize total ownership costs.

OPERATIONAL IMPACT

The JLTV FOV will be capable of operating across a broad spectrum of terrain and weather conditions. The approved JLTV Capabilities Development Document (CDD) identifies the capabilities of the next generation of light tactical vehicles required to support joint forces across the full range of military operations and to provide a vital force enabler, multiplier, and extender.

The joint service program is intended to replace a portion of the Army and Marine Corps High Mobility Multipurpose Wheeled Vehicle (HMMWV) fleet with JLTVs as part of the ground equipment modernization effort. The JLTV's performance characteristics will exceed those of the armored HMMWV Expanded Capability Vehicle (ECV), and will ensure the additional protection and mobility required by the Marine Air Ground Task Force and joint forces. The JLTV FOV will provide the warfighter with increased protection

through the use of scalable armor solutions, while returning light tactical vehicle payloads lost due to the armoring of the HMMWV fleet. The JLTV FOV will also increase warfighter maneuver capacity by providing expeditionary mobility on the modern battlefield. The vehicles will be transportable by CH53 rotary wing aircraft and amphibious/Maritime Prepositioning Squadron ships.

PROGRAM STATUS

The JLTV CDD was approved by the Joint Requirements Oversight Council in January 2012. The JLTV program is in the Engineering and Manufacturing Development (EMD) phase following a successful Milestone B decision in August 2012. During September 2012 EMD phase contracts were competitively awarded to AM General, Lockheed Martin, and Oshkosh Defense for the design and build of 22 prototypes per vendor. Delivery of the vehicles will be followed by 14 months of government testing. Marine Corps Initial Operating Capability for the JLTV FOV is scheduled for September 2017 with Full Operational Capability occurring in September 2021.

Developer/Manufacturer: AM General, Lockheed Martin, and Oshkosh Defense

AMPHIBIOUS COMBAT VEHICLE (ACV)

DESCRIPTION

The ACV is a new-start, pre-Major Defense Acquisition Program that will provide an advanced generation, armored, amphibious combat vehicle. The ACV will be the primary means of tactical mobility for the Marine rifle squad — both at sea and ashore. The ACV will autonomously deliver the assault echelon from amphibious shipping at launch distances at or beyond the visual horizon, with speed to enable the rapid buildup ashore, and provide combat-ready Marines at



the objective. The ACV will possess ground mobility and speed similar to the M1A1 during sustained operations ashore and will possess the capability to provide organic, direct fire support to dismounted infantry in the attack. The ACV will protect the force during offensive and defensive operations, providing 360-degree protection against direct fire, indirect fire, mines, and improvised explosive device threats.

The ACV will replace the legacy Amphibious Assault Vehicle that was fielded in 1972 and will be more than 40 years old when ACV is fielded. The ACV will be configured in two mission role variants: Personnel and Command and Control.

OPERATIONAL IMPACT

The ACV's over-the-horizon launch capability enables the Navy and Marine Corps team to project power from the sea base — and conduct joint forcible entry if required — while providing force protection for the amphibious task force. The ACV will support ship-to-objective maneuver mobility and amphibious maneuver by providing the capability to launch from amphibious ships at operational distances, seamlessly transition between sea and land domains, establish footholds where conditions preclude other types of entry, and enable rapid build-up of combat power before an enemy can react. The ACV will enhance the Ground Combat Element's tactical and opera-

tional mobility with a balanced level of performance, protection and payload. This balance makes the ACV operationally relevant across the full range of military operations. The vehicle will be well protected against the entire range of known and emerging threats while maintaining robust performance requirements in support of the Marine Corps mission profile.

PROGRAM STATUS

The ACV is in the Material Solution Analysis Phase of the Joint Capabilities Integration and Development System process. An analysis of alternatives (AoA) has been completed. The scope of the AoA included development of life cycle cost estimates for each alternative considering major cost drivers, acquisition and sustainment strategies, and fully burdened cost of energy. The AoA has now paved the way for requirements refinement in an effort to transition the program to the next phase of acquisition development.

MARINE PERSONNEL CARRIER (MPC)

DESCRIPTION

The MPC will be effective across the range of military operations during sustained operations ashore and reinforce the assault echelon during forcible-entry operations. Both MPC and the new amphibious combat vehicle will replace the legacy Amphibious Assault Vehicles in the Assault Amphibian (AA) Battalions of Marine divisions. An MPC Company is designed to lift an infantry battalion in conjunction with the infantry's organic wheeled assets. MPC will field a base vehicle (MPC-P) and two supporting mission role variants (MPC-C (command) and MPC-R (recovery)). Two MPC-Ps can transport a reinforced rifle squad. The MPC-C supports mobile battalion command echelon/fire-support coordination center functions and the MPC-R fulfills mobile recovery and maintenance requirements.

OPERATIONAL IMPACT

The MPC supports expeditionary maneuver warfare and the requirements of the Ground Combat Element maneuver task force by providing a platform that possesses a balance of performance, protection, and payload attributes. The vehicle will be well protected against the full range of known and emerging threats while maintaining robust performance requirements in support of the Marine Corps mission profile (30 percent on road / 70 percent off road). The MPC is effective on land while maneuvering with other wheeled and tracked combat and tactical vehicles, possesses sufficient lethality to protect the vehicle and support dismounted infantry in the attack, and retains sufficient payload to carry the infantry's combat loads, mission-essential equipment, and days of supply. The MPC will meet the many and varied demands of MAGTF operations.

Additionally, the MPC will possess a viable tactical water mobility capability. Although not intended to achieve operational water mobility performance levels (e.g., the over-the-horizon maneuver capability), the MPC will use the sea in the littoral operating area as maneuver space, breach inland water obstacles and thereby increase the MAGTF commander's maneuver, options and the complexity of the threat faced by our enemies.

PROGRAM STATUS

In June of 2008, the Marine Requirements Oversight Council validated the MPC requirement and approved the solution as an advanced-generation eight-wheeled armored personnel carrier to be integrated into the AA Battalions. The initiative envisions a Materiel Development Decision in FY 2013 or FY 2014, after which the program would enter the acquisition life cycle at Milestone B. The MPC program, once launched, will rely on full and open competition throughout the developmental cycle.

HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV) EXPANDED CAPACITY VEHICLE (HMMWV-ECV)

DESCRIPTION

The ECV is the fourth-generation design of the HMMWV and has replaced the aging fleet of baseline A1 variants and some A2 variants. The HMMWV was originally fielded with Marine Corps units in the mid-1980s. Upgrades to the HMMWV ECV include a more powerful and environmentally compliant 6.5L turbo engine, microprocessor controlled engine electronic start system, increased payload (500 pounds), improved corrosion prevention, and access panels to facilitate maintenance.

OPERATIONAL IMPACT

To successfully accomplish their missions, Marine Air-Ground Task Forces (MAGTFs) require a light tactical vehicle for command and control, troop transport, light cargo and shelter transport, a towed weapons prime mover, and weapons platform throughout all areas of the battlefield or mission area. In addition, 71 Marine Corps component programs use the HMMWV as their prime mover. For units that require specific vehicle configurations, vehicle kits, capable of being installed at the intermediate level of maintenance or below are provided.

PROGRAM STATUS

Since February 2010, the Marine Corps has procured a limited number of specialty variant ECVs, as the approved acquisition objective for the fleet is being reduced. However, with plans to keep the HMMWV fleet in the Marine Corps inventory until the year 2030, efforts have begun on the HMMWV Sustainment Modification Initiative (SMI) to explore concepts to restore payload, reliability and automotive performance lost due to the increased weight of armoring. An upgraded power train, brakes, suspension, axles, and wheels are among those components and subsystems targeted for

improvement. Four test concepts ranging in capability and cost are scheduled to be designed and built during 2013 for evaluation. Upon conclusion of testing, the Marine Corps will select one SMI concept based upon performance and affordability to go forward with a full and open competition for production. The Marine Corps anticipates fielding the improved HMMWV SMI concept to the Operating Forces beginning in 2016.

Original Developer/Manufacturer:

AM General, South Bend, IN,

HMMWV SMI Vendor: TBD

MEDIUM TACTICAL VEHICLE REPLACEMENT (MTVR)



DESCRIPTION

The MTVR program replaced the medium truck fleet (M809/M939) series 5-ton trucks with state-of-the-art commercial automotive technology. The MTVR has an increased payload of 7.1 tons off-road and 15 tons on-road, a high-performance suspension, traction control, central tire inflation system, automatic transmission, and corrosion technology upgrades.

MTVR family of vehicles includes a cargo variant (both standard and extended wheel base configura-



tions), dump truck, a wrecker, and a tractor. The dump and wrecker variants maintain maximum commonality with the basic MTVR cargo chassis while performing their unique missions. The tractor variant serves as the prime mover for the Mk 970 refueling trailer and the M777 155mm howitzer. The Navy also uses MTVR vehicles for Naval Construction Battalion (Seabee) operations. The High Mobility Artillery Rocket System (HIMARS) Re-supply vehicle (and associated trailer) is an MTVR variant that was procured as part of the USMC HIMARS program.

The MTVR Armor System (MAS) provides complete 360-degree protection as well as overhead and underbody protection for the crew compartment using Mil-A-46100 High Hard Steel and Metal Composite standards. It is designed for the 22-year service life of the vehicle. The MAS can withstand small-arms fire, improvised explosive devices, and mines. It includes upgraded suspension, air conditioning system, removable armored troop carrier (with ballistic glass), machine gun mounts, and the Marine Corps transparent armor gun shield. The reducible-height configuration of MAS allows for removal of cab roof to accommodate maritime prepositioned shipping space requirements.

OPERATIONAL IMPACT

More than 1,000 MTVRs have seen service in support of *Operation Iraqi Freedom*, *Operation Enduring Freedom*, and humanitarian-assistance and disaster-relief missions. With its 70 percent off-road mission profile and highly survivable armor package, the MTVR has been heavily used in contingency operations as well as missions in support of humanitarian operations.

PROGRAM STATUS

The MAS is installed on all MTVR variants deployed to hostile environments. The MTVR Program Office has continued to improve the MAS in response to Urgent Universal Needs Statements. These improvements include the addition of increased underbody blast protection, fuel tank fire-protection kits, and 300-amp alternator kits (e.g., for powering counter-IED technologies), as well as developing the reducible-height MAS configuration. In addition, live-fire testing has resulted in additional MAS upgrades for non-reducible armored MTVRs and for the armored troop carrier. The program office is developing additional safety and crew protection upgrades, such as an automatic fire suppression systems and emergency egress windshields, in response to additional urgent need statements. The program office is also working with the Office of Naval Research under the Future Naval Capability program to develop a fuel economy upgrade kit. The approved acquisition objective of the MTVR is 8,750 vehicles. A follow-on production order was placed at the end of FY 2012 to procure 207 cargo variants and an interservice exchange agreement with the Navy is being executed for 29 Dump Truck variants toward the goal of achieving the desired variant mix within the approved acquisition objective.

Procurement Profile:	FY 13	FY 14
Quantity:	32	0

Developer/Manufacturer:
Oshkosh Defense Corporation, Oshkosh, WI

LOGISTICS VEHICLE SYSTEM REPLACEMENT (LVSR)



DESCRIPTION

The LVSR replaces the current Marine Corps heavy-tactical wheeled vehicle, the Logistics Vehicle System. The LVSR cargo variant transports several cargos, including: bulk liquids; ammunition; standardized containers; bulk, break bulk, and palletized cargo; and bridging equipment. The LVSR has wrecker and tractor variants as well and is being fielded throughout the Marine Air Ground Task Force (MAGTF). The vehicle base design includes factory-installed floor armor and is also designed to accept an add-on armor kit for increased crew protection.

The vehicle is equipped with an independent suspension system for superior off-road mobility in the most severe environments. The LVSR features an on-road payload capacity of 22.5 tons and an off-road payload capacity of 16.5 tons. Its maneuverability is increased by four-axle steering capabilities. The LVSR is also equipped with advanced electronics system for in-cab diagnostics of the vehicle's critical systems. It uses a single-source lubrication system for easier maintenance and has a 600-horsepower C15 engine.

OPERATIONAL IMPACT

To successfully accomplish their mission, MAGTFs require a heavy ground logistics distribution system that is highly mobile, efficient, reliable, and flexible. This system must be capable of operating over in-

creased distances with increased payloads. The LVSR will rapidly distribute all classes of supply, while including a self-loading and unloading capability. The LVSR addresses one of the most significant Marine Corps challenges in Afghanistan, that of getting supplies, equipment, and logistics into the remote areas in which Marines routinely operate.

PROGRAM STATUS

LVSR achieved Initial Operational Capability in September 2009. The original indefinite delivery/indefinite quantity contract for the LVSR was awarded in May 2006 to Oshkosh Defense, Oshkosh, Wisconsin. The approved acquisition objective of the LVSR is 2,000 vehicles. Full-rate vehicle production began in December 2008 and includes add-on armor "B" kits, in addition to the factory-installed integral "A" kit armor. Add-on armor can be applied in the field by maintenance activities. By the end of FY 2012, the full Approved Acquisition Objective of 2000 vehicles was procured consisting of 1489 Cargo variant, 349 Tractor variants, and 162 Wrecker variants. The Program Office and Logistics Command are conducting Reset and Reconstitution planning which may result in additional vehicle procurements.

Procurement Profile:	FY 13	FY 14
Quantity:		
Cargo variant	0	0
Tractor variant	0	0
Wrecker variant	0	0

Developer/Manufacturer:
Oshkosh Defense Corporation, Oshkosh, WI

SECTION 3: AVIATION



AVIATION STRATEGY FOR THE 21ST CENTURY

Across the spectrum of military operations Marine fixed and rotary-wing aircraft shape the battlespace, often in direct support of Marines on the ground. The MAGTF air-ground combined-arms team has proven unequalled in answering the Nation's call across the spectrum of operations, from humanitarian assistance to delivering ordnance on target during crisis and conflict.

Today, the priority is to replace legacy aircraft, some of which have been flying since the Vietnam War, with far more capable aircraft. The Marine Corps challenge is to remain engaged operationally, sustaining the force while executing a transition strategy for the future. In that regard, the FY 2013 Marine Aviation Plan is a phased plan with a ten year and beyond horizon that incorporates force structure changes while balancing active-duty and reserve components of the total force. Our numerous transition task forces are critical enablers; leading the way as we transition from legacy aircraft to new platforms.

The Marine Corps transition strategy can be separated into two mutually supportive, challenging efforts: sustain the legacy fleet and transition to new aircraft. The Aviation Plan is our roadmap for navigating through these challenges, to ensure our continued capability to carry out all six functions of Marine Aviation: (1) assault support; (2) anti-aircraft warfare; (3) offensive air support; (4) electronic warfare; (5) control of aircraft and missiles; and (6) aerial reconnaissance. This "living" document outlines the Marine Corps multiyear transition plan to a dramatically changed fleet, and provides details for:

- Legacy aircraft modernization and sustainment
- Marine Aviation Command and Control System (MACCS) modernization and sustainment
- Aviation Ground Support (AGS) systems sustainment
- F-35B and F-35C Joint Strike Fighter (JSF) transition
- MV-22B Osprey transition
- H-1 upgrades program (UH-1Y and AH-1Z)
- KC-130J transition and Harvest HAWK system introduction
- CH-53K program and heavy lift requirements
- Unmanned aircraft systems (UAS) programs and upgrades
- Operational support aircraft sustainment and upgrades
- Common Aviation Command and Control System (CAC2S)
- AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR)
- Composite Tracking Network (CTN)

F-35B SHORT TAKE-OFF VERTICAL LANDING (STOVL) AND C (CARRIER VARIANT) LIGHTNING II JOINT STRIKE FIGHTER (JSF)



DESCRIPTION

The F-35 JSF is the next generation strike weapons system designed to meet an advanced threat, while improving lethality, survivability, and supportability. It will be the cornerstone of a multi-mission joint force possessing improved mission flexibility and unprecedented effectiveness to engage and destroy both air and ground threats. The F-35 is designed to participate in a wide variety of operations from routine, recurring military activities, to Major Theater War, and peace-keeping operations.

The F-35 was developed using a complete analysis of legacy aircraft shortfalls, emerging threats, and consideration of future operating locations. This approach led to an aircraft design that incorporates advanced stealth characteristics and a powerful sensor suite that provides superior awareness to the pilot and ensures increased survivability and lethality in all environments.

The F-35 has an autonomous capability to strike a broad range of moving or fixed targets, either day or night and in adverse weather conditions. These targets include air and ground threats, as well as enemy surface units at sea and anti-ship or land attack cruise missiles. The F-35 can complete the entire kill chain

without reliance on external sources by using fused information from its onboard systems and/or other F-35s. This capability allows shortened engagement times, less exposure to threats, and retains the element of surprise. Together these elements allow the pilot to control the tactical environment using proactive tactics. When operating in a less restrictive environment the F-35 provides sensor data to Marine Air-Ground Task Force (MAGTF) command and control agencies to enable intelligence collection and targeting across the force.

The F-35 brings unprecedented lethality, survivability, and maintainability never possible in legacy fighter attack aircraft. These attributes have been designed into the aircraft from the beginning of the process and ensure flexibility to counter even more sophisticated threats as they emerge.

OPERATIONAL IMPACT

The F-35 JSF brings strategic agility, operational flexibility and tactical supremacy to the MAGTF. The F-35B variant unites fifth generation stealth, precision weapons and multi-spectral sensors with expeditionary responsiveness of a Short Take-off and Vertical Landing (STOVL) fighter-attack platform. The F-35B will replace AV-8B, F/A-18A/C/D, and EA-6B aircraft. Having a single aircraft capable of performing all these missions decreases logistical requirements and increases operational effectiveness.

The F-35 is a force-multiplier for the MAGTF commander. It can operate without degradation within anti-access or highly contested airspace providing an advanced engagement capability that is not possible with legacy aircraft. The F-35 fuses information from all of its sensors and displays it to the pilot on large panoramic cockpit displays. This comprehensive and intuitive display provides complete situation awareness to the pilot, showing the location and status of both enemy and friendly forces.

The ability for the F-35 to accomplish the entire kill chain independently minimizes reliance on other

support aircraft. This reduces logistical requirements, further decreasing strains on MAGTF resources.

PROGRAM STATUS

Highlights of the F-35B program:

- May 12: VMFAT-501 begins F-35B flight operations at Eglin Air Force Base
- September 12: 948 total F-35B flights
- October 2011: L Class ship trials
- Estimated Initial Operational Capability (IOC): Late 2015
- Estimated Full Operational Capability (FOC): TBD

Procurement Profile:	FY 13	FY 14
Quantity:	6	6

Developer/Manufacturer:
Lockheed Martin, Fort Worth, TX

JOINT STRIKE FIGHTER (JSF) TRANSITION PLAN



The Marine Corps will employ the F-35B and F-35C to support the six functions of Marine Corps aviation. This remarkable breadth of employment will allow the Marine Corps to decrease its tactical aviation inventory while increasing aircraft lethality, surviv-

ability, and supportability compared to those of legacy aircraft.

The VMFAT-501 “Warlords,” the first Marine Corps JSF STOVL training squadron, stood up on April 2, 2010 as part of the JSF Integrated Training Center at Eglin AFB, FL. VMFAT-501 will be assigned to 2d Marine Aircraft Wing for operational control and administrative control, but the Warlords will maintain a command training relationship and co-location with the U.S. Air Force 33rd Fighter Wing. Students are expected to start training in 2012. The Operational Test and Evaluation (OT&E) detachment stands up at Edwards AFB during 2014 and commences Block 2.0 OT&E in 2015.

The Marine Corps will acquire 357 STOVL aircraft and 63 CV aircraft for a total of 420 JSFs. Once the F-35 enters service, the Marine Corps will begin retirement of AV-8Bs and F/A-18A-Ds. All legacy tactical strike aircraft platforms should be retired by 2031.

MARINE AIR GROUND TASK FORCE ELECTRONIC WARFARE (MAGTF EW)

DESCRIPTION

The USMC’s EA-6B Prowler will be decommissioned by the end of FY 2019. This “sundown” plan, combined with rapidly changing dynamics in the electromagnetic operating environment (EMOE), compels an evolutionary approach to the complex problem set of electromagnetic spectrum (EMS) control.

The Marine Corps will address its electronic warfare requirements through a concept known as MAGTF EW, an integrated family-of-systems approach of distributed, platform-agnostic attack and receive capabilities. Far from a compromise plan for the retirement of the EA-6B, the MAGTF EW strategy will unite air, land, and sea-based EMS-dependent technologies to ensure collaborative, efficient, and effective control of the EMS.



Future growth of MAGTF EW will allow for the progressive inclusion of technologies and capabilities from other Services and commercial vendors. At present, the following capabilities comprise the MAGTF EW portfolio in development:

- **Intrepid Tiger II (IT-2)** – A modular, commercial-off-the-shelf based Electronic Warfare pod designed to address irregular warfare targets. The V(1) variant will fly aboard tactical aircraft (TACAIR) assets, the V(2) will fly aboard unmanned aerial systems (UAS), and the V(3) will fly aboard rotary-wing airframes.
- **Software Reprogrammable Payload (SRP)** – A small-format, software-definable, multi-channel, radio-reprogrammable digital technology for radio relay, network management/monitoring, internet

routing, and dynamic bandwidth allocation. SRP contributes to MAGTF EW by providing robust EMS maneuver and adaptability in stressed EMOEs.

- **EW Service Architecture (EWSA)** – An extensible data exchange and hardware protocol intended to connect EW/SIGINT airborne nodes to ground Operators, Cyber/EW Control Cells (C/EWCCs), and other air EW nodes. EWSA will provide “on-demand EW fires” in operational conditions under C/EWCC control, and will unite Air EW, Ground EW and SIGINT via an adaptive network with multiple waveforms. Additionally, EWSA will also provide basic digital interoperability between air platforms.

OPERATIONAL IMPACT

The Marine Corps operational dependence upon the EMS is increasing in amount, type, density, and complexity. Active pursuit of the MAGTF EW strategy allows the Corps an opportunity to replace the low-density, platform-centric EA-6B Prowler capability with a scalable, organic, adaptable and cost-effective system-of-systems for EMS control. This system will be equally applicable across the range of military operations. When fully realized, MAGTF EW will constitute an improvement over current capabilities.

PROGRAM STATUS

The Marine Requirements Oversight Council approved the *MAGTF EW Information Systems Initial Capabilities Document* (IS ICD) in September 2012. MAGTF EW is a distinct program of record and is funded against the FY 2014 FYDP.

IT-2 Block 0 is currently deployed in early operational capability status on AV-8B Harriers. IT-2 Block 1 will incorporate EW Support / surveillance capabilities, and the later Block X variant will move beyond irregular warfare targets to include counter-radar capabilities.

SRP has demonstrated capability in live-flight tests aboard the KC-130J. The next spiral of SRP may incorporate TTNT waveform capability, Link-16, and advanced NSA-accredited crypto capabilities.

EWSA functionality has been demonstrated in tactical demonstrations, with more demonstrations of increasing complexity planned. EWSA is being shared with Army EW, and interested commercial vendors, to pursue new capabilities from a normalized frame of reference and to encourage its adoption by other agencies.

Procurement Profile:	FY 13	FY 14
Quantity:	0	0

Developer/Manufacturer:
Various (NAVAIR, NRL, and prospective commercial vendors)

MV-22B OSPREY



DESCRIPTION

The V-22 Osprey tilt-rotor aircraft, the only such operational military aircraft in the world, is an advanced-technology vertical/short takeoff and landing (VSTOL), multi-purpose tactical aircraft that is replacing the current fleet of Vietnam-era CH-46E & CH-53D helicopters. The V-22 is a multi-mission aircraft designed for use by the Marine Corps, Navy, and Air Force.

The USMC variant, the MV-22B, joins the Joint High-Speed Vessel (JHSV) and Landing Craft Air Cushion (LCAC) as the sea-basing connectors necessary to execute expeditionary maneuver warfare. Specific missions for the MV-22B include expeditionary assault from land or sea, medium-lift assault support, aerial delivery, tactical recovery of aircraft and personnel, air evacuation, and rapid insertion and extraction.

The MV-22B design incorporates sophisticated and mature composite materials technology, “fly-by-wire” flight controls, advanced manufacturing processes, and digital cockpits. The MV-22B’s prop-rotor system, engine, and transmissions are mounted on each wingtip and allow it to operate as a helicopter for takeoff and landing. Once airborne, the nacelles rotate forward 90 degrees, transitioning the MV-22B into a high-speed, high-altitude, and fuel-efficient turboprop aircraft.

OPERATIONAL IMPACT

The MV-22B is becoming the cornerstone of Marine Corps assault support capability, with the speed, endurance, and survivability needed to fight and win on tomorrow’s battlefield. This combat multiplier represents a quantum improvement in strategic mobility and tactical flexibility for expeditionary forces. The Osprey has a 325-nautical mile combat radius, can cruise at 262 knots, and is capable of carrying 24 combat-equipped Marines or a 12,500-pound external load. With a 2,100 nautical-mile single-aerial refueling range, the aircraft also has a strategic self-deployment capability.

PROGRAM STATUS

The Marine Corps transition from the CH-46E to the MV-22B continues at the approximate rate of 3 Ospreys delivered per month and two squadrons transitioned per year. Production of the MV-22B is based on a block production strategy, which is designed to provide continual lifecycle and capability improvements throughout the lifetime of the platform.

Block A aircraft are designed to serve as non-deployable training aircraft, and they include software enhancements, a nacelle reconfiguration, and additional reliability and maintainability improvements compared to the original aircraft design. As of January 2013, 30 Block A aircraft have been delivered and are primarily in service at Marine Corps Air Station New River.

Block B aircraft are the deployable configuration of the MV-22B Osprey. These aircraft provide improvements in effectiveness and maintainability for operators and maintainers, including improved access to the nacelle for inspection purposes and substantial reliability and maintenance improvements across the entire platform. As of January 2013, 108 Block B aircraft have been delivered to the fleet.

Block C aircraft incorporate mission enhancements and increased operational capability. Enhancements include weather radar, a forward-firing

ALE-47 dispenser, improved hover coupled features, an improved environmental conditioning system, and a troop commander situational awareness station. As of January 2013, 31 Block C aircraft have been delivered to the fleet.

Procurement Profile:	FY 13	FY 14
Quantity:		
Block C	17	18

Developer/Manufacturer:
 Bell Helicopter Textron, Fort Worth, TX
 The Boeing Company, Philadelphia, PA

**H-1 UPGRADES
 (UH-1Y VENOM/AH-1Z VIPER)**



DESCRIPTION

The H-1 program (UH-1Y/AH-1Z) replaces the current two-bladed rotor system on the UH-1N and AH-1W aircraft with new four-bladed, all-composite rotor systems coupled with a sophisticated, fully integrated, state-of-the-art cockpit in both aircraft models. The UH-1Y and AH-1Z also incorporate new performance-matched transmissions, a four-bladed tail rotor, and upgraded landing gear. Additionally, structural modifications to the AH-1Z provide the aircraft six weapons stations, two more than on the AH-1W. The advanced cockpit common to both aircraft reduces



operator workload, improves situational awareness, and provides growth potential for future weapons and joint interoperability. The cockpit integrates onboard planning, communications, digital fire control, self-contained navigation, day/night targeting and weapons systems in mirror-imaged crew stations.

OPERATIONAL IMPACT

The UH-1Y Venom (commonly referred to as “Yankee”) and the AH-1Z Viper (referred to as “Zulu”) share 85 percent of replaceable components, which significantly benefit Marine Air Ground Task Force maintainability and supportability. The H-1 program effectively mitigates the narrow power margins of the UH-1N and the high aircrew workloads of the AH-1W while enhancing tactical capability, operational effectiveness and sustainability of our attack and utility helicopter fleet.

UH-1Ns are being rapidly pushed towards retirement due to airframe and engine fatigue, which routinely force aircrew into flight regimes with narrow power margins and little room for error. Continued implementation of the “Yankee Forward” strategy — an effort to accelerate replacement of UH-1Ns with the new UH-1Ys as quickly as possible — is a top Marine Corps aviation priority. Significant operational demands, aircraft attrition, and the current shortfall of attack and utility helicopters, has forged the Marine Corps “build new” strategy for its UH-1Y and AH-1Z

fleet. The success of this effort will more rapidly reduce the current USMC Attack helicopter shortfall.

The UH-1Y conducted its first deployment with the 13th Marine Expeditionary Unit (MEU) in 2009 and has been deployed to Afghanistan since October 2009. Transition to the UH-1Y is complete at Marine Air Group (MAG)-39 and has shifted to MAG-29 on the East Coast. The first AH-1Z deployment was with the 11th MEU in November 2011. Of note, this is the first time the AH-1Z and UH-1Y have deployed alongside each other; fully exploiting the benefits of 85 percent commonality.

PROGRAM STATUS

Ninety-two production aircraft (66 UH-1Ys and 26 AH-1Zs) were delivered through the end of Oct 2012. The UH-1Y achieved Initial Operational Capability in August 2008 and the AH-1Z achieved IOC in February 2011. The H-1 Upgrades overall procurement objective is 160 UH-1Ys and 189 AH-1Zs.

Procurement Profile:	FY 13	FY 14
Quantity:	28	27

Developer/Manufacturer:

Airframe: Bell Helicopter Textron Inc., Fort Worth, TX
 Integrated Cockpit: Northrop Grumman,
 Woodland Hills, CA

AH-1Z Target Sight System: Lockheed Martin, Orlando, FL

KC-130J

DESCRIPTION

The KC-130J is a versatile four-engine tactical air-to-air refueling and assault-support aircraft which provides the only organic long-range, fixed-wing assault-support capability to the Marine Corps. The KC-130J features increased efficiency over legacy KC-130 variants. The Rolls Royce AE 2100D3 propulsion system with Dowty R391 advanced-technology six-bladed



propeller system provides thirty percent more thrust, twenty four percent faster time to climb and twenty percent better fuel efficiency.

A state-of-the-art flight station and integrated advanced defensive system enables fewer aircrew to perform the same missions. Other improvements include an advanced cargo ramp and door, capable of operating at airspeeds up to two hundred fifty knots and an improved air-to-air refueling system which enables increased fuel transfer rates without requiring the installation of the fuselage fuel tank. All active component legacy KC-130 aircraft have been replaced with KC-130Js. Once reserve component squadrons have transitioned to the KC-130J, the Marine Corps will have one type, model, and series of this versatile aircraft.

OPERATIONAL IMPACT

The KC-130J provides tactical air-to-air refueling for fixed-wing, rotary-wing, and tilt-rotor aircraft; rapid ground refueling of aircraft or tactical vehicles; assault air transport of air-landed or air-delivered (parachute) personnel and equipment; airborne command and control augmentation; pathfinder support; battlefield illumination; tactical aero-medical evacuation; and is an enabler for tactical recovery of aircraft and personnel.

In response to an Urgent Universal Need, the Marine Corps has acquired a bolt-on/bolt-off Multi-Sensor Imagery Reconnaissance (MIR)/Weapon Mission Kit for KC-130J aircraft. This kit, known as Har-

vest HAWK, rapidly reconfigures the KC-130J aircraft into a platform capable of performing persistent MIR, targeting and delivery of precision fires using Hellfire as well as Griffin and Viper strike stand-off precision guided munitions. The KC-130J brings increased capability and mission flexibility to combat planning and operations.

PROGRAM STATUS

The Marine Corps KC-130J requirement (active and reserve) is seventy-nine aircraft. The KC-130J is currently in production with forty-six aircraft delivered. A forty-seventh KC-130J is on contract for delivery by May 30, 2014. Initial Operational Capability was achieved in February 2005.

Procurement Profile:	FY 13	FY 14
Quantity:	0	2

Developer/Manufacturer:

Lockheed Martin Aeronautics Company, Marietta, GA

CH-53K HEAVY LIFT HELICOPTER DESCRIPTION

The CH-53K is critical to sea-based expeditionary maneuver warfare for the Marine Corps of 2025. As Marine Air Ground Task Force (MAGTF) equipment gets heavier, demand for vertical heavy lift assets increase. Heavier equipment, such as up-armored High Mobility Multipurpose Wheeled Vehicles (HMMWVs), the future Joint Light Tactical Vehicle (JLTV), and the Light Armored Vehicle (LAV) eliminate medium-lift assets as lift platforms and increase demand for the heavy-lift CH-53K.

The CH-53K provides the Marine Corps with the ability to transport 36,000 pounds of external cargo and is specifically designed to lift 27,000 pounds of cargo up to 110 nautical miles in support of future warfighting concepts. The CH-53K generates nearly



three times the external lift capability of the CH-53E under the same environmental conditions, while fitting within the same shipboard footprint. Performance improvements enable vertical insertion of dual-slung up-armored HMMWVs, the JLTV, LAV, or three individually tailored resupply loads delivered to three different operating bases using the independent triple-hook external load system.

The CH-53K provides unparalleled lift and range capability under high-temperature and high-altitude austere conditions, similar to those found in Afghanistan, thereby greatly expanding the commander's operational reach. It is the only fully "marinized" helicopter that can lift 100 percent of MAGTF equipment from amphibious shipping to inland objectives. The CH-53K, having more lift capacity than present day heavy-lift assets, becomes the aircraft of choice to minimize the MAGTF footprint while maximizing operational efficiency.

Major system improvements include more powerful engines, an increased lift capability, an enhanced drive train, advanced composite rotor blades, a modern digital cockpit, improved external and internal cargo handling systems, and increased survivability and force-protection measures. The CH-53K is designed to greatly improve heavy-lift performance and survivability while reducing shipboard logistical requirements, operating costs, and direct maintenance man hours-per-flight hour compared to the CH-53E.

OPERATIONAL IMPACT

CH-53K maintainability and reliability enhancements decrease recurring operating costs significantly, while improving aircraft efficiency and operational effectiveness compared with the CH-53E. Survivability and force protection enhancements significantly increase protection for aircrew and passengers. The CH-53K will transport three independent external loads tailored to individual unit requirements and provide the critical logistics air bridge to facilitate sea-based and distributed operations.

PROGRAM STATUS

In 2012, the CH-53K program made significant progress. The Ground Test Vehicle (GTV) completed assembly in Oct at Sikorsky's Florida Assembly and Flight Operations (FAFO) facility in West Palm Beach, Florida, and entered the system validation test phase. The GTV will undergo tests ensuring safe operations of the Engineering Development Model (EDM) flight vehicles. All four EDM's are currently in assembly at FAFO, EDM-1 is 40 percent complete and will deliver in Oct 2013, and will conduct the first CH-53K flight in 2014. Milestone C is scheduled for FY16 with Initial Operating Capability scheduled for the first quarter of fiscal year 2019.

General Electric (GE) continues to make great strides with the CH-53K GE38 engine. A new engine, specifically developed to power the CH-53K, the GE38 has achieved over 2400 successful test hours and recently completed the rigorous 1000 hour Missionized Durability Testing. The GE38 (required to produce 7500 shaft-horse-power) has sustained 7760 SHP and peaked at a robust 8300 SHP.

The first Marine Maintenance Detachment and Integrated Test Team arrived at FAFO in January 2013. The maintenance detachments will function as work center supervisors, training other Marines on the CH-53K, and assisting in logistics support development. These Marines will also assist in the assembly of all four EDM's and support subsequent tests. The

Integrated Test Team will work hand-in-hand with their Sikorsky counterparts in test plan development and implementation.

The Foreign Military Sales (FMS) potential of this aircraft continues to grow. Milestone C marks the first opportunity for the U.S. Government to establish FMS contracts with foreign governments, with several countries already expressing interest in the CH-53K.

Developer/Manufacturer:

Sikorsky Aircraft Corporation (SAC), United Technologies Corporation (UTC), Stratford, CT

UNMANNED AIRCRAFT SYSTEMS (UAS)



DESCRIPTION

The Marine Corps has employed UAS since 1986. Since 2001, the demand for dedicated aerial reconnaissance aircraft has grown exponentially, and UAS have played a critical part in supporting the aerial reconnaissance requirement. The Marine Corps has refined its UAS requirements and concept of operations (CONOPS) and has begun the procurement and fielding of improved systems at every level of the Marine

Air Ground Task Force (MAGTF).

The Marine Corps UAS CONOPS divides UAS requirements into three levels that coincide with the various echelons of command in the MAGTF. The larger and more capable systems support higher levels of command, whereas the smaller but more numerous systems directly support lower tactical units.

USMC UAS Requirements include the following:

- Marine Corps Tactical UAS (MCTUAS): RQ-7B Shadow
- Small Tactical UAS (STUAS): RQ-21A Integrator
- Small UAS (SUAS): RQ-11B Raven



OPERATIONAL IMPACT

The Marine Expeditionary Force (MEF) and Marine Expeditionary Brigade (MEB) are supported by MCTUAS, the largest of our UAS systems, the RQ-7B Shadow UAS. The first system was deployed with VMU-1 to support *Operation Iraqi Freedom* in September 2007. Employing MCTUAS electro-optical and infrared (EO/IR) sensors, communications relay payloads, and laser designators, commanders on the ground have increased visual and communications access within their areas of responsibility. The VMU squadron supports the Marine Corps Ground Combat Element (GCE) with route reconnaissance, fires integration and force-protection prior to, during, and post-mission.

PROGRAM STATUS

RQ-7B Shadow programmed upgrades include tactical common data link (TCDL), UHF capability,

weaponization, and a universal ground control station (UGCS) that will increase joint interoperability with other aircraft, UAS, and data systems. Procured as a near-term solution to shortfalls in the older RQ-2B program, the RQ-7B provides multiple capabilities to the MAGTF. Upgrades to the RQ-7B are planned through FY 2018. These upgrades will support the transition to a larger (Group-4) UAS that will provide the MAGTF with persistent ISR, strike, and electronic warfare, on board a faster UAS platform with an improved endurance and payload capacity while maintaining an expeditionary footprint.

OPERATIONAL IMPACT: SUAS

The Marine Expeditionary Unit (MEU) and the infantry regiment are supported by STUAS, with supporting personnel sourced as detachments from the VMU. The STUAS system is designed to provide reconnaissance, communications relay, and target acquisition in support of the GCE. The Marine Corps currently provides STUAS support to the GCE with the Aerosonde UAS under an ISR services contract with AAI.

PROGRAM STATUS: RQ-21A INTEGRATOR

The Marine Corps selected the RQ-21A Integrator (produced by Insitu Inc.) as a government-owned material solution for the STUAS requirement. As 32 RQ-21 systems are fielded, they will replace the remaining contract intelligence, surveillance and reconnaissance (ISR) services in *Operation Enduring Freedom*. The RQ-21A program is in Engineering Manufacturing and Development and is planned for IOC in the fourth quarter of FY 2013.

PROGRAM STATUS: RQ-11B RAVEN

The RQ-11B Raven is produced by AeroVironment Inc. In 2008, 439 RQ-11 systems began replacing the older RQ-14 Dragon Eye. The Marine Corps has also purchased limited quantities of the smaller Wasp III

UAS (also produced by AeroVironment Inc.) to perform a user assessment for a potential add to the UAS family of systems.

OTHER UAS APPLICATIONS

Cargo UAS has been added as an initiative to enhance our assault support capabilities and to reduce the vulnerability of ground logistics supporting Marines stationed at remote combat outposts. Two Lockheed Martin/Kaman KMAX Cargo UAS deployed to OEF in 2011 in support of a Military User Assessment with the VMU as a government-owned/contractor-operated cargo UAS service. The MUA will help to form future CONOPS and a formal program of record that will provide the MAGTF with a UAS system capable of cycling five tons of supplies between a support base and remote outpost within a 24-hour period.

Electronic Attack and UAS. The Marine Corps will incorporate an electronic warfare (EW) capability into current and future UAS platforms, partly to address the eventual retirement of EA-6B Prowlers. This UAS EW capability will comprise a portion of the system-of systems-approach by which electronic warfare capabilities are distributed across manned and unmanned aerial systems. The system-of systems approach allows the nation to move away from low-density/high-demand assets (such as the EA-6B) and make EW ubiquitous across the battle space.

Procurement Profile:	FY 13	FY 14
Quantity:		
RQ-7B (MCTUAS)	0	0
RQ-21 (STUAS)	4	4
RQ-11 (SUAS)	13	0