



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
3000 PENTAGON  
WASHINGTON, DC 20380-1775

IN REPLY REFER TO:  
3900  
PS/jew  
26 Jul 10

From: Assistant Deputy Commandant, Plans, Policies and Operations (PP&O),  
Security Division (PS), 3000 Marine Corps Washington, DC 20380-1775

To: Commanding General, MARCORSYSCOM (PG 10: Attn: Mr. Kenneth Beutel)

Subj: STATEMENT OF NEED FOR CONSOLIDATED EMERGENCY RESPONSE  
SYSTEM (CERS)

- Ref:
- (a) SECDEF MEMO of 29 Jan 2010
  - (b) DODI 6055.17 dtd 13 Jan 2010 Installation Emergency Management Program
  - (c) DODI 6055.06 DOD Fire and Emergency Services (F&ES) Program
  - (d) Marine Requirements Oversight Council (MROC) Decision Memorandum (DM) 20-2010 dtd 17 Mar 2010
  - (e) Marine Requirements Oversight Council (MROC) Decision Memorandum (DM) 40-2010 dtd 08 July 2010
  - (f) NFPA 1221 2010 edition: Standard for the Installation, Maintenance and Use of Emergency Services Communication Services
  - (g) National Emergency Number Association (NENA) Technical Reference 04-001 Issue 2 Recommended Generic Standards for E911 PSAP Equipment
  - (h) NFPA 1061 2007 edition: Standard for Professional Qualifications for Public Safety Telecommunicator
  - (i) National Emergency Number Association (NENA) Functional and Interface Standards for Next-Generation 9-1-1 version 1.0 (i3)
  - (j) CJISD-ITS-DOC-08140-4.5 Federal Bureau of Investigations Criminal Justice Information Systems (CJIS) Security Policy v4.5 dtd Dec 2008
  - (k) National Emergency Number Association (NENA) Standard Security for Next-Generation 9-1-1 (NG-SEC) NENA 75-001 v1 dtd Feb 10
  - (l) United Facilities Criteria (UFC) 4-021-01; Design and O&M: Mass Notification Systems dtd 9 Apr 08
  - (m) United Facilities Criteria (UFC) 4-021-02 w/ ch.1; Security Engineering Electronic Security Systems dtd 18 Dec 02
  - (n) MCO 5530.14A Marine Corps Physical Security Program Manual dtd Jun 09

Encl: (1) Capabilities Required for CERS

1. Request that Marine Corps Systems Command (MCSC) take immediate action to acquire the described and required capability addressed as enclosure (1) of this Statement of Need (SON) in accordance with the references listed above with special emphasis on reference(s) (d) and (e).

2. Reference (a) is the DoD Independent Review of Ft. Hood Incident. Reference (b) is the DoD Installation Emergency Management Program. Reference (c) is the DOD Fire

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and Emergency Services (F&ES) Program. References (d) and (e) are the MROC Decision Memorandums (DMs) endorsing the Emergency Management Command and Coordination (EMC2). Specific prioritization efforts and program funding is addressed in Reference (e). Reference (f) is the requirement for Fire and Emergency Services training and operations. Reference (g) is the National Emergency Number Association (NENA) Technical Reference 04-001 Issue 2 titled Recommended Generic Standards for E911 PSAP Equipment. It is considered to be the overarching recommendations and standards document used by civilian counterparts. Reference (h) is the training and certification standards for dispatch staff. References (i) through (n) denote security requirements for CERS interfaces.

3. Point of contact is Mr. Randy Smith (703) 692-4238 or by email at [randy.r.smith@usmc.mil](mailto:randy.r.smith@usmc.mil).



R. F. GEOFFROY

Copy to:  
CG MARCORSYSCOM (PG 10: Attn: Mr. Kenneth Beutel)

STATEMENT OF NEED  
FOR THE  
CONSOLIDATED EMERGENCY RESPONSE SYSTEM  
Capabilities Required for CERS

1. The Marine Corps has an urgent need to effectively receive, process, and manage emergency requests for assistance at dispatch centers aboard Marine Corps installations. The purpose of the Consolidated Emergency Response System (CERS) is to perform the same rapid emergency response services as the civilian (i.e. city, county, etc.) dispatch center (referred to as a Public Safety Answering Point (PSAP)). As an integrated system, CERS will be used to support command and coordination (C2) functions that dispatch First Responders to support an incident or crisis. CERS will provide dispatching of emergency public safety services in support of mutual aid operations associated with federal/national, state, tribal and local governments/agencies (Continental United States (CONUS) as well as territories and host nations (Outside the Continental United States (OCONUS)). Specifically, it will systematically deploy public safety and force protection personnel in saving lives and safeguarding property relative to Mission Assurance/All-Hazards scenarios, natural disaster response, and homeland defense initiatives. It must be clear that CERS is a tool designed for first responders and should not be confused with an installation level C2 system that supports the overarching crisis management needs of installation commanders.
2. Currently fielded Installation-level emergency communications capabilities do not support the Command and Coordination needs of the Commander. Furthermore, installations emergency response communications and dispatch services are not comparable with the current state of domestic mutual aid partners dispatching services and standards. Installations continue to provide dispatch services in an ad-hoc manner with technologically obsolete systems and methods.
3. MARCORSYSCOM and the EMC2 Working Group have identified commercial and non-developmental systems that have already been fielded to civilian mutual aid partners that satisfy the requirements for effective call handling and processing for emergency responders and that have met the requirements outlined in references (f) and (g). Annex (A) outlines the detailed performance requirements are portrayed in Key Performance Parameters, Key System Attributes and Additional Attributes.
4. CERS will support a wide range of first response crisis operations. Its primary tier one Joint Capability Area (JCA) is "Joint Command and Coordination." Additionally CERS services are applicable to the following tier-one JCAs:
  - Joint Homeland Defense
  - Defense Support of Civil Authorities
  - Joint Stability Operations
  - Joint Interagency Coordination
  - Joint Battle space Awareness
  - Joint Protection

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Table 1 Provides the Marine Corps Tasks applicable to CERS.

<b>Deploy Forces/Conduct Maneuver</b>	
MCT 1.1.2.2	Provide Command Element
MCT 1.6.6.7	Conduct Humanitarian Assistance (HA) Operations
<b>Develop Intelligence</b>	
MCT 2.1.1.2	Develop the Situation
<b>Perform Logistics and Combat Service Support</b>	
MCT 4.6.2.4	Provide Communications/Information Technology
<b>Exercise Command and Control</b>	
MCT 5.1	Acquire, Process, Communicate Information, and Maintain Status
MCT 5.1.1	Provide and Maintain Communications
MCT 5.1.1.1	Provide Single Channel Radio Communications
MCT 5.1.1.6	Relay Communications
MCT 5.1.2	Manage Means of Communicating Information
MCT 5.1.2.5	Control Communication Nets
MCT 5.1.3.1	Maintain COP
MCT 5.1.3.2	Provide Positive ID of Friendly Forces within AO
MCT 5.2	Prepare Plans and Orders
MCT 5.3.1	Direct Operations
MCT 5.3.1.1	Issue Orders
MCT 5.3.2.1	Establish/Conduct Combat Operations Center (COC) Operations
MCT 5.3.2.1.1	Establish Base Operations Center to Plan, Coordinate, Communicate and Execute Installation Support to National Response Plans
MCT 5.3.2.5	Establish/Conduct Rear Area Operations Center (RAOC) Operations
MCT 5.4.1.5	Conduct Civil Military Operations (CMO)
MCT 5.4.2.3	Conduct Information Assurance
<b>Protect The Force</b>	
MCT 6	Protect The Force
MCT 6.1	Provide Security
MCT 6.1.1	Conduct Active Security
MCT 6.1.1.2	Develop Rear Area Security and Base Defense Plans
MCT 6.1.1.2.3	Provide Security for High Risk Personnel and Installation Special Events
MCT 6.1.1.2.4	Coordinate with Local, State and Federal Agencies
MCT 6.1.1.3	Conduct Base Defense
MCT 6.1.1.10.1	Conduct Law Enforcement, Criminal Investigations and US Prisoner Confinement
MCT 6.1.1.10.3	Provide Base/Airfield Security Operations
MCT 6.1.1.10.5	Provide Traffic Control and Traffic Accident Investigations
MCT 6.3.1.1	Provide Emergency Response
MCT 6.3.1.1.1	Provide Fire Protection Services
MCT 6.3.1.1.2	Maintain Law and Order

Table 1: MCT List for CERS

Distribution and prioritization will include twenty locations based on MARFOR Commander Prioritization as outlined in MROC Decision Memorandums 20-2010 and 40-2010. Table 2 reflects that fielding prioritization. The number of CERS workstations will vary based on base populations served and the number of calls for service received.

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Installation	Priority	MARFOR
MCBJ (All Okinawa Camps)	1	MARFORPAC
Camp Lejeune/New River	2	MARFORCOM
MCB Quantico/MCAF	3	MCNCR/MARFORCOM
MCAS Yuma/Regional Hub-CPEN	4	MARFORPAC
MCAS Cherry Point	5	MARFORCOM
MCAS Beaufort	6	MARFORCOM
MCRD Parris Island	7	MCCDC
MCMWTC Bridgeport	8	MARFORPAC
CAMPEN (MCB/MCAS)	9	MARFORPAC
MCAGCC 29 Palms	10	MARFORPAC
MCRD San Diego	11	MCCDC
MCLB Albany	12	MARFORCOM
MCAS Iwakuni	13	MARFORPAC
MCAS Miramar	14	MARFORPAC
MCLB Barstow	15	MARFORPAC
Blount Island	16	MARFORCOM
Marine Corps Base Hawaii	17	MARFORPAC
Guam (DPRI)	18	MARFORPAC
Camp Mujuk	19	MARFORPAC
HH/MBW	20	MCNCR

Table 2: Fielding Prioritization

5. CERS shall be able to receive, process, and manage emergency calls for service in a 24/7/365 environment. CERS shall be staffed by trained and certified personnel to affect the receipt and processing of calls for service to meet the required grade of service (GoS P.01). Training and staffing levels are determined in accordance with references (f) and (h) and validated through in-progress manpower and training analysis.
6. Operations and Maintenance (O&M) costs for this capability will include replacing consumables, replacing damaged and obsolete systems, replacing worn/damaged parts and training/manpower costs. These costs will be delineated in detail in the Life Cycle Cost Estimate.

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7. Initial Operational Capability (IOC): Initial Operational Capability (IOC) is defined when all of the following are met:
  - a. One BPS has been fielded with an operational CERS
  - b. Dispatch Center staffs are fully trained and certified in accordance with pertinent references.
  - c. Authority to operate and life-cycle support has been established
  - d. Legacy dispatch operations are terminated
  - e. Applicable Standard Operational Procedures (SOP), Memorandum of Agreements (MOA), Memorandum of Understanding (MOU), Service in Kind (SIK) Agreements and Status of Forces Agreement (SOFA) are in place.
  - f. Bandwidth is in place for MCNOSC, MCI, and Base G-6 IT and NSS supportability to CERS.
  - g. The desired IOC will be determined as a phased approach corresponding to execution matrix resultant from MROC DM 20-2010 dated 17 March 2010.
  
8. Full Operational Capability (FOC): FOC for CERS will be achieved when all of the following are met:
  - a. All CERS has been fielded to the approved acquisition objective allowance
  - b. Dispatch Center staffs are fully trained and certified in accordance with pertinent references.
  - c. All CERS have received the authority to operate, and life-cycle support has been established
  - d. All legacy dispatch operations are terminated
  - e. Applicable Standard Operational Procedures (SOP), Memorandum of Agreements (MOA), Memorandum of Understanding (MOU), Service in Kind (SIK) Agreements and Status of Forces Agreement (SOFA) are in place.
  - f. Bandwidth is in place for MCNOSC, MCI, and Base G-6 IT and NSS supportability to CERS.
  - g. The desired FOC date is 4th quarter FY16 based on acquisition strategy and execution matrix.

In accordance with references (d) and (e), DC, PP&O, supported by the MARFOR commanders and others, prioritized proposed E-LMR and EMC2 improvements focusing on addressing mission assurance/force protection and medical emergency response risks and shortfalls. DC PP&O shall develop a fiscally informed implementation plan and shall coordinate the completion of a formal DOTMLPF Working Group (DWG) assessment of each installation EMC2 improvements to capture all associated costs and impacts.

9. Failure to procure this system in a timely manner will adversely impact the Marine Corps' ability to effectively respond to any emergency call for service via radio, telephonic or walk-up means within identified response times and call answering times established in references (c) and (f) and will continue to jeopardize the safety and security of Marine Corps installations personnel and property.

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10. CERS will possess the following operational level requirements and performance characteristics:

- a. CERS shall provide reliable, unimpeded, immediate, interoperable, scalable, and flexible C2 for First Responders and emergency service assets.
- b. CERS shall be staffed by sufficient personnel to affect the receipt and processing of calls for service to meet the required grade of service (GoS P.01 defined as a probability that no more than one call out of 100 attempts made will be blocked) and that, where available, physically diverse routing is being used.
- c. CERS shall provide Enhanced 911 (E911) as defined by reference (g) – including the requirement for Automatic Number Identification (ANI) and Automatic Location Identification (ALI) to process (auto-populate) and expedite subscriber calls. This includes cellular call routing with longitude and latitude coordinates.
- d. CERS shall provide Fire Station Alerting and Paging interface to rapidly recall or notify First Responders and Emergency Services personnel by initiating audible and visual alerts to specifically and independently designated fire station/EMS facilities upon notification that an emergency has occurred. Alerts shall be generated in heart-save, ramped tones and visual effects of low to high amplitude to reduce First Responder stress during emergency call notifications.
- e. CERS shall utilize a dispatch workstation with specialized technology to efficiently process and expedite subscriber call answering. Specifically, the workstation provides the dispatcher with the capability to maintain communications and Situational Awareness (SA), by rapidly assessing and assigning available emergency response resources. It can also send text messages to the First Responder or store and retrieve data (i.e. radio logs, field interviews, client information and schedules). The dispatcher workstation functionality includes:
  - i. Computer Aided Dispatch (CAD): CERS shall utilize (CAD) to efficiently process and expedite the dispatching of emergency resources.
    1. Location of Interest - the ability to add special notes or procedures to addresses (e.g. gate code, elderly male at location with health problems send medical when responding, associated with gang members, etc.) that highlight prior calls for service to that location.

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- ii. Telephone software interface capable of E911, call management (routing and transfers, multiple line calls ect), receipt of ANI/ALI, as well as Telecommunications Device for the Deaf /Teletypewriter (TDD/TTY) functionality.
  - iii. Computerized Radio Interface that allows the dispatcher to receive and process multiple requests for service via multiple radio channels, allows for the patching of frequencies providing interoperability.
  - iv. Position Location Identification (PLI)/Automatic Vehicle Location (AVL) to provide the dispatcher a Common Operational Picture (COP) of available emergency response resources
  - v. Logging and recording of all emergency call telephone lines and radio channels to include time stamping, indication of dispatcher actions (enter a new incident, dispatch a unit, unit arrives on-scene, etc.).
  - vi. Emergency medical software that provides authorized guidance with medically approved protocols and first aid instructions until help arrives.
  - vii. CERS mapping capabilities shall leverage the existing investment in the USMC Installation Geospatial Information and Services (IGI&S). Additional technical work remains in the form of creating street address attribution and producing the "route cards" from current position to dispatch locations.
    - 1. Repository of blue prints and city plans (as required under Mutual Aid agreements for off-installation response routes and areas of responsibility).
  - viii. CERS shall leverage existing and future Radio Frequency (RF), cellular infrastructure and bandwidth to provide Mobile Data Terminals located in selected first responder vehicles with the capability to interface with the CAD to provide two way information flow allowing independent query of location and premise history information, status updates and query of CAD information and various databases (i.e. law enforcement, base debarment list etc.).
  - ix. Records Management that consists of all voice recordings and data and is required for tracking trends of various events, call processing, lessons learned, training, after action reports and for increased clarity during investigations.
- f. CERS shall interface with existing and future Mass Notification capabilities to initiate or relay a one way audible communication transmission (e.g. voice or siren over loud speaker/Public Announcement (PA) system or various devices such as personal digital assistants (PDA), voluntary device registration or text) to the masses notifying them of a pending crisis. Alternatively, CERS will be capable of rapidly alerting installation populations through a geographically defined, pre-scripted notification, based on 911 subscribers

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- g. CERS shall provide emergency dispatch center services that consolidate emergency response equipment and personnel on each installation (police, fire and EMS). The facility shall be constructed or modified to support 24 hour operations. Interim Re-locatable Facilities may be used until permanent facilities can be provided.
  - h. Chemical, Biological, Radiological and Nuclear (CBRN) Survivable: CERS will not be designated CBRN Mission Critical per DODI 3150.09 criteria but the system will address survivability in this environment through incorporation of the following:
    - i. Redundancy of Communications and Command/Control systems
    - ii. Interoperability of Command, Control, and Communications architectures
    - iii. Interchangeability of Communications assets
    - iv. Appropriate mix of mobile and stationary C2 platforms
    - v. Doctrine and Policy (e.g. Shelter in Place SOPs/CBRN Operations Orders)
11. Assumptions
- a. Grade of Service (GoS) is a Base Telephone Initiative coverage issue and that commercial telephony can support Grade of Service requirements.
  - b. Radio Frequency coverage is limited to areas of installations covered by populated areas; this coverage is collectively referred to as "the E-LMR Slice".
  - c. Power capabilities supportive of CERS is a Facilities-related responsibility. This responsibility extends to uninterruptible power supplies, lighting and those furnishings specific to a dispatch work space as well as the human factors relative to shift work (i.e. sleeping and hygiene facilities).
  - d. GEOFidelis: The GEOFidelis Program does not manage Floor Plans or interior building layouts or space plans, etc.
    - i. GEOFidelis can contribute to a CERS Mapping Capability in many forms or flavors depending upon the final requirements determination. Examples include:
      - 1. Hardcopy Maps of USMC Installations
      - 2. Digital Maps of USMC Installations
      - 3. Geospatial data of USMC Installation features such as building footprint polygons and streets/road lines.
    - ii. Geospatial data challenges:
      - 1. Current GEOFidelis geospatial data does not carry street address attribution
      - 2. Current GEOFidelis geospatial data is not formatted or segmented to support network vehicle routing (shortest path from point A to

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point B, quickest path from Point A to point B, etc.) though this data may be available at a handful of installations

3. Other geospatial data features which may be required for CERS may not currently exist.

4. Current GEOFidelis geospatial data accuracy, currency, completeness, or quality may not meet the requirements or expectations of CERS.

5. Existing and new Data layers must be closely coordinated and updated in scheduled increments in formats most conducive for population within the Master Street Address Guide (MSAG) while requiring minimal configuration by the end user or administrator.

iii. GEOFidelis is encouraged, whenever possible to synchronize MSAG, ALI and data formats with various NENA standards.

- e. The physical location of the dispatch center does not have to be co-located with Emergency Operations Centers (EOC) or desk sergeant areas. It is recommended that the dispatch be physically separated from those areas in accordance with applicable references pertaining to MAC III SENSITIVE systems and integrated components. A consolidated dispatch center refers to all aspects of emergency response being dispatched from a singular point (fire, police and emergency medical services).
- f. Calls for service can be received via several current and future methodologies. Calls for service can include alarms, telephonic (land line, wireless, TDD/TTY and Voice over Internet Protocol (VoIP)). Whenever possible, inclusion of those classes of service is reflected in requirements in general terms.
- g. CERS is interfaced and integrated with several other programs such as Mass Notification, Electronic Systems Security, CBRN, and Emergency Operations Centers. It is critical that synchronized and integrated planning and implementation occur so as to capitalize on current and future infrastructure and capability.

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Detailed Performance Requirements

1. Key Performance Parameters (KPPs)

1.1. Enhanced 911 (E911): CERS shall provide E911 services as defined by NENA Technical Reference (NENA-04-001 Issue 2, March 2001).

The 3-digit telephone number 911 has been designated for public use throughout the United States and territories to report an emergency, request emergency assistance, or both. This number is intended as a nationwide, universal telephone number to provide the public with direct access to a PSAP. A PSAP is an agency or group of agencies designated and authorized to receive and respond to emergency calls requiring one or more public services (Police, Fire, Emergency Medical Services (EMS), or all three). The E911 feature provides Enhanced 911 service capabilities and PSAP customer services for completing and handling 911 calls. The main characteristic of E911 service is the capability to selectively route a 911 call originated from any station in the 911 service area to the correct primary (or controlling) PSAP designated to serve the originating station's location. For OCONUS installations, various numbers for 911 exist and may encompass transfers of callers to dedicated 911 through a non-three digit number. It is recognized that OCONUS installations may have extended dialing requirements. The following service will not be provided and is the exception to NENA standards adopted:

1.1.1. Night Service: CERS will be manned 24/7/365 by trained and certified personnel in accordance with reference (h).

1.2. Net Ready:

1.2.1. Interoperability: CERS shall provide an integrated systems interface between multi jurisdictional agencies. Best efforts to leverage software based integrations should be utilized. Interoperability is limited to local Memorandums of Agreement and Understanding (MOA/MOU) in regards to information sharing and Computer Aided Dispatch (CAD) to CAD interoperability. Radio communications are to be interoperable and compliant with applicable National Telecommunications and Information Administration (NTIA), Federal Communications Commission (FCC) Part 90, APCO P25, National Institute of Standards and Technology (NIST) standards, Presidential Directives and host nation laws and regulations. Rationale: Compliance with NTIA, FCC, SOFA, international laws and regulations, and MS P25 standards is mandated. Additionally, First Responders require seamless communications with external government and non-government organizations in order to provide mutual aid support in the event of crisis situations and emergencies associated with terrorist acts, natural disasters, and accidental/unintentional emergencies.

1.3. Sustainment: CERS shall be operationally available to support installation operations with limited downtime in all modes. The system, sub-system and

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infrastructure shall be designed with redundancy and resiliency to limit or prevent downtime as well as flexibility and scalability for future technological advances.

1.3.1. Availability: Availability is a measure of the degree to which an item is in an operable state and can be committed at the start of a mission when the mission is called for at an unknown (random) point in time. Availability as measured by the user is a function of how often failures occur and corrective maintenance is required, how often preventative maintenance is performed, how quickly indicated failures can be isolated and repaired, how quickly preventive maintenance tasks can be performed, and how long logistics support delays contribute to down time. Rationale: First Responders require uninterrupted communications to perform their mission of protecting life and property.

1.3.1.1. Operational Availability: CERS shall exhibit a single BPS system operational availability ( $A_o$ ) of 99.7 percent (Threshold) and 99.99 percent (Objective). Availability shall be computed using the following formula:  $A_o = \text{Uptime} / (\text{Uptime} + \text{Downtime})$

1.3.1.1.1. Any of the following events or conditions constitutes system downtime (i.e., operational mission failure) at a Base Post Station (BPS) level.

1.3.1.1.2. Any fault (or maintenance action) that reduces the availability of CERS to less than 99.7%.

1.3.1.1.3. Any fault (or maintenance action) that changes the Grade of Service (GoS) provided for 911 to P.01 or less

1.3.1.1.4. Failure of common equipment suite(s) resulting in the loss of the dispatch center's ability to receive, process, and manage emergency calls for service via any defined class of service and not limited to radio, telephonic and in person in a 24/7/365 environment.

1.3.1.1.5. Failure of more than 50% of total operator workstations in a dispatch center.

1.3.1.2. Materiel Availability: Availability shall be computed using the following formula:  $A_m = (\text{number of operational end items}) / (\text{total number of end items})$ . Events such as scheduled maintenance (e.g. PMCS and/or planned system downtime) are to be considered in the evaluation of the  $A_m$ . CERS shall exhibit a single BPS system material availability ( $A_m$ ) of 97.5 percent (Threshold) and 99.9 (Objective).

1.3.2. Reliability: Routine database maintenance plans and support (e.g. periodic database integrity checks, memory utilization, scheduled data backup procedure, synchronization of redundant database(s)) as well as patch management processes shall be established as a critical factor in achieving system reliability.

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2. Key System Attributes (KSAs)

2.1. Voice Circuit: CERS shall provide a transmission Grade of Service (GoS) for each 911 caller that is at least P.01.

2.2. Mass Notification: CERS shall interface with existing and future Mass Notification capabilities to initiate or relay a one way communication transmission (e.g. voice or siren over loud speaker/Public Announcement (PA) system or various devices such as personal digital assistants (PDA), voluntary device registration or text) to the masses notifying them of a pending crisis. Alternatively, CERS will be capable of rapidly alerting installation populations through a geographically defined, pre-scripted notifications based on 911 subscribers. Mass notification provides real-time information and instructions to people in a building, area, site, or installation using intelligible voice communications along with visible signals, text, and graphics, and possibly including tactile or other communication methods. The purpose of mass notification is to protect life by indicating the existence of an emergency situation and instructing people of the necessary and appropriate response and action.

2.3. Emergency Responder Recall: CERS shall be capable of transmitting an alert that provides notification to the First Responder. Initiation of response shall be conducted at a dispatch console when an emergency response situation arises, regardless of location. Rationale: Paging shall enable subscribers to receive texted form notifications for emergency recall thereby minimizing the communications traffic load on the network. (Threshold = Audible; Objective = Audible and text and Mobile Data Terminals (MDT))

2.4. Dispatch Workstation: CERS shall utilize a dispatch workstation to provide 911 services. Dispatch workstation shall consist of CAD, phone software, CAD map, logging recorder, computerized radio and telephone software interfaces, Fire Station & EMS Alerting and specialized software that allows the dispatcher to provide dispatch life support instructions.

2.4.1. Computer Aided Dispatch (CAD): CERS shall utilize Computer Aided Dispatch (CAD) to efficiently process and expedite the dispatching of emergency resources.

2.4.1.1. Location of Interest - the ability to add special notes or procedures to addresses (e.g. gate code, elderly male at location with health problems send medical when responding, associated with gang members, etc.) that highlight prior calls for service to that location.

2.4.2. Telephone software interface capable of E911, call management (routing and transfers, multiple line calls etc), receipt of ANI/ALI, as well as Telecommunications Device for the Deaf /Teletypewriter TDD/TTY functionality.

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- 2.4.3. Computerized Radio Interface that allows the dispatcher to receive and process multiple requests for service via multiple radio channels, allows for the patching of frequencies providing interoperability.
  - 2.4.4. Position Location Identification (PLI)/Automatic Vehicle Location (AVL) to provide the dispatcher a Common Operational Picture (COP) of available emergency response resources
  - 2.4.5. Logging and recording of all emergency call telephone lines and radio channels to include time stamping, indication of dispatcher actions (enter a new incident, dispatch a unit, unit arrives on-scene, etc.).
  - 2.4.6. Emergency medical software that provides authorized guidance with medically approved protocols and first aid instructions until help arrives.
  - 2.4.7. Repository of blue prints and city plans (as required under Mutual Aid agreements for off-installation response routes and areas of responsibility).
  - 2.4.8. CAD Mapping: CERS mapping capabilities shall leverage the existing investment in the USMC Installation Geospatial Information and Services (IGI&S). Additional technical work remains in the form of creating street address attribution and producing the "route cards" from current position to dispatch locations." CAD mapping significantly contributes to the Dispatcher's decision making process by readily knowing the available resources and readiness of First Responders, cannot be displayed, rendered, or used by the Dispatcher unless it is graphically depicted on a standard CAD mapping platform. (NENA 02-014, Issue 1, July 17, 2007 NENA GIS Data Collection and Maintenance Standards) (Threshold: GPS locations. Objective: multi-layered (routes, utilities, roads, critical infrastructure and addresses) geospatial information )
    - 2.4.8.1. Master Street Address Guide (MSAG) updates will be integral to the validity of CAD mapping systems.
    - 2.4.8.2. Mapping solutions must be provided to support the least amount of additional configuration.
- 2.5. Fire Station and EMS Alerting: CERS shall be capable of conducting Fire Station and EMS Alerting. Fire station/EMS alerting is the first notification capability which alerts First Responders in their designated home station facilities that an emergency has occurred and a response to mitigate suffering and save lives is required. Alerts shall be generated in heart-save, ramped tones and visual effects of low to high amplitude to reduce First Responder stress during emergency call notifications. (Threshold: audible and flashing lights; Objective: audible, flashing lights, ramped heart-save tones.)
- 2.6. Records Management: Records management consists of all voice recordings and data and is required for tracking trends of various events, call processing, lessons learned, training, after action reports and for increased clarity during investigations. (Threshold: storage and reference of all recordings and data in

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accordance with NFPA 1221; Objective: 100% of all records storage and reference will be archived)

2.7. Logging and Recording: CERS shall have a primary and redundant automated logging and recording capability that includes dates and times of voice, radio and data transmission to include beginning and end of events and indication of dispatcher actions (enter a new incident, dispatch a unit, unit arrives on-scene, etc.). (Threshold = 100% of transmissions over a 30-day period will be held live with 365 days of archived transmissions. Objective = 100% of live transmissions, over a 365-day period with archived transmissions as local or state protocol dictates)

2.8. System Security: CERS shall consist of network/information system security, radio subscriber security and site specific facilities security. The MCNOSC will be responsible for ensuring the security and integrity of all enterprise components. In accordance with Department of Defense Directive (DoDD) 8500.01, CERS is classified as a MAC III SENSITIVE system. IA safeguards will ensure the availability, integrity, confidentiality, authentication and non-repudiation of information passing through or residing in it. Security risk associated with CERS shall be addressed and mitigated via the DoD Information Assurance Certification and Accreditation Process (DIACAP) as published in Department of Defense Instruction (DoDI) 8510.01. Furthermore, all BPS shall comply with DoD 8570.01-M "IA Workforce" certification requirements. Meeting these requirements will require a combination of formal training, experiential activities such as on-the-job training, and continuing education. These training and certification requirements must be provided by the Department of Defense at no cost to government employees (military or civilian).

2.9. Physical Security: CERS facilities shall meet the guidelines set forth in MIL-HNDBK-1013 1A/MAC III SENSITIVE (MCO 8500) for System Security Level (SSL) D (Command, Control and Communications Facilities) and the Unified Facilities Criteria (UFC) 4-021-02 NF for Electronic Security Systems. This includes but is not limited to appropriate lighting, security cameras, controlled access points and fenced perimeters around CERS facilities. (Threshold = SSL D; Objective = SSL C)

3. Additional Attributes

In addition to the above stated KPPs and KSAs, CERS must meet the following attributes and compliance requirements.

3.1. Selective Routing (SR) – standard routing of 911 calls to the primary PSAP based on Caller Identification (ANI/ALI)

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- 3.2. Default Routing – standard routing of a 911 call to a defined PSAP when the call cannot be selectively routed.
- 3.3. Alternate Routing – standard routing of 911 calls to a pre-designated alternate PSAP.
- 3.4. Central Office Transfer (selective, fixed and manual) – standard service for 911 calls to be transferred by Dispatch to another destination.
- 3.5. Automatic Number Identification (ANI) – display of caller identification information.
- 3.6. Automatic Location Identification (ALI)/Data Management System (DMS) – display of street address and dispatch information associated with the ANI of a call. Referred to as a Master Street Address Guide (MSAG).
- 3.7. Forced Disconnect – ability to release a 911 call to prevent tie-ups of dedicated facilities.
- 3.8. Automatic Call Distribution (ACD) – automatic distribution of calls to available PSAP attendants.
- 3.9. ANI / ALI Callback: CERS shall provide capability for automatic dialing of the telephone number of a 911 caller by depressing a single button/key if the caller has hung-up was disconnected or the call was abandoned. This feature shall include the capability to call back 911 calls from local and non-local wire line telephone numbers, and wireless and PBX telephone numbers.
- 3.10. ANI / ALI Transfer: CERS shall provide capability to transfer ANI/ALI information for 911 calls transferred by Dispatch to another destination.
- 3.11. Portable/Mobile Ancillary Devices: CERS user community requires ancillary devices with each dispatch workstation tailored upon the user unique mission and job tasks. These devices and capabilities are required to provide a form, fit, and function based upon independent human factors of the user's operational environment. Pre-acquisition surveys shall include user's community input of quantities of these devices to be acquired. These ancillary devices include but are not limited to; noise canceling headsets for high noise environments, hands free devices (i.e. throat and boom microphone), and ergonomic workstations and chairs.
- 3.12. Grade of Service : CERS shall provide a transmission Grade of Service (GoS) for 911 calls that is at least P.01 (probability that no more than one call out of 100 attempts made will be blocked)

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- 3.13. Mass Notification: Wide Area Notification: CERS shall be capable of sending a one way mass notification communication transmission leveraging existing and future mass notification capabilities. The dispatcher may be tasked with sending a mass message notifying tenant organizations and base residents of a pending crisis. Mass notification provides real-time information and instructions to people in a building, area, site, or installation using intelligible voice or pre-recorded and customizable recordings and communications.
- 3.14. Mass Notification: Reverse 911(R911): CERS shall be capable of sending a one way mass notification communication transmission. The dispatcher may be tasked with sending a mass message to a geographically defined area of base residents of a pending crisis through pre-recorded and customizable recordings of real-time information and instructions to people in a building, area, site, or installation.
- 3.15. Mass Notification: Group Defined: CERS shall be capable of sending a mass notification communication transmission leveraging existing and future mass notification capabilities. The dispatcher may be tasked with sending a mass message notifying pre-selected and defined users and groups of an emergency or of a pending crisis.
- 3.16. Training: Alignment to a single standard of skill sets will be required to operate and maintain CERS. Contractor supported/New Equipment Training (NET) shall be developed, maintained and provided by the vendor until initial and follow-on training is available. Marine Corps Systems Command (MARCORSYSCOM) will commission the Manpower, and Training Analysis (M&TA) and RCM analyses. The outcome of the M&TA will determine operator, maintenance, team and mission area training requirements. These training requirements shall include the capability to conduct onboard training through simulation with embedded systems. The Analysis of Alternatives study will provide system design and engineering recommendations in order to reduce manpower and costs while improving system effectiveness and efficiency.
- 3.16.1. Equipment/Vendor specific: Training shall be provided for the use and maintenance of CERS.
- 3.16.2. Dispatching Operations: Training and certification standards are modeled after NENA, APCO and NFPA recommendations. Additional training will be provided to include law enforcement database access roles and responsibilities and geographic specific requirements (i.e. operating environment unique requirements).
- 3.16.2.1. Dispatch center personnel will be certified as required by local and state jurisdiction as one of the following:

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- 3.16.2.1.1. Public Safety Dispatcher in Training (entry) (Public Safety Dispatcher I)
  - 3.16.2.1.2. Public Safety Dispatcher II
  - 3.16.2.1.3. Supervisor Public Safety Dispatcher (NENA Emergency Number Professional Certification) (Public Safety Dispatcher III)
  - 3.16.2.1.4. Center Director (NENA Emergency Number Professional Certification and APCO Core Competencies For Public Safety Communications Manager/Director)
  - 3.16.2.1.5. Other certifications/training as required by state and local jurisdictions
  - 3.16.2.1.6. Other certifications/training as required by mission (i.e. Emergency Medical Protocols, CPR, Hazardous Materials (HazMat), and Telecommunications Device for the Deaf /Teletypewriter (TDD/TTY) operations).
  - 3.16.3. System Administrators as required.
- 3.17. Telecommunications Device for the Deaf /Teletypewriter (TDD/TTY): The Dispatcher's Emergency telephone notification systems shall have the ability to communicate with American Standard Code for Information Interchange (ASCII) based TDD/TTY devices and send scripted emergency messages to the deaf and/or hearing impaired user community.
- 3.18. Logging and Recording (Radio): CERS shall have a primary and redundant automated logging and recording capability that includes dates, times and immediate playback capability and is permissions based (privacy act requirement). Rationale: Recording of communications is required for tracking trends of various events, call processing, lessons learned, training, after action reports, and for increased clarity during investigations. (Threshold = 100% of First Responder talk groups over a 30-day period. Objective = 100% of First Responder talk groups, over a 365-day period).
- 3.19. Logging and Recording (Telephone): CERS shall have a primary and redundant automated call (voice and TDD/TYY) logging and recording capability that includes dates, times, immediate payback capability and integration into existing and future telephone systems. Rationale: Recording of communications is required for tracking trends of various events, call processing, lessons learned, training, after action reports, and for increased clarity during investigations (Threshold = 100% of calls over a 30-day period. Objective = 100% of calls over a 365-day period).
- 3.20. Position Location Information (PLI): CERS shall receive and display existing and future fielding of handheld subscriber units and mobile subscriber units'

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positional location. Rationale: PLI significantly contributes to situational awareness and the decision making process.

(Threshold = Global Position System (GPS); Objective = GPS with Selective Availability Anti-Spoofing Module (SAASM) and Receiver Autonomous Integrity Monitoring (RAIM) capable).

- 3.21. Detection Systems: CERS requires uninterrupted Detection Systems interfaces to ensure security, safety and operational activities of the BPS, its high value assets and any off-base military controlled housing.
- 3.21.1. CERS shall be capable of monitoring and receiving fire and EMS alarming or sensor data, (audio, visual or text).
- 3.21.2. CERS shall be capable of monitoring and receiving intrusion alarms (audio, visual or text).
- 3.21.3. CERS shall be capable of monitoring and receiving CBRN sensor data (audio, visual or text).
- 3.22. Fire and EMS RMS Compatibility: CERS shall provide an interface to the USMC Fire & Emergency Services RMS vendor, Emergency Reporting. Such interface will ship data continuously to the RMS vendor throughout the call, not less than 3 minutes after an event is recorded. The CAD link shall be web services submission method to a secure encrypted website. Full technical details regarding this interface will be made available by request. Rationale: This will ensure compatibility and interoperability of the established Fire and Emergency Services RMS with CAD and CERS. (Threshold = Objective)
- 3.23. Monitoring: CERS shall be equipped with desk top or wall mounted monitors that display news, weather services and near real-time security feeds of the main gate and other high value areas.
- 3.24. EM Response Database Interface: The Dispatch Workstation shall interfaced with databases that provide emergency medical information and protocols, criminal justice information, building blueprints (to include plumbing, gas, electrical, hydrant fixtures, etc), geographical maps and emergency response guides.
- 3.25. Automatic Vehicle Locator (AVL): CERS shall be shall receive and display existing and future fielding of mobile subscriber units (vehicle specific) AVL data, which significantly contributes to the Dispatcher's decision making process by readily knowing the available resources and readiness of First Responders, cannot be displayed, rendered, or used by the Dispatcher unless it is graphically depicted on a standard CAD mapping platform. (NENA 02-014, Issue 1, July 17, 2007 NENA GIS Data Collection and Maintenance Standards)

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- 3.26. Mobile Data Terminals (MDT): CERS shall interface with in-the-field/on scene mobile computing and network devices (collectively referred to as MDTs) to allow real-time, state, local, or federal database query verifications critical to USMC public safety efforts. CERS shall leverage existing and future Radio Frequency (RF), cellular infrastructure and bandwidth to provide Mobile Data Terminals located in selected first responder vehicles with the capability to interface with the CAD to provide two way information flow allowing independent query of location and premise history information, status updates and query of CAD information and various databases (i.e. law enforcement, base debarment list, etc.)
- 3.27. Time Synchronization: All servers, CAD workstations and time pieces within CERS will be interfaced and synchronized utilizing Selective Availability / Anti-Spoofing Module (SAASM) Global Positioning System (GPS) clocking technology and GPS location.
- 3.28. Power: CERS shall have redundant infrastructure power systems which (e.g. in-line UPS, generators and solar) must provide continuous runtime without re-supply or service at peak operating capacity. (Threshold = 48 hours; Objective = 72 hours).
- 3.29. Chemical, Biological, Radiological and Nuclear (CBRN) Survivable: CERS will not be designated CBRN Mission Critical per DODI 3150.09 criteria but the system will address survivability in this environment through incorporation of the following:
- 3.29.1. redundancy of Communications and Command/Control systems
  - 3.29.2. interoperability of Command, Control, and Communications architectures
  - 3.29.3. interchangeability of Communications assets
  - 3.29.4. appropriate mix of mobile and stationary C2 platforms
  - 3.29.5. Doctrine and Policy (e.g. Shelter in Place SOPs/CBRN Operations Orders)
- 3.30. Foreign Language Service: CERS shall have access to a Foreign Language Service that provides immediate high-quality, effective interpretation and translation of all major languages. Thus, the dispatcher with the assistance of the foreign language service will be able to render emergency response services to any non-English speaking caller.

## GENERAL DESCRIPTION OF SYSTEM CAPABILITIES

1. System Description The Enterprise Land Mobile Radio (E-LMR) Slice system includes Radio Frequency (RF) and data network infrastructure. This includes the Radio Frequency Sub-System (RFSS), RF repeater sites (towers, shelters, power and grounding, and environmental control), transmission lines, transmission systems, encryption key management systems, information/network management systems, physical security, information security (hardware and software), radio-telephone interconnect capability, and log recording equipment. It is envisioned to be a commercial off-the-shelf (COTS) equipment integration without a hardware or software developmental stage.
  - 1.1. E-LMR Slice is that portion of the E-LMR system that will support First Responder (fire, rescue, ambulance and Provost Marshall) base, post and station (BPS) daily, emergency, and All-Hazards operations in public, private venture (PPV) housing areas and main population areas as well as the access to these areas.
  - 1.2. The E-LMR Slice Statement of Need (SON), the parent document to this enclosure, and the Marine Requirements Oversight Council Decision Memorandum 20-2010 re-set the E-LMR acquisition effort to be centered on the Emergency Management Command and Coordination (EMC2) Consolidated Emergency Response System (CERS) and E-LMR Slice. The following paragraphs are all E-LMR Slice related.
2. System of Systems (SoS) The Marine Corps' supporting establishment communications capabilities consist of systems that incorporate wired and wireless technologies. Though not considered part of a family of systems, the current and future telecommunications infrastructure will provide the wired means to communicate and support elements of E-LMR Slice communications. Specifically, the telecommunications infrastructure will support the bandwidth requirements for transmitting voice, video, and data throughout the E-LMR Slice campus infrastructure. As part of the larger BPS communications system, the E-LMR Slice infrastructure (RF repeater sites and RFSS sites) and trunked radios/Subscriber Units (SUs) (portable, mobile and BPS station) capabilities will provide the means for transmitting and receiving wireless communication between users (i.e. First Responder community,

which, from this point forward, shall be known as E-LMR Slice subscribers).

3. Concept of Operations E-LMR Slice is envisioned as a tiered system at the BPS and Regional levels. Infrastructure (i.e. RF repeater site management, monitoring and control activities) and E-LMR Slice SUs establish the foundation of the BPS level E-LMR Slice network. This is where frontline CERS, BPS Emergency Operations Center (EOC), and airfield fire, crash and rescue operations are conducted to support First Responder (fire, rescue, ambulance and Provost Marshall) BPS daily, emergency, and All-Hazards operations associated with terrorist/intentional attacks, natural disasters, and accidental/unintentional emergencies. At this level, E-LMR Slice will facilitate RF repeater site management/monitoring, subscriber services, radio dispatch functions, and control of utility activities.

3.1. Command and coordination activities for the E-LMR Slice BPS-level operations are associated with normal regular and normal incident operations. During these operations, E-LMR Slice will support its subscribers and mission critical services. Mission critical services are defined as CERS, airfield fire, crash and rescue operations, safety of life and preservation of property events, and security activities for high value security areas (i.e., ammunition supply points, armories, etc.).

3.2. The Regional level for E-LMR Slice consists of the following nodes: Marine Corps Installations (MCI) Regional Control Centers (RCC), Marine Air Ground Task Force Information Technology Support Centers (MITSC), and Regional Network Operations and Security Centers (RNOSC). At this level, the MCIs independently serve as the command and coordination authority. The MCIs, supported by their MITSC, will provide core E-LMR Slice RFSS capability to each of their subordinate BPSs E-LMR Slice RF repeater sites. The Regional command and coordination authority will also provide oversight of the communications network connectivity and recovery support (i.e. key management, system level management, and infrastructure restoration services). Each MCI is a subscriber of E-LMR Slice services. The MCIs which have been identified to receive E-LMR Slice are MCI National Capital Region (NCR), MCI East, MCI West, MCI Mid-Pacific (MIDPAC) and MCI Western Pacific (WESTPAC).

3.3. Marine Corps emergency services First Responders may be required to conduct off BPS, multi-jurisdictional first response operations with federal, state, tribal and local governments/agencies within United States and Possessions (US&P) as well as territories and host nations (non-US&P) in accordance with the established distance/range requirements found in local standard operating procedures (SOPs), Memorandums of Agreement (MOA), Memoranda of Understanding (MOU), service in kind (SIK) agreements and status of forces agreements (SOFA). When a USMC ground, maritime, or aviation incident occurs on BPS or off BPS, the call (wired or wireless) will be sent to a CERS Dispatch/Public Safety Answering Point (PSAP). CERS is responsible for receiving emergency calls and dispatching E-LMR Slice subscribers to the scene.

3.4. The Marine Corps' E-LMR Slice user will be equipped with a Marine Corps approved sub-set APCO P25 Statement of Requirement (from this point forward, will be known as MS P25) SU that operates in a multi-band environment.

3.5. The airfield operations node conducts operational movement of all personnel and equipment throughout the airfield and coordinates with the Air Traffic Control (ATC) tower during emergency air and emergency ground movement. During crisis mode of operation such as an airfield mishap, a direct E-LMR Slice communications link from the ATC to Aircraft Rescue Fire Fighting, Regional Control Facility, Provost Marshal's Office (PMO)/Marine Corps Police Department, airfield operations, and dispatch is required.

#### 4. Key Performance Parameters (KPPs)

4.1. It has been determined that KPPs for Survivability and Force Protection are not applicable to E-LMR Slice; therefore, they are not included in this document.

Rationale: As a communications system in support of BPS and first responder operations, E-LMR Slice represents mostly small, portable SUs and the supporting infrastructure such as radio towers in support of the radio frequency network. E-LMR Slice is not a manned system and will not be operated in a hostile environment. Additionally, E-LMR Slice is not designed to provide personnel protection from hostile threats.

4.2. The System Training KPP has been determined to be not applicable since the E-LMR capability needs shall be met by commercial off the shelf equipment.

4.3. Net-Ready KPP

The system must support Net-Centric military operations. The system must be able to enter into and be managed on the network, and exchange data in a secure manner to enhance mission effectiveness. The system must continuously provide survivable, interoperable, secure, and operationally effective information exchanges to enable a Net-Centric (NC) military capability.

Rationale: E-LMR Slice subscribers and infrastructure may operate as part of an All-Hazards Task Force. E-LMR Slice must be capable of communicating vertically and horizontally, from alert through deployment, employment, re-deployment and clean-up. The E-LMR Slice capability is a Mission Assurance Category (MAC) III sensitive system.

4.4. Sustainment KPP

The E-LMR Slice system must be operationally available to support installation operations with limited downtime. Uptime is that time when the system is considered to be ready for use and is either operating or in an administratively commanded standby or off state.

4.4.1. Any of the following events or conditions constitutes system downtime (i.e., operational mission failure) at a BPS level.

4.4.1.1. Any fault (or maintenance action) that reduces the trunked frequency availability provided by any repeater site to less than 90%.

4.4.1.2. Any fault (or maintenance action) that changes the Grade of Service (GoS) provided to any SU requesting access to a trunked radio channel resource to 0.03 erlang or greater (Note).

4.4.1.3. Any fault (or maintenance action) that results in the inability to fully perform the following functions:

- 4.4.1.3.1. Proper SU affiliation at any RF repeater site.
- 4.4.1.3.2. Voice call or data routing between two or more RF repeater sites.
- 4.4.1.3.3. Basic radio dispatch operations on a single dispatch center console.

*Note: GoS is the probability that a user's request via a SU for access to a trunked radio channel resource is blocked measured in Erlang. For this requirement we are using Erlang B where the probability (Pb) that a new call arriving at a repeater is rejected because all channels are busy:  $B(E, m)$  when E Erlang of traffic are offered to m trunks (communication channels).*

*Where:*

- (a) Pb is the probability of blocking*
- (b) m is the number of resources such as servers or circuits in a group*
- (c)  $E = \lambda h$  is the total amount of traffic offered in erlangs.*

- 4.4.2. Down time at a Regional level (i.e., operational mission failure) is defined as failure of key management operations on at least one key management facility (KMF) ES.

Rationale: First Responders require uninterrupted communications to perform their mission of protecting life and property.

#### 4.4.3. Operational Availability

The E-LMR Slice system shall exhibit a single BPS system operational availability (Ao) of 99.7 percent (Threshold) and 99.99 percent (Objective). Availability shall be computed using the following formula:  $Ao = \text{Uptime} / (\text{Uptime} + \text{Downtime})$  (Note)

*Note: For purposes of computing Ao:*

- (a) USMC-provided Local Area Network (LAN), Base Area Network (BAN) or Wide Area Network (WAN) shall be considered to have 100% availability*
- (b) E-LMR Slice system shall be considered to consist of multiple RFSSs, interconnected ESs and RF repeater sites*
- (c) Failure of SUs shall not be considered as system downtime.*

## 1.1. Interoperability KPP

The system will provide an integrated systems interface between multi jurisdictional agencies that is compliant with National Telecommunications and Information Administration (NTIA), Federal Communications Commission (FCC) Part 90, APCO P25, applicable National Institute of Standards and Technology (NIST) standards, and host nation laws and regulations.

Rationale: Compliance with NTIA, FCC, SOFA, international laws and regulations, and MS P25 standards is mandated. Additionally, First Responders require seamless communications with external government and non-government organizations in order to provide mutual aid support in the event of crisis situations and emergencies associated with terrorist acts, natural disasters, and accidental/unintentional emergencies.

## 2. Key System Attributes (KSAs)

### 2.1. Material Reliability

The E-LMR Slice system as a whole must be capable of uninterrupted operation within a specific time period. Specific attributes may apply to hardware and software independently. Backup power sources such as Uninterruptable Power Supplies (UPS) and generators may be used to help mitigate downtime and failures.

#### 2.1.1. Mean Time Between Operational Mission Failure (MTBOMF)

Operational mission failures are those failures that occur and prevent the system from performing its intended mission. MTBOMF shall be computed using the following formula:

$$\text{MTBOMF} = \frac{\text{Mission Time}}{\text{Total Number of Operational Mission Failures}}$$

For both software and hardware: (Threshold  $\geq$  2,160 hours; Objective  $\geq$  5,760 hours).

#### 2.1.2. Mean Corrective Maintenance Time for Operational Mission Failure (MCMTOMF)

This includes time for maintenance preparation, fault detection and isolation, on-board parts procurement, fault correction, adjustments and calibration, as well as operational test. It does not include off-platform logistics delay time. MCMTOMF is computed using the following formula:

$$\text{MCMTOMF} = \frac{\text{Total Elapsed Time to Correct Operational Mission Failures}}{\text{Total Number of Operational Mission Failures}}$$

For Software: (Threshold <= 45 minutes; Objective = 10 minutes).

For Hardware: (Threshold = 3 hours; Objective = 1 hour).

#### 4.4.4. Mean Logistics Delay Time (MLDT)

For the E-LMR APCO P25 infrastructure (minus subscriber devices) to include a BPS or Regional system:  
(Threshold = 18 hours; Objective = 8 hours).

#### 4.4.5. For non-APCO P25 related equipment (i.e. towers, shelters, environmental control units, secondary power): (Threshold = 30 days; Objective = 7 days).

Rationale: First Responders require uninterrupted communications to perform their mission of protecting life and property.

#### 4.5. RF Coverage Range

E-LMR SUs and fixed terrestrial networked stations shall be able to transmit and receive in the required frequency ranges with 95% RF coverage for PPV housing areas and main population areas and those access routes to the PPV.  
(Threshold = 95%; Objective = 100%).

Rationale: BPS E-LMR infrastructure must be able to provide RF coverage in accordance with E-LMR Slice.

#### 4.6. Power Generation Redundancy

##### 4.6.1. Infrastructure

Redundant infrastructure power systems which support RF sites and RFSS's (e.g. in-line UPS, generators and solar) must be able to provide continuous runtime

without re-supply or service at peak operating capacity.  
(Threshold = 72 hours; Objective = 100 hours).

Rationale: E-LMR requires uninterrupted power to support communications.

#### 4.6.2. Portable SU Battery Power

Portable radio SUs require a reliable duty cycle (%TX /%RV /% Stand-by) and battery life. (Threshold = 8 hrs (5 /5 /90) at -20°C to +60°C; Objective = 12 hrs (10 /10 /80 at -20°C to +60°C) (Note).

Rationale: Portable SUs require a reliable duty cycle and battery life.

Note: Temperature T and O based on MIL-STD-810F.

#### 4.7. System Security

E-LMR Slice System Security shall consist of network/information system security, radio subscriber security and site specific facilities security. E-LMR shall comply with System Security related DOD, NIST and APCO P25 standards.

##### 4.7.1. Network/Information System Security:

Shall consist of the defense, management, Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) compliance and network administration of the E-LMR Slice infrastructure. The E-LMR system shall use AES 256 encryption and must comply with the FIPS 197 standards. The E-LMR Slice capability is a MAC III, Sensitive system. (Threshold = Objective)

##### 4.7.2. Radio Subscriber Security:

Upon initial procurement, the E-LMR SUs shall provide current FIPS capability and meet existing operational commercial grade encryption requirements (i.e. DES and AES standards). During life of the Radio Subscriber; the security capability is upgradeable w/o hardware replacement. (Threshold = Current FIPS 140-2; Objective = Maintaining pace with FIPS Standard)

#### 4.7.3. Physical Security

E-LMR Slice facilities shall meet the guidelines set forth in MIL-HNDBK-1013 1A/MAC III (MCO 8500) for System Security Level (SSL) D (Command, Control and Communications Facilities). This includes but is not limited to appropriate lighting, security cameras, controlled access points and fenced perimeters around E-LMR Slice related facilities. (Threshold = SSL D; Objective = SSL C)

Rationale: E-LMR Slice capability must provide flexibility to communicate via a non-secure transmission path (i.e. mutual aid) as well as provide transmission security that shall deny unauthorized access to information.

#### 4.8. Multi-Band SUs

##### 4.8.1. SU Modes of Operation

All E-LMR Slice SUs shall have the capability to support multiple channels in either conventional or trunked operation. (Threshold = Multi-band conventional and trunked; Objective = Multi-band conventional and trunked video)

Rationale: Adequate SU modes of operation shall provide E-LMR Slice subscribers the flexibility required to communicate without reprogramming the SUs.

##### 4.8.2. Channel Scanning

All E-LMR Slice SUs shall be capable of scanning available channels. (Threshold = 16 channels cross band; Objective = 32 channels cross band)

Rationale: In operational situations the E-LMR Slice subscriber must be able to scan across channels for activity while not interfering with the subscriber's mission.

##### 4.8.3. Position Location Information (PLI)

The E-LMR Slice SU, and mobile SUs shall be capable of transmitting PLI data (Threshold = Global Position System (GPS); Objective = GPS with Selective Availability Anti-Spoofing Module (SAASM) and Receiver Autonomous Integrity Monitoring (RAIM) capable).

Rationale: PLI significantly contributes to situational awareness and the decision making process.

#### 4.8.4. Spectrum

The SU shall support secure digital and analog communications across the U.S. National Table of Frequency Allocations for VHF, UHF, 700 MHz and 800 MHz public safety frequency bands or the equivalent host nation allocations. This capability should be provided in a single subscriber device. For further clarification the following paragraphs pertain (as directed by the Deputy Secretary of Defense Memorandum "policy for Land Mobile Radio (LMR) Systems" dtd August 2001):

4.8.4.1. Compliance with the NTIA and DoD United States & Possessions mandate to transition to narrowband operations (12.5 KHz) on VHF 162-174 MHz by January 1, 2005; VHF 138-150.8 MHz, 380-399.8875 MHz and UHF 406.1-420 MHz by January 1, 2008.

4.8.4.2. Conformance with the Association of Public Safety Communications Officer's Project 25 Standards.

4.8.4.3. Incorporation of an interoperability solution with other federal, state, or local emergencies without violating current rules and regulations concerning the national spectrum management policy.

(Threshold = Authorized E-LMR spectrum at each BPS);  
Objective = All E-LMR VHF and UHF frequency bands)

Rationale: Meets the NRF, NIMS and APCO P25 other associated interoperability missions with a single SU.

#### 4.8.5. Emergency Response Recall

The E-LMR portable SU shall be capable of receiving an audible alert that provides notification to the user. Initiation of response shall be conducted at a dispatch console when an emergency response situation arises, regardless of location. (Threshold = Audible; Objective = Audible and text)

Rationale: Paging shall enable E-LMR Slice subscribers to receive texted form notifications for emergency

recall thereby minimizing the communications traffic load on the network.

4.8.6. Over-The-Air Re-keying (OTAR) and Over-The-Air - Programming (OTAP).

4.8.6.1. E-LMR Slice base station, mobile or portable SU shall be capable of OTAR functionality that supports the generation and distribution of encryption keys across E-LMR Slice network. This includes over the air re-keying to all mobile, portable, and base stations. Additionally, the key management facility (KMF) must be capable of distributing keys to other KMF's. (Threshold = Regional; Objective = Regional and BPS)

4.8.6.2. The system shall be capable of remotely apply software changes to any authorized BPS station, mobile or portable SU via the Common Air Interface. This feature applies to both trunking and conventional E-LMR systems. (Threshold = Regional; Objective = Regional and BPS)

Rationale: System reprogramming can be a time consuming task. A flexible E-LMR Slice system enables rapid re-configuration to meet varying mission needs, enabling E-LMR Slice managers to remotely assign priority users access when the system is busy. OTAR and OTAP shall provide effective management of E-LMR Slice encryption and operational programming and reprogramming.

4.9. Repeater Site Building and Tower Growth

4.9.1. Repeater site buildings shall be built to accommodate growth in subscribers and capabilities from initial base line capacity requirements, including (but not limited to) power, Heating, Ventilation and Air Conditioning, backhaul (microwave, copper, fiber), solar, rack space, etc. (Threshold = 50 percent capability growth; Objective = 100 percent capability growth)

4.9.2. Towers shall be built to accommodate growth in subscribers and capabilities from initial base line capacity requirements, including (but not limited to)

antennas and associated cable. (Threshold = 50 percent growth; Objective = 100 percent growth)

Rationale: To accommodate site and RF tower expansion of future subscriber and capability.

#### 4.10. Logical and Physical Transport Network Diversity

Information Transport shall leverage logical and physical diversity throughout E-LMR Slice RFSS network infrastructure. Information Transport shall provide logical or physical diversity between Regional RFSS to subordinate E-LMR Slice RF repeater sites. (Threshold = Logical diversity shall be available on 100% of all transport network links; Objective = Physical diversity shall be available on 100% of all transport network links).

Rationale: To reduce the effects of network outages, logical and physical diversity provides alternate transmission paths for the information to transgress. This shall ensure that there is no single point of failure between E-LMR Slice RF site (within BPS) and its Regional RFSS node connectivity or between two Regional RFSS's. Logical diversity is defined as two circuits utilizing the same (one) physical path from one service delivery node. Physical diversity is defined as two circuits over two physically separated paths from two separate service delivery nodes.

#### 4.11. Remotely Configure Workstation Clients

BPS and Regional E-LMR Slice Managers shall be able to remotely reconfigure the Operational Workstation Clients. (Threshold = ability for any MCI (Region) to reconfigure any BPS Operational Workstation Clients; Objective = ability for any E-LMR Slice BPS to reconfigure another BPS's operational workstation).

Rationale: Provide continuity of operations for dispatch, RCF, airfield recovery and EOCs/RCCs.

#### 4.12. Voice Recorder

A voice recording capability which logs and records selected radio communications that is permissions based (privacy act requirement). (Threshold = 100% of First

Responder talk groups over a 30-day period. Objective = 100% of First Responder talk groups, over a 365-day period).

Rationale: Recording of communications is required for tracking trends of various events, call processing, lessons learned, training, after action reports, and for increased clarity during investigations.

#### 4.13. Network Management

The E-LMR system shall include network management capabilities

4.13.1. The system shall have real-time performance monitoring of the Regional, BPS, and Local Area Transport Boundaries to include circuits with a visual display of the different levels of the network and associated equipment. (Threshold = Objective)

4.13.2. The system shall have real-time fault identification of the affected component or equipment at the master sites and repeater sites. Faults shall be displayed via visual alarms. (Threshold = Available to Regional managers; Objective = Available to Regional and BPS managers)

4.13.3. The system shall capture and log network outage events (display items: date, time, event, severity code, downtime, status, mitigation comment). (Threshold = Available to Regional managers; Objective = Available to Regional and BPS managers)

4.13.4. Network management clients shall be designed to configure different levels of access. (Threshold = Available to Regional managers; Objective = Available to Regional and BPS managers)

4.13.5. Network Management Clients shall be capable of password protection and authentication. (Threshold = User name and password logins; Objective = PKI/CAC enabled access)

4.13.6. The Network Management software function shall be capable of providing statistical and analytical reports including but not limited to: number of calls by user, region, site, talk-groups; number of busies; call usage by day, week, month, year; call usage based on time by hour of day, system historical reports and user-defined reports. (Threshold = Available to Regional managers; Objective = Available to Regional and BPS managers)

Rationale: Network Management capabilities are necessary to quickly identify, respond, and mitigate network outages. These capabilities allow E-LMR Slice system managers the ability to ensure our critical first responder communication network is always available with minimum down time.

#### 4.14. APCO P25 Standards Compliance

The E-LMR Slice system and all subscriber devices shall be APCO P25 compliant. (Threshold = USMC E-LMR APCO P25 subset; Objective = Full APCO P25 SOR compliance)

Rationale: APCO P25 is a suite of standards that can be purchased individually; it is paramount that all appropriate standards be procured to ensure interoperability with partners.

#### 4.15. Chemical, Biological, Radiological and Nuclear (CBRN) Survivable

First responder and mission critical subscribers are required to support operations in contaminated environments. Therefore, E-LMR Slice equipment must be capable of operating in CBRN environments in accordance with DODI 3150.09 CBRN Survivability. E-LMR Slice subscribers shall be required to perform routine tasks such as operating equipment or replacing batteries while wearing PPE Levels (A, B, C and D) and all Mission Oriented Protective Posture (MOPP) levels in accordance with DoD 6055.17. Hence, the portion of radio assets intended for first responders and mission critical users should be fielded with a capability that allows the user to communicate through appropriate protective gear without breaking the seal of protective masks or MOPP clothing and shall be able to withstand operational decontamination

procedures. (Threshold = MOPP Levels 1 and 2; Objective = MOPP Levels 3 and 4)

Rationale: DODI 3150.09 requires mission critical / CBRN mission critical capabilities to be CBRN survivable.

## 5. Additional Attributes

In addition to the above stated KPPs and KSAs, E-LMR Slice command and coordination network services must meet the following attributes and compliance requirements.

### 5.1. Remote Disable

5.1.1. The E-LMR Slice portable and mobile SU shall be capable of being disabled remotely in the event of a security breach, compromise or lost unit. (Threshold = Available to Regional managers; Objective = Available to Regional and BPS managers)

Rationale: The means of identifying or excluding (locking out) individual E-LMR units from network operations is critical to maintaining network security when the physical security of an individual SU becomes compromised.

### 5.2. In-Building RF Coverage

#### 5.2.1. In Building Operations

E-LMR Slice shall be capable of supporting in-building operations that require radio communications to the E-LMR communications infrastructure. (Threshold = Transportable solution for priority 1 structures; Objective = Permanent solution for priority 1 structures and transportable solution for priority 2 structures).

Rationale: In building coverage is required to support first responders in their performance of All-Hazards missions.

#### 5.2.2. Portable/Mobile Ancillary Devices

The E-LMR Slice user community requires ancillary devices with each SU tailored upon the user unique mission and job

tasks. These devices and capabilities are required to provide a form, fit, and function based upon independent human factors of the user's operational environment. Pre-E-LMR Slice integration surveys shall include user's community input of quantities of these devices to be acquired. These ancillary devices include but are not limited to; noise canceling headsets for high noise environments, hands free devices (i.e. throat and boom microphone), paddle microphone, over-the-shoulder microphone, compatibility with Self-Contained Breathing Apparatus, Enhanced Vehicular Chargers for portable subscribers, compatible with waterproof microphones.

6. Modernization Schedule. E-LMR modernization schedule is depicted in Table 1.

FY	Installation	Priority	MARFOR
12	MCBJ (All Okinawa Camps)	1	MARFORPAC
12	Camp Lejeune/New River	2	MARFORCOM
12	MCB Quantico/MCAF	3	MCNCRC/MARFORCOM
12	MCAS Yuma/Regional Hub	4	MARFORPAC
13	MCAS Cherry Point	5	MARFORCOM
13	MCAS Beaufort	6	MARFORCOM
13	MCRD Parris Island	7	MCCDC
13	MCMWTC Bridgeport	8	MARFORPAC
14	CAMPEN (MCB/MCAS)	9	MARFORPAC
14	MCAGCC 29 Palms	10	MARFORPAC
14	MCRD San Diego	11	MCCDC
14	MCLB Albany	12	MARFORCOM
15	MCAS Iwakuni	13	MARFORPAC
15	MCAS Miramar	14	MARFORPAC
15	MCLB Barstow	15	MARFORPAC
16	Blount Island	16	MARFORCOM
16	Marine Corps BPS Hawaii	17	MARFORPAC
16	Guam (DPRI)	18	MARFORPAC
16	Camp Mujuk	19	MARFORPAC
N/A	HH/MBW	20	MCNCR

Table 1: MROC ELMR Modernization Schedule Execution Matrix BPS-by BPS Prioritization

## 7. Other Schedule Considerations

- 7.1. Initial Operational Capability (IOC). IOC for E-LMR Slice shall be achieved when the following exists:
- 7.1.1. Two RF repeater sites located at separate BPSs are connected to the Regional RFSS.
  - 7.1.2. Regional subscriber traffic is processed with a proven roaming capability at both BPS locations.
  - 7.1.3. Both BPSs attain the ability to communicate with mutual interoperability talk group assignments.
  - 7.1.4. The Regional RFSS control centers are appropriately staffed and operating with specified roles and responsibilities.

IOC is projected for the end of FY12.

b. Full Operational Capability (FOC). FOC shall be achieved when E-LMR Slice telecommunications infrastructure upgrades have fully incorporated at each of the following: MCI National Capital Region (NCR), MCI East, MCI West, MCI MIDPAC, and MCI WESTPAC BPS. The projected FOC for E-LMR Slice is in FY 17.