PNL-10689
UC-620

# FEDERAL EMERGENCY MANAGEMENT INFORMATION SYSTEM (FEMIS)

# BILL OF MATERIALS (BOM) FEMIS: PHASE I

## Version 1.2

**Thomas F. Coonelly**
**Lawrence H. Gerhardstein**
**John A. Hucks**
**W. David Millard**
**Timothy R. Riordan**
**Paul V. Rohde**
**Forrest E. Strycker**
**Blanche M. Wood**

July, 1995

Prepared for the CSEPP Office
United States Army Chemical
and Biological Defense Command
under a Related Services Agreement
with the U.S. Department of Energy
Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

ACKNOWLEDGMENT

This software and its documentation were produced with Government support under Contract Number DE-AC06-76RLO-1830 awarded by the United States Department of Energy. The Government retains a paid-up non-exclusive, irrevocable worldwide license to reproduce, prepare derivative works, perform publicly and display publicly by or for the Government, including the right to distribute to other Government contractors.

## DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

# 1.0 General

## 1.1 Overview

This paper describes the Bill of Materials (BOM) for the Federal Emergency Management Information System (FEMIS) for release 1.1.

FEMIS runs on two computer platforms: A UNIX platform, employed as a data server, and a personal computer (PC) using a Windows NT operating environment. FEMIS will support the use of commercial off-the-shelf software (COTS) software applications and tools. The hardware set includes a UNIX data server, a PC Communications server (at the source of MET data only), and a number of PC Client workstations, peripheral devices and network support equipment as described in this document. Servers and PCs require the operating system, utility software, communications and other internal cards also listed in the following sections.

Several configurations are possible at a CSEPP Site. In this description, a Site is understood to be comprised of several installations, including the depot, surrounding Immediate Response Zone (IRZ) and Protective Action Zone (PAZ) counties, and the state EOC. In general, the main differences between possible configurations are the number of users at an installation, the location of the UNIX data server, and the WAN link between installations. Two typical installation configurations are **With Data Server** and **Without Data Server**. See section **5.0 Computer Networks** for additional details. The number of PC workstations may vary at an installation.

## 1.2 References

The following documents will provide additional information on FEMIS hardware and software needs.

Pacific Northwest Laboratory. 1994. FEMIS System Requirements Specification (SRS), FEMIS: Phase , v2.0. Pacific Northwest Laboratory, Richland, WA.

Pacific Northwest Laboratory. 1994. FEMIS Software Subsystem Component Recommendations (Part One). Pacific Northwest Laboratory, Richland, WA.

Pacific Northwest Laboratory. 1994. FEMIS Software Subsystem Component Recommendations (Part Two), Pacific Northwest Laboratory, Richland, WA.

Pacific Northwest Laboratory. 1994. FEMIS Hardware Requirements Specification, FEMIS Phase I, v2.0, with Addendum dated July 1, 1994. Pacific Northwest Laboratory, Richland, WA.

Pacific Northwest Laboratory. 1994. FEMIS Power Requirements, Pacific Northwest Laboratory, Richland, WA.

USAISEC-CONUS. 1992. Design of Interface Between On-post Emergency Operations Centers (EOC) and Off-post EOCs for The Chemical Stockpile Emergency Preparedness Program (CSEPP). Data Systems Branch, Systems Engineering Division, USAISEC-CONUS, Fort Ritchie, MD.

# 2.0 Hardware Requirements

To successfully run FEMIS, the following hardware must be present.

## 2.1 UNIX Server

Each EOC requires access to a UNIX data server. This server should be physically present in the EOC. If the sever is not physically present, it can be remotely accessed across a WAN link of adequate capacity.

### 2.1.1 Sun SPARCServer 1000e (For Installations With More Than 15 Users)

The Sun server recommended for use at CSEPP sites is the SPARCServer 1000e. To ensure an appropriate level of performance PNL recommends that the SPARCServer contain multiple CPUs. The following configuration will meet FEMIS needs:

Sun SPARCServer 1000e [1]

4 Sun Superscalar SPARC 8 CPUs (standard configuration: 60MHz processor, 1MB on board RAM, system expandable to 8CPUs)

On chip cache 36KB / processor
Supercache 1MB / processor
96MB 384MB RAM (4x96)
4MB PrestoServe NVSIMM

SPARC Storage Array utilizing Redundant Array of Inexpensive Disks (RAID) technology with ~15GB of useable RAID, Level 5 disk space with an array comprised of multiple small drives of approximately 1.0GB, and appropriate S-Bus controllers [2]

20" color monitor with GX frame buffer, compatible with the server
8mm internal tape drive [3]
Internal 644MB CD ROM drive

Disk storage capacity is a function of the size of the installation database and the number of EOC's supported by the data server. Enclosure 1 contains a list of required server hardware components with appropriate vendor part numbers. A migration path from the earlier 670MP to the SPARCServer 1000e is available thru Sun Microsystems (UG-6X0-S1102).

Notes:
1. Two Fast SCSI-2 buffered ethernet cards (10MBits / sec, twisted pair, 10BaseT) are included with this system.
2. Sun standard configuration is 6 SCSI controllers in one cabinet with a Fibre Channel S-Bus card.
3. FEMIS will be issued on CD. While most software can be obtained on CD, 8mm, 4mm or 1/4" format, system size dictates a large capacity on-board tape drive and large capacity device (such as a stacker) to support system backups. See Enclosure 1 for more information. 670MP servers at the depots had on-board 8mm tape drives. An 8mm drive is a commonly used, easily supported format and is suggested as a good solution for the on-board drive. The choice of the 4mm stacker for backups is based on cost since 8mm stackers are significantly more expensive than the 4mm type.

### 2.1.2 Sun Microsystems SPARCStation 20, Model 612 (For Installations With 15 or Fewer Users)

A lower cost alternative to the SPARCServer 1000e, adequate to support smaller EOCs is the SPARCStation 20 model 612. To insure an appropriate level of performance PNL recommends that the SPARCServer contain multiple CPUs.

The following configuration will meet FEMIS needs:

SPARCStation 20, model 612 [4]
2 Sun Superscaler SPARC CPUs (standard configuration: 60MHz, 1MB on board RAM)

On chip cache 36KB / processor
Supercache 1MB / processor
96MB 192MB RAM (2x96)
2MB PrestoServe NVSIMM

SPARC Storage Array utilizing RAID technology with ~15GB of useable RAID, Level 5 disk space with array comprised of multiple small drives of approximately 1.0GB, and appropriate S-Bus controllers [5]

20" color monitor with SX frame buffer, compatible with the server
8mm internal tape drive [6]
Internal 644MB CD ROM drive

Disk storage capacity is a function of the size of the installation database and the number of EOC's supported by the data server. Enclosure 1 contains a list of required server hardware components with appropriate Sun part numbers.

Notes:

4. One Fast SCSI-2 buffered ethernet card (10MBits / sec, twisted pair, 10BaseT) is included with this system.
5. Sun standard configuration is 6 SCSI controllers in one cabinet with a Fibre Channel S-Bus card.
6. FEMIS will be issued on CD. While most software can be obtained on CD, 8mm, 4mm or 1/4" format, system size dictates a large capacity on-board tape drive and large capacity device (such as a stacker) to support system backups. See Incl 1. 670MP servers at the depots had on-board 8mm tape drives. An 8mm drive is a commonly used, easily supported format and is suggested as a good solution for the on-board drive. The choice of the 4mm stacker for backups is based on cost since 8mm stackers are significantly more expensive than the 4mm type.

## 2.2 PC Client Workstation

### 2.2.1 Intel 486 Platform

FEMIS will run on an 80486 platform which has a minimum of a 60MHz processor or better, 32MB of RAM and a 500MB hard disk, but performance in the graphics applications will be unacceptably slow. Users who need to use the FEMIS GIS or other graphics functionality should select the faster, Pentium-based PC platform.

### 2.2.2 Intel Pentium Microprocessor PC, 60MHz

The preferred PC client platform is the Pentium-based PC configured as follows:

Intel Pentium Microprocessor PC
60MHz or better
32MB RAM
500MB Disk (1.2GB optional)
32 bit, 30 (or better) MHz Local Bus
32 bit (or better) graphics accelerator card, Local Bus design
Internal CD ROM drive

1.44 3.5" internal floppy drive
1 parallel / 2 serial ports
3COM (3C509, 3C509-TP) Ethernet Adapter card (10MBits/sec, 10Base2)
17" color VGA monitor (SVGA capable)
Standard 101 key keyboard
Mouse

## 2.3 Other Hardware

### 2.3.1 Communications Server

Intel 80486 processor, minimum 33 MHz processor with MS-DOS 6.22 or better.

### 2.3.2 Supporting Hardware

Network hardware including Wellfleet or CISCO Routers as specified in the USAISEC-CONUS CSEPP Network Design document. See section 1.2 References.

Data link (RS232) to the installation Met System computer.

Laser Printers (HP Laserjet III, IV , Sun Laser Printer or other LAN compatible laser printer).

Color printer capable of "A" and "B" size output (optional) and of operating across the EOC LAN.

Screen projection hardware compatible with a PC Client workstation (optional).

Uninterruptable Power Supply (UPS) of sufficient capacity to operate the EOC system for a length of time acceptable to installation management. For an EOC with 1 data server and 25 PC clients (including a communications server if used) a UPS rated between 40 and 50kVa should provide adequate protection. Individual EOCs should calculate their power needs based on their existing and planned hardware and may elect to purchase a larger or smaller UPS accordingly.

# 3.0 Software Requirements

## 3.1 Data Server Software [7]

FEMIS Server Application Set [8]
Sun Microsystems Solaris v2.4 with database accelerator
ArcInfo GIS v 7.0.2 or better
    ArcInfo Network (optional)
    ArcInfo GRID (optional)
ArcView 2.0b for Sun Server (optional)
Oracle RDBMS v7.1 with distributed option
    Oracle SQL*Net v2.0 (one license for each PC on the network) [9]
    Protocol Driver for TCP/IP [10]
    Oracle SQLPlus 2.0 [11]
RSAREF Data Security Program [12]
Novell GroupWise v4.1 Message Server Pack for Unix
Novell GroupWise Client / Admin Pack for Windows [13]
Novell GroupWise v4.1 SMTP Gateway for Unix [14]

Notes:

7. The Beame & Whiteside NFS client products work best if the bwnfsd process is running on one or more of the local UNIX servers. The source code for bwnfsd is public domain and is distributed with the client product. After installation the source files can be found in the utility sub-directory under the Beame & Whiteside product directory, d:\bwnt. Extensive help can be found in the bwnfsnt.hlp Windows help file included with the NT product. Using the Winhelp search function on the bwnfsd keyword will display many useful topics.
8. The Evacuation Simulation (ESIM) model from the Oak Ridge Evacuation Model System (OREMS) will be part of the FEMIS Server Application Set in a future release.

9/10. Oracle licenses are sold in sets, for example, 1, 8, 12, etc. The number of licenses for SQL*Net and the Protocol Driver for TCP/IP must equal the number of licenses for Oracle 7.1

11. Only one license per server is required for SQLPlus.
12. RSAREF is a non-commercial (public domain) product distributed by RSA Laboratories, Redwood City, CA.
13. Admin portion of the Novell GroupWise Client / Admin Pack for Windows is installed on the Unix server.
14. Enables mail to / from SMTP-based mail systems across a LAN and across a WAN. Additional gateways will be supported in a future release.

## 3.2 PC Client Software

FEMIS Client Application Set [15]
Microsoft Windows NT Workstation (CD-ROM edition) v 3.5 [16]
ArcView v2.0b GIS
Novell GroupWise v4.1 Client / Admin Pack for Windows [17]

BW-Connect: NFS Client for Windows NT x86 v3.5
Microsoft Project v4.0
Oracle SQL*Net v2.0
Oracle TCP/IP adapter v2.0
WordPerfect for Windows v6.0 or better (optional)
Microsoft Office v4.3 (optional) including:
Microsoft Excel v5.0 or better
Microsoft PowerPoint v4.0 or better

Notes:

15. The Dispersion Model (D2PC (July 94)) and the Dose/Time Model (PARDOS v2.1) are part of the FEMIS Client Application Set.
16. The version specified includes documentation. Additional licenses may be obtained without documentation by procuring the Windows NT License Pack .
17. Client portion is installed on the PC client, it contains the DOS-based GroupWise administrative software, the GroupWise for Windows client and 5 mailbox licenses. Purchase the Client / Admin Pack once per EOC, and purchase Novell GroupWise Additional License Packs as needed to have one license per mailbox.

## 3.4 Communications Server Software

MS-DOS 6.22 or better
Microsoft Windows v3.1
Beame and Whiteside Network Communication Software v3.1
FEMIS External Communications software

# 4.0 Telecommunications

Telecommunication access is required at each EOC for voice and dial-in access. This service includes commercial telephone lines suitable for modem data transmission for external communications and remote user interface. Ideally these lines should be 19.2 KBPS or better. Leased lines with a minium capacity of 56KBPS are preferred for serverless (remote) login to FEMIS including shelters, Joint Information Center (JIC), etc. 19.2 KBPS service will provide remote access capability, however performance levels will be less compared to more capable service.

# 5.0 Computer Networks

The physical computer network should fit the description provided in the USAISEC-CONUS paper entitled Design of Interface Between On-post Emergency Operations Centers (EOC) and Off-post EOC's for The Chemical Stockpile Emergency Preparedness Program (CSEPP). Each EOC will contain a single Sun server and disk array, adequately sized to accommodate the FEMIS Application set, models, installation database, PC Client workstations, a PC External Communications Server, and appropriate peripheral devices as described in this document. This hardware must be linked by a 10 megabit per second thinwire ethernet LAN and should be interfaced with a minimum of T1 communications throughput speed (1.544 Mbps) between EOCs and if one EOC is without a server and is supported remotely from another installation. Adequate communications support equipment such as bridges, routers, and modems are required as specified in the USAISEC-CONUS paper.

# Enclosure 1

## Component and Part Number List for FEMIS Unix Data Servers

### Sun SPARCServer 1000e

| Qty | Part No.[18] | Description |
|---|---|---|
| 1 | S1000E | SPARCserver 1000E 50MHz system cabinet with CD, Solaris 2.x license. |
| 2 | 1205A | SPARCserver 1000E 50MHz system board with two 60MHz SuperSparc+ processors, no memory. |
| 2 | X771A | 2 X 1.05GB internal SCSI-2 expansion disk. |
| 1 | X3540L | Type 5 country kit for US and canada only. |
| 1 | X359A | 20" color monitor, TurboGX frame buffer, cable. |
| 1 | X831A | 8mm internal tape backup unit |
| 1 | SOLS-C | Solaris 2.X Server Media Kit. |
| 3 | X163A | 128Mb ECC memory expansion SIMMs. |
| 1 | X177A | 4MB NVRAM Prestoserve NFS accelerator. |
| 1 | X1057A | 25MB/s Fiber Channel Optical Sbus card. |
| 1 | X654A | Sparcstorage Array Model 101 with 18 X 1.05GB (18.0 GB) Fast/Wide SCSI-2 disks. |
| 1 | X978A | 15-meter Fiber channel cable |
| 1 | X827A | 20GB 4mm tape autoloader desktop storage module (optional) [19] |

Notes:

18. All part numbers are from Sun Microsystems.
19. Optional autoloader to be used for unattended backups of the system

## Sun SPARCStation 20, model 612

| Qty | Part No.[20] | Description |
|---|---|---|
| 1 | 20SX8-612-64-P46 | SX 24-bit, 20" color monitor, 8MB SX frame buffer, 64MB, 1.05GB internal SCSI-2 disk. |
| 2 | X164P | 64MB memory expansion (64MB SIMM). |
| 1 | X178A | 2MB NVRAM Prestoserve NFS accelerator. |
| 1 | X1057A | 25MB/s Fiber Channel Sbus card. |
| 1 | X654A | Sparcstorage Array Model 101 with 18 X 1.05GB (18.0.GB) Fast/Wide SCSI-2 disks. |
| 1 | X978A | 15-meter Fiber channel cable. |
| 1 | X578A | 644MB internal SunCD 2plus. |
| 1 | X834A | 8mm desktop storage pack |
| 1 | X3540A | Type 5 country kit for US and canada only. |
| 1 | SOLS-C | Solaris 2.X Server Media Kit. |
| 1 | SOLD-S-LU | Solaris desktop to server upgrade. |
| 1 | X827A | 20GB 4mm tape autoloader desktop storage module (optional) .[21] |

Notes:
20. All part numbers are from Sun Microsystems.
21. Optional autoloader to be used for unattended backups of the system