

Federal Emergency Management Information System (FEMIS)

System Administration Guide

for

FEMIS Version 1.5.3

November 20 2002

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

Acknowledgment

The FEMIS product is being developed by the Pacific Northwest National Laboratory as part of the US Army's Chemical Stockpile Emergency Preparedness Program (CSEPP).

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

This material was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the United States Department of Energy, nor Battelle Memorial Institute, nor any of their employees, MAKES ANY WARRANTY, EXPRESSED OR IMPLIED, OR ASSUMES ANY LEGAL LIABILITY OR RESPONSIBILITY FOR THE ACCURACY, COMPLETENESS, OR USEFULNESS OF ANY INFORMATION, APPARATUS, PRODUCT, SOFTWARE, OR PROCESS DISCLOSED, OR REPRESENTS THAT ITS USE WOULD NOT INFRINGE PRIVATELY OWNED RIGHTS.

References to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply endorsement, recommendation, or favoring by the US Army or Battelle.

The software has not been reviewed for export out of the United States. A license or license exception may be required for export.



This document was printed on recycled paper.

Federal Emergency Management Information System (FEMIS)

System Administration Guide for FEMIS v1.5.3

Robert A Burnett
Richard J Carter
Tim R Downing
Brian J Homer
Nancy A Holter

Daniel M Johnson
Ranata L Johnson
Sharon M Johnson
Robert M Loveall
Stacy A Schulze

Chitra Sivaraman
Alex J. Stephan
LaMar R Stoops
Blanche M Wood

November 20, 2002

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

Pacific Northwest National Laboratory
Richland, Washington 99352

Preface

The Federal Emergency Management System (FEMIS)^(a) is an emergency management planning and response tool. The following documents were developed to support system users.

This **FEMIS System Administration Guide** provides information on FEMIS System Administrator activities as well as the utilities that are included with FEMIS.

The **FEMIS Data Management Guide** provides the information needed to manage the data used to support the administrative, user-environment, database management, and operational capabilities of FEMIS.

The **FEMIS Installation Guide** provides instructions for installing and configuring the FEMIS software package.

The **FEMIS Release Notes** provide a description of what is new in the release and any information specific to this release that was not available when other documents were published.

The **FEMIS Bill of Materials** defines FEMIS hardware, software, and communication requirements.

The **FEMIS Online Help System** explains how to use the FEMIS program, which is designed to help emergency management personnel plan for and respond to a Chemical Accident or Incident (CAI) Event at a military chemical stockpile. For System and Database Administrators, the Troubleshooting Guide consists of error messages and known problems as well as suggestions to resolve these errors and problems.

(a) The FEMIS program is being developed by the Pacific Northwest National Laboratory as part of the US Army Chemical Stockpile Emergency Preparedness Program (CSEPP). Pacific Northwest National Laboratory is operated for the US Department of Energy by Battelle under Contract DE-AC06-76RLO 1830.

Contents

1.0	Overview	1-1
1.1	Point of Contact	1-2
1.2	Document Organization.....	1-2
1.3	Software Products.....	1-3
2.0	FEMIS Monitoring Tools.....	2-1
2.1	AutoRecovery	2-2
2.1.1	How to Execute AutoRecovery.....	2-2
2.1.2	Messaging Service	2-4
2.1.3	FEMIS Logging	2-4
2.1.4	FEMIS Log File Archive	2-5
2.1.5	Sending E-mail.....	2-5
2.1.6	AutoRecovery "Watchdog" Timeout Parameter.....	2-5
2.1.7	AutoRecovery Database Monitoring Parameters.....	2-6
2.1.8	Dynamic Insertion/Deletion of Remote Server in Replication	2-7
2.1.9	AutoRecovery Events/Actions	2-7
2.1.10	Detecting System Problems with AutoRecovery	2-12
2.1.11	Using AutoRecovery	2-12
2.2	UNIX FEMIS Monitor.....	2-14
2.2.1	Background	2-14
2.2.2	UNIX FEMIS Monitor Configuration File	2-14
2.2.3	UNIX FEMIS Monitor Scripts.....	2-16
2.2.4	UNIX FEMIS Monitor Daemon Program.....	2-17
2.2.5	UNIX FEMIS Monitor Client Program	2-17
2.3	FEMISMon Watcher (FWATCH.EXE)	2-18
2.3.1	Notification Status.....	2-18
2.3.2	Menu Options.....	2-18
2.4	FEMIS Monitor PC (FMONPC.EXE)	2-19
2.4.1	Replication Status	2-19
2.4.2	Options Menu.....	2-20
2.5	Network Monitor (WS_WATCH.EXE)	2-21
3.0	FEMIS Notification Service.....	3-1
3.1	UNIX Host Notification Service.....	3-1
3.1.1	UNIX Notification Service	3-2
3.1.1.1	Executable Binary Files	3-3
3.1.1.2	Configuration Data File	3-3
3.1.1.3	Service Port Data File	3-3
3.1.1.4	Protocol Numbers	3-3
3.1.1.5	Daemon Server Startup	3-4

3.1.2	Notification Server Configuration Options.....	3-4
3.1.2.1	Command-line Options.....	3-4
3.1.2.2	Clone Process in Background Option	3-5
3.1.2.3	Display Version Options.....	3-5
3.1.2.4	Diagnostic and Quiet Modes.....	3-5
3.1.2.5	Service Port Name Option	3-6
3.1.2.6	Service Port Environment Option.....	3-6
3.1.2.7	Display IP Address and Service Port	3-6
3.1.2.8	Enable Log Files	3-6
3.1.2.9	Nonstandard Port from Command Line.....	3-7
3.1.2.10	Connecting to Other EOC's Notification Server	3-7
3.1.2.11	Multiple Remote EOC Servers Limitation.....	3-7
3.1.2.12	Server to Server Connection	3-7
3.1.2.13	Which Service Port to Use.....	3-9
3.1.2.14	Enable Keep Alive	3-10
3.1.2.15	Registered and Unregistered Service Port	3-10
3.1.3	femis_event EVENT Configuration File	3-10
3.1.4	Notification Server Utilities	3-12
3.1.4.1	UNIX Client Application – fev.....	3-12
3.1.4.2	UNIX Client Command-line Options	3-12
3.1.4.3	Client ID Number	3-12
3.1.4.4	UNIX Client Protocol	3-13
3.1.4.5	UNIX Client Example.....	3-13
3.1.4.6	UNIX Client Diagnostics.....	3-14
3.1.4.7	UNIX Client Information Diagnostic \$i	3-15
3.1.4.8	UNIX Client Socket Connections Diagnostic \$s	3-16
3.1.4.9	UNIX Client Auxiliary Connect Information Diagnostic \$aux	3-17
3.1.4.10	UNIX Client Remote Servers Diagnostic \$rem.....	3-18
3.1.4.11	UNIX Client Event Board Diagnostic \$eve.....	3-18
3.1.4.12	UNIX Client Synchronize Action \$sync.....	3-19
3.1.4.13	Data Driven Notification Command Line Arguments	3-19
3.2	PC Notification Service	3-20
3.2.1	PC Notification Service Overview.....	3-20
3.2.1.1	Executable Binary Files	3-20
3.2.1.2	Notification Service Startup.....	3-21
3.2.2	PC Notification Service Configuration Options	3-21
3.2.2.1	Configuration Parameters	3-21
3.2.2.2	Notification Service Configuration File.....	3-21
3.2.2.3	Command-line Options.....	3-22
3.2.2.4	Environment Variables	3-22
3.2.2.5	Host Server Name and Port.....	3-22
3.2.3	PC Notification Service Operation.....	3-22
3.2.3.1	Notification Service Window	3-22
3.2.3.2	Lost Connections	3-24

3.2.4	PC Notification Test Client.....	3-24
3.2.4.1	PC Test Client – NOTITEST.EXE	3-24
3.2.4.2	PC Test Client Configuration.....	3-24
3.2.4.3	PC Test Client Command-line Options	3-24
3.2.4.4	PC Test Client Functions	3-25
3.2.4.5	PC Test Client Diagnostics	3-26
3.2.5	Notification Server Troubleshooting.....	3-27
3.2.5.1	Check Notification Server Active.....	3-27
3.2.5.2	Check Notification Server Communication.....	3-27
3.2.5.3	Aborting Notification Server	3-28
3.2.5.4	Fixing Notification Port	3-29
3.2.5.5	PC WinSock Errors.....	3-29
3.3	Starting/Stopping Notification Service	3-30
3.3.1	Starting Notification Service.....	3-31
3.3.2	Stopping Notification Service	3-31
3.4	Data Transfer Notification	3-32
3.4.1	Data Acknowledgement Notification Window	3-32
3.4.2	Data Acknowledgement Monitoring Window	3-32
4.0	FEMIS Command Server	4-1
4.1	cmdservd – FEMIS Command Server Daemon.....	4-1
4.1.1	Synopsis	4-1
4.1.2	Availability	4-1
4.1.3	Description	4-1
4.1.4	Options.....	4-2
4.1.5	Syntax Check	4-3
4.1.6	Installation.....	4-6
4.1.7	Protocol	4-7
4.1.8	Messages	4-7
4.1.8.1	Message Format.....	4-7
4.1.8.2	Message Fields.....	4-8
4.1.8.3	Operation Codes	4-8
4.1.8.4	Command Message.....	4-9
4.1.8.5	Error Messages	4-9
4.1.8.6	Reply Messages	4-10
4.1.8.7	Alert Messages.....	4-11
4.1.8.8	Message Example	4-11
4.1.9	Service Port and Name.....	4-12
4.1.10	Files.....	4-12
4.2	cmdserv.conf – FEMIS Command Server Configuration File	4-12
4.2.1	Availability	4-12
4.2.2	Description	4-12
4.2.3	Syntax	4-13

4.2.4	Block Syntax	4-14
4.2.4.1	ACCESS Block.....	4-15
4.2.4.2	HOST Block	4-15
4.2.4.3	SITE Block	4-16
4.2.4.4	ALL Block	4-17
4.2.4.5	ENTRY Block.....	4-17
4.2.5	Directive Syntax and Semantics.....	4-18
4.2.5.1	Site Directive	4-19
4.2.5.2	Executable Directive.....	4-19
4.2.5.3	Directory Directive	4-20
4.2.5.4	Password Directive	4-20
4.2.5.5	Outfile Directive	4-21
4.2.5.6	Errfile Directive	4-22
4.2.5.7	Argument Directive	4-22
4.2.5.8	Environment Directive.....	4-23
4.2.5.9	File Directive	4-24
4.2.5.10	Put Directive	4-24
4.2.5.11	Allow Directive.....	4-25
4.2.5.12	Deny Directive.....	4-25
4.3	cmdserv – FEMIS Command Server Test Client (UNIX)	4-26
4.3.1	Synopsis	4-26
4.3.2	Availability.....	4-26
4.3.3	Description	4-26
4.3.4	Options	4-26
4.3.5	Installation.....	4-27
4.3.6	Protocol	4-27
4.3.7	Operation	4-27
4.3.8	Messages	4-30
4.3.9	Configuration File	4-30
4.3.10	Service Port and Name.....	4-30
4.3.11	Files.....	4-30
5.0	FEMIS Meteorological Application.....	5-1
5.1	Meteorological Input Using the FEMIS DEI	5-1
5.2	Meteorological Input Via the FEMIS Met Data	5-1
6.0	FEMIS Contact Daemon	6-1
6.1	Message Format	6-1
6.2	Configuration File.....	6-1
7.0	FEMIS Data Exchange Interface (DEI)	7-1
7.1	Software and Hardware Components	7-1
7.1.1	Software Components	7-1
7.1.2	Hardware Components.....	7-1

7.2	Program Detail – femisdei	7-1
7.2.1	Startup Phase.....	7-2
7.2.2	Processing Loop Phase.....	7-2
7.2.3	Shutdown Phase	7-3
7.3	Program Detail – fprofdei	7-4
7.4	Configuring the Programs.....	7-4
7.4.1	Configuration – femisdei	7-4
7.4.1.1	femisdei UNIX User Account.....	7-5
7.4.1.2	femisdei FTP Profile File.....	7-5
7.4.1.3	femisdei Configuration File	7-5
7.4.2	Configuration – fprofdei	7-9
7.5	Operation	7-9
7.5.1	Operation – femisdei.....	7-9
7.5.2	Operation – fprofdei.....	7-9
7.6	Purging Old Data	7-10
7.7	DEI Troubleshooting	7-11
7.7.1	Troubleshooting – femisdei	7-11
7.7.2	Troubleshooting – fprofdei	7-11
8.0	FEMIS GIS Database	8-1
8.1	Spatial Data Description	8-1
8.2	Spatial Data Maintenance	8-1
8.3	GIS Utilities	8-2
8.3.1	Loading the GIS Utilities	8-2
8.3.2	Opening the GIS Utilities.....	8-3
8.4	Zone Editor	8-3
8.4.1	Editing the Zone Theme.....	8-4
8.4.2	Updating the FEMIS Database	8-8
8.4.3	Distributing the New Zone Files.....	8-9
8.5	General Hazard Theme (GIS Zone Theme) Definition	8-9
8.5.1	Adding a New General Hazard Theme	8-9
8.5.2	General Hazard Database Reports	8-10
8.5.3	Modifying General Hazard Theme Display Attributes.....	8-11
8.5.4	Distributing the New GIS FEMISGIS.INI and Symbol Lookup Changes.....	8-13
8.6	GIS Configuration.....	8-13
8.6.1	Symbol Lookup Table.....	8-14
8.6.2	Symbol Defaults.....	8-15
8.7	Customizing the FEMIS Map	8-15
8.7.1	Customizing the FEMISGIS.INI File	8-16
8.7.2	Altering the Default FEMIS Map	8-19
8.7.3	GIS Configuration Editor.....	8-20
8.7.4	Theme Projection Utility.....	8-20
8.7.5	Adding Orthophotos.....	8-22
8.8	Backup Procedures	8-22

9.0 FEMIS Oracle Database.....	9-1
9.1 Data Description	9-1
9.2 Replication	9-2
9.3 Database Maintenance	9-2
9.4 How AutoRecovery Works with the Database	9-3
10.0 Server Network Time Protocol (NTP) Set Up	10-1
11.0 Security Measures	11-1
11.1 UNIX Server Security.....	11-1
11.1.1 Software Patches.....	11-1
11.1.2 Shared Directories.....	11-1
11.2 Database Security	11-1
11.2.1 Replication Schema.....	11-2
11.2.2 Modifications to the Manage Database Passwords Tool	11-2
12.0 Backup Strategy for FEMIS.....	12-1
12.1 Recommended Backup Strategy	12-1
12.1.1 File System Backups.....	12-1
12.1.1.1 Full File System Backups	12-2
12.1.1.2 Incremental File System Backups.....	12-2
12.1.2 File System Backup Procedures for the UNIX Server.....	12-2
12.1.3 Oracle Database Backups.....	12-4
12.1.3.1 Cold Full Backups of the Oracle Database	12-5
12.1.3.2 Hot Full Backups of the Oracle Database.....	12-5
12.1.3.3 Logical Backups of the Oracle Database	12-6
12.1.4 External Storage of Folders and Deletion of Old Folder Data.....	12-6
12.1.5 Managing the FEMIS Log Files.....	12.7
12.2 System Backups for Sun Solaris System	12-7
13.0 FEMIS UNIX Server.....	13-1
13.1 Maintenance of the FEMIS UNIX Server	13-1
13.1.1 Monitor Oracle and FEMIS	13-1
13.1.2 Perform System Backups	13-1
13.2 Troubleshooting the FEMIS UNIX Server	13-1
13.2.1 FEMIS Troubleshooting	13-1
13.2.2 Samba Services	13-2
13.2.2.1 Samba User Authentication	13-2
13.2.2.2 NFS and Samba Interaction	13-3
13.2.2.3 FEMIS Samba Directory Structure.....	13-4
14.0 FEMIS PC Utilities	14-1
14.1 FSTARTUP.....	14-1
14.2 FUPDATE.BAT.....	14-1
14.3 WINECHO.....	14-2
14.4 FIXINI.....	14-2

14.5	WRITEREG	14-3
14.6	WRITEINI	14-3
14.7	MSGBOX	14-4
14.8	AUTOEXNT	14-5
14.9	NTPQ	14-5
14.10	NTPDATE	14-6
14.11	INSTSRV	14-6
14.12	SWITCHDB	14-6
14.13	FUNITCVT	14-6
14.14	Stand-Alone Watchful Eye	14-7
14.15	Remote Evacuee Registration	14-7

Tables

1.1 Integrated COTS Software Products	1-3
7.1 Sample femisdei.cfg File.....	7-12
7.2 femisdei Command Line Options	7-13

Figures

2.1 AutoRecovery's Integration of Monitoring, Notification, and Recovery	2-3
2.2 FEMIS Monitor/PC Window	2-20
3.1 FEMIS Notification Service Window	3-23
3.2 Notification Service Test Window	3-25

Acronyms and Definitions

ACTS	Automated Computer Time Service
API	application program interface
APR	Project file format (ArcView)
CAI	Chemical Accident or Incident
COTS	Commercial-Off-The-Shelf
CSEPP	Chemical Stockpile Emergency Preparedness Program
D2PC	Chemical wind dispersion model used in FEMIS
DBMS	Database Management System
DDN	Data Driven Notification
DEI	Data Exchange Interface
DLL	Dynamic Linked Library
DSN	Data Source Name
E-mail	electronic mail
EMIS	Emergency Management Information System
EOC	Emergency Operations Center
FEMIS	Federal Emergency Management Information System
FTP	File Transfer Protocol
GB	gigabyte–billion bytes
GID	Group Identification number
GIS	geographic information system
GMT	Greenwich Mean Time
GPS	Global Positioning System
IANA	Internet Assigned Number Authority
IEM	Innovative Emergency Management, Inc.
ID	identification number
IP	Internet Protocol
KB	kilobyte–thousand bytes
LAN	local area network
MB	megabyte–million bytes
Met	meteorological
MHz	megahertz–millions of cycles per second
NFS	Network File System
NIST	National Institute of Standards and Technology
NTP	Network Time Protocol
PC	personal computer
PDC	Primary Domain Controller
PID	process identification number
PNNL	Pacific Northwest National Laboratory
PPP	Point to Point Protocol
RER	Remote Evacuee Registration
RDBMS	relational database management system
SBCCOM	US Army Soldier and Biological Chemical Command

SQL	Structured Query Language
SQL script	Sequence of SQL statements that perform database operations
TCP/IP	Transmission Control Protocol/Internet Protocol
UDP	User Datagram Protocol
UID	User Identification number
UNIX	Generic name for the server operating system
UTM	Universal Transverse Mercator
WAN	wide area network
Windows NT	Microsoft Network Operating System for Workstations
Windows 2000	Microsoft Operating System
WinSock	Windows Sockets
WWV	NIST radio station broadcasting continuous time status