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NEMS

National Emergency Management System

Federal Emergency Management Agency

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Director

Federal Emergency Management Agency

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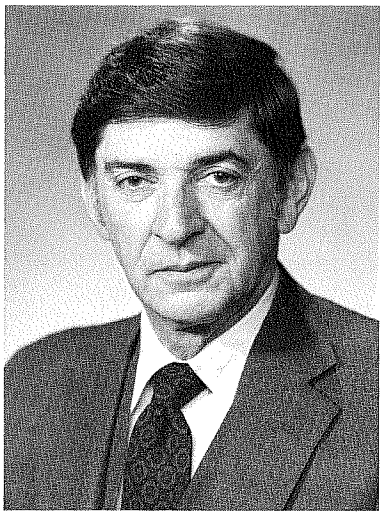
FOREWORD



The Federal Emergency Management Agency (FEMA) is the Federal point of contact for emergency management programs in both peace and war. FEMA works directly with State and local governments and others in the entire emergency management community to lessen the potential effects of disasters and to increase emergency response programs.

The Agency supports State and local government emergency planning, preparedness, mitigation, response and recovery programs. As necessary, FEMA provides funding, technical assistance and resources, equipment and direct Federal support. Ensuring effective emergency communications in times of crisis is also a FEMA responsibility.

To ensure that these actions are as responsive as possible to emergencies of all types, FEMA has developed an Integrated Emergency Management System, or IEMS. This system was created after FEMA reviewed response actions to natural disasters and other hazards. FEMA found elements of emergency response were common to all emergencies . . . elements such as communications, population evacuation and sheltering, law enforcement and direction and control.

IEMS recognizes that basic emergency capabilities are required as a foundation for response to any emergency. The system advances each level of preparedness as a building block for dealing with the next level of emergency intensity. It is strongly believed that the Integrated Emergency Management System holds great promise for across-the-board improvement in emergency capabilities at all levels of government.

In emergency information programs (communications and Automated Data Processing (ADP) systems), FEMA is responsible for the centralized control and daily management of the National Emergency Management System (NEMS) which provides a nationwide infrastructure at the Federal, regional and State levels for various information and communications systems and networks.

This manual provides the basic description of the FEMA NEMS, its concepts and status, and is provided as an information mechanism to keep you apprised of our efforts in this critical area.

Various acronyms have been used throughout this manual. For your convenience, a list of these acronyms, with their descriptions, has been provided.

Louis O. Giuffrida
Director

LIST OF ACRONYMS

ADP - Automated Data Processing
AEICC - Alternate Emergency Information Coordination Center
AFOC - Air Force Operations Center
AFSARC - Air Force Search and Rescue Center
AFTN - Aeronautical Fixed Telecommunications Network
ANMCC - Alternate National Military Command Center
ANWC - Alternate National Warning Center
AOC - Army Operations Center
ARS - Advanced Record System
CARDA - Continental Air Reconnaissance for Damage Assessment
CARDAC - Continental Airborne Reconnaissance and Damage Assessment Center
CIA - Central Intelligence Agency
CIDERS - Computer Interactive Display, Entry and Retrieval System
COC - Combat Operations Center
CPU - Central Processing Unit
CRT - Cathode Ray Tube
DCS - Defense Communications System
DCW - Direction, Control and Warning
DCWCS - Direction, Control and Warning Communications System
DDD - Direct Distance Dialing
DIA - Defense Intelligence Agency
DMIS - Disaster Management Information System
DOE - Department of Energy
DTS - Diplomatic Telecommunications Service
EBS - Emergency Broadcast System
EICC - Emergency Information Coordination Center
EOC - Emergency Operations Center
EPABX - Electronic Private Automatic Branch Exchange
FAA - Federal Aviation Administration
FBI - Federal Bureau of Investigation
FCO - Federal Coordinating Officer
FEMA - Federal Emergency Management Agency
FIAMIS - Federal Insurance Administration Management Information System
FNARS - FEMA National Radio System
FNATS - FEMA National Teletype System
FNAVS - FEMA National Voice System
FORSCOM - U.S. Army Force Command
FSTS - Federal Secure Telecommunications System
FTS - Federal Telecommunications System
GENSER - General Service
ICS - Interagency Communications System
IEMS - Integrated Emergency Management System
IMS - Information Management System
JNACC - Joint Nuclear Accident Coordination Center
MCOC - Marine Corps Operations Center
MIS - Management Information System
MWTCS - Modernized Weather Teletypewriter Communications System
NATO - North Atlantic Treaty Organization
NAWAS - National Warning System
NCCEM - National Coordinating Council on Emergency Management
NEMS - National Emergency Management System
NEST - Nuclear Emergency Search Team
NFARS - NORAD Forward Automated Reporting Systems
NFIRS - National Fire Incident Reporting System
NICS - NATO Integrated Communications System
NMCC - National Military Command Center
NMIC - National Military Intelligence Center
NOAA - National Oceanic and Atmospheric Administration
NOC - Navy Operations Center
NORAD - North American Aerospace Defense Command
NSA - National Security Agency
NVOAD - National Voluntary Organizations Active in Disasters
NWC - National Warning Center
NWSTN - National Weather Service Telecommunications Network

OIS - Office Information System
RACES - Radio Amateur Civil Emergency Services
REDCOM - U.S. Army Ready Command
REICC - Regional Emergency Information Coordination Center
SACNET - Secure Automatic Communications Network
SCEPP - Southern California Earthquake Preparedness Project
WATS - Wide Area Telecommunications System
WAWAS - Washington Area Warning System
WHSR - White House Situation Room
WWMCCS - Worldwide Military Command and Control Center

The Federal Emergency Management Agency (FEMA) has comprehensive responsibilities for managing the civil aspects of emergencies affecting the United States. The dimensions and complexity of that mission involve a wide variety of management functions, all critically dependent upon information. A correspondingly comprehensive mechanism of communications and information systems is required in order to perform those functions. Such a mechanism is being implemented by FEMA in the form of an integrated National Emergency Management System (NEMS) that is capable of supporting the full range of information requirements in every phase and type of activity associated with emergency management. The NEMS provides information necessary for the Emergency Management Authority, the President, Vice President and Director of FEMA, to exercise timely decision-making across a wide continuum of emergency situations. This report presents a descriptive overview of the NEMS.

Purpose

This overview has been developed to provide information explaining the FEMA NEMS concept to interested parties. FEMA would use this publication for coordination and orientation throughout the emergency management community.

Scope and Approach

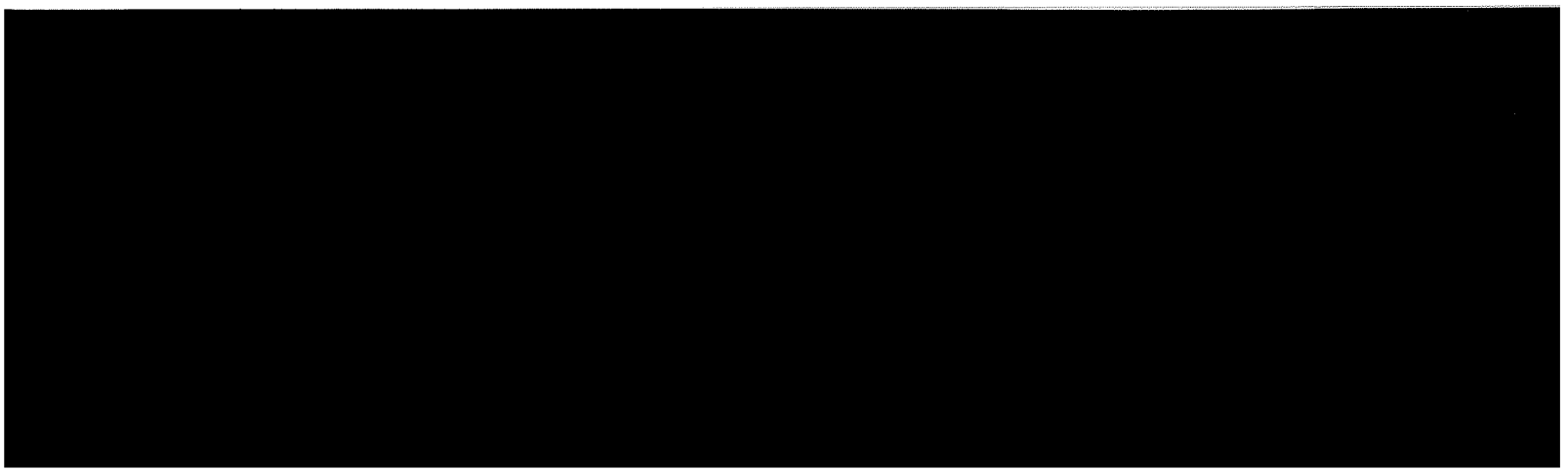
To achieve the broad objectives outlined above, the overview examines the NEMS generically from three perspectives. The first is from the viewpoint of the underlying concept, cast in terms of the nature of the NEMS, its capabilities, and significant operative properties characterizing the system. Also described is the functional relationship of NEMS to the Integrated Emergency Management System (IEMS) concept.

The second perspective focuses on the major components making up the NEMS, including both existing and planned assets. These system components are identified according to three categories as follows:

- Key nodal facilities where management processes are conducted;
- Principal telecommunications systems available;
- Information systems and their associated ADP equipment.

Finally, the NEMS is viewed from the perspective of how the system components fit together. The following main areas of its internal and external structure are outlined:

- Organizational configuration of the core elements of NEMS proper, down to and including the FEMA Regions;
- NEMS interfaces with other Federal agencies (civil and military);
- Interfaces with State and local governments;
- Interfaces with voluntary and private sector organizations.

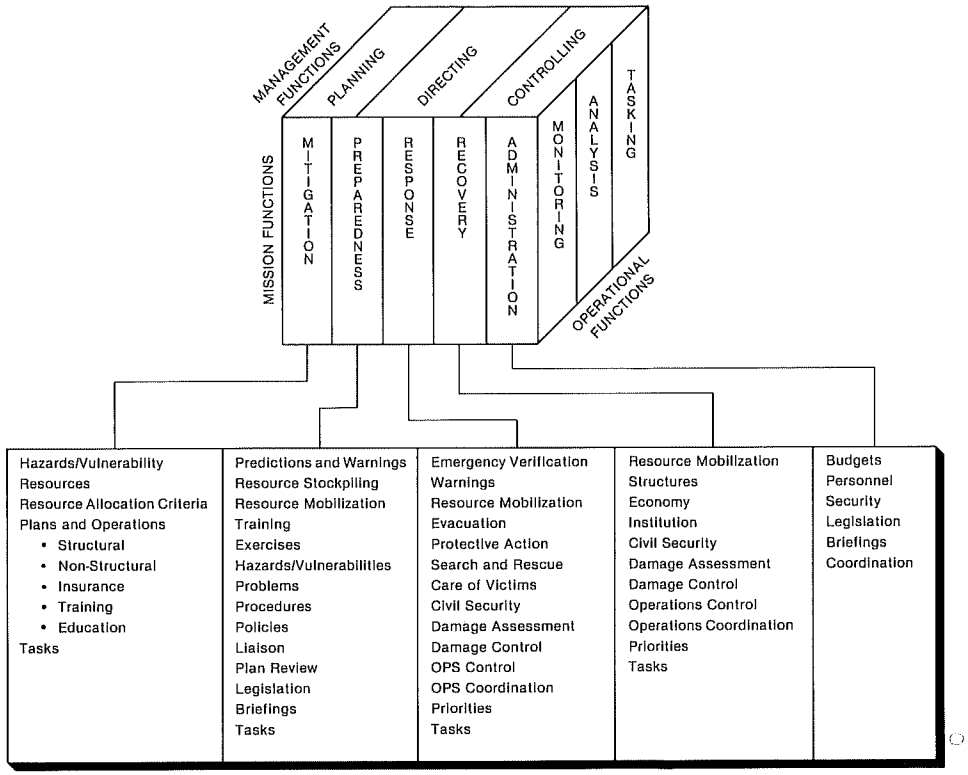


Background

FEMA is the focal point within the Federal Government for dealing with a wide spectrum of emergencies affecting the United States in peace and war. It has a central role in both domestic and national security emergencies, ranging from natural and technological disasters through wartime nuclear attack. FEMA's statutory responsibilities with respect to these emergencies involve: *mitigation* (prevention, risk reduction, and effects limitation); *preparedness* (policy, planning, programs, training, and education); *response* (active coordination of on-scene activities during an emergency); and *recovery* (restoring affected areas to normalcy). It thus deals with all emergencies in a comprehensive time frame: pre-emergency, trans-emergency, and post-emergency. And its responsibilities include the coordination of emergency activities through all levels of government — Federal, State, and local — and the private sector of the Nation.

Broadly viewed, the basic mission of FEMA is to protect the population and resources of the Nation and preserve the continuity of constitutional government. This broad and complex mission requires a supporting emergency management system of corresponding breadth and complexity. An extensive and elaborate mechanism consisting of communications networks, information systems, and physical facilities is needed. All of the elements of that mechanism have to be rationally organized to form an integrated system capable of supporting every aspect and phase of FEMA's emergency management responsibilities. Recognition of these needs led FEMA to formulate the concept of a National Emergency Management System (NEMS) and to initiate steps to make the concept a reality. Shown in Figure 1 is a schematic model of the overall NEMS and how it relates to the FEMA mission.

Figure 1
NEMS FUNCTIONAL REQUIREMENTS



NEMS Definition

The FEMA National Emergency Management System (NEMS) is the comprehensive mechanism for gathering, processing, and exchanging information in support of

the emergency management community at the Federal, regional, State, and local levels of government. It consists of the physical facilities, telecommunications, and information systems required for FEMA's vital management mission. Information is the key commodity of the NEMS — information for decision making and its execution at all levels of government, in all forms of emergency, in all time phases, and throughout the entire range of mitigation, preparedness, recovery, and response functions.

Specific Requirements of the NEMS

The following requirements drive and shape the development of the NEMS:

- Existing communication networks, information systems, and physical facilities are to be utilized to the maximum and are being integrated into the overall development of the system.
- Development of the system will follow a phased, evolutionary sequence — beginning with the integration of existing systems and near-term improvements to them followed by long-term improvements aimed at optimizing future capabilities.
- Special emphasis is being placed on system survivability and continuity of capability. The NEMS must be able to survive and function in a wide spectrum of emergency environments: routine, day-to-day normalcy; peacetime disasters of many types; conventional war; and nuclear war.
- A central, continuing aim of FEMA is to build a consistent response capability for national security and domestic emergency needs. The NEMS must serve this aim by developing effective linkages between the civil sector and national security components. Its information systems and communication networks of necessity cross the usual civilian and military boundaries and must be able to serve the needs of these various components.
- The NEMS must be able to interconnect and operate with other Federal, State, and local systems that serve national security and emergency preparedness functions.

All of the foregoing emphasize that the NEMS must possess the following systems performance attributes:

- Connectivity;
- Survivability;
- Interoperability with interfacing systems;
- Security;
- Flexibility (including use of multi-media and variable network configuration);
- Reliability;
- Responsiveness;
- Capacity;
- Multiple modes (voice, teletype, data, facsimile, video); and
- Low operational and maintenance costs.

Relationship of the NEMS to the Integrated Emergency Management System (IEMS)

Correlative with the development of the NEMS, FEMA has embarked upon a long-term strategy for integrating management functions and activities across the full spectrum of emergencies. This includes natural disasters such as

tornadoes, hurricanes, floods, and earthquakes; technological disasters, such as explosions, release of hazardous materials, accidents involving radiological materials, and possible nuclear power plant accidents; resource shortages; and possible nuclear attack. The resulting Integrated Emergency Management System stresses the preparedness activities common to all emergencies, including planning, warning, communications and control, population movement, food, shelter, medical care, and the provision of other critical resources. It also stresses the need for achieving stronger linkage and cohesion among Federal, State, and local emergency management agencies in carrying out their plans, programs, and operations.

The NEMS will serve as a major mechanism for implementing the IEMS concept. It will aid in its development by supporting FEMA program offices with improved communication and ADP capabilities for program planning and operation; by improving coordination among Federal agencies involved in response to various emergencies; by facilitating the exchange of information between and among Federal, State, and local levels of government and the private sector; and by standardizing management information systems and communication protocols among the agencies and organizations participating in mitigation and preparedness programs for major domestic and national security emergencies.

General Description of the NEMS

The NEMS is one of the principal instruments by which FEMA fulfills its basic mission and responsibilities. It supports FEMA and the entire emergency management community — including Federal, State, and local governments; private industry; and volunteer organizations throughout the Nation — by facilitating the rapid and orderly flow of emergency-related information between and among these various participants.

The purview of NEMS essentially coincides with that of FEMA as a whole. The NEMS thus deals with the entire continuum of FEMA information requirements — covering the principal areas of FEMA responsibilities in all emergency environments and all time phases. The principal areas of responsibility include disaster mitigation, resource management, preparedness planning, communications and warning, continuity of government, nuclear civil protection, civil security, crisis management, emergency operations reporting, emergency public information, damage assessment and radiation defense.

In essence, the NEMS is the system that acquires, processes, and delivers information on which decisions can be made. One of its principal functions is to assist the National Emergency Management Authorities, the FEMA Director, and other key Federal decision makers by providing the information they need to formulate and implement protective policies, plans, programs, and operations. It must provide both the information base and the communication media to support the decision making and decision implementation processes at the highest levels of government. It must be able to perform in all operating environments and in all time phases — pre-emergency, trans-emergency, post-emergency. Further, it must provide for the selection and utilization of the most suitable system modules by decision-makers, as emergency situations dictate. The NEMS also provides FEMA program offices with the communications and ADP support needed in their planning and operational responsibilities. And it serves as the focal point of queries to and from outside agencies and organizations.

In general then, the NEMS is designed to provide the information base and the means of communication for fulfilling those functions essential to emergency mitigation, preparedness, response, and recovery. It provides a single, recognized point of contact and the mechanism whereby national resources can be brought quickly and effectively to bear on all aspects of emergency management problems.

The NEMS concept is predicated upon many different systems elements that together provide the means for carrying out its various functions. Essentially these involve three basic types of instrumentalities: physical facilities, telecommunications, and information systems. The major NEMS components in each category, both existing and planned, are discussed in the sections following.

NEMS Physical Facilities

The basic elements of the NEMS anatomy are the several installations serving as key functional nodes within the system framework. These physical components are the operational force where other components converge and serve as interface points with the NEMS users. Present and planned facilities are described below.

Existing NEMS Facilities

There are a number of such principal nodal facilities that now comprise NEMS. They include the following:

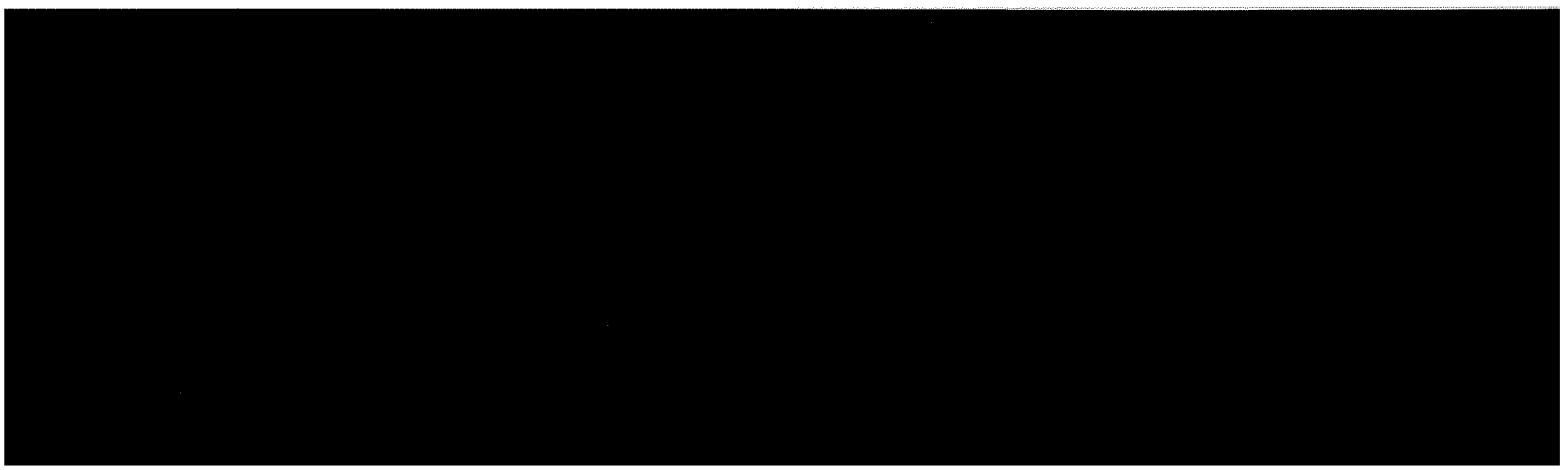
- Emergency Information Coordination Center (EICC) — located at FEMA Headquarters, Federal Center Plaza, 500 C Street, S.W. in Washington, D.C. The new EICC complex contains an operations area, work stations for program staff emergency teams, conference room, a communications center, ADP center, and executive aids (terminals and computer driven displays).
- Alternate Emergency Information Coordination Center (AEICC) – located in Virginia to back up the EICC - containing a communications center, computer center, terminals and displays, briefing/conference rooms, and operations areas for Federal Agencies.
- Olney, MD Emergency Operations Center (EOC) facility — containing one of the major FEMA computer centers, plus other elements.
- National Warning Center (NWC) — colocated with NORAD Combat Operations Center (COC), Cheyenne Mountain Complex, Colorado Springs, CO.
- Alternate National Warning Center (ANWC) — colocated with Olney computer center.
- Regional EICC's – located in the ten FEMA Regions – correspond to Uniform Federal Regional Council Cities, of which six Regions have hardened EOCs.
- Charlottesville Computer Facility — ADP software support for FEMA.
- Temporary ad hoc field facilities of a Federal Coordinating Officer (FCO) — set up during an emergency on site or near the objective area.

Planned Facilities

Important new facilities are planned to be added as components of the NEMS, particularly in the FEMA regions. These facilities are REICC's and primarily serve to interconnect the FEMA regions with the FEMA National Headquarters as well as with the State EOCs. The regional EICC's will support the FEMA Regional Directors in the same fashion that the EICC/AEICC facilities provide support at the National level.

NEMS Telecommunications Capabilities

Considerable in-place communications assets are presently available to FEMA. Substantial increases and improvements are being provided for in the near and midterm future. When implemented, the resulting capabilities are expected to satisfy most of the NEMS communications requirements.



Existing FEMA Systems

Listed below are the telecommunications systems now operated by FEMA. All were acquired in their present form as a legacy from predecessor agencies, although some are being upgraded. They include:

- National Warning System (NAWAS) — voice, via commercial circuits
- Washington Area Warning System (WAWAS) — voice, via commercial circuits
- Emergency Broadcast System (EBS) of the President — voice, via common carrier (supporting subsystems managed and operated by FEMA, including activation of network)
- FEMA National Teletype System (FNATS) — utilizes commercial channels; coverage extends down to State EOCs
- FEMA National Voice System (FNAVS) — based on DCS AUTOVON long lines to Regions, and dedicated commercial circuits from Regions to States
- FEMA National Radio System (FNARS) — HF network down to Regions (voice and radio teletype record traffic), with local network in each region to States
- Interagency Communications System (ICS) — voice and record

In addition, FEMA has some fixed communications assets, such as switching centers, and a limited amount of stored deployable communications, including mobile equipment, for national and regional use in the field during emergencies. It also has limited facsimile available and, on a local internal basis, closed-circuit TV.

Existing U.S. Government Systems Used by/ Accessible to FEMA

A wide range of government telecommunications systems belonging to other Federal agencies and departments, both civil and military, are used by or available to FEMA. Many are general service (GENSER) systems, but others are mission-oriented or function-specific networks. Some would be accessible only in extremes, with FEMA entry restricted to special circumstances. Most of them, however, can be used to relay FEMA traffic. The major ones are listed below according to the agency having primary jurisdiction:

- Federal Telecommunications System (FTS) of the General Services Administration;

  FTS Voice Network;

  Federal Secure Telecommunications System (FSTS);

  Advanced Record System (ARS) — common-user teletype/data network (not available at the Regions); and
- Defense Communications System (DCS)

  AUTOVON;

  AUTOSEVOCOM; and

  AUTODIN.

  WWMCCS/NMCS-related communications systems, for example, JCS Alerting Network (JCSAN), Minimum Essential Emergency Communications Network (MEECN), NMCS Emergency Conference Network, Washington Area Wideband System (WAWS).
- NATO Integrated Communications System (NICS)
- State Department Diplomatic Telecommunications Service (DTS)

[redacted]

- National Weather Service Teletypewriter Network (NWSTN)
- NOAA Weather Radio Network
- Department of Energy (DOE) Communications
  - DOE Emergency Communications System — HF
  - DOE Secure Automatic Communications Network (SACNET)
  - Nuclear Emergency Search Team (NEST) Communication Networks (VHF-UHF)
- Federal Aviation Administration (FAA) Communications
  - FAA Executive Staff Command and Control Network
  - FAA Modernized Weather Teletypewriter Communications System (MWTCS)
  - Aeronautical Fixed Telecommunication Network (AFTN)
  - FAA Emergency Radio Communications
    - National Command System Network
    - Regional Command System Networks.

Existing Commercial Communications Services Used by FEMA

A substantial proportion of FEMA's communication activity, both day-to-day and during emergencies, is conducted over the utility-type commercial systems generally serving the public at large. Among these, the main ones are:

- Commercial Common Carrier Telephone:
  - Wide Area Telecommunications System (WATS); and
  - Direct Distance Dialing (DDD);
- TWX/TELEX;
- News Wire Services Teletypewriter Networks — as subscriber; and
- Public News Media (press, radio/TV broadcasts) — one way transmission only.

Existing Private-Sector Communications Available to FEMA

A host of privately owned telecommunications systems blanket the Nation. In many areas their coverage is nationwide in scope or even international. Some are highly sophisticated state-of-the-art networks employing advanced transmission media and providing several modes of service, such as voice, record, data, facsimile, or even video conferencing. An example is the Marriott Corporation's satellite system, with 15 earth stations currently in operation and 20 more planned. These nonpublic communications include the private networks of industrial manufacturing companies, railroads and other forms of transportation, oil and gas pipelines, electric utilities, retail merchandizing and other business firms, and financial services organizations.

Such facilities might be useful to FEMA in dealing with emergencies. At present, however, these private-sector capabilities are only potentially available for FEMA use. The exact utility of these systems has not been evaluated and the necessary physical and procedural arrangements that would allow entry into the systems are not in place.

Planned Telecommunications

Several major programs of large-scale new acquisitions, improvements, and general upgrading of FEMA's telecommunications capabilities are being pursued. The object is to create an independent Direction, Control and Warning (DCW) communications system wholly owned, controlled and operated by FEMA. It is intended to be the survivable backbone system for NEMS. Plans call for a comprehensive and integrated nationwide system that is operationally flexible in terms of multi-media multi-mode capabilities. A critical feature is that the DCW plant infrastructure would belong to FEMA (or other U.S. Government agencies) and not depend on commercial common carriers as at present. Other additions and enhancements are also to be provided. The major new telecommunications carriers planned by FEMA for its Direction, Control, and Warning Communications System (DCWCS) consist of:

- Low Frequency Groundwave Radio Teletype Network — National to Regions and between Regions
- Meteor Burst Radio Network — National to Regions and between Regions.
- Satellite Communications (VIA DSCS III, 2 channels for FEMA) — digital voice, teletype, facsimile, and data network. National to each Region and laterally between Regions, using transportable earth terminals.
- Disaster Area Radio Network (VHF) in each Region, for field deployment to emergency sites.
- FEMA Mobile Communications — in each FEMA Region. Self-contained, self-deployable communications modules (minimum mobile operations), for tying in National/ Regional/ State/ Local authorities and communications systems.
- Interim Expanded NAWAS — addition of warning terminals in counterforce areas (for a total of 5000 Warning Points vs. current 2400) and conversion of system to meteor burst radio links.
- Second generation EBS — Replacement of EBS carrier connectivity to all State EBS entry points — to be flexible multi-media, based on Satellite, HF, and/or LF radio links in lieu of present commercial circuits.
- Secure Video Communications — for conferencing throughout FEMA Headquarters and with other Federal Agencies.

Over and above the new telecommunications carriers, important new systems capabilities are planned that will greatly increase the utility and effectiveness of all the NEMS communications assets. Electronic Private Automatic Branch Exchanges (EPABX) are to be installed at FEMA Headquarters, the Special Facility, and each of the ten FEMA Regions. In addition, an expanded and improved secure voice system is planned, which will provide for telephone security terminals at FEMA Headquarters (plus an internal secure telephone system within the headquarters), the Special Facility, each of the ten Regional centers, and the EOCs of each of the 50 States and the U.S. Territories. Also planned is an enhanced secure record communications system, which involves installing 118 secure terminals, including automated message handling features, at all of the same sites as for the secure voice system, as well as at each Federal Agency emergency operations/command center. Besides these automated secure terminals, Regional message switching computers (store, forward, route) are to be provided in each of the ten FEMA Regions for general record traffic. Other major telecommunications improvements are planned, such as the replacement and upgrading of FNARS radio equipment at all State and Territory EOCs, along with replacement and upgrading of the mobile/transportable HF radio equipment of each FEMA Region that is used to link the Regional EOC and on-site emergency management elements in the field.

Recapitulation — NEMS Telecommunications Capabilities

FEMA's present and planned telecommunications assets provide for a comprehensive and integrated communications system to be part of the NEMS infrastructure. Capabilities will run the full range of media and modes, in various combinations, and extend from the highest national level down to the local authorities on scene in the emergency area. A salient characteristic is the flexibility afforded by the multiple transmission media available, namely:

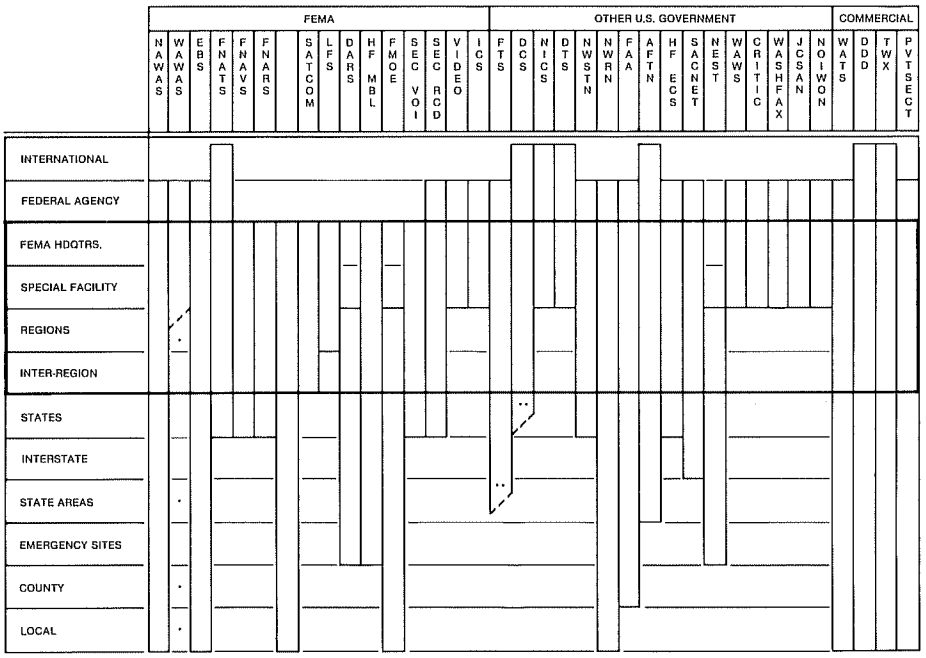
- Terrestrial
  - Landline (wire cable/fiber optics)
  - Radio
    - Low frequency (LF)
    - Meteor Burst (MB)
    - High frequency (HF) Troposcatter
    - Line of Sight (LOS) Microwave
    - VHF-UHF (deployable, for local area use)
- Satellite (SHF) — with fixed and transportable earth terminals..

Equally significant is the multiple types and forms of communication that the different carrier media will allow. The NEMS telecommunications provide for the following (both secure and non-secure) modes:

- Voice — with local electronic automatic switching
- Teletype — with automatic message handling/switching
- Data — via voice grade and high-speed circuits
- Facsimile
- Video — limited to Washington area conferencing.

Portrayed in Figure 2 is a graphic summary of the NEMS telecommunications capabilities when fully implemented. It identifies the major systems owned or available for use by FEMA and shows the scope of coverage of each. The horizontal block indicated by heavy lines marks the organizational bounds of FEMA proper. Notably, most of the individual communications systems extend far beyond those bounds, in many cases spanning echelons above FEMA and reaching all the way down to the State and local level.

Figure 2
NEMS TELECOMMUNICATION CAPABILITIES COVERAGE



*Covers Washington geographical environs, including D.C., Region III EOC, Northern VA, and MD vicinity
**May extend to selected facilities down to county and local level

NEMS Automated Information Capabilities

In view of the broad scope and functional diversity of the FEMA mission, the NEMS requires correspondingly large-scale and complex automated information capabilities. The sections immediately following discuss the present and planned information system components as well as the major ADP support elements.

Existing FEMA Information Systems

A number of structured information systems were inherited by FEMA from predecessor agencies. Some of these are of considerable magnitude and have wide general applications in support of a variety of mission functions. Others are more narrowly oriented and specialized, supporting only particular types of applications limited to a given management area. Listed below are the principal information systems currently incorporated into the NEMS framework:

- Disaster Management Information System (DMIS) — resident at Special facility, with duplicate files maintained at Olney
  - Federal disaster assistance reporting, planning, and program management data
  - Includes public assistance and individual assistance data
- Federal Insurance Administration Management Information System (FIAMIS) — centered at Special facility
  - Management data for the National Flood Insurance Program
  - Limited applications for planning, mitigation, and emergency response
  - Policy and claims data maintained by contractor (see below)
- Federal Insurance Administration (FIA) information support systems — contractor operated
  - Management data for flood and crime insurance programs
  - Floodplain data and map distribution
  - Policy and claims processing and record files
- National Fire Incident Reporting System (NFIRS) — U.S. Fire Administration system
  - Transferred from Commerce Department, with data links to FEMA Fire Administration offices
  - Management data for fire statistics analysis (currently on 40 states).

There are also scores of other subject- or function-unique management information systems in existence or being developed by various individual offices or line divisions of the FEMA organization. At least 32 can be identified at present. Some are relatively simple, topic-specific storage and retrieval systems, such as the MIS for Health Manpower data. Others involve comparatively elaborate data bases and fairly complex applications software in support of an entire program area. Undoubtedly these special-purpose management information systems will continue to proliferate as implementation of the full Office Information System (OIS) progresses throughout FEMA.

In addition to information systems, the NEMS Automated Information Capabilities include data and generalized support software for file management and information retrieval and display. Included in the NEMS data bank are the critical emergency data files necessary to support the agency mission. Also included are such FEMA developed software tools as the Computer Interactive Display, Entry and Retrieval System (CIDERS) and the Information Management System (IMS).

Non-FEMA Information Systems Accessible to NEMS

Many of the information systems of other Federal agencies and departments are indirectly available to the NEMS. In most cases, though, access is not by means of an interactive on-line interface. Rather, FEMA obtains and utilizes output products of those systems by request or on a prearranged reporting basis. Numerous information systems of almost any agency may be so included, either as routine practice or at one time or another when circumstances warrant. Some of the WWMCCS Information Systems (WIS) are particularly relevant sources. A notable example is the DOD Joint Damage Assessment Data Base maintained by CCTC of DCS. Another is the Continental Air Reconnaissance for Damage Assessment (CARDA) system of the Air Force (transmitted via the NORAD Forward Automated Reporting System (NFARS),which is essential to the FEMA mission in a trans-attack and post-attack environment.

Existing ADP Capabilities Available to NEMS

Several computer systems owned or used by FEMA are part of the current NEMS information system assets. Again, most of these were inherited from predecessor agencies. The main ones are identified below:

- FEMA Special Facility Computer Center – currently employing a Sperry 1100/61 system, plus two PDP 11/45 processors

  Remote terminals connecting each of the ten Regions.

  Supports the Critical Emergency Data File operating and applications systems, DMIS, and FIAMIS (total of 124 support applications)

- FEMA Computer Center at Olney, MD – currently based on a Sperry 1100/61 system

  Supports civil defense applications, as well as NFIRS and other MIS ADP

  Serves in parallel with Special Facility for processing national security emergency data; has selected database magnetic tapes prepositioned

  Can be accessed from Regional terminals.

- FEMA Headquarters Computer Complex — Wang processor, plus terminals and remote job entry equipment that can access Special Facility and Olney computers

- FEMA Charlottesville Computer Center – microcomputers plus graphics

  Used in damage assessment studies, modeling, and other applications

  Also for software development for Special Facility and other elements of FEMA

- Contractor-ADP support of the Federal Insurance Administration — remote private-sector computers providing data services under contract.

Throughout the FEMA organization, a considerable number and variety of ADP terminals exist. Currently, there is a total of some 370 CRTs, printers, and processors, (including more than 100 microcomputers) of different types serving the NEMS. They are installed in the EICC, at work stations in headquarters staff sections in the Special Facility, the Regions, and elsewhere. Most of this terminal gear can access the two main computers in some way and in varying degree, and also one or more of the minicomputers or other processors as well. FEMA management personnel recognize that this collection of equipment does not presently constitute an Integrated ADP Component of the National Emergency Management System. This is however, a critical part of a FEMA program to develop such an integrated ADP system.

Recently Completed or Planned Information/ADP Support Systems

Two major increments of expansion and improvement relating to information systems are planned by FEMA. One is a general program of new equipment acquisition and technical measures to increase substantially the capabilities of the entire ADP infrastructure supporting NEMS. The other is the development and implementation of a specific new information system as a keystone of NEMS.

The programmatic hardware enhancements are planned to provide modernization and the first phase of a FEMA-wide distributed computer system. The objective is to provide for an Integrated ADP Access System as part of NEMS. Principal elements of the program include:

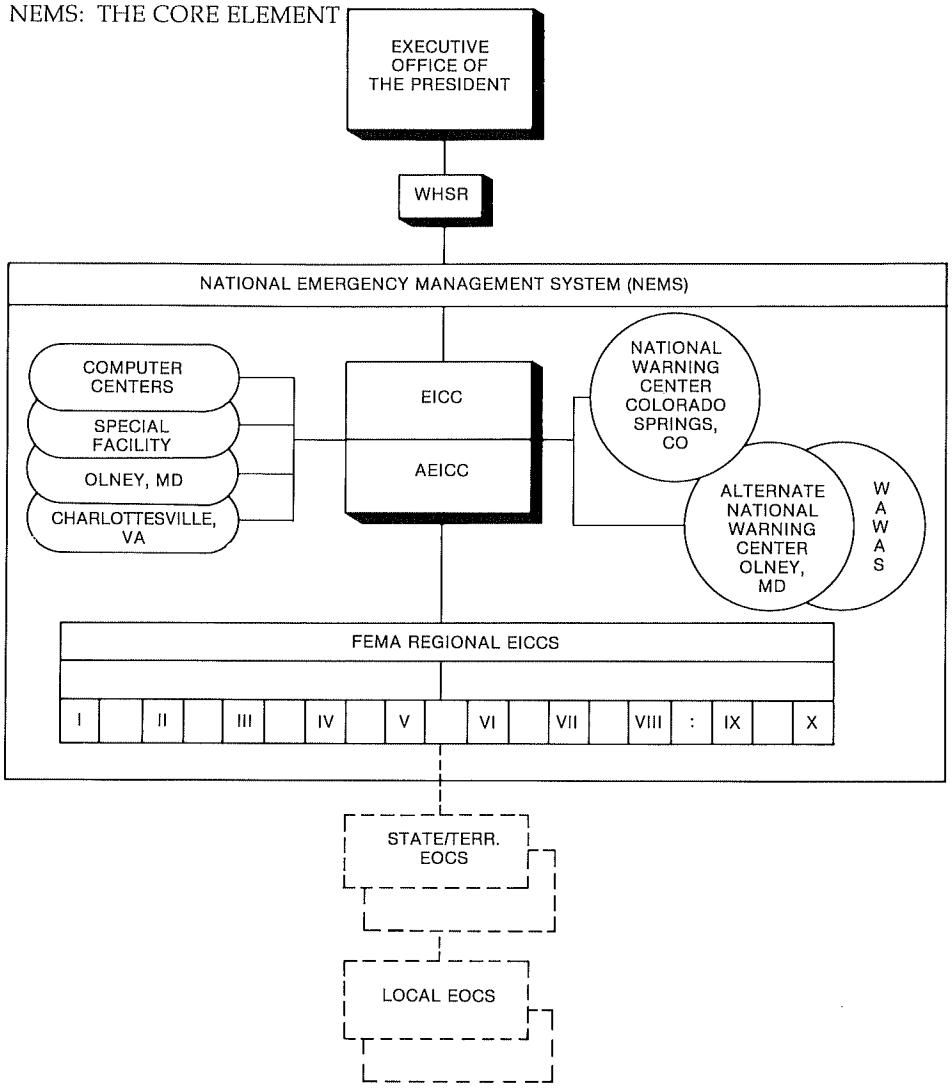
- Replaced CPU mainframe and memory at Special Facility and Olney computer centers, with new Sperry 1100/61's, plus new peripherals, at both sites
- Installed microcomputer clustered terminals at 20 locations (initially), including FEMA Headquarters, the Special Facility, Olney, Charlottesville, and the 10 FEMA Regions, plus 3 split regions.

The new information system planned for the future is a deployable automated, distributed information management system. It is to be the primary survivable NEMS component oriented to the wartime nuclear attack environment, but will also be relied upon for dealing with other large-scale emergency situations in peacetime as well. Among the unique design characteristics and operational features of this new system are the following:

- Modular configuration, consisting of multiple mobile units
- Flexible network topology, with distributed databases, processing, and applications among the respective modules (and presumably serving remote users)
- Data content — predetermined essential information relating to essential emergency management functions, plus scenario-unique information.

All of the foregoing suggests an exceedingly complex structural configuration of the NEMS. Indeed, the effort to mold so many diverse elements into a fully articulated and integrated unity represents a unique challenge in information management system design. Never before has there been an attempt to combine so many disparate entities and elements into a single functioning structure aimed at unified action on emergency management. In the subsequent discussion, the various elements in this complex structural configuration are outlined.

Figure 3
NEMS: THE CORE ELEMENT



The NEMS Core Elements

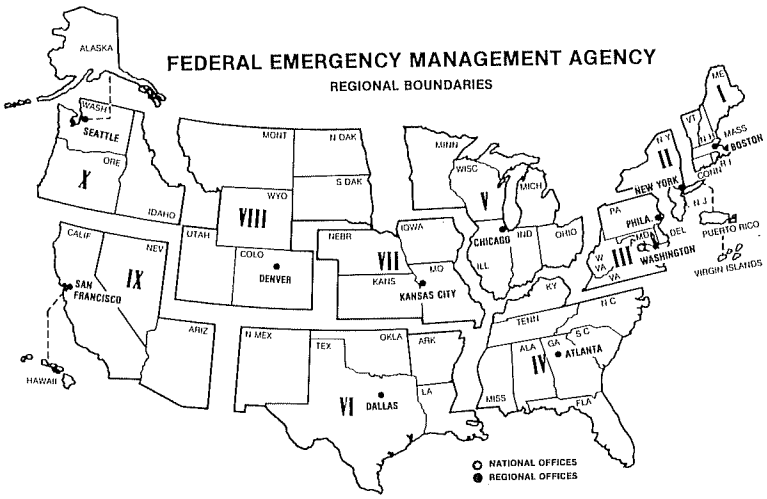
The core of the NEMS is comprised of those parts of the national emergency organization directly under the control of FEMA. As shown in Figure 3, it includes the Emergency Information and Coordination Center (EICC), located in FEMA Headquarters, Federal Center Plaza, 500 C Street, S.W., Washington, DC, and the Alternate EICC (AEICC), located in Virginia. These principal elements are supported with backup telecommunications and computer capabilities in the Computer Centers at the Special Facility, at Olney, MD, and at Charlottesville, VA. The warning capability is contained in the National Warning Center, colocated with the North American Aerospace Defense (NORAD) Command, at Colorado Springs, CO, and the Alternate National Warning Center, located at Olney, MD. The other important part of the NEMS comprises the

ten FEMA Regional Offices located in or near the Federal Regional Center cities shown on the accompanying map (Figure 4).

Federal Civil Agency Functional Interfaces

The NEM's principal elements — the EICC and AEICC — are functionally related to numerous organizations and agencies external to FEMA. Figure 5 shows the functional interface between the EICC/AEICC and the Federal civil agencies that have some role in emergency mitigation, preparedness, response, and recovery. Several points need to be noted about these Federal agency interrelationships. First, the frequency and intensity of contact and interaction between FEMA and these other civil agencies varies by type of emergency, by time phases, by different scenarios within a given emergency type, and by different FEMA functions to be served. In peacetime emergencies, some civil agencies are much more heavily involved with FEMA than others. For example, the Small Business Administration participates in every Presidentially declared major disaster, because it provides loans to victims and small businesses to aid them in repairing, rebuilding, or replacing their homes, businesses, or other property. Similarly, the Farmers Home Administration

Figure 4
REGIONAL OFFICES



Regional Offices

There are 10 FEMA Regional Offices. Each office is headed by a Regional Director who reports to the FEMA Director and is responsible for all FEMA programs in the region.

FEMA Regional Offices are:

Region I (Boston)
442 J.W. McCormack, POCH
Boston, MA 02109
(617) 223-4741

Region II (New York)
26 Federal Plaza
New York, NY 10278
(212) 264-8980

Region III (Philadelphia)
Curtis Building, 7th Floor
6th & Walnut Streets
Philadelphia, PA 19106
(215) 597-9416

Region IV (Atlanta)
Gulf Oil Bldg., Sutie 664
1375 Peachtree Street, N.E.
Atlanta, GA 30309
(404) 881-2400

Region V (Chicago)
300 South Wacker Drive
(24th Floor)
Chicago, IL 60606
(312) 353-1500

Region VI (Dallas)
Federal Regional Center, Rm. 206
Denton, TX 76201
(817) 387-5811

Region VII (Kansas City)
Old Federal Office Bldg., Rm. 300
Kansas City, MO 64106
(816) 374-5912

Region VIII (Denver)
Federal Regional Center, Bldg. 710
Denver, CO 80225
(303) 234-6542

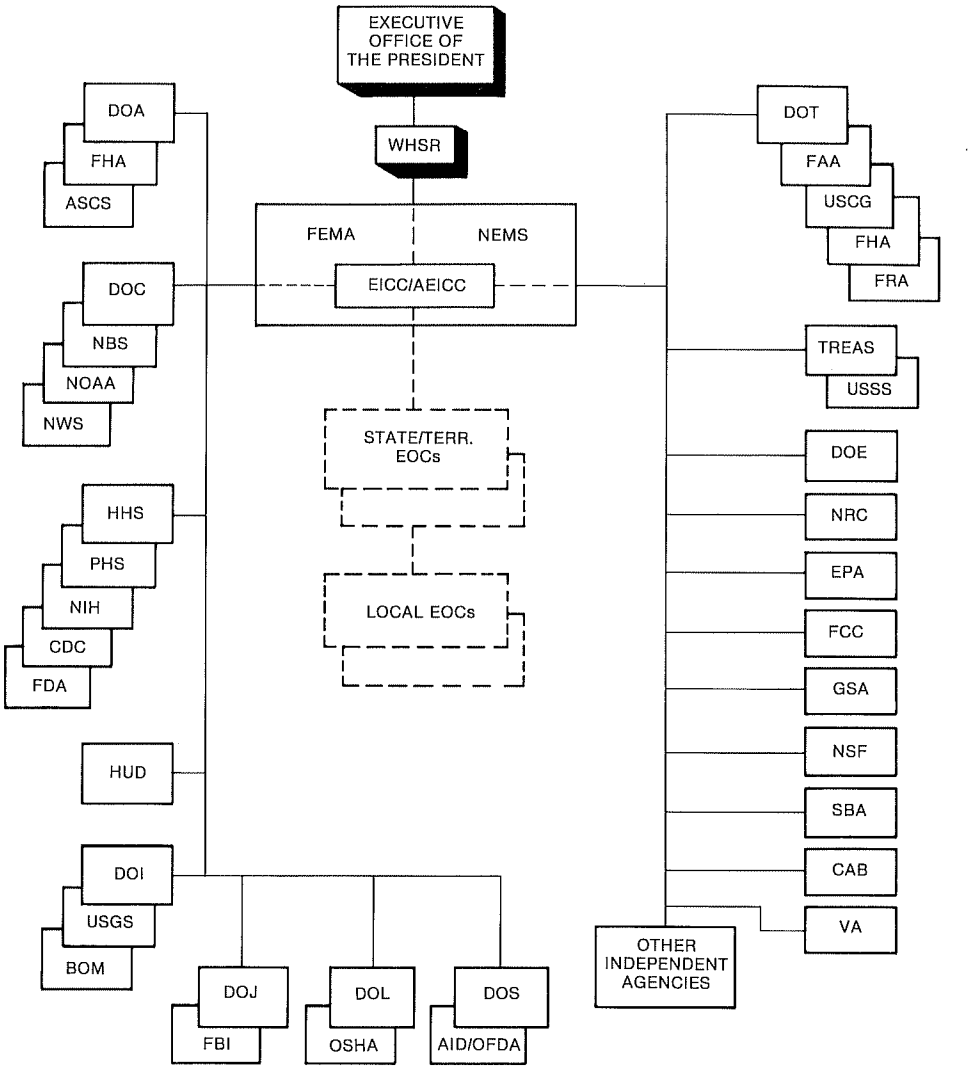
Region IX (San Francisco)
211 Main Street, Rm. 220
San Francisco, CA 94105
(415) 556-8794

Region X (Seattle)
Federal Regional Center
Bothell, WA 98011
(206) 481-8800

in the Department of Agriculture becomes involved in disasters affecting rural areas. It provides emergency loans to farmers, ranchers, and aquaculture operators for losses and expenses arising from natural disasters.

The type of disaster or emergency also dictates which agencies become involved in FEMA policies, plans, and operations. The National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS), located in the Department of Commerce, specialize in protective measures pertaining to meteorological-type emergencies; and FEMA relies heavily on their expertise in disaster mitigation, preparedness, and response activities for hurricanes, tornadoes, floods, and tsunamis. The U.S. Geological Survey, in the Department of Interior, performs a similar function for disasters involving earthquakes, expansive soils, floods, landslides, land subsidence, tsunamis, volcanoes, and water erosion. In a similar way, FEMA is involved with the Federal Bureau of Investigation (FBI) and the Department of Justice when dealing with terrorism and civil disturbances; with the Nuclear Regulatory Commission for events involving nuclear emergencies; with the Department of Health and Human Services and its relevant components (the Public Health Ser-

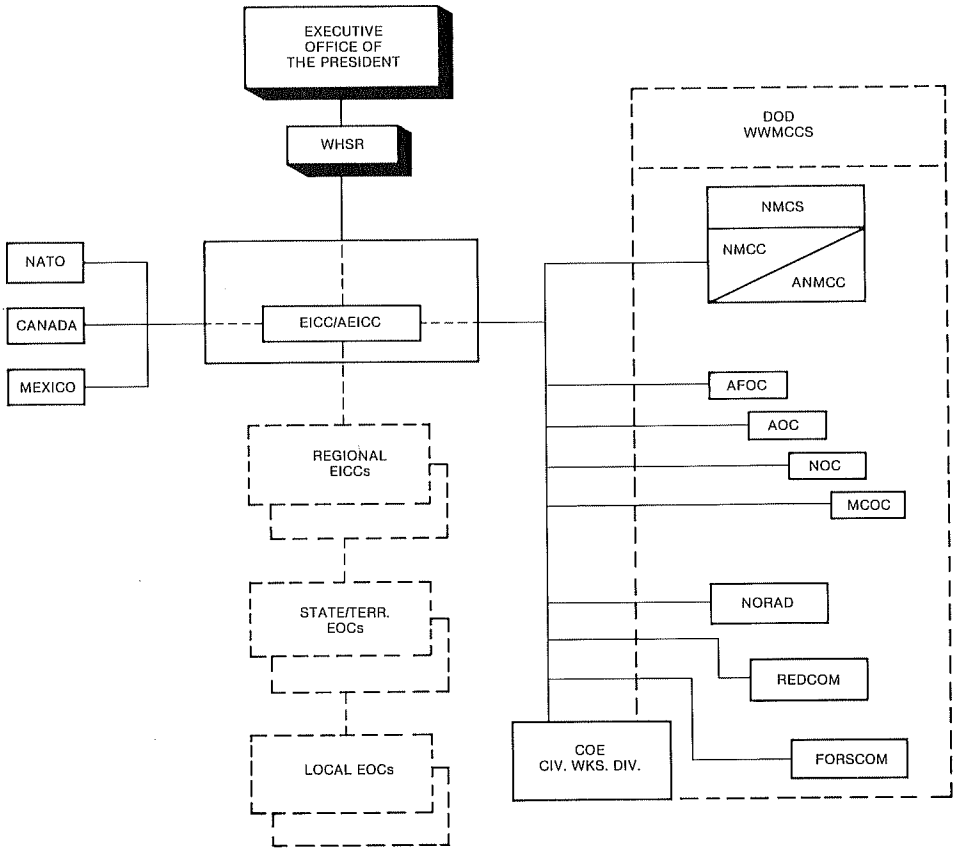
Figure 5
NEMS: FEDERAL CIVIL AGENCY FUNCTIONAL INTERFACES



vice, the Centers for Disease control, the National Institutes of Health, and the Food and Drug Administration) for health and disease-related emergencies; and the Department of Transportation and its relevant components (the Federal Aviation Administration, the U.S. Coast Guard, the Federal Highway Administration, and the Federal Railroad Administration) for emergencies affecting the various transportation systems.

In preparation for and response to a wartime conventional or nuclear attack, virtually all elements of the Federal Government become involved in FEMA's network of contact and coordination. In this context, the departments and independent agencies that have a role in peacetime emergencies take on new or additional responsibilities, assigned to them by Presidential Executive Orders. Additionally, some independent agencies not normally involved in peacetime disaster mitigation, preparedness, response, and recovery are now assigned a role in the overall emergency management picture. For example, the Export-Import Bank is directed to develop plans to utilize its own and other resources to expand productive capability abroad for essential materials, to arrange for foreign barter, and to acquire emergency imports in support of the domestic economy.

Figure 6
NEMS: MILITARY AGENCY FUNCTIONAL INTERFACES



The Securities and Exchange Commission is directed to develop emergency control plans, programs, procedures, and regulations for stock trading, protection of securities records, and the formation and flow of private capital as it relates to new securities or expansion of prior offerings. The U.S. Information Agency is directed to develop preparedness programs for the continuation of essential emergency foreign information activities.

Military Agency Functional Interfaces

In fulfilling its peacetime and wartime emergency management responsibilities, FEMA draws on many of the facilities and resouces of the Department of Defense and its military components. Figure 6 shows the interface between the NEMS EICC/AEICC and the key military elements contained within the overarching structure of the Worldwide Military Command and Control System (WWMCCS). The principal WWMCCS point of contact for time-sensitive information is the National Military Command Center (NMCC), and the Alternate National Military Command and Control Center (ANMCC). For contact with the individual Military Services, the EICC/AEICC communicates with the Air Force Operations Center (AFOC), the Army Operations Center (AOC), the Navy Operations Center (NOC), or the Marine Corps Operations Center (MCOC). For example, in ordering airlift to be used in a major domestic disaster, FEMA deals directly with the Air Force via the Air Force Operations Center.

Other important interfaces with the military forces include the North American Aerospace Defense Command (NORAD), located in Colorado Springs, CO; the U.S. Readiness Command, located at McDill AFB, FL, its U.S. Army component, the U.S. Army Force Command (FORSCOM), located at Fort McPherson, GA, plus the numbered Army Headquarters for military support of civil authority and disaster support. FEMA's National Warning Center, colocated with NORAD, draws on this resource for its own operations. REDCOM and FORSCOM provide support and assistance to FEMA in domestic emergencies and disasters. The Corps of Engineers Civil Work Division plays important roles in flood protection for cities and major river valleys, and provides engineering services for assessing physical damage, for debris clearance, and for other actions aimed at protecting property from further damage.

FEMA and the NEMS EICC/AEICC also interface with the North Atlantic Treaty Organization (NATO) and with the emergency management agencies of Canada and Mexico in developing plans and preparations for coping with potential future national security emergencies.

Command, Control, Communications, and Intelligence (C^3I) Center Interfaces

In carrying out its hazard monitoring, warning, alerting, and emergency response functions, the NEMS EICC/AEICC interfaces with many different command, control, communications, and intelligence centers that monitor emergency occurrences and responses to these occurrences. The military C^3 centers mentioned above are included in this category of communication contacts. There are also additional specialized military centers that FEMA contacts when the circumstances warrant. These include, for example, the National Military Intelligence Center (NMIC), colocated with the NMCC; the Air Force Search and Rescue Center (AFSARC), located at Scott AFB, IL; the Continental Airborne Reconnaissance and Damage Assessment Center (CARDAC), colocated with the ANMCC; and the Joint Nuclear Accident Coordination Center (JNACC), a joint DOD-DOE center located at Kirkland AFB, NM.

For current intelligence information, the EICC/AEICC maintains contact with the operations centers of the Central Intelligence Agency (CIA), the Defense Intelligence Agency (DIA), and the National Security Agency (NSA).

For peacetime natural and man-made emergencies, the EICC/AEICC contacts include NOAA's National Weather Service and its various specialized hazard centers (the National Hurricane Center in Coral Gables, FL; the Eastern Pacific Hurricane Center, San Francisco, CA; the Central Pacific Hurricane Center, Honolulu, HI; the Hurricane Warning Office, San Juan, PR; the National Meterological Center, Camp Springs, MD; the National Severe Storms Forecast Center, Kansas City, MO; and the National Tsunami Warning Center, Honolulu, HI). Other centers on the contact roster—all located in the Washington, DC metropolitan area — include the U.S. Coast Guard Flag Plot, in the Department of Transportation (for information on hazardous materials spills); the Federal Aviation Administration Communications Center (for aircraft accidents and for pilot reports on other disasters); the Department of Energy and Nuclear Regulatory Commission Operations Centers (for emergencies involving nuclear materials), the National Communications System Defense Communications Agency Operations Center (for communications outages), the State Department Operations Center (for contacts with U.S. embassies and foreign governments), and the Health and Human Services and Centers for Disease Control Operations Centers (for information on emergency medical, public health, and epidemic problems).

Although many of these centers tend to specialize in particular types of hazard and emergency information, some of them can provide useful information on a wide range of emergencies. For example, the FAA Communications Center is the focal point for receiving commercial pilot reports on emergencies or disasters on the ground and thus can provide useful information on the location and geographic scope of electric power blackouts, floods, tornadoes, explosions, forest fires, and other events that require FEMA attention.

Interfaces with State and Local Governments

The routine communications between and among FEMA Headquarters and State and local governments are usually channeled through the ten FEMA Federal Regional Offices and follow the usual federal-state-local organizational hierarchy. Under special circumstances and emergency conditions, however, that routinized channel may be modified or redirected. For example, in fulfilling its mandate from Congress as coordinator of The National Earthquake Hazard Reduction Program, FEMA enters into cooperative partnership agreements with States and localities to develop long-term earthquake mitigation and preparedness measures. Thus the FEMA-sponsored Southern California Earthquake Preparedness Project (SCEPP) involves a partnership between and among FEMA Headquarters, FEMA Regional Center IX, and the California Seismic Safety Commission. The partnership also includes the California State Office of Emergency Services, various other elements of the California State Government, and representatives of the principal

Southern California communities and relevant private sector organizations. Moreover, under actual disaster and emergency conditions the usual chain of direction and control may be temporarily bypassed by direct contacts between the EICC/AEICC and local emergency operations centers (EOCs) or by the appointment of a FEMA Federal Coordinating Officer, who, working with a State Coordinating Officer, administers Federal assistance to a local disaster-struck area.

Interfaces with Voluntary Organizations

The United States is characterized by a vast proliferation of voluntary organizations in virtually every field of human interest. The field of disasters and emergencies is no exception. From the early days of the Republic to the present, voluntary disaster relief and assistance agencies have played a significant role in post-disaster response and recovery. Public Law 93-288, the Disaster Relief Act of 1974, officially recognizes three voluntary relief agencies by name — the American National Red Cross, the Salvation Army, and the Mennonite Disaster Service — as ones that agree to work under the coordination of the FEMA established Federal Coordinating Officer in Presidentially declared major disasters. But many other voluntary organizations become involved in various aspects of emergency mitigation, preparedness, response, and recovery. In disaster response and recovery functions, for example, there are 21 different groups involved in the umbrella organization known as the National Voluntary Organizations Active in Disaster (NVOAD). In addition to the three relief agencies already mentioned FEMA's Individual Assistance Division, Office of Disaster Assistance Programs, has contact with such other NVOAD members as the Church World Service, the Lutheran Council in the USA, the National Conference of Catholic Charities, the Seventh Day Adventist Community Service, the Southern Baptist Convention, the United Methodist Committee on Relief, the American Radio Relay League, the Christian Reformed World Relief Committee, the Church of the Brethren General Board, the Presbyterian Church in the United States, REACT International, Inc., the Society of St. Vincent de Paul, and the United Presbyterian Church, U.S.A. The efforts of these national-level organizations are augmented by the work of their local chapters and a large number of other local charitable groups that become involved in post-disaster relief and recovery. In every major disaster, the Federal Coordinating Officer deals with these local voluntary agencies during the operation of the FEMA-established Disaster Assistance Centers.

In general, virtually every program element in FEMA works with various voluntary organizations, and the NEMS EICC/AEICC must be prepared to establish appropriate communication links with these organizations on either a permanent or an ad hoc basis.

Interfaces with Other Private Sector Organizations

FEMA's many responsibilities for civil defense, emergency mobilization, and disaster assistance inevitably brings the agency into contact with a vast number of different organizations in the private sector of U.S. society. The Agency as a whole has frequent contact with professional emergency management organizations, e.g., the National Emergency Management Association and the National Coordinating Council on Emergency Management (NCCEM). It works with the principal public interest groups representing national, State, and local government officials – e.g., the National Governor's Association, the International City Management Association, the U.S. Conference of Mayors, the National League of Cities, and the Council of State Governments.

Each of FEMA's program areas tends to have its own set of contacts with relevant private sector organizations. For example, in the health resources area, National Preparedness Programs, there are frequent communications with such organizations as the American Medical Association, the American College of Emergency Physicians, the American Hospital Association, the American Pharmaceutical Manufacturing Association, and various medical colleges. FEMA's Office of Civil Preparedness, National Preparedness Programs, has contacts, among many others, with the American Association for Industrial Security, the Association of Plant Engineers, the American Public Works Association, the Construction Sciences Research Foundation, and the Chemical Manufacturers's Association. As administrator of the National Defense Executive Reserve Program, FEMA also participates in the recruitment and training of civilian executives to serve in key government positions during periods of national emergency. The approximately 3,000 executives assigned to 26 units in 10 Federal agencies are drawn from a diverse roster of private sector businesses and industries. The several hundred executive reservists assigned to FEMA itself include representatives from banking and many industrial corporations.

Many of FEMA's contacts with private sector organizations are of an ad hoc nature for limited action or information exchange purposes and the relationship is not formalized by a memorandum of understanding or other formal agreement. In other instances, however, the frequency of information exchange or the importance of the private sector organization to FEMA plans, programs, and operations may dictate a more formal, continuing relationship and the establishment of special or permanent communication and data links.

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