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U.S. DEPARTMENT OF ENERGY
STRATEGIC PETROLEUM RESERVE
DM Petroleum Operations Company

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TASK No: MS-OM-1239

STRATEGIC PETROLEUM RESERVE

RADIO COMMUNICATIONS NETWORK

SUMMARY OF WORK

12/18/2013
SUMMARY OF WORK

PART 1 PURPOSE AND SCOPE

The subcontractor shall provide all tools, equipment, software, supplies, transportation, facilities, labor and supervision necessary to perform a comprehensive analysis of the existing SPR Radio Communication Network (See Appendix A) and provide two State-of-the-Art recommendations based on "Best Value" for replacement. The recommendations provided shall support all requirements as stated in this Summary of Work and maintain compliance with DOE Orders. The initial analysis of the existing Radio Communication Network shall include but not be limited to all aspects of wireline and wireless radio communication systems (i.e.. telephone system, Wide Area Network, Land Mobile Radio (LMR), fixed, mobile, and handheld satellite systems, smart wireless devices, mass notification system, etc.) used at all SPR sites and the New Orleans Project Management Office (PMO). Wireless Communication Network recommendations shall provide efficient, effective, and reliable communications to support mission critical requirements during normal and emergency situations. Consideration shall include but not be limited to evaluating all new wireless and wireline technologies such as wireless mesh technologies, MPLS Networks, satellite communications, etc.... The recommendations will consider compatibility with future upgrades of communications systems, thus avoiding obsolescence problems. The engineering design shall consider any economies and efficiencies gained through the potential combination of existing SPR communications components into a holistic approach.

1.01 DEFINITIONS

A. Comprehensive Analysis

Comprehensive Analysis is defined as the effort required by the sub-contractor to carefully examine all aspects of the existing Radio Communications Network to obtain a thorough understanding of how mission critical requirement are currently satisfied.

B. Wireless Communications Network

Wireless Communications Network is defined as to include all aspects of wireline and wireless communication systems (i.e.. telephone system, Wide Area Network, Land Mobile Radio (LMR), fixed, mobile, and handheld satellite systems, smart wireless devices, mass notification system, etc.) used at all SPR sites and the New Orleans Project Management Office (PMO). Consideration shall be given to include all wireless and wireline devices available when determining proposed recommendations.

C. Requirements

Requirements is defined as the effort required to ensure that the wireless communication systems recommended complies with DOE Orders, SPR Requirements as stated in the Graded Security Policy (GSP), National Telecommunication Information and Administration Manual (NTIA), DOE Radio Procedures Guide, International Telecommunication Union (ITU) Radio Regulations, and Telecommunications Industry Association (TIA)

D. Recommendation

Recommendation is defined as the effort required recommending a State-of-the-Art Wireless Communication Network based on "Best Value" that includes supporting documentation for all systems included in the proposed networks. This documentation shall include but no be limited to make, model, and quantity of all fixed and subscriber equipment proposed, associated services required, maintenance, propagation surveys, engineering drawings displaying equipment layouts and integration, budgetary costs for all equipment, services, and maintenance, and Life Cycle Cost Analysis of all systems recommended.

1.02 LOCATION

Listed below are the 5 SPR site and off-site locations where radio communications are required.

SPR SITES	OFF-SITE	LOCATIONS
Project Management Office		850 S. Clearview Pkwy. Elmwood Complex New Orleans, La. 70123
Bayou Choctaw	Brine Disposal Wells	Hwy. 1148 (Off La. 1) Plaquemine, La. 70764
West Hackberry	Raw Water Intake	Hwy 390 (Off Hwy. 27) Hackberry, La. 70645
Big Hill	Raw Water	South Wilbur Road Winnie, TX. 77665
Bryan Mound	Seaway Dock Texas City, TX	1900 County Road 242A Freeport, TX. 77541

ADDITIONAL OFF-SITE AREAS WHERE COVERAGE IS REQUIRED:

- Boat launches and waterways used by emergency responders for spill clean-up

- Off-site Staging Areas (Along pipelines used by the SPR, surrounding waterways near pipelines, etc.)

- Traffic Control Points at Off-site Staging Areas (Security)

- Off-site Alternate Emergency Operation Centers (EOC)

- Along pipelines and valve stations that are the responsibility of the SPR for spill response

- Continuous wireless communications while outside of the established site coverage area during evacuation convoys and other escorts

1.03 WORK INCLUDED

The sub-contractor shall perform a comprehensive analysis of all aspects of the existing Radio Communications Network at each site and the New Orleans Office based on the mission critical requirements which this network supports. The sub-contractor shall then provide a minimum of two proposed recommendations based on "Best Value" to replace the existing Radio Communications Network. The recommendations shall be based on State-of-the-Art technology and maintain compliance with all mission critical requirements as stated in this Summary of Work. The subcontractor shall provide detailed documentation, drawings, and an equipment list representing equipment quantities, nomenclature, capabilities and propagation surveys indicating signal levels of all wireless and wireline systems recommended. Each recommendation shall include budgetary costs relating to equipment, service, and maintenance. A Life Cycle cost analysis shall be included for each recommendation. The proposed recommendations shall be based on the DOE and SPR Requirements as stated in section "A" and "B" below:

A. DOE Requirements

1. DOE Order 422.1; Attachment 2 d: Program Requirement Communications

2. DOE Order 150.1; Chapter II: Communication Requirements

3. DOE Order 151.1; Chapter VIII: Communication Requirements

4. DOE Order 473.3; Attachment 2. Section C.3b: Equipment

B. SPR Requirements

Handheld and Vehicular Wireless Requirements

1. All LMR radio devices if recommended are required to operate using Project 25 protocol for digital operation and communicate One-to-All.
2. All wireless devices are required to operate for at least 8 hours at an 80-10-10 ratio.
3. All wireless devices are required to communicate from inside and outside of buildings.
4. A minimum of four channels of communication are required at each site location: Operations, Security (see 12, 13 below), Maintenance, and Pipeline. An additional channel is designated for Degas at the West Hackberry site.
5. Operations and Maintenance (O&M) wireless devices are required to communicate on all channels except for Security.
6. Security wireless devices are required to communicate on all channels.
7. All SPR wireless devices are required to communicate at any SPR site in accordance with 5 and 6 above to provide emergency support.
8. All handheld and vehicular wireless devices are required to operate direct between devices on dedicated channels if the network fails.
9. All SPR handheld wireless devices are required to be intrinsically safe and meet Military 810 Specs (Ruggedized)
10. Security wireless devices require AES encryption, duress signaling, and man-down operation. Security does not require GPS locaters inside handheld and vehicular wireless devices however; consideration should be given to the implementation of this feature.

11. Security wireless devices require frequent Encryption Key Change-Over using Over-the-Air-Rekeying (OTAR) via a centralized Key Management Facility.
12. Security requires a Primary and Alternate encrypted channel for wireless communication. The current alternate encrypted channel used by Security shares the channel 4 Mixed Mode (digital/analogue) Pipeline repeater with Pipeline personnel.
13. Consideration should be given to provide Security with an alternate wireless communications channel in a different band to support communications if the Security channels are jammed by adversary action.
14. Emergency response personnel (select O&M employees) are required to communicate while in transit to an off-site location, within their response group at the off-site event location, and also back to the Control Room Operator at the respective SPR site. Security personnel share the same responsibilities since they deploy with emergency response personnel.

Control Room Operator (CRO) and Central Alarm System (CAS) Dispatcher Requirements

1. An emergency mass notification system is required to notify all employees of events that may impact them such as: shelter in place, evacuation, weather, safety concerns, etc...
2. All site channels including Mutual Aid and Local Law Enforcement channels are required to be monitored at all times by the CRO and CAS Dispatcher.
3. CRO and CAS Dispatcher are required to have transmit capability on all site channels including Mutual Aid and Local Law Enforcement
4. All SPR site wireless channels (Operations, Security, Maintenance, and Pipeline) are required to be recorded at all times and retain a minimum 48 hour memory for reply.
5. Emergency response personnel, while working on-site or off-site locations are required to have access to an interoperability channel of direct communications with outside response organizations (Wireless Interoperability Patch).
6. CAS Dispatcher is required to receive a unique duress or man-down audible and displayed alarm identifying security police officers in trouble.
7. CRO and CAS Dispatcher require redundant or backup ac power source on all networks if the primary power fails.

8. During emergency situations, the Operations Control Center (OCC) in NOLA is required to have voice communications capability with each site as required over the encrypted security channel.

Emergency Response

1. Incident Command at the event site requires wireless communications with all SPR and outside agency emergency response personnel in addition to Internet access to the SPR Business Network and Web EOC.
2. Close to real-time overflight aerial images of oil spills saved in .jpg format are required to be downloaded from aircraft and uploaded to Web EOC.
3. The SPR Emergency Response Team is required to use wireless devices for critical communications during Hazmat and Fire Suppression incidents. Wireless devices must be waterproof and allow uninterrupted usage while wearing chemically resistant fully encapsulated suits with self contained breathing apparatus (SCBA) and also when wearing proximity/bunker firefighting gear.

COOP/Hurricane Deployment

1. An emergency mass notification system is required to notify all employees of evacuation proceedings, employee accountability, status information during the deployment period, and return to work information.
2. EOC resources are required to provide communications to the outside world from any unknown remote location (This requirement is currently satisfied by using the DOE Emergency Communications Network (ECN); Government network managed and operated out of HQ)
3. Voice communication is required for a team of 25 executives while traveling in an environmentally disrupted area to an emergency deployment location to contact personnel via the public telephone and cellular network.
4. Video teleconferencing capability is required from remote locations back to SPR sites and HQ.
5. Data communication is required for a team of 20 personnel to connect to the Internet, Web EOC, and the SPR Business Network.
6. Voice communication is required for a team of 20 personnel to contact others via the public telephone and cellular network while operating out of the EOC.

C. Current SPR Handheld Portable Device Inventory

1. See Appendix B

D. Current SPR Vehicular or Mobile Device Inventory

1. See Appendix C

E. SPR Site Points of Contact

NEW ORLEANS	Charles Lorentz	(504) 734-4583
BAYOU CHOCTAW	Mikelyn Vaughn	(225) 692-6900 EXT 280
WEST HACKBERRY	Bob Lyles	(337) 558-3200 EXT 220
BIG HILL	Estelle Roane	(409) 981-8200 EXT 280
BRYAN MOUND	Terry Akers	(979) 230-2200 EXT 280

1.04 WORK NOT INCLUDED

N/A

1.05 MATERIAL AND SERVICES FURNISHED BY THE GOVERNMENT

N/A

1.06 CONDITIONS AFFECTING THE WORK

A. The Subcontractor shall supply a draft copy of the final report for review and comment within 120 days of official Notice to Proceed. Comments and questions regarding the draft report will be supplied to the Subcontractor within 21 days of receipt of Draft Report. Subcontractor will then have an additional 45 days to submit completed Final Report, responding to all questions and comments in the Final Report.

B. The Subcontractor will supply, with bid, Submittal items 2.06.A and 2.06.B.

C. The Subcontractor will supply, with bid, a cost estimate with details for the proposed work.

D. The Subcontractor will supply, with bid, a proposed Schedule of Work, showing work breakdowns and milestones for the project.

E. The Subcontractor will supply the Final Report in Microsoft Word and PDF form. If spreadsheets or other programs are used to generate the report, the native files used to generate the report are also required.

PART 2 QUALITY ASSURANCE

2.01 MANUFACTURER'S QUALIFICATIONS

N/A

2.02 CONTRACTOR'S QUALIFICATIONS

N/A

2.04 FIELD QUALITY CONTROL

N/A

2.05 MINIMUM REQUIREMENTS

The Subcontractor shall have the capability and staffing qualified personnel to perform a comprehensive analysis of all SPR sites in a timely manner.

Subcontractor shall have employed on staff at least one telecommunications engineer that has a bachelor's degree in electrical engineering or have a minimum of 10 years experience working with similar contracts in scope and size and provide evidence of it. Subcontractor shall have resources readably available to evaluate the existing network and propose two optional network designs based on new systems or changes in existing communications systems to achieve greater economy, efficiency and eliminate obsolescence; recommend technical coordination of communication equipment including preparation of specifications and construction and maintenance standards; make evaluation studies; recommend coordinated use of facilities on a shared basis between SPR sites and make recommendations on equipment inventories.

The Subcontractor shall adhere to minimum quality requirements as outlined elsewhere in the contract documents.

2.06 SUBMITTALS

A. The Subcontractor shall provide Names and contact info from other contracts of work performed previously in scope and size. (Section 2.05)

B. The Subcontractor shall provide resumes of all team evaluators and consultants that will be evaluating or recommending proposed solutions. (Section 2.05)

C. The subcontractor shall provide a minimum of two proposed recommendations based on "Best Value" to replace the existing Radio Communications Network. (Section 1.03 WORK INCLUDED)

D. The subcontractor shall provide detailed documentation, drawings and an equipment list representing equipment nomenclature, quantities, capabilities and propagation surveys indicating signal levels of wireless systems recommended. (Section 1.03 WORK INCLUDED)

E. The subcontractor shall provide budgetary costs relating to equipment, service, and maintenance. (Section 1.03 WORK INCLUDED)

F. The subcontractor shall provide a Life Cycle cost analysis for each recommendation. (Section 1.03 WORK INCLUDED)

End of Section

APPENDIX A

STRATEGIC PETROLEUM RESERVE
RADIO COMMUNICATIONS PLAN

Publication Number AAA7005.3

(OUO Documentation Removed)

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END OF SECTION

ABBREVIATIONS AND ACRONYMS

AOL	Alternate Operating Location
CAS	Central Alarm Station
CCTV	Closed Circuit Television
COOP	Continuity of Operations
CRO	Control Room Operator
CSL	Command StarLite
DCS	Distributed Control System
ECN	Emergency Communications Network
ECV	Emergency Command Vehicle
ERT	Emergency Response Team
EMT	Emergency Management Team
ICPT	Incident Command Post Trailer
ICS	Incident Command Structure
KMF	Key Management Facility
MCT	Mobile Communications Trailer
MOU	Memorandum of Understanding
NNSA	National Nuclear Security Administration
NOC	Network Operations Center
NOLA	New Orleans, Louisiana
OTAR	Over-the-Air-Rekeying
PMIC	Project Management Information Center
SMTR	Subcontract Manager's Technical Representative
SPR	Strategic Petroleum Reserve
SPRO	Strategic Petroleum Reserve Office

EXECUTIVE SUMMARY

This document defines the Strategic Petroleum Reserve (SPR) Radio Communications Infrastructure, which outlines a comprehensive description of the configuration and functionality of all the components that compose the radio communications network and ensure mission essential requirements are satisfied.

1. PURPOSE

This document reflects and implements an effective radio communications operational plan in accordance with DOE Orders, the Department of Energy Radio Services Procedural Guide, and the National Telecommunications and Information Administration Manual (NTIA). This plan establishes and provides the Department of Energy (DOE) Strategic Petroleum Reserve an efficient, effective, and reliable radio communications infrastructure that satisfies requirements and supports the DOE mission under normal and emergency conditions.

2. SCOPE

The SPR Radio Communications Plan describes and identifies equipment architecture, network configuration, and the processes employed at all SPR facilities, which ensure operational effectiveness in the utilization of spectrum dependent resources.

3. OVERVIEW

The SPR Radio Communications Infrastructure provides intra-site radio communications utilizing frequencies in the Government-allocated VHF spectrum. There are four SPR locations, which currently operate using four half-duplex repeaters that support a combination of analogue/digital voice and data communications. Control stations and radio control consoles facilitate communications with the site Control Rooms and Central Alarm System (CAS). Field personnel use mobile and portable radios to communicate with the Control Room Operators and the CAS Dispatchers. Each of the four SPR sites utilize 190-foot radio towers with antennas strategically positioned ensuring radio coverage reliability to operate, maintain, and protect SPR assets.

Satellite and cellular telephones are used at each site and New Orleans Office in support of emergency situations impacting SPR resources. A commercially acquired contracted service has been established to support the SPR with a Web-Based Mass Notification System, which allows for emergency notification messaging to be generated in a moment's notice to all SPR personnel.

Incident Command Post Trailers (ICPT) at each SPR site location and a Mobile Communications Trailer (MCT) in New Orleans have been outfitted with essential radio and satellite communications equipment in support of emergency response situations.

4. COMMUNICATIONS SYSTEMS

The Department of Energy (DOE) Strategic Petroleum Reserve (SPR) employs a variety of communication systems which utilizes frequencies across various bands of the spectrum to ensure efficient, effective, and reliable radio communications satisfying DOE requirements for normal and emergency operations.

4.1 RADIOS

The SPR radio network infrastructure at each site is comprised of four 125 watt high powered repeaters which operate in the DOE VHF allocated band of frequencies set aside for government use. Two 50 watt VHF base station consolettes are used as control stations wire-lined to the CAS and the Operations Control Room consoles. Both control stations are multi-frequency and have the capability to operate on all site frequencies including talk-around or direct channels. Radio control consoles are used by the CAS Operator and the Operations Control Room Operators to control up to eight multi-frequency analogue/digital base stations and repeaters. The most predominant features of the console allow for simultaneous monitoring of all channels, digital display of Security Emergency Identification Codes, and Radio Crosspatch for Interoperability. 110 watt VHF mobile radios are installed in all SPR vehicles requiring communications on any of the 4 main radio channels in support of normal and emergency operations. Operations and Maintenance personnel use five watt VHF intrinsically safe analogue portable radios programmed with different Digital Private Line Coding at each site. Security uses five watt VHF intrinsically safe analogue/digital encrypted portable radios. These radios utilize a 64 bit, 16 hexadecimal Data Encryption Standard Output Feedback (DES-OFB) algorithm. All SPR mobile and portable radios are programmed to operate at any site on any channel with the exception of non-Security radios operating on the encrypted Security Channel.

4.1.1 Normal Operational Channels

Four half-duplex repeater channels support normal daily activities for Operations, Security, Maintenance, and Pipeline. Operations, Maintenance, and Pipeline channels operate in the Analogue Narrowband Mode and use Digital Private Line (DPL) coding. The Operations and Maintenance Channels mainly support on-site communications, however each net is designed for extended coverage well beyond the confines of the site perimeter. The Pipeline Channel has been designed to support long range communications along the distant route of the sites pipeline. The Security Channel operates in the Digital Narrowband Mode with DES-OFB encryption. The Security Channel, like Operations and Maintenance mainly supports on site communications, however, is also designed for extended coverage well beyond the confines of the site perimeter.

4.1.2 Emergency Operational Channels

The Pipeline Repeater Channel has been designated as the main emergency channel since it uses the highest antenna on the radio tower which yields the greatest coverage area, and during normal operations, has the lowest traffic usage. The Pipeline Repeater is programmed for mixed mode (Analogue and Digital) operation allowing Security encrypted traffic as well as analogue traffic to utilize the same channel during an emergency. The Maintenance Channel has been designated as the Interoperability Channel used for Mutual Aid communications during emergency situations. This channel is used to cross-patch radio traffic between emergency response organizations and site personnel.

4.1.3 Channel Plan

All SPR sites use the same frequencies for like channels designations (i.e. Operations, Maintenance, etc.) but utilize different DPL codes for analogue radios and different Network IDs (NIDs) for digital radios thus minimizing co-site interference. Other than the programming of analogue radios with the encrypted Security frequency, every SPR portable and mobile radio is programmed with all site frequencies, DPL codes and NIDs ensuring operation at any site on any channel allowing consistency of radios when relocated between sites. (See Attachment "A")

4.1.4 Interoperability

DOE O 473.3 Attachment 3, Section C, Chapter III; COMMUNICATIONS, ELECTRICAL POWER, AND LIGHTING, Section 1.b (4) states that "A mechanism must be established to ensure communications with LLEAs." In addition, the National Incident Management System (NIMS) identifies the requirements for a standardized framework for communications, information management, and information-sharing support at all levels of incident management.

The DOE Strategic Petroleum Reserve with the cooperation of local agencies shall ensure that effective, interoperable communications processes, procedures, and systems exist between such agencies. During emergency situations, the SPR shall ensure that information flows efficiently through a commonly accepted architecture. Effective information management enhances incident management and response by helping to ensure that decision making is more accurately articulated.

Each SPR site has established Memorandum of Understanding (MOU) with local agencies in support of emergency response agreements. The DOE Strategic Petroleum Reserve shall continue to enter into Mutual aid agreements and Emergency Management Assistance Compacts (EMACs) which provide the means for one jurisdiction to provide resources or other support to another jurisdiction during an incident.

4.2 TOWER SITES

4.2.1 Support Structure

190' radio communications towers have been erected at each of the four SPR sites. All towers are guided except for a 190' self-support located at Bayou Choctaw. Each tower is equipped with fall protection and meets OSHA standards. Every tower is in compliance with Federal Aviation Administration (FAA) regulations and requirements.

A mid-intensity strobe light is installed at the top of each tower for additional safety to low flying aircraft. Located at the base of each tower is a climate control building which houses all site repeaters and in some cases Mutual Aid base stations. All repeaters and base stations in the tower buildings are grounded for lightning protection and protected from power surges. The AC power supplied to each site tower building is backed up by the sites emergency generator. All site tower buildings are locked and protected via intrusion detection devices monitored by Security.

4.2.2 Antenna Configuration

All antennas, placement levels, and configurations on site towers have been strategically located to ensure optimum signal coverage for normal and emergency communications. Antennas are Direct Ground potential to suppress transient surges created by lightning from being coupled to the radio repeaters and base stations. All antenna transmission line is ½" heliax foam connected through Poly-Phasers for lightning protection and grounded in accordance with Motorola's R-56 Standard.

The Pipeline repeater antenna is a 6 db. gain omni-directional broad banded array located at the 200' AGL. The Security repeater antenna is a 3 db. gain omni-directional broad banded array located at the 175' AGL. The Maintenance repeater antenna is a 3 db. gain omni-directional broad banded array located at the 150' AGL. The Operations repeater antenna is a 3 db. gain omni-directional broad banded array located at the 125' AGL.

VHF Consolette Control Station antennas are unity gain, omni directional, and Direct Ground potential. They are mounted at the top of 50' poles located near the CAS. Antenna transmission line is LMR 400 coaxial cable and grounded in accordance with Motorola's R-56 Standard.

Mutual Aid radios are primarily located in the Tower Building at each site to best facilitate site operations. Antennas and cable type differ depending on radio type, frequency, and power output. All Mutual Aid radios are controllable from the Control Room and also the CAS radio control consoles.

4.3 SATELLITE COMMUNICATIONS

Several different types of satellite systems are used on the SPR that satisfy mission essential requirements providing communications support during outages and emergency situations.

4.3.1 BGAN InMarSat

A transportable Broadband Global Area Network (BGAN) Satellite Flyaway Package has been provided for each site's ICPT and the New Orleans MCT for communications support during emergency situations. The Flyaway package includes an InMarSat Satellite terminal integrated with a four port Ethernet switch, which provides multiple computer access to the Internet from remote locations. The terminal provides immediate connectivity supporting data, voice, and facsimile traffic via satellite utilizing space segment on demand supplied by a commercial satellite airtime provider. These Satellite Flyaway Packages have been designed to be used not only in the sites ICPT, but are also portable and are capable of operating in a vehicle using a 12 vdc cigarette lighter adapter.

4.3.2 Mobile Satellite Telephones

Commercially provided Mobile Satellite telephones are available for issue to executive management and key response personnel that require voice communications support in route during emergency event situations. The commercially provided constellation is comprised of Low Earth Orbiting (LEO) satellites that are strategically located in orbit to provide uninterruptible coverage around the world. These versatile portable telephones can be used as an independent handheld unit, in vehicles operating on vehicular power, or indoors using a power supply and a roof mount antenna.

4.4 WIRELESS DATA NETWORK

4.4.1 Air-to-Ground 900 MHz Wireless Link

Each SPR Site's ICPT has been provided a wireless link for emergency communications support between an aircraft and the ICPT. This wireless link provides a communications path for transmitting digital imagery from an aircraft to the ground. The aircraft portion of the link has been designed to be self-contained and consists of a high resolution digital camera, an Access Point Radio with a directional panel antenna, a USB to Ethernet Converter, and a sealed lead acid battery all packaged in a soft carry case for ease of deployment. The ICPT ground equipment is comprised of a laptop, a 5-port Ethernet switch, and a Subscriber Module utilizing an omni-directional antenna, which operate in conjunction for receiving the digital imagery sent by the aircraft. After pictures are taken of the ground scene from the fix-wing aircraft, the pilot redirects the aircraft and flies toward the ICPT. When the aircraft is approximately one (1) to two (2) miles from the trailer, the pilot begins flying a circular pattern around the ICPT. The photographer aims his antenna through the window in the direction of the ground access point. The Ground Operator

radios the Camera Operator in the aircraft when an association lock has been made and the wireless link is ready for digital imagery transmission. At this time, the Camera Operator plugs in the camera's USB cable to the USB to Ethernet Converter. The Ground Operator begins seeing the Picture File Folder designated for download being populated. The operator in the ICPT now has the option to review, crop, or alter these files. Utilizing the network connection located on the motherboard of the laptop, the altered digital imagery can now be transferred via the BGAN InMarSat terminal to WebEOC for viewing by others participating in the event.

4.5 MASS NOTIFICATION SYSTEM

4.5.1 General

The purpose of the SPR Mass Notification System is to alert essential response employees for their recall to duty if needed in an emergency and to provide situational awareness to the general employee population for major events and requested actions. The system is contractually provided and features an automated web based messaging system served by multiple telephone lines, allowing near simultaneous notification to all requested recipients. The targeted audience can also be reached on multiple personal electronic devices and contact telephone numbers as submitted into an SPR database. Managers can then confirm the receipt of the message from the recipient entering a response code into the system, thus controlling an adequate cadre of emergency responders in route to the scene. This SPR Mass Notification System satisfies DOE Order 151.1C to ensure an efficient, effective, and reliable Mass Notification Service that meets mission essential requirements.

4.5.2 Requirement

In order to provide all SPR employees a safe and secure working environment and maintain compliance with "DOE O 151.1C; Comprehensive Emergency Management System"; Element 12; NOTIFICATIONS AND COMMUNICATIONS, which states:

"Initial emergency notifications must be made promptly, accurately and effectively to workers and emergency response personnel/organizations, appropriate DOE/NNSA elements, and other Federal, Tribal, State, and local organizations and authorities."

4.5.3 Event Notification

The Mass Notification System is a Web based service accessible via the Internet. SPR Organizational Leaders manage the contact information database and assign Group Leaders who are responsible for initiating event notifications. Depending on the situation, Group Leaders will determine the predestinated group or individual personnel to be contacted in addition to creating the voice/text message that will be generated in the notification. The Group Leader will monitor the recipients' acknowledgements via the Mass Notification System Website to determine the receipt level of the message.

4.5.4 Training and Testing

The Mass Notification system provides for Web-based and localized training via DVD as part of the introductory process for new system users and as a refresher. The training provides all the information required to begin using and maintaining the Mass Notification System.

The Mass Notification system's training model is to "train the trainer" with the goal of teaching key users how to fully utilize and manipulate the system. As such, all trainees must demonstrate a comprehensive understanding of system operation and capabilities in addition to passing a Limited Scope Performance Test (LSPT) before the User is considered proficient for system operation.

The Mass Notification System is tested at minimum on a quarterly basis at each SPR site and the New Orleans Office. Mass Notification tests are alternated each quarter between all SPR personnel as a group and emergency responders.

4.6 CELLULAR TELEPHONES AND BLACKBERRIES

4.6.1 General

The Strategic Petroleum Reserve leases Blackberries/cellular telephone equipment and services from a commercial service provider on an annual basis. The service provider owns and operates a network of transmitters, which encompasses a coverage area that includes the entire SPR and surrounding areas. Cellular repeaters have been installed at the sites that have poor coverage from within the Control Building to augment communications.

4.6.2 Distribution

Cellular telephones and Blackberries are issued to Key Management and personnel supporting emergency response activities. These devices are programmed with local phone numbers respective to their domicile area.

4.7 EMERGENCY COMMUNICATIONS NETWORK

4.7.1 Overview

The Emergency Communications Network (ECN) is a multi-faceted Voice over Internet Protocol (VoIP) communications network providing classified and unclassified voice, video, and data communications between DOE/NNSA Headquarters and approximately 40 remote fixed sites and mobile units via dedicated leased lines and satellite transmission.

The Unclassified ECN connects SPRO with DOE HQ, DOE Operations and Field Offices, some DOE contractor sites, and other Federal agencies. The Unclassified ECN and Classified ECN are two separate networks distinguished by the security level of data processed, and the type of controls implemented to meet the respective DOE requirements for each type of system. Both networks include local and remote workstations, file servers, data mass storage devices, a video system and telecommunications equipment. Some resources operate strictly in the classified network (Red) and some operate strictly in the unclassified network (Black).

The Classified and Unclassified ECN is operational twenty-four hours a day, seven days a week, ready to process unclassified and classified information. The operation of the ECN is monitored 8 hours a day during normal working hours by the Network Operation Center (NOC) and 24 hours a day in support of emergency events. A MOU has been established between SPRO and DOE-NNSA for operational use and service of this Network.

The ECN is used by the SPR to support emergency operations and Continuity of Operations. A fixed ECN Node is installed at the New Orleans Office, Stennis Site, and each of the four SPR storage facilities. A mobile ECN Node is installed in the Emergency Command Vehicle (ECV) and in the MCT. A portable tactical ECN Node is contained in the ECV and mission ready for emergency response.

4.7.2 NOLA ECN Node

The NOLA ECN Node operates in the classified and unclassified mode utilizing both a terrestrial T-1 circuit and a satellite backup network. The primary mode of operation is the leased T-1 connection provided by DOE-NNSA HQ for both classified and unclassified traffic. The ECN Satellite Network in NOLA automatically switches over and backs up the T-1 telephone line if interruptions of the circuit occur.

The Red or Classified portion of the NOLA ECN Fixed Node is comprised of a classified work station, a classified VoIP phone, and a classified Video Teleconferencing system all located in the Communications Center.

Likewise, the Black or unclassified portion of the NOLA ECN Fixed Node is comprised of an unclassified workstation, a VoIP telephone, and a Video Teleconferencing System located in the Operations Control Center

(OCC) and the Management Information Center (MIC). Eight laptops and eight VoIP phones are also kept powered up and operationally ready in the OCC for emergency activation or deployment if required to support voice and network outages. Fiber optic lines are routed between the 850 and 900 buildings which, support voice and data communications in the Project Management Information Center (PMIC).

4.7.3 Site/Stennis ECN Node

Each SPR ECN Fixed Node located at Stennis and the sites operates in the unclassified mode and is comprised of four laptops and four VoIP telephones. Sixteen network drops have been installed at each site between the Control Building and the New Facility Building. Big Hill is configured in the same respect; however has an Ethernet switch located in the Security Building which supports the CAS and the DCS AOL. Other sites DCS AOL are located either in the Control Building or the New Facility Building.

In general, each network connection provides connectivity to an IP phone first, then to the laptop utilizing only one port for both pieces of equipment. One phone and laptop is designated specifically for use by the Site's Control Room Operator (CRO). The other three phones and laptops are strategically located in offices and meeting rooms in accordance with site requirements to support emergency communications during network outages.

4.7.4 Mobile ECN Nodes

The SPR has acquired three ECN Mobile Satellite Nodes. A self acquisitioning satellite system has been installed in the ECV, which utilizes government bandwidth to eliminate congestion during emergency situations over commercially provided services. Voice over Internet Protocol (VoIP) telephones, laptops, and a Video Teleconferencing System connect to the node allowing for remote emergency communications access using voice, data, and video. External ports on the network router allow for remote communication resources via fiber optic cables and switches to alternate locations if the expansion of workforce personnel and resources are required.

A second self acquisitioning satellite system is installed in the MCT. This system utilizes similar equipment and operates identical to the one installed in the ECV.

The third mobile satellite system used by the SPR is a Tactical Fly-Away system which provides all the same capabilities as the larger mobile mounted systems. This system is stored in the ECV and currently shares equipment resource assigned to the ECV and the MCT when deployed.

5. EMERGENCY DEPLOYMENT

5.1 EMERGENCY COMMAND VEHICLE

The SPR has designed and procured an Emergency Command Vehicle (ECV) to meet the requirements of Continuity of Operations (COOP) for sustainable operations, the DOE 151.1C requirement for an Alternate Emergency Operations Center, and to provide a mobile platform for the SPR Emergency Management Team (EMT) and/or incident commanders during emergency or security events and business recovery operations. The ECV functions as a mobile executive briefing facility, and as a work space to support 8 to 10 executives with full computer work stations and communication / voice and data systems for connectivity with all SPR sites and DOE Headquarters.

The SPR ECV is multifaceted, versatile, and self sufficient. It can operate indefinitely on shore power or operate on generator power for 3-4 days based on its fuel supply. The ECV contains a self acquisitioning satellite system utilizing government bandwidth, Voice Over Internet Protocol telephones, laptops, Video Teleconferencing Network, Network Server, Network printer/scanner/copier, 6 large Aqua-LCD panels, Video Switcher and controller, two-way radios, Satellite TV, and other associated electronic equipment.

The SPR ECV fulfills COOP requirements to provide an operational capability within 12 hours with robust communications for the SPRPMO executive group. The ECV has the capability to assure a confidential SPRPMO executive meeting facility available at short notice located outside of a risk area or set-up and establish the resource near site of the incident location.

Activation of the ECV must be approved by the DOE Project Manager once the SPR EMT is convened for emergency operations. Activation of the ECV may be recommended by DM Operations and Maintenance and/or DM Emergency Preparedness. The ECV activation for non-emergency events must receive prior approval from the DOE Project Manager, or his designee. The ECV may be dispatched to support NOLA OCC hurricane operations. The ECV may also be approved for operational performance testing and in drills and exercises.

The ECV is stored at the Stennis Facility Warehouse, Building 9355, in the North Bay. Electrical power outlets have been installed to maintain shore power to the vehicle at all times. Fiber optic cables are available to connect the ECV to the Stennis Fixed Satellite Node, which enables all communications equipment to remain operational for computer and equipment updates and allows the ECN Network Operations Center (NOC) to continually monitor the ECV for operational readiness.

5.2 NOLA MOBILE COMMUNICATIOINS TRAILER

The SPR has also designed and procured a Mobile Communications Trailer which, supports SPR mission essential requirements during emergency situations. This vehicle will be deployed to support Security, Emergency Management, Drawdown events and Exercises at all SPR sites. The MCT shall be prepared to support, at the direction of the U.S. Department of Energy, other DOE Facilities including State and Local Government. The DOE Project Manager and the DM Project Manager have the authority to dispatch MCT personnel to an event site. DM Communications personnel who are qualified to set up, program, and operate all communications equipment involved shall man the MCT.

The MCT contains radio communications equipment capable of operating on frequencies common to most emergency response organizations (i.e. local law enforcement agencies, fire departments, and mutual aid) throughout the surrounding area of the SPR sites that could be contacted for assistance during an emergency.

The majority of the radio communications equipment in the MCT is software controlled via a laptop allowing new frequencies and parameters to be programmed immediately when deployed. The MCT has the capability of operating from commercial power, generator power, or battery power.

The MCT is designed to support two-eight channel dispatch control stations, one master control station, three four-control stations, and remote (wireline) control stations located within limited distance from the trailer. Each dispatch location has the capability of operating on the same or different channel to support radio traffic more effectively. The MCT contains several types of radio communications equipment which, allow for interoperability across the frequency spectrum with most local, state, and federal agencies.

The MCT functions as a multipurpose command, control and communications trailer that will greatly enhance emergency response and spill management operations capability. The MCT provides for immediate mobilization and dispatch, can be set up for 24 hour operations with minimal prep time near the event scene, provide real time communications, command, and control with reduced risk of power interruption, which will complement and enhance existing site response capability. Personnel operating the MCT are on 24-hour call notification to respond and provide communications support for all site emergencies.

The MCT also contains an ECN VoIP Satellite system similar to the one installed in the ECV. The MCT likewise utilizes government bandwidth, contains five VoIP telephones, five laptops, a tactical Video Teleconferencing System, a Network Switch, a network printer/ scanner/copier, two large LCD screens, and a Video Switcher. The MCT supports five dispatch locations providing video teleconferencing, VoIP telephones, and Internet access through the ECN Network.

5.3 SITE INCIDENT COMMAND POST TRAILERS

The Site Incident Command Post Trailers are equipped with essential radio communications equipment to support an initial response to an emergency situation on site and the surrounding area. ERT personnel authorized to operate the ICPT are also on 24-hour call notification to respond and provide field communications support back to the respective site during emergencies.

Each ICPT is equipped with two VHF mobile radios capable of operating on all SPR frequencies including the Main and Alternate encrypted channels used by Security, an Air to Ground VHF-AM portable radio for communications with over flight airplanes, two VHF Marine potable radios, a BGAN InMarSat satellite terminal, which provides a Gateway to the Internet for data, and a 900 MHz wireless radio link that supports the transmission of digital imagery from a fixed wing aircraft to the ICPT. A portable satellite telephone is available at each site for use during deployments to support voice communications when cellular communications are congested, poor, or non-existent. All ICPT are equipped with ACU-1000 Radio Interfaces which provide the capability of radio patching SPR and emergency response agency radio channels together allowing for interoperability between these agencies that otherwise could not communicate over a common channel. These interfaces have the capability of performing up to 5 dual radio patches simultaneously.

6. PROGRAM MANAGEMENT

6.1 FREQUENCY MANAGEMENT

The SPR Frequency Manager has the required background in wireless communications and regulatory policy pertaining to use of the federal spectrum by government agencies. The SPR Frequency Manager functions as Point of Contact for all site frequency use and related issues. His responsibility is to maintain an awareness of radio communications related matters as they pertain to policies, rules, regulations, standards, and procedures. The SPR Frequency Manager also advises the federal staff that has oversight of the spectrum program on the efficient use of the spectrum, and federal and departmental policy related to spectrum management.

The SPR Frequency Manager is responsible for performing the following duties:

- Maintain a comprehensive working knowledge of policy changes and emerging technologies that impact the use of the spectrum.
- Maintain a data base of all local licensed and non-licensed systems.
- Review all spectrum requirements for regulatory compliance and submit frequency authorization requests and system certification requests to the DOE FAS representative.
- Coordinate and resolve any interference incidents as appropriate.
- Develop local policy for procurement of wireless equipment and systems that is in concert with DOE and NTIA requirements to ensure spectrum coordination and availability of the frequency prior to release of funds.

- Review local use of spectrum to ensure compatibility with license parameters.
- Encourage efficient use of the spectrum by combining services, using commercial services, using existing services provided by other agencies, and deleting licenses as appropriate.
- Maintain a working knowledge of Spectrum XXI and other related software applications.
- Maintain a current copy of the classified Government Master File (GMF) and classified computer system for its use.
- Prepare and submit all applications for spectrum certification to the Spectrum Planning Subcommittee (SPS) representative to process through the NTIA.
- Maintain a data base of all site radio licenses and non-licensed devices operated at the site.
- Provide local coordination for the Site Communications Coordinator for all actions involving other federal agencies, state, and local governments.
- Participate in all local and regional user groups involving spectrum use issues.
- Act as the spectrum liaison between the HQ Spectrum Program and the Site Communications Coordinator for all matters relating to the request, coordination, and assignment of radio frequencies.

6.2 OVER-THE-AIR-REKEYING

The SPR utilizes a Motorola Key Management Facility (KMF), which is located in the classified area of the New Orleans Office to generate Data Encryption Standard (DES) encryption keys to all SPR Security radios. The KMF is comprised of a Wireless Network Gateway (WNG), a Radio Network Controller (RNC), a Server, and a Client workstation. (ISDN) lines connect the KMF to each respective site security repeater. The Key Management Facility (KMF) System Administrator is responsible for performing all Over-the-Air-Rekeying (OTAR) functions from the Client workstation located at the New Orleans Office. Periodic changing of Traffic Encryption Keys is performed as required. Time and date of OTAR sessions are not pre-announced and occur at different time intervals during the year. After each session has been initiated from the KMF Administrator in NOLA, the sites are notified via email to perform the rekey process on all radios and test them for a successful Key Transfer.

The KMF Administrator has the capability at a moments notice to view the currency of any and all encrypted radios on the Encrypted Network. The KMF System Administrator can also zeroize a radio's encryption keys or inhibit the radio entirely from transmitting or receiving if lost or compromised.

6.3 MAINTENANCE AND SERVICE

All work performed on the SPR Radio Communications equipment is conducted in compliance with a Radio Maintenance and Services contract directly with a commercial contractor. This commercial contractor subcontracts its work to franchise contractors strategically located within a 50 mile radius of each SPR location. All maintenance and service is performed by qualified certified technicians operating out of a Certified Service Center. All replacement parts are Original Equipment Manufacturer to maintain the integrity of factory specifications and warranty.

Maintenance and support services performed on the Emergency Communications Network are governed by a Memorandum of Understanding between DOE SPRO and DOE HQ. National Security Technologies (NSTec) performs the contractual maintenance and service support on the ECN Network for the DOE HQ.

The operations, maintenance, and support plan is based on a two-tier approach.

NSTec provides organizational level support, which includes work physically performed at the location of the SPR DOE ECN portable or fixed nodes. These tasks include the aligning of antennas, the physical set-up or change out of equipment, and the cycling of power to reset equipment.

NSTec also provides Depot level support, which is work physically performed at the DOE Remote Sensing Lab (RSL) Depot in Las Vegas, Nevada. Depot level support includes operation of the ECN Network Operations Center, ECN Helpdesk, spare provisioning and warehousing, system design, and remote monitoring.

END OF SECTION

ATTACHMENT A

SPR FREQUENCY PLAN

(OUO)

REMOVED

ATTACHMENT B

TYPICAL SITE RADIO NETWORK CONFIGURATION

SPR
SECURITY

200'
SEC ALT/
EMERGENCY

SITE PORTABLES

190'
TOWER
HEIGHT

175'
SEC PRI

150'
OPS

125'
MAINT
(FUTURE)

ALL SITE CHANNELS
911 RESPONSE
MUTUAL AID

CAS BLDG

CAS

Tx Tx
Rx Rx

EXISTING POLE

50'
SEC
PRI
BASE

50'
SEC
ALT
BASE

AIR-COND
ROOM

4
REPEATERS

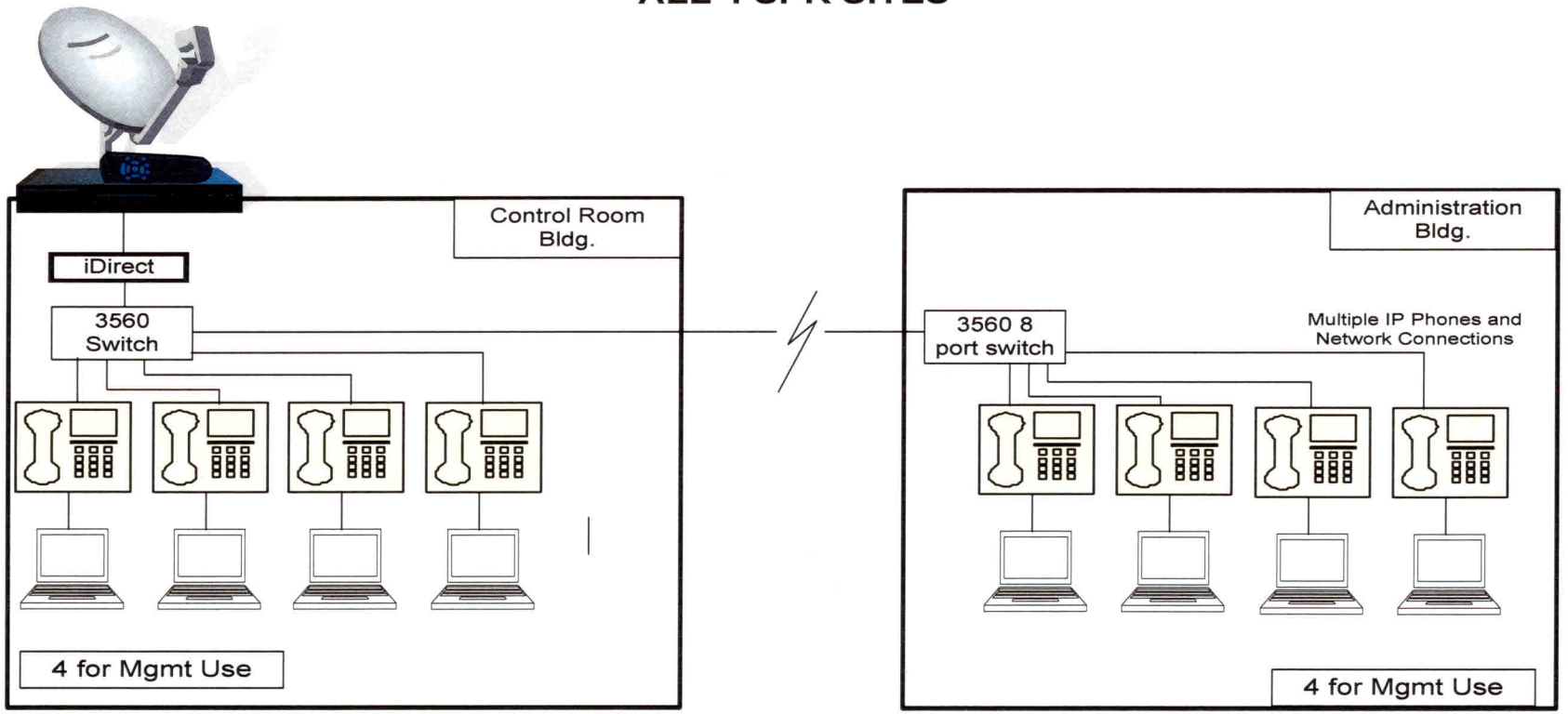
CONTROL ROOM

ALL SITE CHANNELS
AIR TO GROUND
CELLULAR
911 RESPONSE
ECN SATELLITE COMM
MUTUAL AID

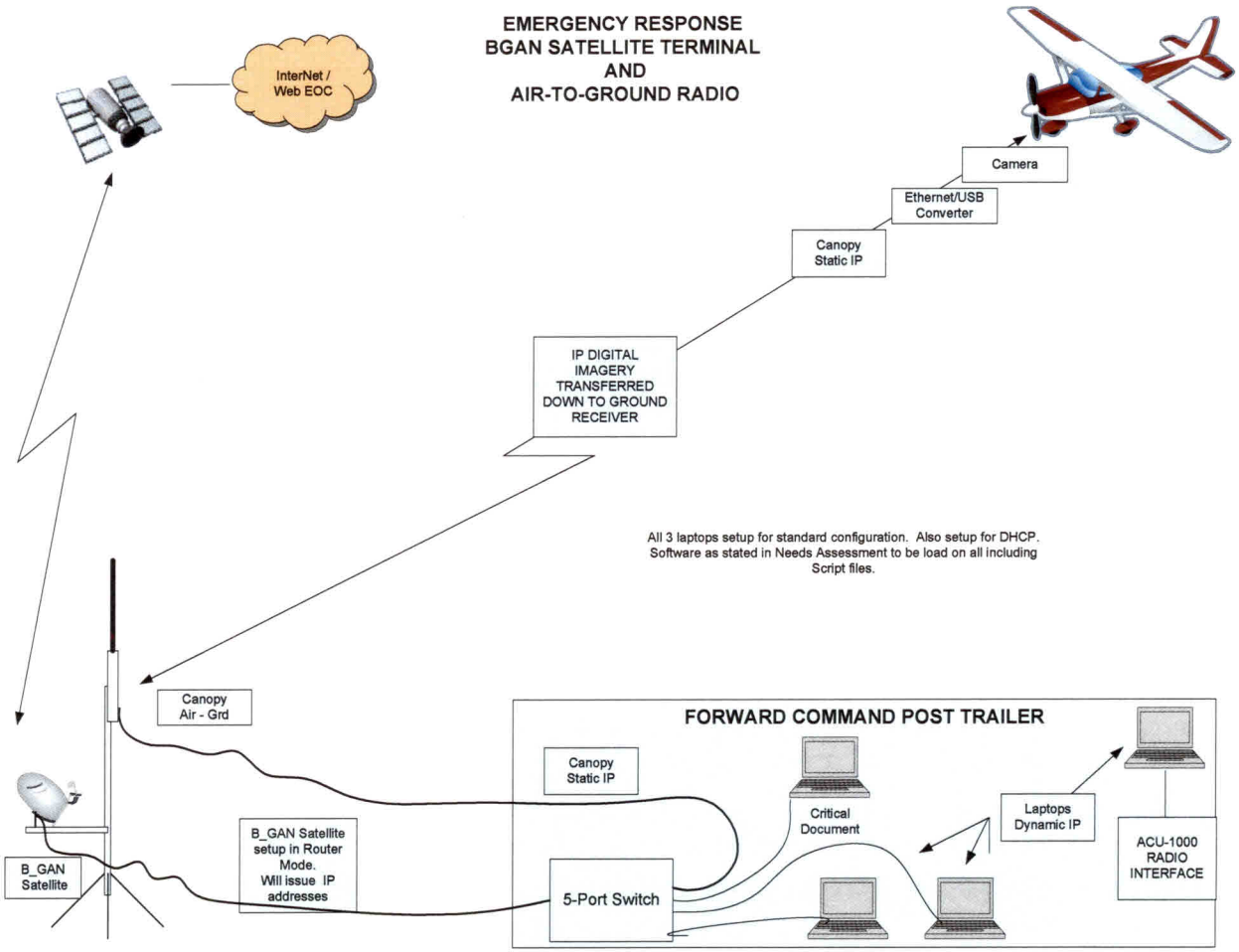
C.R.

ATTACHMENT C

TYPICAL EMERGENCY COMMUNICATIONS NETWORK NOLA, STENNIS and ALL 4 SPR SITES



ATTACHMENT D



END OF APPENDIX A

APPENDIX B

CURRENT SITE HANDHELDS							
DEPARTMENT	NO	BC	WH	BH	BM	ST	Total
CAVERN		1	2				3
COMM	43						43
CONSTR		7	11	11	13		42
DEGAS					10		10
DOE		2	3	3	3		11
ENGR		1		5	2		8
ES&H/EM		3	4	6	8		21
LAB		1					1
MAINT		13	20	32	24	3	92
OPS		10	14	25	23		72
PROPERTY		4	1				5
SEC. SPECIALIST		3					3
SITE DIRECTOR		1		1	2		4
RADIO POOL		22	11	11	17		61
SITE SUPPORT		1	1	1			3
SPARE/REPAIR POOL	82						82
WORKOVER			10				10
TOTAL O&M	125	69	77	95	102	3	471
TOTAL SECURITY	24	35	36	35	35		165

PROPOSED SITE HANDHELDS								
DEPARTMENT	NO	BC	WH	BH	BM	ST	OTHER	Total
COMM	30							30
CONSTR		7	10	10	10			37
DOE		3	3	3	3			12
ES&H/EM		3	5	5	5			18
MAINT		13	25	25	25	3		91
OPS		10	20	20	20			70
RADIO POOL		2	5	5	5			17
SITE SUPPORT		12	7	7	7			33
DEGAS							10	10
WORKOVER							10	10
TOTAL O&M	30	50	75	75	75	3		328
TOTAL SECURITY	22	33	34	34	34			157

HANDHELD RADIOS	TOTAL	REQUIRED	% DECREASE
O&M	471	328	30
SEC	165	157	5

APPENDIX C

CURRENT SITE VEHICULAR RADIOS						
DEPARTMENT	NO	BC	WH	BH	BM	Total
COMM	6					6
CONST		1				1
DOE	1	1	2			4
ECV	1					1
EMG MGMT	1	1	2	7	1	12
ES&H					1	1
MAINT		1			4	5
MAINT/ERT		3	8	5		16
OPS		1	2			3
OPS/ERT		2		3		5
PROP		1			1	2
SPARE	2		2		2	6
WORKOVER			2			2
TOTAL O&M	11	11	18	15	9	64
TOTAL SEC	14	10	9	10	10	53

PROPOSED SITE VEHICULAR RADIOS						
DEPARTMENT	NO	BC	WH	BH	BM	Total
COMM	4					4
CONST		1				1
DOE	1	1	2			4
ESH/EM	0	2	2	2	2	8
MAINT		4	6	5	4	19
OPS		3	2	3		8
RADIO POOL	0	1	1	1	1	4
PROPERTY		1	1	1	1	4
WORKOVER			2			2
TOTAL O&M	5	13	16	12	8	54
TOTAL SEC	4	9	9	9	9	40

VEHICULAR RADIOS	TOTAL	REQUIRED	% DECREASE
O&M	64	54	16
SEC	53	40	25

END OF DOCUMENT