NEMIS
CONCEPT
OF
OPERATIONS

(OPERATIONS AND MAINTENANCE)

FEMA
Information Technology Services Directorate
Operations Division

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TABLE OF CONTENTS

APENDIXES

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The Federal Emergency Management Agency's (FEMA) primary charter is to provide assistance to individuals, businesses, and state, and local governments during a time of disaster. This assistance takes many forms. Disaster mitigation, preparation, response, and recovery are all aspects of disaster assistance. In the past, FEMA automated a portion of this support, but for the most part, these tasks were satisfied via manual preparation. The automated support was developed in the early 1980s and has been overtaken by new technologies and functional requirements. For this reason FEMA began development of the National Emergency Management Information System (NEMIS).

While NEMIS introduces a powerful method for providing automated support to FEMA employees in their day-to-day disaster assistance activities, it also generates new requirements for operations and maintenance (O&M). FEMA must analyze the O&M requirements and plan for the implementation of the NEMIS system and its associated hardware and software life cycle support.

1.1 SCOPE

This document addresses FEMA's requirement for operating and maintaining the NEMIS system. It briefly discusses the NEMIS system and its components, and all associated systems that impact NEMIS operation. It is provided as a draft for developing a NEMIS concept of operations.

1.2 OBJECTIVES

This document was developed to provide an overview of the NEMIS system, identify its key O&M requirements, quantify those requirements in the form of skill levels and positions, and provide a general approach for operating and maintaining the system into the future.

Section 2 provides an overview of the NEMIS system. Section 3 merges the system and administrative requirements into a general concept of operations for NEMIS. Section 4 identifies the administrative support requirements of the proposed system broken down by skill sets. Sections 5 and 6 briefly address maintenance and training. Section 7 identifies the assumptions and constraints which impact the O&M functional requirements. Appendix A, Appendix B, and Appendix C cover the proposed implementation of the O&M NEMIS administrative tools (i.e., BMC Patrol, Tivoli, and MS System Management Server).

1.3 REFERENCED DOCUMENTS

- Final NEMIS Software Product Alternatives Analysis, Deliverable 9, June 27, 1996 through Revision B. Prepared for the Federal Emergency Management

Agency, Information Technology Services Directorate, Applications Development Division, Major Programs Branch, through the General Services Administration, National Capital Region, Contract GS11K94BJD0001, Task Number N1N586003, Work Request Number FEMA 0001.

- Draft NEMIS System/Subsystem Specification (SSS), Deliverable 7, July 1, 1996 through Revision D. Prepared for the Federal Emergency Management Agency, Information Technology Services Directorate, Applications Development Division, Major Programs Branch, through the General Services Administration, National Capital Region, Contract GS11K94BJD0001, Task Number N1N586003, Work Definition No. FEMA 0002.

2. NEMIS OVERVIEW

NEMIS is a FEMA-wide system of hardware, software, telecommunications, and applications that provides a new technology base to FEMA and its partners to carry out the emergency management mission. NEMIS integrates and automates tools to support operations for:

- Incident Activities;
- Preliminary Damage Assessments (PDA);
- Declaration Activities;
- External Interfaces to Other FEMA Systems and Other Government Systems;
- Public Information;
- Donations;
- Application Processing;
  - Human Services (HS);
  - Infrastructure Services (IS);
  - Mitigation Services (MT);
  - Emergency Coordination (EC);
- Inspections;
- Helpline;
- Program Planning & Budgeting;
- Functional Data Administration;
- Emergency Support (ES);
- NEMIS-Wide Functions for Access to the FEMA Library, Imaging, Global Postings, Management Reporting. Action Tracking, and Online Help.

This section provides a very high level description of the NEMIS system and subsystems. Under the Anteon development contract, the FEMA IT Programs Management Group (PMG) produced the NEMIS System Subsystem Design Document (SSDD). Appendix A of this document is an abridged version of the SSDD system description section. It provides a more detailed description of the NEMIS system and how it provides operational support for the functions listed above.

NEMIS has expandability and hooks to include other FEMA operations as desired. NEMIS enables FEMA to use information as a strategic resource to provide effective and timely response, recovery, mitigation, and services. NEMIS provides managers with access to the data and analytical tools necessary for making effective plans and decisions. In addition to providing automated support for a full range to integrated emergency management processes, NEMIS is a comprehensive effort to interface with such other systems as:

- Integrated Financial Management Information System (IFMIS);
- Logistics Information Management System (LIMS) databases;
- Automated Deployment Database (ADD);

- National Emergency Coordination Center (NECC);
- Personnel Computer Time and Attendance Remote Entry System (PC-TARE);
- US Army Corps of Engineers system;
- Natural Resource Conservation Service (NRSC) system;
- Individual Family Grant (IFG) system;
- Farm Service Agency (FSA) system;
- Small Business Administration (SBA); and
- Other agencies' systems.

The NEMIS enterprise database is a collection of distributed disaster data and workflow databases that are linked together to permit the comprehensive retrieval of information across the entire FEMA enterprise. Common data formats and naming conventions allow existing and future applications to share and exchange data. NEMIS enables applications to share and exchange data, as they have been unable to do in the past. Information exchange among programs and organizational elements will facilitate coordinated FEMA/state emergency management.

In addition, NEMIS is a valuable tool for increasing the partnership between FEMA and the states. This helps to coordinate the partnership with states by enabling the sharing of data and providing states with the same automated processes used by FEMA. NEMIS provides automated support for joint FEMA/state critical functions such as:

- Managing infrastructure projects and grants;
- Providing individual and family grants; and
- Conducting PDAs.

Likewise, the state/FEMA partnership is crucial to all phases of NEMIS development, from requirement definition, to testing and operations. To ensure that NEMIS provides support integral to state operations, National Emergency Management Association (NEMA) and state representatives were involved with the NEMIS task forces. The NEMIS task forces were responsible for defining the processes that NEMIS automated.

In addition to the states, FEMA works in close partnership with several federal agencies that provide disaster-related services. NEMIS will automate aspects of these relationships, such as the process of issuing and tracking mission assignments, providing reimbursement for transient accommodations, making SBA loan determinations, and others. In addition, FEMA provides and receives information from a number of other federal agencies (OFAs). NEMIS is planned to interface with several OFA systems to replace current manual or ad hoc transmission of data. More coordinated exchange of information reduces duplication of effort in providing disaster assistance which results in better customer service with a coordinated federal effort.

Again, Appendix A of this document provides a detailed description of the NEMIS system and it's associated subsystems. Please refer to Appendix A for a brief description of technical hardware, software, and architecture functionality.

2.1 NEMIS SCHEDULE

The current NEMIS development schedule is depicted in Figure 2.1-1. Note that the NEMIS development and implementation schedule is subject to change.

Task Name	Start	Finish
NEMIS Version 1	**Mon 7/1/96**	**Wed 12/31/97**
Version 1 Requirements	Mon 7/1/96	Tue 10/1/96
Alpha (Spiral 2)	**Tue 10/1/96**	**Mon 1/13/97**
Alpha Test	Mon 1/13/97	Fri 1/31/97
Beta (Spiral 3)	**Mon 7/1/96**	**Fri 5/9/97**
Architecture	**Mon 9/30/96**	**Wed 7/30/97**
Database	**Tue 10/1/96**	**Mon 6/9/97**
System Integration	Mon 5/5/97	Mon 6/9/97
Documentation	Tue 10/1/96	Mon 6/30/97
Implementation	**Mon 12/2/96**	**Wed 10/15/97**
System Test	**Mon 3/17/97**	**Mon 6/30/97**
Internal	Mon 3/17/97	Mon 4/14/97
Pre-OGAT/setup	Tue 5/27/97	Mon 6/9/97
OGAT-Test	Tue 6/10/97	Mon 6/30/97
Deployment	**Tue 7/1/97**	**Tue 12/30/97**
Program Management	Tue 10/1/96	Wed 12/31/97
QA	Tue 10/1/96	Wed 12/31/97
CM	Tue 10/1/96	Wed 12/31/97
Training	**Fri 11/1/96**	**Mon 12/22/97**
Training Plan	**Fri 11/1/96**	**Thu 1/23/97**
Manuals	**Mon 12/2/96**	**Tue 7/8/97**
Initial Training	**Fri 11/1/96**	**Fri 5/23/97**
Continued Training	**Thu 11/14/96**	**Mon 12/22/97**
Version 2 Requirements	**Tue 3/4/97**	**Fri 8/1/97**

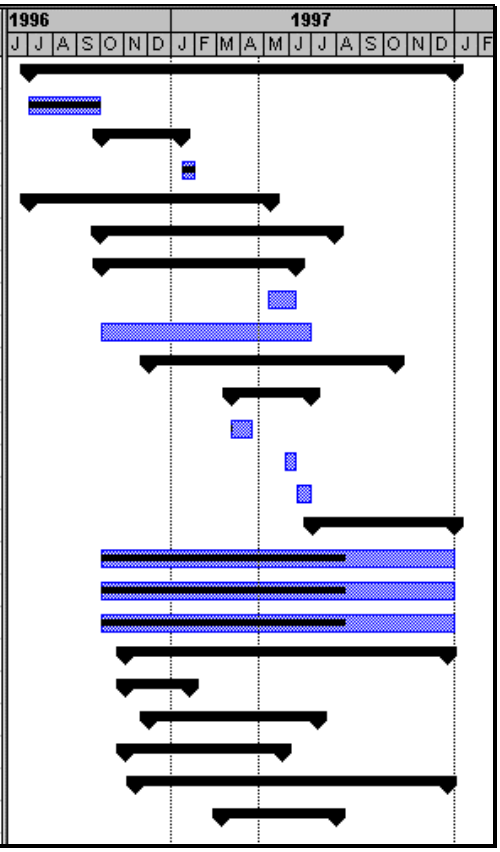

Figure 2.1-1, NEMIS Development Schedule

2.2 NEMIS FUNCTIONS

The sections below identify NEMIS specific activities that O&M support. These functions are NEMIS specific and may be a superset or subset of current FEMA O&M functions.

2.2.1 Oracle Relational Data Base Management System (RDBMS)

NEMIS uses Oracle at all sites for access control (username/password), data manipulation, reporting, and data replication. However, while Oracle is used at all sites, the support provided by a NEMIS/Oracle system is dependent upon the function provided by that site. For example, FEMA's National Processing Centers (NPSC) take request for financial housing assistance for disaster victims. Therefore, NEMIS disaster housing support is only provided at a NPSC site. A Disaster Field Office (DFO) processes requests from state and local governments to restore the disaster area infrastructure (IS).

The FEMA region supporting the disaster also provides this type of assistance. Therefore, both the DFO and the Region NEMIS systems are equipped to support IS.

This type of focused access provides the best environment for FEMA employees, local governments, and disaster victims. However, maintenance of this environment requires a large amount of administrative support and a specialized understanding of where data resides, how it is replicated, backed up, and recovered. NEMIS users access Oracle via network SQL calls riding on Microsoft's TCP/IP protocol stack.

2.2.2 ViewStar Workflow Management

NEMIS will automate many FEMA functions. This includes automating some of the workflow through the FEMA work environment using a software product called ViewStar. In the ViewStar environment, a NEMIS user creates application folders that ViewStar forwards through the FEMA work environment via a set of predefined queues coded into the NEMIS system. The NEMIS business rules were derived from the original FEMA business process analysis performed by the NEMIS developer. For example, FEMA creates a disaster relief request when a disaster victim contacts FEMA for disaster support. This request is automatically passed through the NEMIS system by ViewStar queues, processing agents and business rule analysis until all individuals responsible for authorizing the support have reviewed the request and provide their input.

ViewStar uses Oracle's database for storage and tracking of application folders and their associated documents. It also uses a flat file system for queuing workpackets on the local NetWare file server. Workpackets are processed and passed between the Oracle and file system by ViewStar processing agents on the Microsoft (MS) NT servers.

The O&M requirements for maintaining the ViewStar environment are equal to those imposed by the Oracle system. While the systems and configurations remain equivalent from site to site, the data and processing requirements are not consistent. ViewStar imposes the same requirements for administrative support and specialized understanding of where data resides, how it is replicated, backed up, and recovered.

2.2.3 NEMIS Intranet WEB Server

NEMIS currently uses Oracle's WEB server for WWW based access to specific NEMIS information. Authorized users with WEB browsers can access NEMIS databases on the Oracle servers via TCP/IP, SQL, and HTML protocols. This type of access, commonly referred to as "thin client" access, may become more prevalent in future releases of the NEMIS system. O&M requirements of these systems is directly dependent upon the nature of the data, the size and complexity of the WEB services provided. The more pages, links, and database ties a WEB site has, the more O&M is required to maintain it. The NEMIS Intranet server will maintain database links directly to the NEMIS Oracle data and therefore require the "WEB Master" to have a working knowledge of the WEB server, its specific ties to Oracle using PL/SQL routines, and the NEMIS Oracle database environment.

2.2.4 Microsoft NT Server

NT is the basis for all NEMIS server functions. However, access to these functions are embedded in network database, workflow, and World Wide Web (WWW) applications. Users will not be required to directly login to the NEMIS NT server. While this may slightly ease O&M functions, O&M is still required.

NT introduces a completely new network operating system (NOS) environment into FEMA. Network Administrators must be trained in the new environment and be conscious of the special configuration requirements that Oracle and ViewStar impose on the environment. NT's version of "enterprise networking" is accomplished via Domains. Implementing and maintaining NT domains will be an integral part of the O&M enterprise management of the NEMIS NT server environment. Server processes for backing up the NT server must also incorporate the NEMIS support applications (i.e., Oracle and ViewStar). Administrators must be knowledgeable of the local area network (LAN) environment and must possess skills for maintaining TCP/IP and SQL protocols as well as FEMA's traditional NetWare IPX/SPX environment. NT represents a whole new method for monitoring and maintaining the LAN and server environments.

2.2.5 Microsoft Exchange Server

MS Exchange server will be implemented to allow ViewStar to communicate workflow application folders between sites and to enable communication with field inspection palm pads. Like NT, MS Exchange is a foreign system to FEMA's cc:Mail Administrators. When properly configured, MS Exchange receives messages from clients and automatically and intelligently forwards them to their recipients. cc:Mail uses a database store-and-forward approach that requires external e-mail routers to pass mail from site to site with limited intelligence. In the NEMIS environment, O&M of MS Exchange will be limited to maintenance of the ViewStar interface and for inspection services communications.

2.2.6 Emergency Information System (EIS) InfoBook and MapInfo

EIS is a commercial off the shelf (COTS) application that has been specifically designed to provide automated command and control functions for emergency managers. InfoBook is a front-end for EIS that presents NEMIS emergency data in the format of a three ring binder. The software looks and works like a regular three-ring binder. Users access emergency coordination information like maps, data, models, and communications by using the mouse to point to the kind of information required. EIS InfoBook comes in several editions, each with its own set of tabs and capabilities selected to meet the needs of individual users. FEMA's version of the software has been tailored to NEMIS requirements and has been integrated with MapInfo Geographical Information System (GIS). MapInfo provides NEMIS users with the capability to easily display graphical emergency data in a geographical format. The emergency data input to MapInfo will be extracted directly out of the NEMIS disaster databases on the NT Oracle server. O&M's role for maintaining the MapInfo is limited to providing general user support and loading

new MapInfo data sets and maps after they have been verified by the PMG data support team.

2.2.7 Oracle Discoverer

Specific NEMIS users have requirements to develop ad hoc queries against NEMIS data. These users will use Oracle's Discoverer query software. Users and support teams must have a working knowledge of this software and the location of NEMIS data in the system in order to produce the required reports.

2.2.8 Configuration Control Management

NEMIS is a grouping of many different pieces of hardware platforms and software programs. All releases of the system will be thoroughly tested to operate in the FEMA environment on systems specifically configured to support NEMIS. It is imperative that these hardware and software configurations be documented and maintained so there is a standard environment for operations and future releases of the system. This will be accomplished by the O&M group using configuration control software, a software change request system, and through the development of the standard NEMIS environment.

2.2.9 Local Area Network/Wide Area Network (LAN/WAN)

The key function of NEMIS is to provide useful data to the end-user. This must be accomplished without regard to the physical location of the user or the data. NEMIS will accomplish this using the FEMA LAN/WAN infrastructure. Local data will be kept as current as possible using Oracle's data base replication tools over the FEMA Switched Network (FSN) and users will access the data over their LAN. When a user requests data that does not originate locally or is not replicated to the user's LAN, the user will access the data over the FSN as a remote user. All of these data access methods must be monitored and maintained. Routers on the FSN must be "tuned" for providing optimal transmission routes and efficient use of the WAN. The LANs must be properly segmented and maintained to provide adequate addressing, bandwidth, and error free transmission of NEMIS data.

2.2.10 Client Workstation Support

The NEMIS client workstation provides the user with all access and functionality to the NEMIS data. It must support Oracle, ViewStar, TCP/IP, all of the NEMIS client applications, the FEMA standard software suite, and the end user's applications. O&M has the responsibility to ensure that all of these applications work with each other. They must also troubleshoot client side hardware and software problems.

2.2.11 NEMIS Security

While NEMIS does not contain classified information, the system is required to protect its information in accordance with the Computer Security Act of 1987 and the Privacy Act. This means that access to the NEMIS system must be controlled and that the data inside the system may not be freely distributed. The development team has built logging

and auditing functions into the system in addition to those provided by the COTS software.

The built-in security functions of NEMIS are being provided through a COTS product called PadLock. PadLock is an application security system that allows or disallows access to PowerBuilder applications, screens, or fields on the screens via role based access controls (RBAC) assigned to the NEMIS username.

In addition to the PadLock RBAC security, some NEMIS functions will also use Oracle RBAC. Oracle's RBAC will be implemented against the Oracle username and provide secure RBAC to the NEMIS data using roles, privileges, and triggers. O&M has the responsibility of monitoring and maintaining the logs generated by PadLock and Oracle to maintain system integrity.

3. GENERAL CONCEPT OF OPERATIONS

In its current state, FEMA maintains hundreds of server-centric LAN environments that service the day-to-day e-mail, file, and print service requirements of its user base. The local administrators are not forced to follow networking standards and naming conventions developed by IT policy makers. Simple conventions such as user names vary from site to site. The results are "islands" of functional systems that operate within themselves, but do not interact well as an enterprise system. If NEMIS were implemented with the same lack of structure and standards, it would be very likely that one NEMIS site would not be able to communicate with another.

However, on the telecommunications side of FEMA, strict standards, policies, and procedures have been adopted and followed. Management of the overall system is approached from a centralized concept that allows the administrators to keep control within a well-defined group. System changes are effected centrally and cascaded out to remote sites. Local administrators have limited access, but are capable of aiding the central administrators and troubleshooting local system problems. This allows FEMA to make best use of its manpower assets by maintaining a core of high level support at the central site and minimizing the requirement for highly skilled localized talent. This is the best approach for an agency wide system like NEMIS.

The only way to maintain consistent data integrity and best utilize FEMA's small knowledge pool across an agency wide system of this magnitude is to implement a centralized enterprise management operation for NEMIS. The following subsections identify the approach for the O&M centralized concept (section 3.1) and a detailed description of the centralized (section 3.3) and localized (section 3.2) functions accomplished by this approach.

3.1 APPROACH

To best support the implementation of NEMIS, FEMA O&M must implement a tiered support architecture. The tiered structure must provide a localized help desk, administrative support and access to a high-level centralized technical support capability. This plan identifies three primary support tiers: Tier One for general support; Tier Two for administrative support; and Tier Three for high level technical support. Tiers One and Two provide localized support and Tier Three provides centralized support.

Tier One support provides general assistance to NEMIS users on operating procedures and COTS software assistance. Tier One support reports directly to the Tier Two administrators and administrative access to mid or high-level system controls are very limited. It is very important to understand that the Tier One support teams are the eyes and ears of the O&M directorate as they interface daily with the customer. Tier One personnel must be competent, customer oriented, and capable of supporting the user environment. Tier Two is comprised of local administration teams that provide day-to-day support to the end user and act as a buffer between the user community and the Tier

Three support team. Tier Three support is the centralized team of Administrators capable of managing any component of the NEMIS system.

Tier Three is further divided into three separate levels. As shown in Figure 3-1 Tier Three Enterprise Support Levels, Tier Three is comprised of a National Helpdesk (Level 1), an O&M administrative team (Level 2), and an engineering/development support faction (Level 3).

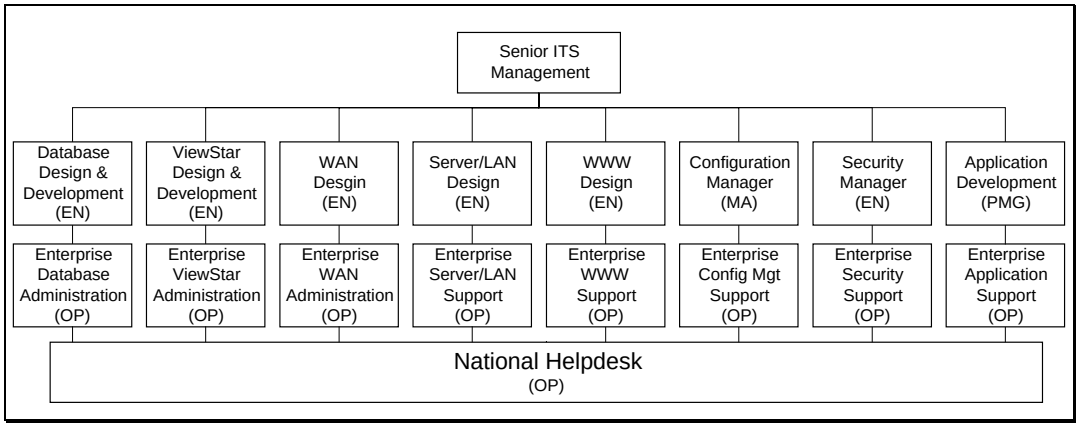

Figure 3-1 Tier Three Enterprise Support Levels

All support requests that can not be handled by Tiers One and Two will be passed up to Tier Three, Level 1. Tier Three, Level 1 will pass the support requests to the proper Tier Three, Level 2 administrative support team. If for some reason, the support request can not be handled at Tier Three, level 2, it will be coordinated and passed to the engineering/development faction at Tier Three, Level 3. Figure 3-2 Overview of Support Request Flow Between Tiers provides a graphical representation of this approach.

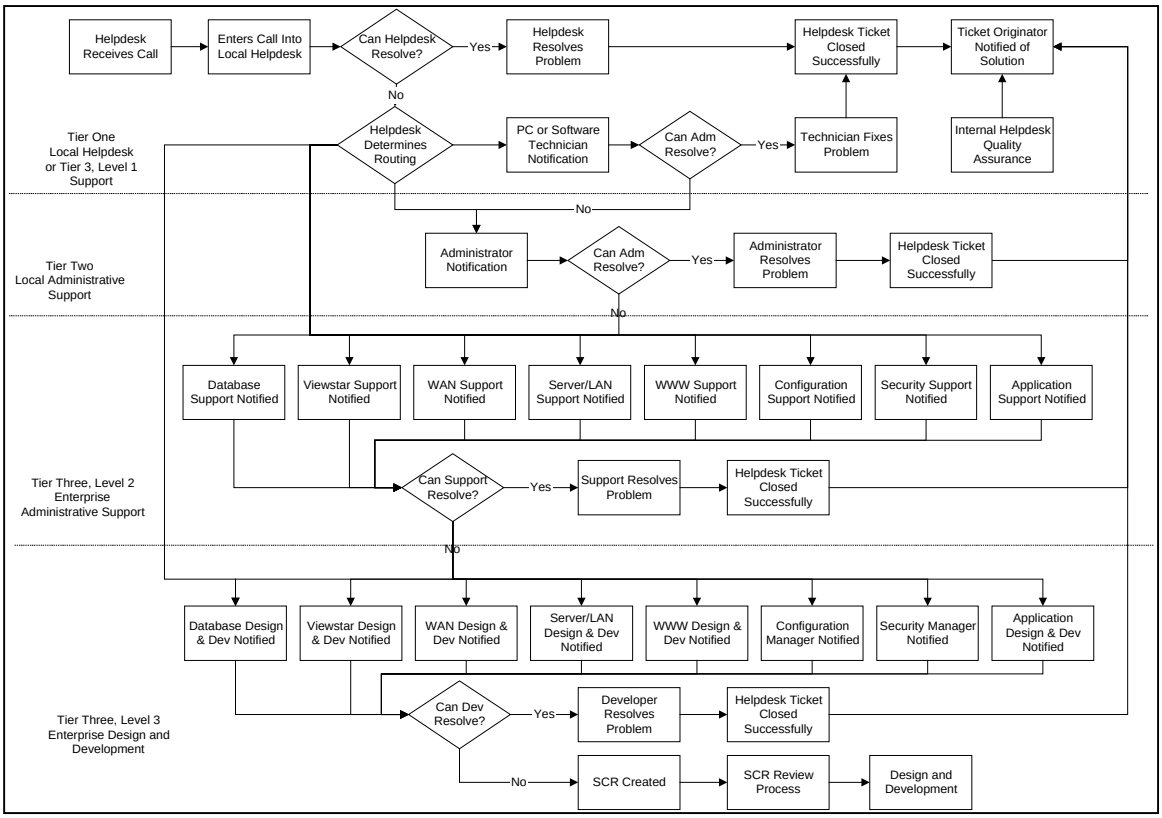

Figure 3-2 Overview of Support Request Flow Between Tiers

3.1.1 Tier One Support

Tier One support provides primary Helpdesk support at all NEMIS sites. This team works directly for the Tier Two support team and performs all of the basic duties required to keep a NEMIS site functional. The primary skill set requirements for a Tier One support team member is a functional knowledge of PCs, FEMA standard software, and the client side of NEMIS. Tier One support mans the Helpdesk phones, enters Helpdesk trouble tickets, and troubleshoots basic NEMIS problems over the phone. Figure 3-3 Localized Support - Tier One Support Structure, shows the placement of Tier One support within the localized support team. In the figure, the unshaded area represents Tier One.

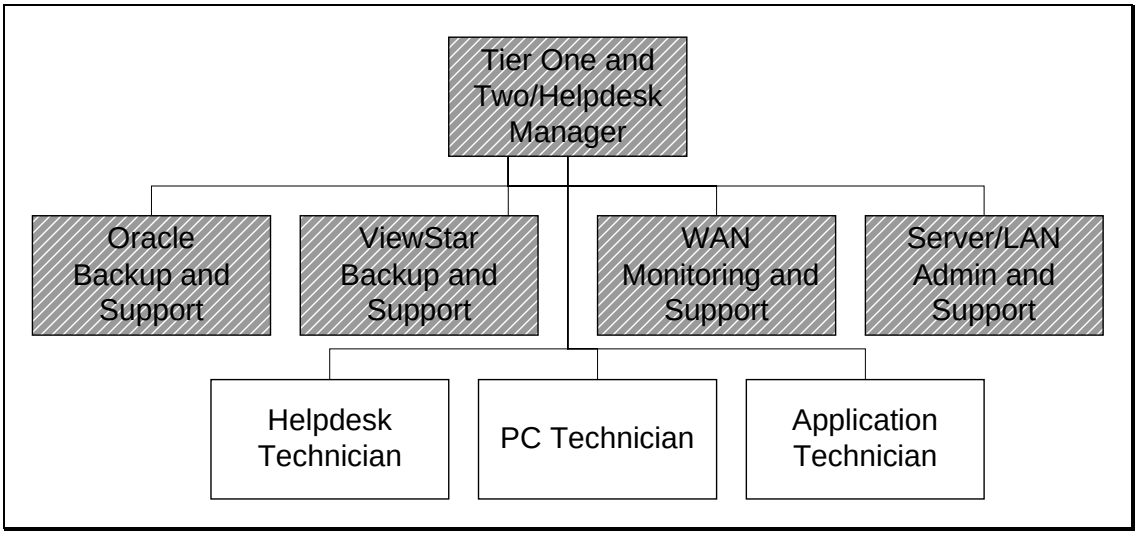

Figure 3-3 Localized Support - Tier One Support Structure

It is important to note that the Tier One support is O&M's primary interface with the customer. While it is important to provide a stable system through Tiers Two and Three, it is just as important to maintain a high degree of user satisfaction through Tier One. Personnel supporting Tier One must be competent, customer oriented, and knowledgeable of their specific duties. Individual team members providing Tier One support should be selected very carefully.

3.1.1.1 Overview of NEMIS Functions Supported

The following bulleted list identifies the overall responsibility of the Tier One support team. Some of the specific functions associated with these duties are explained later in this section. These duties are provided for staff planning purposes and are as accurate as can be estimated for a system that has not yet been implemented. As NEMIS is implemented and O&M functions mature, the bullets below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

- Application installation, troubleshooting and support (Section 3.2.5)
- PC installation, troubleshooting and support (Section 3.2.5)
- Printer installation, troubleshooting and support (Section 3.2.5)
- Remedy Helpdesk phone support (Section 3.2.5)
- Work with Tier Two to implement site hardware and software changes (Section 3.2.5)

3.1.1.2 Skill Set Required

In order to support the general functions described above, FEMA O&M will be required to staff the Tier One support team with individuals that have an acceptable level of skill and knowledge of the NEMIS architecture. The following list identifies the general skill

set the team must posses. Section 4 of this document provides a skill set matrix for each skill set identified below.

- Helpdesk Technician
- FEMA Application Specialist
- PC Technician

3.1.1.3 Locations

Tier One support is required at all NEMIS sites.

3.1.2 Tier Two Support

Tier Two support provides localized, mid-level O&M support at primary NEMIS sites. This team coordinates localized operations with the centralized administration team and provides for the needs of the local customer. While the training and experience requirements for Tier Two support is not as stringent as Tier Three, these individuals do require a high level of practical NEMIS system experience and training. Tier Two provides more Helpdesk-oriented support and interacts directly with the NEMIS end users. Figure 3-4 Localized Support - Tier Two Support Structure, shows the placement of Tier Two support within the localized support team. The unshaded area represents the Tier Two support team. Notice that the local site manager is included in the Tier Two structure. For manning purposes, this position can be satisfied by one of the other Tier Two positions (e.g., server or Oracle support).

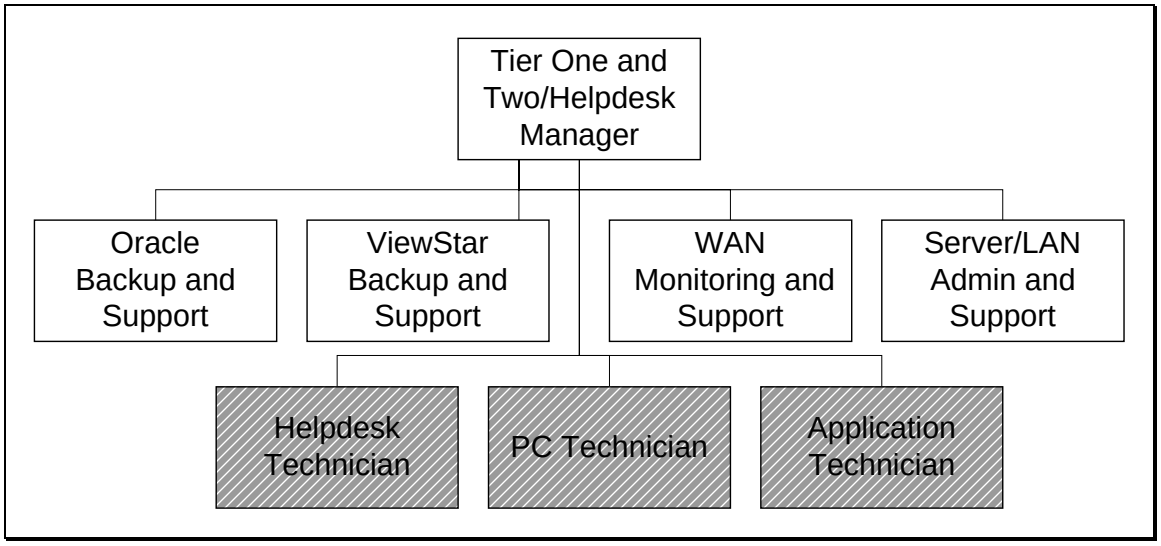

Figure 3-4 Localized Support - Tier Two Support Structure

3.1.2.1 Overview of NEMIS Functions Supported

The following bulleted list identifies the overall responsibilities of the Tier Two support team. Some of the specific functions associated with these duties are explained later in this section. These duties are provided for staff planning purposes and are as accurate as

can be estimated for a system that has not yet been implemented. As NEMIS is implemented and O&M functions mature, the bullets below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

- NEMIS Server backups to include Oracle, NT, and ViewStar (Section 3.2.1)
- General Oracle report generation (Section 3.2.1)
- NEMIS Server monitoring using BMC Patrol and other COTS tools (Section 3.2.1)
- ViewStar queue monitoring (Section 3.2.2)
- Server/LAN support (Section 3.2.3)
- WAN support (Section 3.2.4)
- Remedy Helpdesk support (Section 3.2.5)

More specific duties and functions will be identified as NEMIS becomes operational.

3.1.2.2 Skill Set Required

In order to support the general functions described above, FEMA O&M will be required to staff the Tier Two support team with individuals that have an acceptable level of skill and knowledge of the NEMIS architecture. The following list identifies the general skill set the team must posses. Section 4 of this document provides a skill set matrix for each skill set identified below.

- Oracle Technician
- ViewStar Technician
- MS NT/Novell NetWare Administrator
- LAN Administrator
- WAN Coordinator
- Help Desk Manager

3.1.2.3 Locations

Tier Two support is required at all NEMIS server sites that have a medium to large user community. Therefore, Tier Two support will be required at the following locations.

- HQ FEMA
- MWEAC
- NETC
- All Regions
- Denton, Texas

- Hyattsville, Maryland
- All other medium and large FEMA supported sites

The list attempts to maximize FEMA's Tier Two personnel across the NEMIS environment. However, support can be shuffled should the need for a Tier Two technician arise at a small location.

3.1.3 Tier Three, Level 1 Support

The NEMIS O&M Tier Three, Level 1 National Helpdesk will provide all Tier One and Two teams with a centralized point of contact into the Tier Three support structure. Tier three, Level 1 will use Remedy Helpdesk system to enter trouble ticket calls into the system. Like the Tier One Helpdesk, the Tier Three, Level 1 support will include initial trouble ticket resolution activities. If the trouble ticket can not be solved in a satisfactory period of time, the ticket will be forwarded to the Tier Three, Level 2 support team. Figure 3-5 Centralized Support - Tier Three, Level 1 Support Structure, shows the placement of Tier Two support within the localized support team. The unshaded area represents the Tier Three, Level 1 support team.

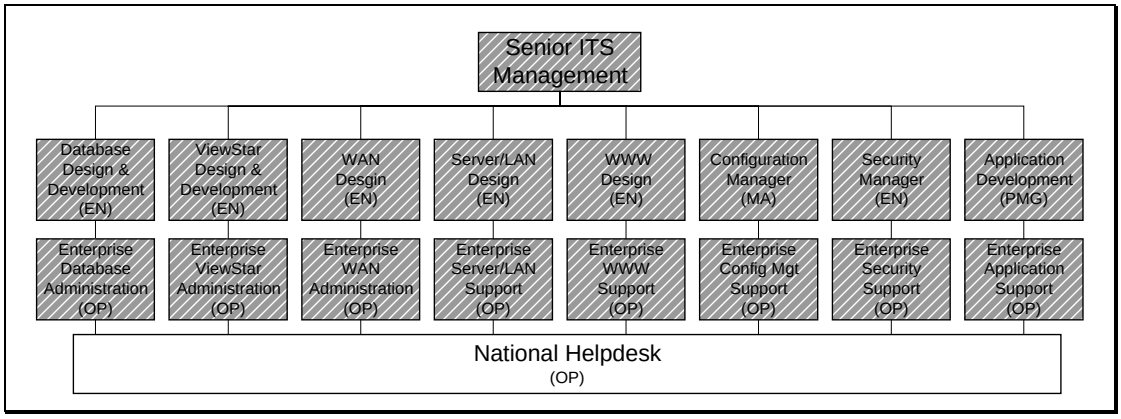

Figure 3-5 Centralized Support - Tier Three, Level 1 Support Structure

3.1.3.1 Overview of NEMIS Functions Supported

The following bulleted list identifies the overall responsibility of the Tier One support team. Some of the specific functions associated with these duties are explained later in this section. These duties are provided for staff planning purposes and are as accurate as can be estimated for a system that has not yet been implemented. As NEMIS is implemented and O&M functions mature, the bullets below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

- Manage and maintain the National FEMA (Remedy) Helpdesk system (Section 3.2.5)
- Develop and generate enterprise level helpdesk reports (Section 3.2.5)
- Act as a liaison between local and centralized support functions (Section 3.2.5)

- Assist in the development of Enterprise wide SLAs (Section 3.2.5)
- Provide general user assistance for any/all FEMA user issues (Section 3.2.5)
- Provide referral to local helpdesk support team (Section 3.2.5)
- Application troubleshooting and telephonic support (Section 3.2.5)
- PC troubleshooting and telephonic support (Section 3.2.5)
- National Helpdesk phone support (Section 3.2.5)
- Work with Tier Two to coordinate site hardware and software changes (Section 3.2.5)
- Work with Tier Three, Level 2 to coordinate national level trouble ticket support.

3.1.3.2 Skill Sets Required

In order to support the general functions described above, FEMA O&M will be required to staff the Tier Three, Level 1 support team with individuals that have an acceptable level of skill and knowledge of the NEMIS architecture. The following list identifies the general skill set the team must posses. Section 4 of this document provides a skill set matrix for each skill set identified below.

- Enterprise Helpdesk Manager
- Enterprise Helpdesk Coordinator
- Helpdesk Technician
- FEMA Application Specialist
- PC Technician

3.1.3.3 Tier Three, Level 1 Locations

Tier three, Level 1 support will be provided out of FEMA's Mount Weather facility. This centralized support approach will allow FEMA O&M to best utilize its high end NEMIS personnel. Furthermore, co-locating and consolidating the Tier Three, Level 1 and 2 support for all of the primary NEMIS functions will promote a more cohesive support of the FEMA enterprise.

3.1.4 Tier Three, Level 2 Support

The NEMIS O&M Tier Three, the most experienced and highly trained individuals in the IT-OP Division must staff Level 2 support team. The team will support the overall day-to-day functions of the FEMA enterprise, identify enterprise level standard operating procedures, oversee the implementation of NEMIS servers, and provide high level help desk support to tiers one and two. These individuals will be responsible for the most complex O&M duties in the NEMIS system. This group of experienced and highly trained individuals will form the Enterprise Systems Management (ESM) team.

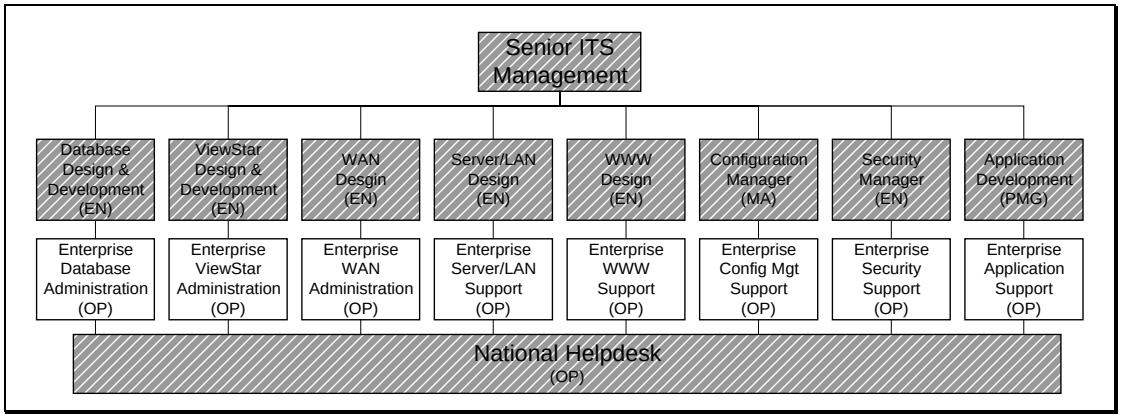

Figure 3-6 Centralized Support - Tier Three, Level 2 Support Structure

The ESM is the core of the of centralized NEMIS support. In addition to the day-to-day Tier Three support duties, the ESM team members are responsible for working with FEMA senior O&M managers and the IT, Management Division, Policy and Requirements Branch to identify SOPs for NEMIS and its support environment. The ESM team will also work directly with the IT Engineering Division to identify short and long term requirements for the NEMIS environment. The reporting structure for the ESM team should be as high as possible in the O&M management chain to avoid unnecessary delays or political obstacles that may slow the team's response process.

3.1.4.1 Overview of NEMIS Functions Supported

The following bulleted lists identify the general responsibilities of the ESM team and the Tier Three support team. The first set of bullets represents the duties that are performed solely by the ESM team members. The second set of bullets is the responsibilities of all Tier Three Team members.

Some of the specific functions associated with these duties are explained later in this section. These duties are provided for staff planning purposes and are as accurate as can be estimated for a system that has not yet been implemented. As NEMIS is implemented and O&M functions mature, the bullets below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

This list represents the general duties of the ESM Team members.

- Management of the Tier Three, Levels 1 and 2 support teams (Section 3.3.1)
- Work with PMG to plan, test and coordinate all NEMIS system changes (Section 3.3.1)
- Develop SOPs for all NEMIS systems and subsystems (Section 3.3.1)

- Work with IT policy makers to define, implement, and enforce standards (Section 3.3.1)
- Work with PMG to identify and review system requirements (Section 3.3.1)
- Train the Tier Three, Level 1 and 2 support team on high level system functions (Section 3.3.1)
- Plan for the NEMIS O&M system life cycle (Section 3.3.1)

In addition to the ESM functions identified above, the Tier Three, Level 2 support team will also perform the following.

- High level Oracle database support, recovery, planning, and implementation (Section 3.3.3)
- High level ViewStar support, recovery, and planning, and implementation (Section 3.3.4)
- High level WAN maintenance administration, recovery, and planning (Section 3.3.5)
- High level server/LAN maintenance support, recovery, and planning (Section 3.3.6)
- Support and monitor NEMIS system configurations (Section 3.3.7)
- Enterprise security monitoring and administration (Section 3.3.8)
- High Level WWW Maintenance Support and Planning (Section 3.3.9)
- High/Enterprise level Helpdesk issues (Section 3.3.10)

More specific duties and functions will be identified as NEMIS becomes operational.

3.1.4.2 Skill Sets Required

In order to support the general functions described above, FEMA O&M will be required to staff the Tier Three support team with individuals that have an acceptable level of skill and knowledge of the NEMIS architecture. The following list identifies the general skill set the team must posses. Section 4 of this document provides a skill set matrix for each skill set identified below.

- Enterprise Oracle DBA
- Oracle DBA
- Enterprise ViewStar Administrator

- ViewStar Administrator
- Enterprise WWW Webmaster
- Senior MS NT/Novell NetWare Enterprise Administrator
- MS NT/Novell NetWare Enterprise Administrator
- Enterprise LAN/WAN Administrator
- WAN Administrator
- LAN Support
- NEMIS System Security Support Team
- NEMIS Configuration Control Support Team

The skill sets required to support NEMIS may be expanded as NEMIS becomes operational and additional O&M functions are identified.

3.1.4.3 Tier Three, Level Two Locations

The centralized support approach will allow FEMA O&M to best utilize its high end NEMIS personnel. Furthermore, co-locating and consolidating the Tier Three, Level 1 and 2 support for all primary NEMIS functions will promote more cohesive support of the FEMA enterprise. Tier Three, Level 2 support will be provided out of FEMA's Mount Weather facility.

3.1.5 Tier Three, Level 3 Support

Tier Three, Level 3 of the NEMIS support structure is the final, in house support structure within FEMA. This level of support is manned by the engineers and developers that architect the systems and software that make up NEMIS. Trouble tickets that are escalated to this level of support have passed through the entire support system and may require modification to a system or subsystem within NEMIS. Figure 3-7 Centralized Engineering/Development - Tier Three, Level 3 Structure, shows the placement of Tier Three, Level 3 in the NEMIS support structure. Note that the unshaded area represents the Tier Three, Level 3 team.

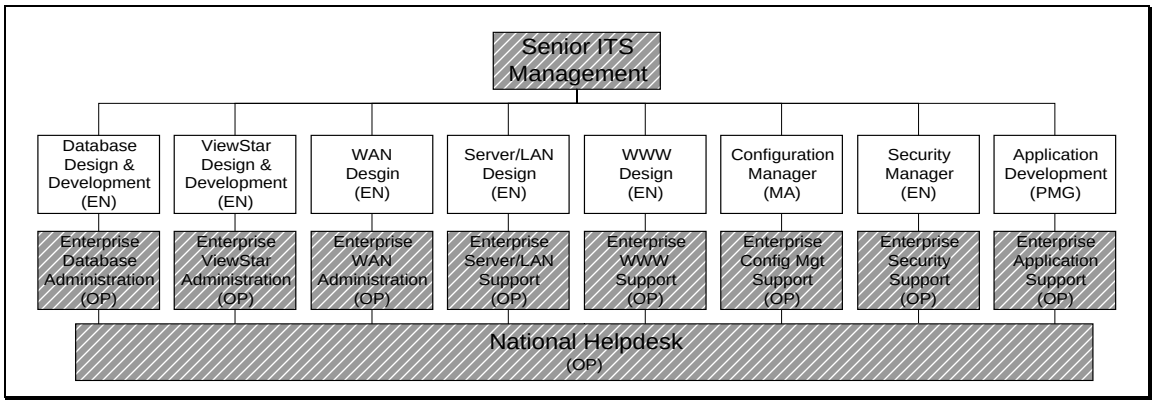

Figure 3-7 Centralized Engineering/Development - Tier Three, Level 3 Structure

The day-to-day duties of Tier Three, Level 3 are primarily engineering and development. However, they will be requested to assist the O&M support structure when required. As this document is specific to the O&M functions of NEMIS, it will only discuss the Tier Three, Level 3 support of O&M functions. It is assumed that the ENG and PMG have documentation that supports and guides their engineering and development functions.

3.1.5.1 Overview of NEMIS Functions Supported

The following bulleted lists identify the general responsibilities of the Tier Three, Level 3 teams. Again, these duties are specific to the engineers and developers in the support of the O&M teams. The day-to-day engineering and development tasks performed by these groups should be identified in separate documentation.

The following duties are provided for planning purposes and are as accurate as can be estimated for a system that has not yet been implemented. As NEMIS is implemented and O&M functions mature, the bullets below will be expanded by the supporting groups (ENG, MA, and PMG) to provide detailed descriptions of the functions or reference other supporting NEMIS documentation (i.e., engineering diagrams or software design documentation).

- Work with O&M to plan, test and coordinate all NEMIS system changes;
- NEMIS system development life cycle;
- Gather and Analyze NEMIS system requirements;
- Develop NEMIS system components, enhancements, and patches;
- Test NEMIS system components, enhancements, and patches;
- Final in house support for Oracle database trouble resolution;
- Development of enterprise wide Oracle ad hoc reports and canned system reports;
- Final in house support for the NEMIS ViewStar system issues;
- Modification of ViewStar workflows and maps;
- Final in house support for WAN trouble ticket issues;
- Final in house support for LAN and server trouble ticket issues;
- System configuration management and control;
- NEMIS version and release control;
- Define NEMIS system hardware baselines;
- Enterprise security determination and standards;
- Final in house support for WWW trouble ticket issues;
- Web page design and development; and
- Provide support to all O&M support areas as required.

3.1.5.2 Skill Sets Required

In order to support the general functions described above, FEMA ENG, MA, and PMG will be required to staff their Tier Three, Level 3 support teams with individuals that have an acceptable level of skill and knowledge of the NEMIS architecture. The following list identifies the general skill set that is recommended for each area. However, each faction

has other primary engineering and development tasking that may overlap with the skill sets identified. Therefore, each faction should review their staffing requirements across their entire engineering and development efforts and provide a complete skill matrix that covers all of their respective efforts. This matrix should also identify skill set requirements that over lap with those identified below. As these functions fall outside of the O&M support requirement, they are identified but expanded upon in Section 4 of this document. Furthermore, the training requirements for these positions are not covered by this document.

- Oracle Database Design Engineer
- Oracle DBA
- Oracle Report Designer
- ViewStar System Design Engineer
- Web Designer
- Senior MS NT/Novell NetWare Enterprise Administrator
- Senior WAN Administrator
- NEMIS System Security Manager
- NEMIS Configuration Control Manager

3.1.5.3 Tier Three, Level 3 Locations

While it would be advantageous to co-locate the Tier Three, Level 3 support functions with the ESM, it may not be feasible given that the primary duties of Tier Three, Level 3 are engineering and development. Furthermore, as NEMIS and the O&M support structure matures, there will be fewer requests for assistance to the Tier Three, Level 3 support factions. Therefore, each faction should establish a primary point of contact for each functional area in Tier Three. This point of contact may be telephonic or Helpdesk driven and could be located at Mount Weather or FEMA Headquarters.

3.1.6 Mobile/Remote Support Teams

NEMIS has been developed to support all FEMA disaster support personnel at all disaster support locations. This includes users at DFOs or remote field offices. In the case of emergency support, NEMIS sites must be implemented as quickly as possible to support the DFO mission. Therefore, O&M must be capable of responding to the support requirements of these remote NEMIS locations. However, this capability should not be provided at the expense of fixed support sites. FEMA should utilize a cadre of NEMIS trained IT disaster support personnel, Mobile Emergency Response System (MERS) technicians and Disaster Temporary Employees (DTEs) to accomplish this mission. MERS ADP staff could be trained as the Tier Two support and use the DTEs as the Tier One support.

3.1.6.1 Overview of NEMIS Functions Supported

Initial NEMIS sites will have the same functional requirements as Tier Two and Three support sites.

3.1.6.2 Skill Set Required

MERS teams will support Tier Two functions and therefore, will require skills equivalent to Tier Two support. The DTEs will support Tier One functions and therefore must possess Tier One skills.

3.1.6.3 Locations

The mobile team will support the emergency disaster response requirements of the DFOs and remote field offices. They will work directly with the Tier Three support team and the IT Disaster Support staff to implement and provide short-term support for NEMIS disaster support servers.

3.2 LOCALIZED ADMINISTRATIVE FUNCTIONS (TIER 1 & 2)

A centralized approach to support does not eliminate the need to provide support at a local site. It does minimize the requirement for high-end support. However, because local support is the O&M interface to the customer, a high level of expertise coupled with inter-personal skills are required. This is the justification for a two-tier approach at the local site.

Local support must be competent, capable of working with end users in a friendly and timely manner, and provide an interface to the centralized team. The following subsections identify some of the localized team duties. As NEMIS is implemented and O&M functions mature, the subsections below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

3.2.1 Localized Oracle RDBMS Database Administrative Functions (Tier 2)

The centralized Oracle management team will perform most Oracle administrative functions. Localized support will be limited to the following duties:

- Knowledge of the local Remedy helpdesk system;
- Understanding of the local helpdesk trouble ticket and escalation policies;
- Interface with and assist the centralized Oracle management team;
- Use BMC PatrolWatch to monitor the Oracle instance;
- Assist in the backup/recovery of the NEMIS system with LAN/Server support;
- Execute local NEMIS (Oracle) system reports;
- Troubleshoot Oracle workstation problems;

- Help develop “Service Level Agreements” (SLAs) with the user community and Tier Three;
- Maintain local NEMIS reference data; and
- Provide mid level Helpdesk support for local Oracle users.

3.2.2 Localized ViewStar Administrative Functions (Tier 2)

The local ViewStar Administrator may require more hands on support of the ViewStar system. This is due to ViewStar’s lack of an enterprise management strategy in a very large ViewStar installation. However, NEMIS uses ViewStar as an embedded application. NEMIS users do not directly interface with ViewStar client software. Most duties associated with local administration will be monitoring the ViewStar environment for signs of trouble and working with the centralized management team to resolve problems. Localized ViewStar support consists of:

- Knowledge of the local Remedy helpdesk system;
- Understanding of the local helpdesk trouble ticket and escalation policies;
- Interface with and assist the ViewStar centralized management team;
- Assist in the backup/recovery of the NEMIS system with LAN/Server support;
- Use BMC PatrolWatch to monitor the ViewStar server processes
- Maintain ViewStar space allotments;
- Manage online ViewStar documentation;
- Execute local ViewStar system reports;
- Help develop “Service Level Agreements” (SLAs) with the user community and Tier Three;
- Troubleshoot ViewStar workstation problems; and
- Provide mid level Helpdesk support for ViewStar users.

3.2.3 Localized Server/LAN Administration (Tier 2)

Localized Server/LAN administrative support is required to keep the NEMIS environment operational. It is the responsibility of the local support to ensure the smooth operation of the NEMIS servers, workstations, and networks.

The local Server/LAN support team is the eyes and ears of the entire NEMIS IT-OP support structure. The local team is not only responsible for the day-to-day operation of the environment, but it must also plan and coordinate all system-related issues with the local customer and the centralized support team. Localized Server/LAN support consists of:

- Knowledge of the local Remedy helpdesk system;
- Understanding of the local helpdesk trouble ticket and escalation policies;
- Interface with and assist the local customer;
- Interface with and assist the centralized server/LAN administrative team;
- Help develop "Service Level Agreements" (SLAs) with the user community and Tier Three;
- Use Tivoli tool to create, modify, and delete NEMIS user accounts;
- Use BMC PatrolWatch and other system provided utilities to monitor the NEMIS NT server environment;
- Plan, coordinate, and execute NEMIS server backup and recovery;
- Plan, coordinate and execute the installation of NEMIS client PCs;
- Plan, coordinate and execute the installation of NEMIS support tools in the environment;
- Perform local hardware preventative maintenance;
- Perform local hardware repairs and updates;
- Assist in the automated distribution of updates to the NEMIS client;
- Use local LAN support tools to track and monitor the local LAN environment;
- Configure, implement, and monitor NEMIS client Novell NetWare network printer support;
- Troubleshooting local cable plant problems;
- Day-to-day support of the local FEMA office automation network users, servers, and workstations (NetWare);

- Monitor and maintain the local site computer environment;

- Help develop "Service Level Agreements" (SLAs) with the user community and Tier Three;

- Enforce enterprise LAN, workstation, and server standards and policies.

3.2.4 Localized WAN Support Functions (Tier 2)

Localized WAN support is required to provide physical support and assistance to the centralized WAN management team. As most of the monitoring and maintenance of the WAN/router environment will be performed from a central location, the duties performed under this title could be rolled into the localized Server/LAN support team functions. Localized WAN support consists of:

- Knowledge of the local Remedy helpdesk system;

- Understanding of the local helpdesk trouble ticket and escalation policies;

- Physical monitoring of the local router;

- Assist centralized WAN administrator troubleshoot routers and;

- Help develop "Service Level Agreements" (SLAs) with the user community and Tier Three;

- Enforce WAN standards and policies.

3.2.5 Localized Help Desk Support (Tier 1 & 2)

As previously stated, the local helpdesk is the front line of the IT-OP support structure. Individuals on this team are the direct interface to the NEMIS customer. Therefore it is essential that these individuals be well trained and qualified in their primary support skills. Localized helpdesk support consists of:

- Knowledge of the local Remedy helpdesk system;
- Understanding of the local helpdesk trouble ticket and escalation policies;
- Manage site Helpdesk support;
- Application installation, troubleshooting and support;
- Execute PC installation, troubleshooting and support;
- Maintain local printer installations, troubleshooting and support;
- Provide Helpdesk phone support to the user community;
- Work with Tier Two to implement client hardware and software changes;
- Help develop "Service Level Agreements" (SLAs) with the user community;
- Track site Helpdesk functions, technician utilization, and trouble tickets; and
- Generate site Helpdesk reports.

3.3 CENTRALIZED ADMINISTRATIVE FUNCTIONS (TIER 3, LEVEL 1 & 2)

Centralizing FEMA's O&M operation and support will allow FEMA to best utilize its personnel and administrative software. It will also provide a central site for developing standards for operation. Both of these benefits bolster FEMA's push to implement an enterprise based O&M support system.

The following subsections identify centralized approaches and team duties. The approach descriptions identify how the overall O&M function fit into a single, cohesive environment. The duties identified provide a more detailed description of the overviews provided in section 3.1.1.1, Overview of (Tier Three) NEMIS Functions Supported. As NEMIS is implemented and O&M functions mature, the subsections below will be expanded into separate sections that provide detailed descriptions of the functions or reference other supporting NEMIS O&M documentation (i.e., administration manuals and SOPs).

3.3.1 Centralized Enterprise Management Approach

Simply centralizing O&M functions does not provide an enterprise solution to system operation, maintenance, and/or administration. The Tier Three, Level 2 support environment must be closely associated and reliant upon each other to provide a complete support solution. The use of monitoring and administration tools and access to these tools must be planned for the entire enterprise environment. For this reason, IT-OP has implemented a NEMIS Operation Center. All Tier Three, Level 2 support personnel will co-located in the same general area at Mt. Weather and they will use a common set of monitoring tools to maintain the NEMIS environment.

IT-PM has provide a complete set of tools to manage the NEMIS environment. The local and central administrative teams to monitor the NT, Oracle, Exchange, ViewStar, and NEMIS (Human Services) systems will use BMC Patrol. Tivoli User Administration services will be used by local and centralized teams to manage the NEMIS user and security environment. Microsoft's System Management Server will be used to automate the distribution of NEMIS software and maintain a NEMIS client inventory.

3.3.1.1 BMC Patrol

BMC Patrol will be used to monitor the entire NEMIS environment. Out of the box Patrol is capable of monitoring 100+ NT server function, 75+ Exchange functions, and 150+ Oracle RDBMS functions. IT-PM has customized the BMC Patrol monitoring capability to perform ViewStar and some NEMIS specific monitoring functions (i.e., Human Services). This overall system approach for NEMIS monitoring will allow the IT-OP centralized management team to quickly and accurately react to problems.

For example, if the BMC Patrol monitors on the Oracle, Server/LAN and ViewStar administrator's systems all indicate that those systems have failed, it is likely that the WAN connection to the site is down. This could quickly be confirmed through the WAN administration team. Without a coordinated troubleshooting effort, the IT-OP support team might have wasted time checking out localized system problems before looking to a larger WAN type problem. Furthermore, without a centralized monitoring tool, they might have waited for a user initiated complaint.

The general approach for implementing BMC Patrol in the NEMIS environment is provided in Appendix A.

3.3.1.2 Tivoli User Administration

NEMIS is a client server application that is based on several COTS systems. MS NT is the base operating system of the server environment. Oracle RDBMS is the data repository for NEMIS information and provides some NEMIS system security. PadLock is used to provide application level role based access controls. The NEMIS security subsystem uses all of these environments to extend NEMIS management control security. All three of these NEMIS components require some level of user management.

Without a common user management tool IT-OP would have to manage each of these components as a separate system/subsystem. Therefore, Tivoli was procured and customized by IT-PM to provide a single point of user management for these systems/subsystems.

Tivoli is a client server based system. The client is used to manage users in a centrally located database. Localized administrators will use a customized Tivoli desktop to create, modify, and/or delete users in their specific environment (e.g., Region VI administrator manages Region VI users). The centralized administrators will manage the Tivoli database and all of the localized administrative user accounts.

The server side of the Tivoli system will store the user information provided by the local administrators and distribute it to the target systems. The distribution process actually performs the user creation, modification, and/or deletion.

The general approach for implementing Tivoli User Administration in the NEMIS environment is provided in Appendix C.

3.3.1.3 MS System Management Server (SMS)

As previously stated, NEMIS is a client server system. Each user of the NEMIS system must use a client side front-end to operate in the environment. NEMIS is also a distributed system. Clients can and probably will be located anywhere where there is a FEMA location or access requirement (e.g., state and/or local government). All of these clients must be upgraded as new releases and patch fixes are made available. IT-PM purchased SMS to automate this process.

The general approach for implementing MS System Management Server in the NEMIS environment is provided in Appendix C.

3.3.2 Overall Centralized NEMIS Management Functions (Tier 3, Level 2 and Senior Management)

While NEMIS has a functional support requirement in the FEMA O&M environment, it also directly impacts several FEMA wide requirements and senior management level functions. The ESM and Tier Three support teams will be primarily responsible for these management level functions. The following bullets identify some of these overall functions and management areas that must be addressed from a centralized approach.

- Maintain the Concept of Operations and all other support documentation;
- NEMIS disaster server planning and setup;
  - Pre-load the NT and Novell servers
  - Pre-load the NEMIS Oracle databases
  - Pre-load the ViewStar file systems and databases
  - Pre-load the NEMIS COTS applications and databases
  - Pre-load the NEMIS support systems
  - Setup the NEMIS Oracle routing databases
  - Coordinate implementation with IT Engineering and Mobile Support Teams
- Coordination with FEMA disaster support functions;
  - Initialize replications after implementation
  - Coordinate ViewStar queues with NEMIS databases
  - Download/Snapshot database updates
- Identify O&M system support requirements;
  - Collect and track System Change Requests (SCRs)
  - Work directly with PMG staff to identify short and long term requirements
  - Develop O&M scripts and procedures for day-to-day maintenance of the enterprise
- Plan NEMIS O&M life cycle;
  - Monitor and track all aspects of the NEMIS environment
    - Processor utilization
    - Disk utilization
    - Memory utilization
    - Oracle table space
    - ViewStar queues and cache
    - Develop detail monthly, quarterly, and yearly reports based on historical and trend data collection.
    - Use reports to plan and justify future NEMIS environment expenditures
  - Lifecycle Hardware reporting and replacement/upgrade planning
  - System hardware expansion
- Develop detailed training plan for Tier Two and Three personnel;
  - Structure a plan for long term organized training (commercial instruction, video tapes, books) supported by On the Job Training (OJT) by peers
  - Include training requirements in Tier Two and Three performance reviews

    - Identify quantity and cost requirements for recurring organized training
    - Include recurring training costs in long term budget requirements
- Evaluate FTE and DTE resources in the NEMIS environment;
    - Review current staffing and assignments
    - Determine best utilization in new NEMIS environment
    - Request a formal, professional staffing review after NEMIS has been "full-up" operational for several months.

3.3.3 Centralized Oracle Database Administrative Functions (Tier 3, Level 2)

Every NEMIS site will require access to NEMIS information via an Oracle RDBMS. Centralized management of these resources is required to insure data availability and integrity. Given the NEMIS requirement for data to be distributed and available to any NEMIS user regardless of physical location, NEMIS Oracle database management will be a very difficult undertaking. To adequately monitor and maintain the NEMIS Oracle environment the centralized Oracle support team must fully understand the operational NEMIS Oracle environment.

While the enterprise management of the NEMIS Oracle environment is a large task, most of the tools necessary to achieve centralized management are provided through Oracle's Enterprise Management tool and BMC Patrol monitors. Like most administrative tools, both the enterprise management and BMC Patrol tools will require the development of special NEMIS specific configurations to automate the management process.

The BMC Patrol tool will allow the centralized administration team to simultaneously monitor all instances of Oracle in the NEMIS environment. Problems or potential problems will be identified at the site level. The centralized administrator can then "drill down" into the site and view the problem at the instance and or Oracle component level.

The following bulleted list identifies some of the specific duties performed by the Tier Three, Level 2 Oracle Administrators.

- NEMIS Oracle technical architecture;
    - Provide high level support to local Oracle support teams
    - Physical database configuration
    - NEMIS schema design
    - Replication architecture
    - Replication internals
    - Replication groups
    - Network configuration
        - SQL*Net listener configuration
        - Global instance names
        - Database links
- Installations and upgrades;
    - Oracle software installation
    - Oracle database creation
    - NEMIS database creation

        - Tablespaces
        - Roles
        - Schemas
        - Database Links
        - User accounts
    - Import certified reference tables
- Default tablespace;
- Temporary tablespace;
- Default roles;
- Passwords;
- Synonyms (public vs. private);
    - Oracle software/database upgrades
    - Installation and configuration of replication support
    - NEMIS installation and upgrades
- Backup and recovery;
    - Database backup procedures
        - Cold database backup
        - Hot database backup
        - Offsite, online backups (between NPSCs)
        - Backup media handling
    - Database recovery procedures
        - Instance failure
        - Media failure
        - DBA recovery drills
    - Failure procedures
        - Database recovery at alternate site
        - Connection request redirection
        - Failover testing
- Space management and planning;
    - Object growth characteristics
    - Schema reorganization
- Monitoring and tuning;
    - Ongoing performance monitoring
    - Database tuning
    - Application tuning
    - Network tuning
- Replication management;
    - Building the replicated environment
    - Quiescing the environment
    - Maintaining replication sites
    - Monitoring replication performance
    - Recovering from replication errors
- Security and user account maintenance;
    - Account creation
    - Global userids
    - Initial password

    - Default roles
    - Profile
- Migration planning;
    - NEMIS database upgrades
    - Migration window
    - Migration test and verification
    - Fallback procedures
- Enterprise manager operations; and
- Coordinate with the ViewStar, WAN, LAN, Configuration Control, and Security Teams to enact system level changes and ensure smooth operations.

3.3.4 Centralized ViewStar Administrative Functions (Tier Three, Level 2)

NEMIS workflow maps, process agents, the ViewStar queue and file system, and the ViewStar Oracle tables all makeup the NEMIS ViewStar system. Centralized ViewStar administration will be accomplished via the FEMA WAN.

IT has customized the BMC Patrol monitor to watch key functions of the ViewStar system. The ViewStar Enterprise Management Team will use the Patrol monitor to quickly identify when a ViewStar process agent has failed. At this point, the administrator will login to remote ViewStar systems to maintain the NEMIS ViewStar environment or he/she will contact the local support for hands on assistance.

The ViewStar Enterprise Management Team will perform the following tasks:

- General administration of the ViewStar system;
- Maintain workflow maps;
- Use BMC to monitor all process agents;
- Monitor and repair ViewStar file systems and Oracle tables;
- Monitor the WEB server and imaging system interfaces;
- Monitor the MS exchange transport services;
- Maintain client side business process interface (BPI) for Power Builder;
- Repair damaged ViewStar tables and file systems;
- Maintain and purge ViewStar tracking tables;
- Execute enterprise ViewStar system reports;
- Plan and monitor ViewStar backup processes;
- Provide high level support to local ViewStar support teams; and
- Coordinate with the Oracle, WAN, LAN, Configuration Control, and Security Teams to enact system level changes and ensure smooth operations.

3.3.5 Centralized WAN Administrative Functions (Tier 3, Level 2)

NEMS requirements for remote login, dial-up access, and database replication will impact the FEMA WAN. The Enterprise WAN Management Team must continually monitor and manage the WAN environment to provide the fastest most secure transport

for the NEMIS environment. This requirement will require the team to perform the following:

- Execute WAN changes;
- HP OpenView enterprise monitoring;
- Router monitoring and maintenance;
- TACACS management;
- Modem pool management;
- Remote control PC setup and management;
- WAN bandwidth utilization/error monitoring;
- WAN troubleshooting;
- Assist in the development of WAN standards and policies;
- Monitor and control Cisco protocol routing;
- Maintain dynamic IP address name resolution via DNS;
- IP address management and control; and
- Coordinate with the Oracle, ViewStar, LAN, Configuration Control, and Security Teams to enact system level changes and ensure smooth operations.

3.3.6 Centralized Server/LAN Administrative Functions (Tier 3, Level 2)

The implementation of NEMIS includes the installation of MS NT servers. Under their current version of NT server Microsoft implements an enterprise level management strategy based on NT domains. The NEMIS environment will be based on a single NT domain called NEMIS.

The Tier Three, Level 2 Server/LAN Administration Team, will centrally manage the NEMIS Domain. Localized administrative accounts will be established to perform system backups and hardware maintenance. These localized administrators will not have access to the Domain administrative privileges.

BMC Patrol will be installed on all NEMIS NT systems and configured to monitor specific key components of the system. Both the localized and centralized administrative teams will have access to the BMC NT Monitor information.

The following list identifies some of the duties of the centralized server/LAN administrative functions:

- NEMIS server monitoring using BMC Patrol;
- Plan and monitor NT server installations;
- Oversee the implementation of NEMIS in the NT environment;
- Maintain a consistent hardware and software baseline environment for the NT systems;
- Plan and monitor NetWare server installations;
- Plan, implement and maintain NetWare Directory Services;
- Provide high end Helpdesk support for servers and end-users;

- Assist in the development of LAN standards and policies; and
- Coordinate with the Oracle, ViewStar, WAN, Configuration Control, and Security Teams to enact system level changes and ensure smooth operations.

3.3.7 Centralized Configuration Management Support Functions (Tier 3, Level 2)

The NEMIS environment includes specific versions of the NEMIS system and COTS software and hardware. It is important that all of these components operate at same level to ensure system and data integrity.

The NEMIS Configuration Manager will work closely with the Tier Three, Level 3 NEMIS configuration manager to maintain a baseline for NEMIS software environment. MS SMS software distribution tool will be used to maintain the NEMIS client environment. Tier Three, Level 3 Configuration Manager will provide any updates or patches to the Tier Three, Level 2 Configuration Support team. An automated distribution job will be developed and SMS will automatically distribute the new software to the NEMIS client PCs.

The Tier Three, Level 2 support will also maintain server baseline documentation and control the release of server updates in the environment.

The following list identifies some of the specific support functions the team will provide:

- Identify and document NEMIS hardware and software baseline configuration information;
- Publish baseline configuration information;
- Manage the NEMIS SMS environment;
- Manage and execute NEMIS client automatic software distribution;
- Maintain the SMS SQL Server environment;
- Maintain the SMS PC hardware and software inventory system;
- Generate SMS reports;
- Monitor and maintain distribution of COTS software updates, patches and upgrades;
    - Novell NetWare
    - MS NT Server
    - MS NT Workstation
    - MS Windows 95
    - Oracle
    - ViewStar
    - MS Office 97
    - WEB browsers
    - Anti-Virus software
- Coordinate with the Oracle, ViewStar, WAN, LAN, and Security Teams to enact system level changes and ensure smooth operations.

3.3.8 Centralized Security Support Functions (Tier 3, Level 2)

The NEMIS system receives input for disaster victims that has been identified as sensitive but not classified. This information must be protected as described by the Privacy Act, Computer Security Act, and the FEMA Information Resource Management Policies and Procedures Directive (FIRMPD). Therefore, the NEMIS Security Manager will be responsible for the following duties:

- Assist the Enterprise Security Manager to develop and maintain system security policies and procedures;
- Interface with physical and computer security representatives;
- Monitor, review and control NEMIS security log files;
- Enforce security policies and procedures; and
- Work with the Oracle, ViewStar, WAN, LAN, and Configuration Control Teams to enact system level changes and ensure smooth operations.

3.3.9 Centralized WWW Administrative Functions (Tier 3, Level 2)

The NEMIS WWW server is based on Oracle's WWW server. This server provides special links to the NEMIS Oracle data base servers. The subsystems designed on the NEMIS Intranet server will use these special links to control data in the NEMIS system. Therefore, the functions performed by the NEMIS WWW Administrator must also include interaction with the Oracle data base team to facilitate smooth interaction. The initial release of NEMIS will provide one WWW server. The duties listed below are functions that must be performed by the NEMIS WWW Administrator:

- Administer the WWW server;
- Maintain NEMIS internal and external WWW links; and
- Coordinate with FEMA intranet WWW Administrators.

3.3.10 National Helpdesk Support (Tier 3, Level 1)

Tier Three Helpdesk support provides the highest level of internal NEMIS assistance available to the NEMIS end user. While Tier Three will respond to Helpdesk trouble tickets from Tiers One and Two, their primary Helpdesk support will concentrate on tickets that require centralized support for resolution. This includes application support for the NEMIS users. Tier Three, Level 1 helpdesk support will be trained in the use of all NEMIS subsystems.

The list below identifies the areas where Tier Three will support Helpdesk functions:

- Manage and maintain the Enterprise Remedy helpdesk system;
- Handle trouble tickets that require centralized support for resolution;
- Route requests for assistance to the proper local helpdesk location;
- Trouble tickets that generate a requirement for a change of the NEMIS system; and

- Request for assistance from a Tier Two Administrator.

4. SKILL SET MATRIX

The following table provides a lost of the skills required to provide FEMA O&M with competent and capable support for the NEMIS environment. The table identifies formal education, training, and relative experience as the prime requirements for the NEMIS support team. However, it is important to note that these are only guidelines and that each individual considered for the NEMIS support positions should posses experience that is relevant to FEMA's NEMIS O&M requirements. All applicants must be interviewed and their specific capabilities and competence analyzed before being considered for positions.

TIER THREE POSITION	RELATIVE EDUCATION/TRAINING/EXPERIENCE (CENTRALIZED)					
	FORMAL ED	RELATIVE TRAINING	RELATIVE EXP	ORACLE EXP	VIEW STAR EXP	NT/NW EXP
Enterprise Oracle DBA	BS Degree In CS	Oracle DBA	10 Years with Oracle	10 Years 2 with replication	N/A	2 Years N/A
Oracle DBA	BS Degree	Oracle DBA	5 Years with Oracle	5 Years 1 with replication	N/A	1 Years N/A
Enterprise ViewStar Administrator	BS Degree In CS	ViewStar Internals & Developer	3 Years with Workflow	1 Year SQL	1 Year	1 Year 1 Year
ViewStar Administrator	Associates Degree	ViewStar Admin	2 Year with Workflow	N/A	1 Year	1 Year 1 Year
Enterprise WWW Webmaster	Associates Degree	Oracle WEB Server	3 Years WEB Develop	1 Year PSQL	N/A	1 Year N/A
Senior MS NT/Novell NetWare Enterprise Administrator	BS Degree In CS	MCSE and/or CNE	10 Years in PC Networking	1 Year	N/A	3 Years 5 Years
MS NT/Novell NetWare Enterprise Administrator	BS Degree In CS	MCSE And/or CNE	5 Years in PC Networking	N/A	N/A	2 Years 3 Years
Enterprise WAN Administrator	BS Degree In CS	Cisco Certified	10 Years in WAN 5 w/Cisco	1 Year Oracle Over WAN	N/A	5 Years TCP/IP 6 Years IPX/SPX
LAN/WAN Administrator	BS Degree	Cisco Certified	7 Years in LAN/WAN Protocols	N/A	N/A	3 Years TCP/IP 4 Years IPX/SPX
Helpdesk Manager	BS Degree	Helpdesk Customer Srv Training	4 Years Helpdesk 1 Year Mgmt	1 Year Gen Support	1 Year Gen Support	2 Years Gen Support

TIER THREE POSITION	RELATIVE EDUCATION/TRAINING/EXPERIENCE (CENTRALIZED)					
	FORMAL ED	RELATIVE TRAINING	RELATIVE EXP	ORACLE EXP	VIEW STAR EXP	NT/NW EXP
National Helpdesk Technician	Associates Degree	Helpdesk Training	2 Years Helpdesk	1 Year Gen Support	1 Year Gen Support	1 Year Gen Support
FEMA Application Specialist	Associates Degree	MS Apps Expert Cert. NEMIS Client	2 Years w/FEMA Std Apps	1 Year a Plus	1 Year a Plus	2 Years
NEMIS System Security Support	BS Degree	Computer & Info Security	1 Years Computer Security	1 Year Security	N/A	1 Year Security
NEMIS Configuration Control Support	BS Degree	Config Mgmt	1 Years Config Mgmt	N/A	N/A	N/A

Table 4-1 Centralized NEMIS Skill Set Requirement Matrix

TIER ONE OR TWO POSITION	RELATIVE EDUCATION/TRAINING/EXPERIENCE (LOCALIZED)					
	FORMAL ED	RELATIVE TRAINING	RELATIVE EXP	ORACLE EXP	VIEW STAR EXP	NT/NW EXP
Oracle Technician	Associates Degree	Oracle DBA a Plus	1 Years with Databases	1 Year	N/A	1 Years N/A
ViewStar Technician	Associates Degree	ViewStar Admin a Plus	N/A	N/A	N/A	1 Year 1 Year
MS NT/Novell NetWare Administrator	Associates Degree	NT or NetWare Admin	3 Years in PC Networking	N/A	N/A	1 Year 2 Years
LAN Administrator	Associates Degree	LAN Admin (protocols)	2 Years in Protocols	N/A	N/A	1 Year TCP/IP 2 Years IPX/SPX
Helpdesk Manager	Associates Degree	Helpdesk Customer Srv Training	1 Years Helpdesk 1 Year Mgmt	N/A	N/A	2 Years Gen Support
Helpdesk Technician	Associates Degree	Helpdesk Training	2 Years Helpdesk	N/A	N/A	1 Year Gen Support
PC Technician	Associates Degree	A+ PC Repair Training	2 Years Helpdesk/ PC Repair	N/A	N/A	1 Year Gen Support
FEMA Application Specialist	Associates Degree	MS Apps Expert Cert. NEMIS Client	2 Years w/FEMA Std Apps	N/A	N/A	1 Year a Plus

Table 4-2 Localized NEMIS Skill Set Requirement Matrix

5. SITE STAFFING REQUIREMENTS

NEMIS provides FEMA with the unique opportunity to implement a functional software solution to what is currently accomplished primarily via manual/hardcopy (i.e., pencil, paper, FAX, e-mail). While this is a benefit to the end user, it poses several support issues to FEMA O&M. First and foremost, how do you staff such a system?

Staffing an existing system is a very difficult task. On several occasions over the past few years, FEMA has hired independent contractors that specialize in evaluating their clients existing staffing and provided recommendations for improving the staffing structure. To say the least, identifying personnel, their skill set requirements, and staffing locations for NEMIS is a very complicated task.

Our approach for identifying site staffing requirements was to discuss the environment with the developers, industry experts, and NEMIS specialists, provide them with an overview of the operational approach, and request their input for staffing requirements. Staffing requirements for Helpdesk functions were the most difficult to identify. This is due to the fact that NEMIS has no benchmark for Helpdesk statistics. The industry uses Helpdesk and Helpdesk technician availability statistics to justify staffing requirements. Therefore, we used an estimate based on a ratio of number of technicians to number of users. Our estimate uses a ratio of one Helpdesk technician (telephone support) to every 200 users, one PC technician (hardware support) to every 100 users, and one Application specialist (software support) to every 100 users. The tables shown below are the results of this analysis.

5.1 CENTRALIZED STAFFING REQUIREMENT

The table below shows the estimated staffing requirements for supporting NEMIS at Mount Weather and using HQ FEMA as a backup site. The table also attempts to identify on-hand resources and provide an estimated staffing short fall. This effort is a long and tedious undertaking and is currently underway. The document will be updated as personnel are identified and assigned to positions.

CENTRALIZED POSITION	MOUNT WEATHER	HQ FEMA	POSITION TOTAL	ON-HAND FTE	ON-HAND CONT.	SHORT FALL
Tier 3, Lvl 2 – Senior Enterprise Oracle DBA	2	1	3	0	0	3
Tier 3, Lvl 2 – Enterprise Oracle DBA Support	2	1	3	0	0	3
Tier 3, Lvl 2 – Senior Enterprise ViewStar Admin	2	1	3	0	0	3

CENTRALIZED POSITION	MOUNT WEATHER	HQ FEMA	POSITION TOTAL	ON-HAND FTE	ON-HAND CONT.	SHORT FALL
Tier 3, Lvl 2 – Enterprise WWW Webmaster	1	1	2	0	0	2
Tier 3, Lvl 2 – Senior Enterprise Server/LAN Admin	2	1	3	0	0	3
Tier 3, Lvl 2 – Enterprise LAN/Server Admin Support	2	1	3	0	0	3
Tier 3, Lvl 2 – Senior Enterprise WAN Admin	2	1	3	0	0	3
Tier 3, Lvl 2 – Enterprise WAN Admin Support	2	1	3	0	0	3
Tier 3, Lvl 2 – Enterprise Config Mgmt Support	1	1	2	0	0	2
Tier 3, Lvl 2 – Enterprise Security Support	1	1	2	0	0	2
Tier 3, Lvl 2 – Enterprise Application Support	4	2	6	0	0	6
Tier 3, Lvl 1 – National Helpdesk Support	6	4	10	0	0	10
SITE TOTALS	27	16	43	0	0	43

Table 5.1-1 Estimated NEMIS Centralized Staffing Requirements

5.2 LOCALIZED FIXED FACILITY STAFFING REQUIREMENTS

Table 5.2-1 Estimated NEMIS Localized Fixed Site Staffing Requirements shows the estimated staffing requirements for the large FEMA fixed sites. Note that the Mount Weather site represents support for the local user community and are above and beyond the centralized staffing requirement shown above. The figures shown are based upon the following assumptions.

- 400 Mt Weather Users
- 800 HQ FEMA Users
- 640 TX NPSC/TX Users
- 500 MD NPSC/NTC Users
- 244 VA NPSC/NTC Users

This effort is also underway and the document will be updated periodically to show staffing assignment progress.

LOCAL POSITION	MOUNT WEATHER	HQ FEMA	TX NPSC /NTC	MD NPSC /NTC	VA NPSC /NTC	TOTALS	ON-HAND FTE/DTE	ON-HAND CONT	SHORT FALL
Tier 2 – Oracle Technician	2.5	.5	.5	.5	.5	4.5	0	0	4.5
Tier 2 – ViewStar Technician	.5	.5	.5	.5	.5	2.5	0	0	2.5
Tier 2 - WAN Support	2	2	2	1	1	8	0	0	8
Tier 2 – Server/LAN Admin	2	2	3	2	2	11	0	0	11
Helpdesk Manager	1	1	2	1	1	6	0	0	6
Helpdesk Technician	6	4	3.5	2.5	1.5	17.5	0	0	17.5
PC Technician	4	8	6.5	5	2.5	26	0	0	26
Application Technician	4	8	6.5	5	2.5	26	0	0	26
SITE TOTALS	22	26	24.5	17.5	11.5	101.5	0	0	101.5

Table 5.2-1 Estimated NEMIS Localized Fixed Site Staffing Requirements

5.2.1 Mount Weather Staffing and Skill Set Requirements

POSITION	PERSONNEL	REQUIREMENT
Senior Enterprise Oracle DBA	2	Central/Enterprise Systems Management Team
Enterprise Oracle DBA Support	2	Central Management
Senior Enterprise ViewStar Admin	2	Central/Enterprise Systems Management Team
Senior Enterprise Server/LAN Admin	2	Central/Enterprise Systems Management Team
Senior Enterprise WAN Admin	2	Central/Enterprise Systems Management Team
Enterprise WAN Admin Support	2	Central Management
NEMIS System Security Manager	1	Central/Enterprise Systems Management Team

POSITION	PERSONNEL	REQUIREMENT
NEMIS Config Control Manager	1	Central/Enterprise Systems Management Team
	14	

Table 5.2.1-2 Centralized Enterprise Staffing Requirements (Mount Weather)

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	MWEAC Site Support
ViewStar Administrator	.5	MWEAC Site Support
LAN/WAN Administrator	2	
Server LAN Administrator	2	MWEAC Site Support
Helpdesk Manager	1	Enterprise/MWEAC Site Support
Helpdesk Technicians	6	Enterprise/MWEAC Site Support
PC Technicians	4	Enterprise/MWEAC Site Support
Application Specialists	4	Enterprise/MWEAC Site Support
	20	

Table 5.2.1-3 MWEAC Site Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Virginia NPSC
ViewStar Administrator	.5	Virginia NPSC
MS NT/NetWare Server Administrator	2	Virginia NPSC
LAN/WAN Administrator	1	Virginia NPSC
Helpdesk Manager	1	Virginia NPSC
Helpdesk Technicians	1.5	Virginia NPSC
PC Technicians	2.5	Virginia NPSC
Application Specialists	2.5	Virginia NPSC
	11.5	

Table 5.2.1-4 Virginia NPSC/NTC Staffing Requirements

5.2.2 Denton Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Server/LAN Administrator	1	Denton NTC
LAN/WAN Administrator	1	Denton NTC
Helpdesk Manager	1	Denton NTC
Helpdesk Technicians	1.5	Denton NTC
PC Technicians	2.5	Denton NTC
Application Specialists	2.5	Denton NTC
	9.5	

Table 5.2.2-5 Denton NTC Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Denton NPSC
ViewStar Administrator	.5	Denton NPSC
Server/LAN Administrator	2	Denton NPSC
LAN/WAN Administrator	1	Denton NPSC
Helpdesk Manager	1	Denton NPSC
Helpdesk Technicians	2	Denton NPSC
PC Technicians	4	Denton NPSC
Application Specialists	4	Denton NPSC
	15	

Table 5.2.2-6 Denton NPSC Staffing Requirements

5.2.3 Hyattsville NPSC/NTC Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Hyattsville NPSC/NTC
ViewStar Administrator	.5	Hyattsville NPSC/NTC
MS NT/NetWare Server Administrator	2	Hyattsville NPSC/NTC
LAN/WAN Administrator	1	Hyattsville NPSC/NTC
Helpdesk Manager	1	Hyattsville NPSC/NTC
Helpdesk Technicians	2.5	Hyattsville NPSC/NTC
PC Technicians	5	Hyattsville NPSC/NTC
Application Specialists	5	Hyattsville NPSC/NTC
	17.5	

Table 5.2.3-7 Hyattsville NPSC/NTC Staffing Requirements

5.2.4 FEMA HQ Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Report Writer	1	FEMA HQ
Oracle Administrator	.5	FEMA HQ
ViewStar Administrator	.5	FEMA HQ
NEMIS System Security Manager	1	Central Management
MS NT/NetWare Server Administrator	2	FEMA HQ
NEMIS WEB Master	2	Central/Enterprise Systems Management Team
LAN/WAN Administrator	2	FEMA HQ
Helpdesk Manager	1	FEMA HQ
Helpdesk Technicians	4	FEMA HQ
PC Technicians	8	FEMA HQ
Application Specialists	8	FEMA HQ
	30	

Table 5.2.4-8 HQ Site Staffing Requirements

5.3 REGIONAL STAFFING REQUIREMENTS

NEMIS must be supported at all locations. Therefore, adequate staff must be identified to maintain the system in the Regions. The tables below attempt to identify staffing levels associated with the predefined Tier One and Two positions. The figures shown make the following assumptions.

- One Helpdesk technician (telephone support) to every 200 users;
- One PC technician (hardware support) to every 100 users; and
- One application specialist (software support) to every 100 users.

Furthermore, given the complexity of the NEMIS system and subsystems, no site will have less than 3 personnel available to support NEMIS. Identifying support staff for the Regional sites requires specific knowledge of the site and its users. Over the next several months, O&M management will be working with the Regional representatives to identify their site requirements and assist them in their efforts to support the NEMIS environment. This document will be updated with specific Regional staffing figures as they are identified.

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region I
ViewStar Administrator	.5	Region I
MS NT/NetWare Server Administrator	1	Region I
LAN/WAN Administrator	.5	Region I
Helpdesk Manager	1	Region I
Helpdesk Technicians	TBD	Region I
PC Technicians	TBD	Region I
Application Specialists	TBD	Region I
Totals	TBD	

Table 5.3-1 Region I Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region II
ViewStar Administrator	.5	Region II
MS NT/NetWare Server Administrator	1	Region II
LAN/WAN Administrator	.5	Region II
Helpdesk Manager	1	Region II
Helpdesk Technicians	TBD	Region II
PC Technicians	TBD	Region II
Application Specialists	TBD	Region II
Totals	TBD	

Table 5.3-2 Region II Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region III
ViewStar Administrator	.5	Region III
MS NT/NetWare Server Administrator	1	Region III
LAN/WAN Administrator	.5	Region III
Helpdesk Manager	1	Region III
Helpdesk Technicians	TBD	Region III
PC Technicians	TBD	Region III
Application Specialists	TBD	Region III
Totals	TBD	

Table 5.3-3 Region III Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region IV
ViewStar Administrator	.5	Region IV
MS NT/NetWare Server Administrator	1	Region IV
LAN/WAN Administrator	.5	Region IV
Helpdesk Manager	1	Region IV
Helpdesk Technicians	TBD	Region IV
PC Technicians	TBD	Region IV
Application Specialists	TBD	Region IV
Totals	TBD	

Table 5.3-4 Region IV Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region V
ViewStar Administrator	.5	Region V
MS NT/NetWare Server Administrator	1	Region V
LAN/WAN Administrator	.5	Region V
Helpdesk Manager	1	Region V
Helpdesk Technicians	TBD	Region V
PC Technicians	TBD	Region V
Application Specialists	TBD	Region V
Totals	TBD	

Table 5.3-5 Region V Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region VI
ViewStar Administrator	.5	Region VI
MS NT/NetWare Server Administrator	1	Region VI
LAN/WAN Administrator	.5	Region VI
Helpdesk Manager	1	Region VI
Helpdesk Technicians	TBD	Region VI
PC Technicians	TBD	Region VI

POSITION	PERSONNEL	REQUIREMENT
Application Specialists	TBD	Region VI
Totals	TBD	

Table 5.3-6 Region VI Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region VII
ViewStar Administrator	.5	Region VII
MS NT/NetWare Server Administrator	1	Region VII
LAN/WAN Administrator	.5	Region VII
Helpdesk Manager	1	Region VII
Helpdesk Technicians	TBD	Region VII
PC Technicians	TBD	Region VII
Application Specialists	TBD	Region VII
Totals	TBD	

Table 5.3-7 Region VII Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region VIII
ViewStar Administrator	.5	Region VIII
MS NT/NetWare Server Administrator	1	Region VIII
LAN/WAN Administrator	.5	Region VIII
Helpdesk Manager	1	Region VIII
Helpdesk Technicians	TBD	Region VIII
PC Technicians	TBD	Region VIII
Application Specialists	TBD	Region VIII
Totals	TBD	

Table 5.3-8 Region VIII Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region IX
ViewStar Administrator	.5	Region IX
MS NT/NetWare Server Administrator	1	Region IX
LAN/WAN Administrator	.5	Region IX
Helpdesk Manager	1	Region IX
Helpdesk Technicians	TBD	Region IX
PC Technicians	TBD	Region IX
Application Specialists	TBD	Region IX
Totals	TBD	

Table 5.3-9 Region IX Staffing Requirements

POSITION	PERSONNEL	REQUIREMENT
Oracle Administrator	.5	Region X
ViewStar Administrator	.5	Region X
MS NT/NetWare Server Administrator	1	Region X
LAN/WAN Administrator	.5	Region X
Helpdesk Manager	1	Region X
Helpdesk Technicians	TBD	Region X
PC Technicians	TBD	Region X
Application Specialists	TBD	Region X
Totals	TBD	

Table 5.3-10 Region X Staffing Requirements

6. MAINTENANCE

O&M has the charter to ensure that the NEMIS environment operate smoothly with as little down time as possible. While the design of the system includes fault tolerant features like UPS, multiple CPU servers, and redundant power supplies, there is still a chance that the system or a system component may fail. These situations must be planned for to mitigate extended down time of the server.

Furthermore, all devices have a "useful" life cycle. If the device becomes antiquated or breaks, it must be replaced. O&M must monitor the NEMIS environment and plan for stocking spare parts and the ultimate replacement of the equipment. Monitoring the server environment will provide historical trend information to justify the expansion of the hard disk or memory systems. Consistent monitoring of the system will also identify component failure trends and allow FEMA O&M to plan the long term funding of spare parts.

Monitoring the system and tracking trend data will also aid in the planning for long term funding of the life cycle. As parts are used they must be replaced. As systems become antiquated or break, new systems must be purchased. All of these efforts combined make up the life cycle maintenance of the NEMIS environment.

7. ASSUMPTIONS AND CONSTRAINTS

The staffing figures include FEMA full-time employees, Disaster Temporary Employees, and contractors. It is assumed that FEMA does not currently employ individuals with the necessary skills and background to staff the NEMIS Enterprise Systems Management Team and that this requirement will be out-sourced.

The approach for implementing the support structure must not only include capable trained personnel, but also a self supporting life cycle program that keeps people trained as individuals cycle in and out of the environment. This can be accomplished via formal classroom training and/or On-The-Job Training (OJT). The O&M NEMIS Training Plan must be developed and it must identify a training structure that supports long term stability.

The three levels of support require O&M guidelines and standards in order to function as a single support system. It is assumed that SOPs and policies for maintaining the NEMIS environment will be developed and updated as required.

This document assumes that the staff tasked to maintain the NEMIS environment will be provided with adequate tools (hardware and software) to accomplish their day-to-day duties.

While there is some overlap with non-NEMIS O&M system support, this document was developed to identify an O&M concept for managing NEMIS. If this document satisfies FEMA's requirements for the O&M of NEMIS and can be supported and implemented, it could be used as a model for the O&M of other non-NEMIS activities.

APPENDIX A

A. PROPOSED BMC ARCHITECTURE FOR NEMIS

BMC Patrol will be used to monitor the primary components of the NEMIS environment; MS NT, Oracle RDBMS, MS Exchange, ViewStar, and the NEMIS Human Services subsystem. This will be accomplished by loading the BMC Patrol Agent on all NEMIS servers that run one, some, or all of these primary components. The Agent runs as a service in the NT environment and collects data on specific aspects of the environment at predetermined intervals. The BMC Patrol Administrators control the specific components monitored. The Administrators also control the interval at which the Agent polls the component. The data collected by the Agents is stored locally on the NT server. Periodically the data will be extracted and stored in a centralized data repository for historical system research.

NEMIS administrators will use Patrol Console and PatrolWatch to actively monitor the state of the system and its components. The central administration team will use patrol Console. Each primary component will have a separate team monitoring the specific NEMIS component. For example, the Oracle team will have two BMC Consoles in their area that is configured primarily to monitor key Oracle RDBMS components. The LAN/Server team will have one that watches the NT server components. The Console will also be used centrally to control the BMC Agents and administrator's Console desktop look and feel.

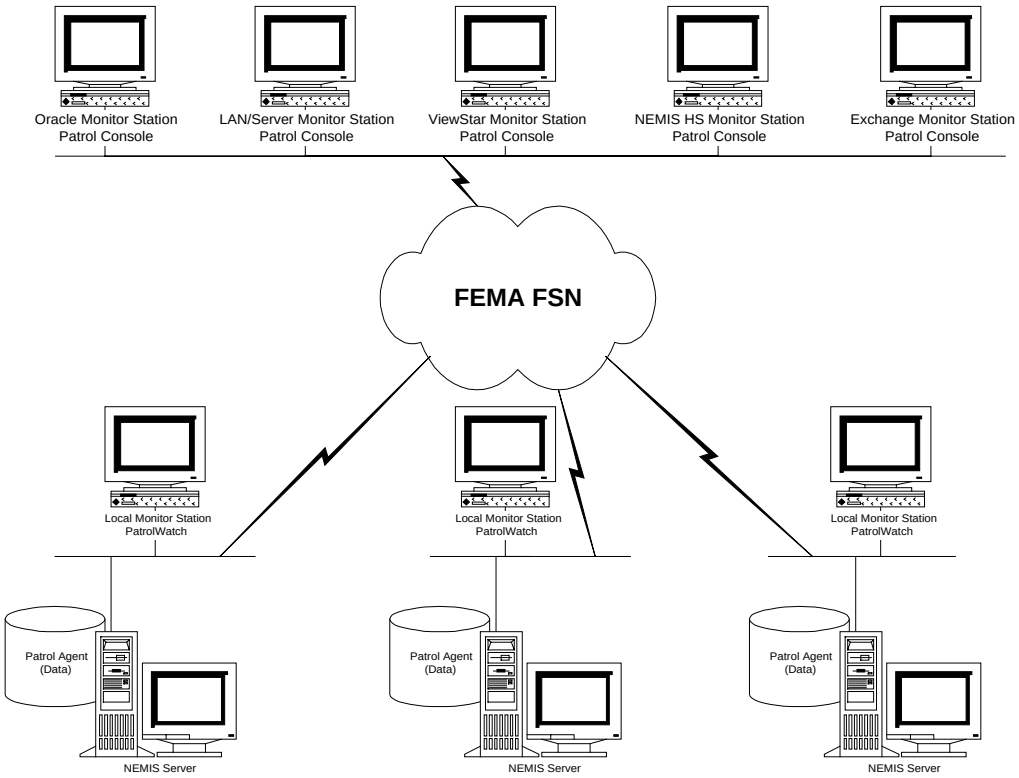

Figure a-1 - BMC Patrol Environment (Conceptual View)

Local administrators will use the PatrolWatch tool to monitor the over-all health of the NEMIS servers. This tool operates much the same way as the Console, but lacks the Agent configuration capability of the centralized tool. Figure A-2 presents an overview of the architecture described above. Both the central and local tools will notify the administrators of a problem by flashing the offending site icon. The administrators can then drill down through the site and server icons to the specific component.

APPENDIX B

B. PROPOSED TIVOLI ARCHITECTURE FOR NEMIS

In order to facilitate simplified and secure user management in the NEMIS[1] environment, the TME 10 Framework and TME 10 User Administration products will be deployed nationwide on all NEMIS systems. TME 10 will provide a simple, easy to use environment for administrators to manage user accounts. All actions taken by subordinate administrators are controlled and enforced by policy defined by senior NEMIS management. This paradigm allows for the secure delegation of administrative tasks to junior administrators without the need for constant oversight, the time for which will be at a premium when the organization is operating in crisis mode.

The TMR[2] layout will mirror the anticipated layout of the Windows NT Domain structure within NEMIS. This will provide a clear and consistent environment for the administrative staff and minimize ambiguities that could compromise security and otherwise hinder disaster assistance personnel in the performance of their assigned duties.

TMR Design

The TMR server is the heart of the Tivoli Management Environment (TME). All managed resources must be defined to a TMR server. All of the desired Tivoli management applications must also be installed on the TMR servers (some may also have binaries that must be installed on the managed devices as well). The TMR server serves as the central arbiter within the systems management strategy that allows all of the various applications and components to communicate and integrate with each other.

Server and Managed Nodes

The TMR will consist of the TMR Server, located at the Mt. Weather, VA facility. The hardware for this system will be one of the NEMIS systems already in existence. It is anticipated that the addition of TMR duties will not adversely affect this machine in any way. The TME 10 software and database will require approximately 300 MB of disk storage.

[1] National Emergency Management Information System
[2] Tivoli Management Region

The TMR also will consist of approximately 74 Managed Nodes[3]. These systems are made up of the NEMIS applications servers, Oracle database servers, etc. These systems are also Compaq SMP systems. As in the case of the TMR server, it is not anticipated that the TME software will in any way adversely effect NEMIS operations from a system resources point of view.

Conceptually, the TMR can be visualized in Figure b-1. As can be seen, the TMR forms a sort of virtual network of Tivoli managed systems. Managed nodes are not constrained by physical location within the FEMA Switching Network.

Policy Region Design

A Policy Region is a collection of TME 10 resources that are governed by a common set

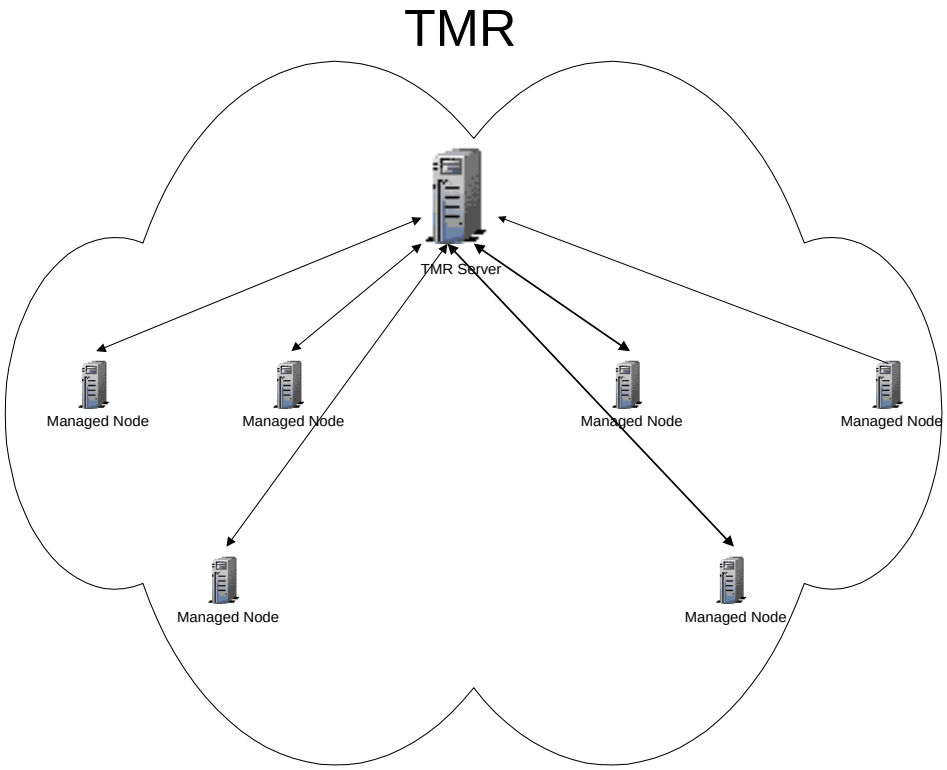

Figure b-1 – Single TMR (Conceptual View)

of policies. Policies are rules that govern the management of resources, such as saying that all user accounts must have passwords, and password aging must be enabled. Traditionally, these rules take the form of shell scripts, written procedures and/or guidelines, some of which may be known only to senior system administrators. The TME 10 framework provides a multi-level policy facility that will enable NEMIS' senior

[3] A managed node is a computer resource under the administrative purview of the TMR server. A Managed node can only belong to 1 TMR but can be administered from any connected TMR provided the proper privileges have been granted.

administrative staff to encode acceptable policies and values for individual resources. This will result in the rules set forth being strictly enforced across-the-board, allowing for the secure delegation of system management tasks to other administrators within the enterprise.

Policy regions will be created within the NEMIS environment to represent a management domain or "sphere of influence" for one or more system administrators. These policy regions will strictly enforce the policies associated with the region and its resources. Administrators will be delegated resource management authority over one or more of these policy regions. They will only be allowed to perform operations and changes that are consistent with policies that have been set up.

The policy region layout for NEMIS will closely mirror the NT domain layout. It is anticipated there will be one policy region representing each of the 10 FEMA regions, one for each of the three NPSCs, and one for Headquarters in Washington D.C. There will also be one additional policy region created to hold the standby DFO systems. This will allow them to be as up-to-date as possible when they are deployed to a disaster site.

Policy Region Naming Conventions

With the exception of the top-level policy region and the region holding the inactive DFO systems, policy region names will follow the NT domain naming convention established by FEMA when it is finalized. Until this occurs, region names in this document will be geographic (e.g.: Region 5, Hyattsville, Headquarters, etc.)

The layout of the policy regions is illustrated in Figure b-2. It will be a two tiered hierarchical construct centered around the "NEMIS" top-level policy region.

Policy Region Contents

With few exceptions, the contents of the policy regions will be uniform; differing only in the number of managed nodes assigned.

Policy regions will contain Managed Nodes, Profile Managers[4], and perhaps a Task Library[5]. Managed nodes will be created by senior administrative staff in the policy region where they reside as described above. Each policy region will have a Profile Manager containing the required User and Group Profiles for that region. The layout and contents of a sample policy region is illustrated in Figure b-2.

[4] Profile Manager - A group of profiles that are subscribed to as one unit by individual profile endpoints. These endpoints can be managed nodes or other profile managers

[5] Task Library - A feature of TME 10 that enables administrators to create and store tasks and jobs that can be run on one or more managed resources within the TME environment. It can serve as a storage site for binaries, scripts or programs used by TME-based applications

Profile Managers and Profiles

In TME 10, all user and group account creation is done within the context of a Profile Manager. Profile managers can contain two basic entities: Profiles[6] and Subscribers. For NEMIS there will be two types of profile in use: User and Group. The icons for user and group profiles that will appear in the profile manager are illustrated in figures 5 and 6 respectively.

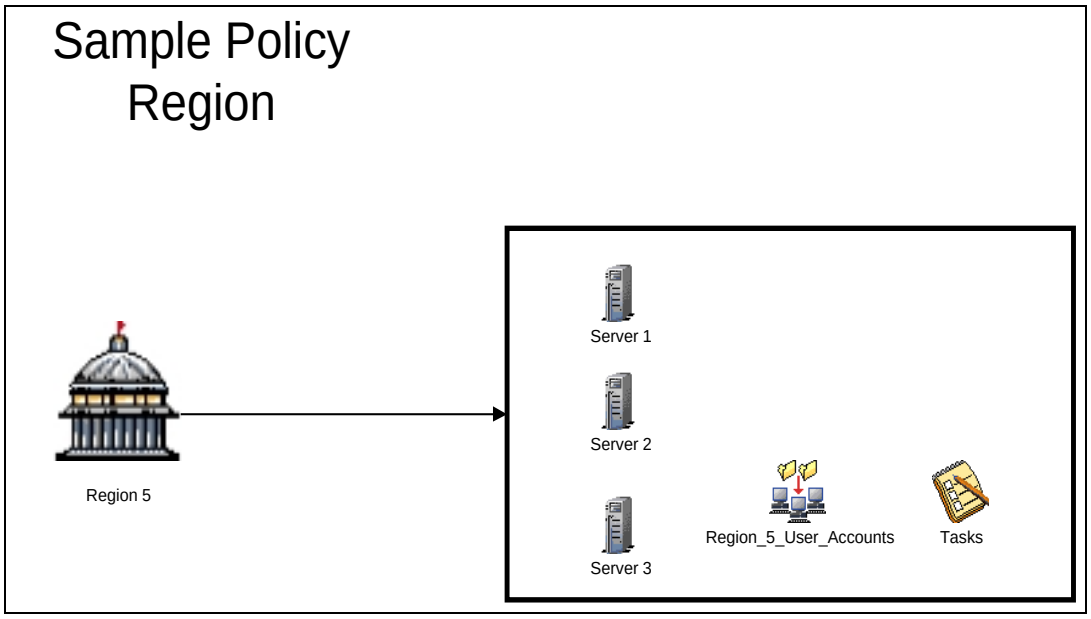

Figure b-2 – Sample Tivoli Policy Region

Figure b-3 Tivoli Users

Figure b-4 Tivoli Group Icon

[6] Profile - A collection of application-specific information.

The User profile will contain information such as user name, login name, user ID, user group, home directory, etc., for each user that is defined in that profile. In addition, the user profiles for NEMIS will be customized to add additional fields required to create and manage Oracle accounts and add data to selected Oracle tables on the Consolidated Master. Additionally, the Add User dialog screen will be modified to add an additional button. When the administrator makes this selection, he or she will be presented with a list of valid users drawn from the ADD database. Group profiles will be used to create and maintain NT administrative groups. These allow for the simplification of granting privileges to users by grouping them administratively and granting the privilege to the group as a whole.

Default and Validation Policies

As stated earlier in this document, policies are used throughout TME 10 to what can be done and how it is to be accomplished. TME 10 User Administration is no exception. There are two sets of policies that come into play.

The Default policy mechanism is engaged from the Add User dialog screen when the administrator chooses the “Generate Defaults” button. This allows the administrator to enter a minimum amount of data on the initial form; the system will fill in the rest of the blanks in accordance with the policies defined by senior NEMIS staff.

After defaults have been generated, the administrator is afforded the opportunity to make any changes deemed necessary. When all changes are made, the administrator selects either the “Add and Close” or “Add” button. At this time, the Validation policy mechanism is run against the new and/or modified user data. Validation policy ensures that the user account is created in a way that complies with NEMIS standards. It will not allow a non-compliant account to be created. The administrator will have to make the necessary changes to the user data before the account can be created. Typically, if the generated defaults are used exclusively, then an account will never fail validation.

There can be Default and Validation policies in place for each field on the “Add User” dialog screen. These policies are typically shell or Perl scripts, but can be converted to binary executables if desired.

Profile Distribution

In order for the new user account to physically be created, the user profile must be distributed to its subscribers. This operation is accomplished in one of several ways:

- Select “Distribute” from the “Profile” drop down menu in the “User Profile Properties” dialog. Another dialog will appear allowing the administrator to define the terms of distribution and which subscribers to distribute to.
- The admin is also afforded to opportunity to “schedule” the distribution, and hence account creation, for some time in the future.

- The administrator can “drag-and-drop” the icon for the user profile onto the selected subscribers.
- Select the profiles to be distributed and the subscribers to distribute to then select “Distribute” from the “Profile Manager” drop down menu while at the Profile Manager screen.
- From the command line: ***C:\ wdistrib @UserProfile:Region_5_Users @ManagedNode:Region_5_PDC***

The overall architecture for NEMIS calls for NT accounts to only be created on PDC systems. Thus, only NT PDCs will be a subscriber to the User Accounts profiles. NT “trust relationships” will be relied upon to ensure that the users’ accounts are valid on systems where a user needs access.

Oracle Accounts
The creation or deletion of an NT account will automatically trigger the creation/deletion of an Oracle account for that user on all Oracle servers throughout NEMIS.

NEMIS Accounts
The creation or deletion of an NT account will automatically trigger the NEMIS account information in the USER_DEF table to be flagged inactive. This action will be performed on the NEMIS master consolidated database and Oracle replication will push the inactive user status out to all NEMIS sites.

PadLock Accounts

The creation or deletion of an NT account will automatically trigger the creation/deletion of the PadLock account for that user on the master PadLock server (master consolidated database). Oracle replication will push the deleted user out to all NEMIS sites.

Tivoli Administrators

NEMIS’ senior administrators will only create Tivoli administrators for the various policy regions. There will be two or three senior administrators with the requisite global TMR roles (privileges).

Each policy region will have at least two Tivoli administrators with the appropriate roles to perform the necessary User Admin functions within their respective regions only. The senior Tivoli administrators can only grant additional resource roles, which allow them to perform administrative functions outside their region.

The senior administrators will have all privileges TMR wide. Regional administrators will have only those privileges needed to effectively perform their job.

Administrators will log in to one of their local NT systems. There they will be validated by NTs security mechanism. After successful NT validation, the TMR server as legitimate Tivoli administrators will validate them again. Only then will they be granted

access to their Tivoli Desktop. Failed validations at any point result in a security event being generated in the NT Event Log.

The administrators' Tivoli Desktop will contain icons for only those resources over which they have administrative purview. Attempted actions outside of defined policy will result in privilege violation errors. These policies can only be changed or overridden by the senior administrators.

The senior Tivoli administrators' desktops will contain icons to all managed resources within the TMR. New administrators can only be created from these desktops. All administrator accounts are stored within the "Administrators" collection (iconic representation in Figure 7). Opening this collection will give the senior administrator access to all Tivoli administrators' accounts (Tivoli accounts…). The iconic representation for an administrator is shown in Figure 8.

Figure b-5 Sample Admin Icon

Figure b-6 Sample Senior Admin Icon

APPENDIX C

C. PROPOSED SMS ARCHITECTURE FOR NEMIS

The SMS architecture is currently under development. Therefore the following description is one possible architecture that maybe implemented. This document will be updated as the SMS architecture is finalized and made available for general use. The primary use of SMS in the NEMIS environment is software distribution. Therefore, the architecture defined below is optimized for cost, ease of management, and functionality for an SMS implementation used primarily for software distribution.

NEMIS will use a single SMS environment with one primary SMS site and several secondary SMS sites. Primary SMS servers require MS SQL servers to provide the SMS data repository. Secondary site support primary site distribution and monitoring. The NEMIS primary SMS site will be homed at Mt Weather. Regions, NPSCs, HQ, and other fixed FEMA sites will support the secondary SMS servers. Microsoft has recommended that the primary to secondary server relationship be as flat as possible to better control the software distribution and inventory processes. Therefore, all secondary systems will be directly subordinate to the primary SMS server at Mt. Weather. All NEMIS clients will be loaded with SMS client software to facilitate software distribution, inventory, and remote network control.

For software distribution, the Tier Three, Level 2 Configuration Management support team will receive updates and patch fixes from the Tier Three, Level 3 Configuration Manager and use the primary SMS server to create a distribution package and a distribution job. The package is the software upgrade/patch combined with the client instructions for its installation. These installation instructions can be automated to force the update and provide all user side response for the installation. The job is the set of instructions to the SMS system that tell it how to perform the distribution to the secondary systems. Once the package and the job are built, the job is executed and the package is passed to the secondary SMS server. As each SMS client logs into the secondary SMS server, the package is distributed in accordance with the package install instructions.

SMS also provides a client inventory component. In the NEMIS architecture, all SMS clients will periodically report its specific hardware and software configuration to the primary SMS server at Mt Weather. This data will be stored in the SMS SQL Server data repository. The SMS administrative utility on the primary server will be used to generate enterprise wide client reports against the inventory.

The Tier Three, Level 1 helpdesk and application support team will use the SMS administrative tool to remote control user desktops. This will allow the support technician to take over the end-user's PC and show him/her to use the application.