Emergency Operations

EICC

Emergency Information and Coordination Center System Description

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Director

Foreword

The role of the Federal Emergency Management Agency (FEMA) is to protect the civilian population of the United States in time of disasters or emergencies. Within FEMA, the Emergency Information and Coordination Center (EICC) serves as the focal point for the day-to-day operations. Information collected during emergency situations flows into the EICC from FEMA headquarters and from the field, as well as from other agencies—public and non-profit—involved in the emergency management community at the national, state, and local levels. In turn, that information is disseminated to specific emergency managers who must make disaster-related decisions on a timely basis.

The systems involved in this process are described in detail in this system description along with the vast array of other capabilities housed within the EICC. Under Presidential and congressional mandate, these emergency management resources are being made available to the various levels of emergency managers to enhance their response and recovery responsibilities in dealing with life-threatening incidents.

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TABLE OF CONTENTS

TABLE OF CONTENTS
(Concluded)

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS
(Concluded)

LIST OF TABLES

1. INTRODUCTION

The Emergency Information and Coordination Center (EICC) is the primary information gathering and action control facility of the Federal Emergency Management Agency (FEMA). Its primary mission is to provide the National Emergency Management Authority with the information and facilities for making accurate and timely decisions, and with the communications required for rapid and reliable transmission of these decisions, under all conditions of peace or war.

As a key element in FEMA's National Emergency Management System (NEMS), the EICC serves as the focal point--on a 24-hour, year-round basis--for the collection, analysis, and dissemination of all types of information related to emergency management. Located at FEMA Headquarters in Washington, D.C., the Center is tied directly to the White House Situation Room and Domestic Policy Staff, to an alternate EICC (AEICC) located in the FEMA Special Facility (a complex outside the local Washington metropolitan area), to 10 FEMA Regional EICCs (REICCs), and to a large number of national operations centers run by various civil and military, and public and private agencies. These ties with other elements of FEMA's National Emergency Management System are shown in Figure 1-1.

This document provides potential users with a description of the Center and its emergency management capabilities. It reviews the EICC concept of operations; its organization and staffing pattern; and its physical layout and facilities. Following this, it describes in detail the major capabilities of the Center in terms of its decision support system and related components: telecommunications, audiovisual display, and information systems. It ends with a discussion of the planned and potential future developments of the EICC.

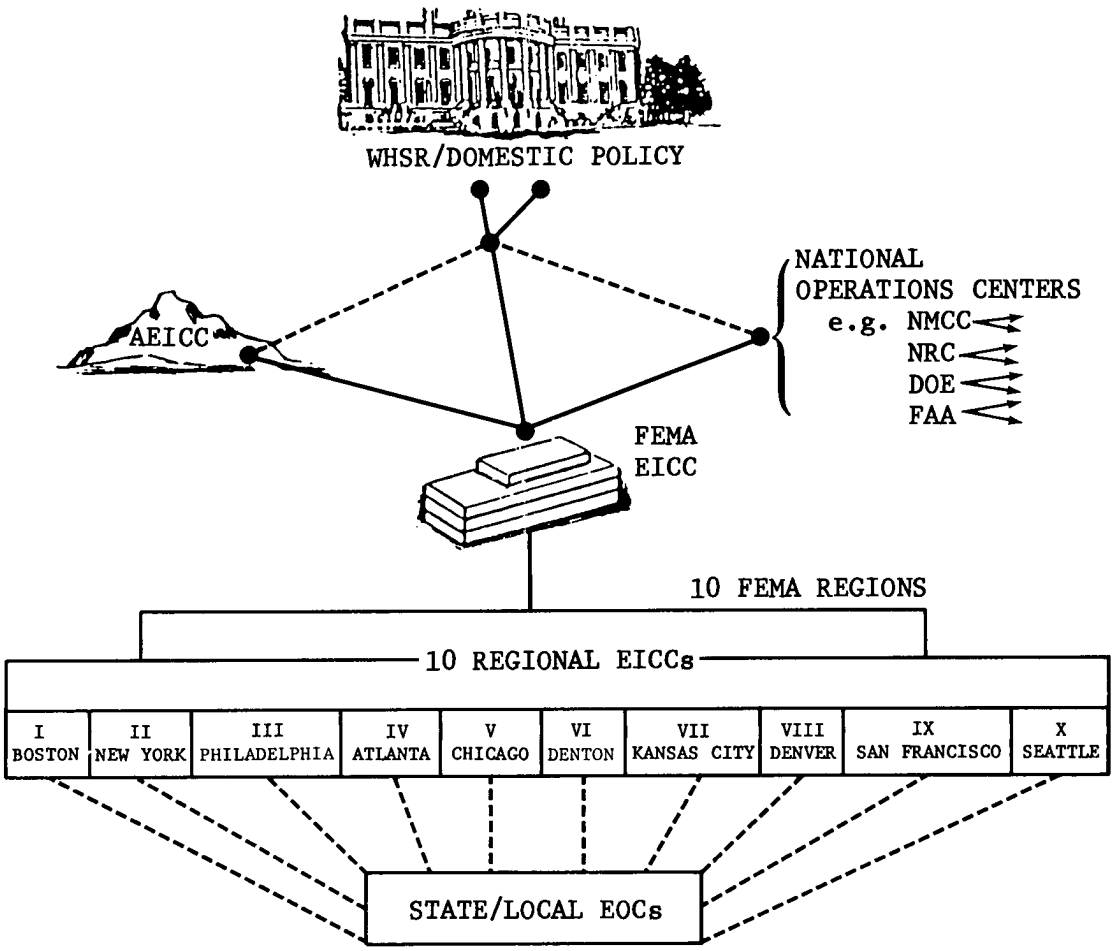

FIGURE 1-1
FEMA NATIONAL EMERGENCY MANAGEMENT SYSTEM

2. CONCEPT OF OPERATIONS

The EICC is designed to function effectively in both routine and emergency operations and to serve the emergency-related information needs of FEMA decision makers and those of the entire Executive Branch. It routinely functions as an around-the-clock information and coordination center, constantly monitoring potential and actual hazards that may adversely affect the Nation's people, resources, and continuity of government. The Center provides information services and communications support for all of FEMA's program areas and, under special operational conditions, for the Executive Branch of government. It also serves as a repository for nationwide emergency management data, including information on the location of major hazards throughout the country and the emergency management response capabilities available to support FEMA's preparedness plans relating to those hazards.

During domestic or national security emergencies, the EICC assumes a dominant role. It continues to serve as the point of contact for the exchange of information with the Executive Office of the President, other federal agencies, FEMA's program directors, and FEMA's regional EICCs, which connect with state and local emergency operating centers. During such emergencies, the Center:

- o Supports the National Emergency Management Authority--the President, Vice President, and FEMA Director. It provides the staff, physical facilities, telecommunications, and information systems to gather, collate, analyze, disseminate, record, display, file, store, and retrieve the information needed to make timely and effective decisions, and to manage the emergency.

- Provides for centralized management of information. It serves as a central clearinghouse for the Executive Branch of government and provides an environment for coordinating the activities of the Executive Branch, so that federal departments and agencies act in a corporate way in managing the crisis or emergency.

- Permits multiple emergency management operations. When augmented by program and support staff, the EICC is capable of dealing with several different emergencies simultaneously, including those that require the handling of classified information and depend on secure communications.

The EICC is closely linked to other major national emergency centers, with national voluntary relief agencies, with the FEMA REICCs, and with state and local emergency operations centers, as required, in an information exchange network.

The EICC may be viewed as a Decision Support System (DS^2), providing the National Emergency Management Authority and other key emergency managers with the information and facilities needed for critical decision making and for transmitting these decisions to the operational personnel who implement them. The operation of this DS^2 relies on three component systems:

- A Multi-Media Telecommunications System (MMTS), which provides the pipeline through which information is transmitted.

- An Executive Display System (EDS), which provides a graphic, visual means for displaying and correlating data in an interactive mode.

- An Integrated Emergency Management Information System (IEMIS), which provides the information systems, models, and data processing systems needed for emergency management.

Graphically, this conceptual model may be visualized as shown in Figure 2-1.

The staff, physical facilities, and the Decision Support System comprise the essential elements of the EICC. The subsequent discussion provides further details on each of these elements.

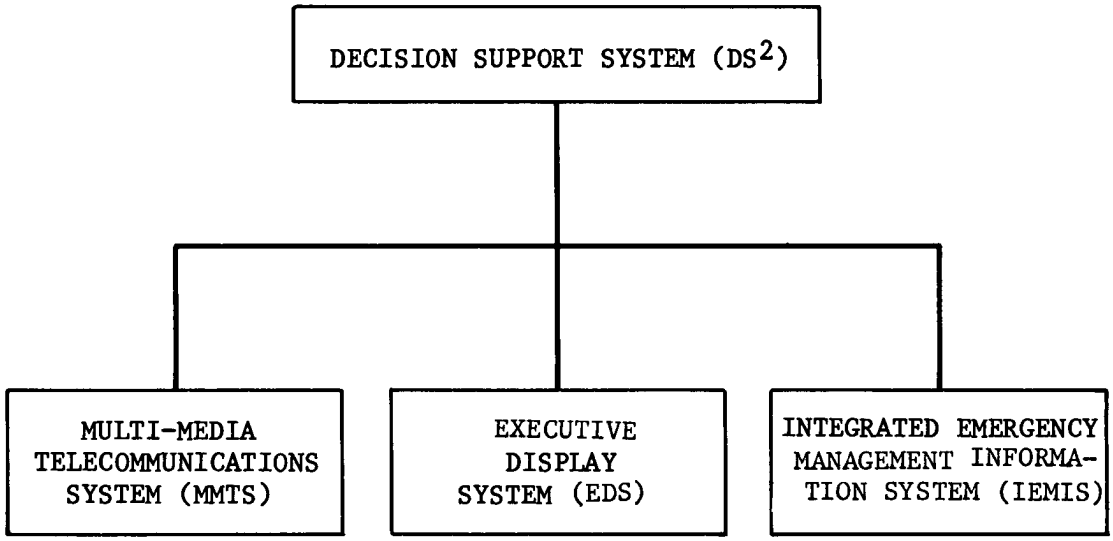

FIGURE 2-1
DECISION SUPPORT SYSTEM COMPONENTS

3. EICC ORGANIZATION AND STAFFING

The basic principle guiding the organization and staffing of the EICC is flexibility--i.e., the nature and number of people working in or utilizing the Center is determined by the needs and demands of the situations being managed. Thus, at any given time, the EICC is staffed at a level to ensure that the full range of FEMA activities are adequately supported and that the facility resources are efficiently utilized. A cadre of full-time, regular personnel carry out the day-to-day operations of the Center. Depending upon the intensity, severity, complexities, and duration of situations that develop, the regular staff will be augmented by FEMA and other federal and voluntary agency personnel to respond fully to the requirements generated by an activity.

The EICC Emergency Action Staff contains two elements:

- An Operations Element, which has overall management responsibility for EICC operations.
- A Communications Element, which handles and processes classified and unclassified communication traffic between it and a full range of governmental and non-governmental sources and subscribers.

This organizational structure is shown in Figure 3-1.

The basic, around-the-clock support for the EICC activities is provided by a Manager, two Operations Officers, and five Emergency Action teams. The five Emergency Action teams

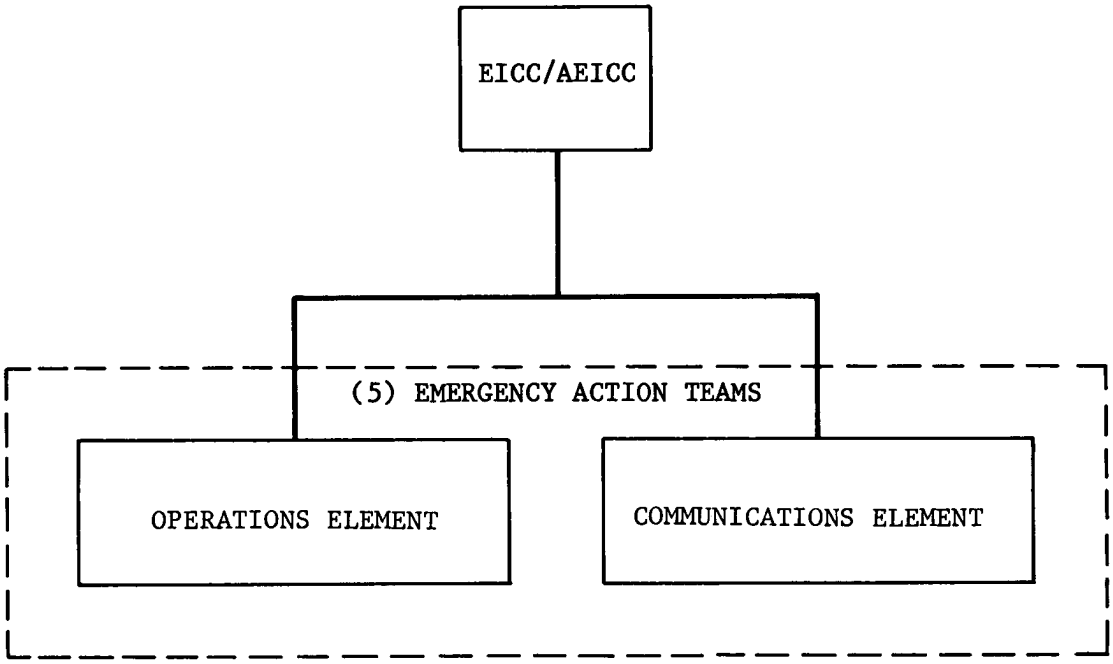

FIGURE 3-1
ORGANIZATION OF EICC/AEICC EMERGENCY ACTION STAFF

combine the Operations Element and the Communications Element personnel. Each team is composed of an Emergency Action Officer, an Emergency Action Specialist, two Communications Operations Specialists, a Message Center Clerk, and an Electronics Maintenance Technician. Continuous support is provided by a Hydrologist/Meteorologist, a Cartographer, a Communications Supervisor, an Intelligence Officer, an Audiovisual Production Manager, an Information System Manager, and two Computer Graphics Specialists.

Liaison officers are also assigned to the EICC from such FEMA directorates and offices as Emergency Operations, National Preparedness Programs, State and Local Programs and Support, Public Affairs, and Congressional Relations. Designated individuals serve as a conduit for a program or staff to receive, exchange, and distribute information regarding ongoing emergency management activities. Other liaison officers are assigned on an ad hoc basis.

When it becomes apparent that the capabilities of the staff will be exceeded, the EICC may be augmented by off-duty EICC personnel, FEMA's program offices, interagency personnel, and from a pool of trained, experienced reservists. Augmentation may range from a few FEMA program staff working normal hours to over 200 people from FEMA and many other federal and voluntary agencies. Additional FEMA program personnel with special technical or program expertise augment the regular EICC staff in order to respond effectively to the needs of a particular situation. Similarly, liaison personnel from other federal agencies will come to the Center to provide specialized knowledge and expertise.

4. FACILITIES

The EICC, located on the mezzanine floor of FEMA Headquarters, in Washington, D.C., contains a variety of work areas, offices, task force areas, and other operational areas, covering a floor space of about 18,000 square feet (Figure 4-1). These areas include:

- Executive Information and Display Area
  The Executive Information and Display Area is an acoustically conditioned briefing room used only by FEMA and other agency senior level emergency managers. The facility is equipped with a computer graphics workstation, a stage, special lighting, an electronic lecturn, and two front- and one rear-projection devices capable of showing medium- and high-resolution video and computer displays (Figures 4-2 through 4-6).

- Task Force Area A
  Task Force Area A is a dedicated work space for unclassified operational and exercise use. It may be divided into two separate rooms and contains six computer workstations, a computer graphics workstation, porcelain and tack boards, and front- and rear-projection screens for medium- and high-resolution video and computer displays. The entire area has a raised floor overlaying a flexible power/telephone grid which allows emergency managers to arrange the room in any desired configuration (Figures 4-7 through 4-9).

- Task Force Area B
  Task Force Area B is similar to Task Force Area A but is larger and can be divided into three areas instead of two. It is equipped with six computer workstations, three closed-circuit monitors, a front projection screen for medium- and high-resolution video and computer displays, and porcelain and tack boards. The area also has a small stage and the same type of flexible power/telephone grid as Task Force Area A (Figures 4-10 through 4-13).

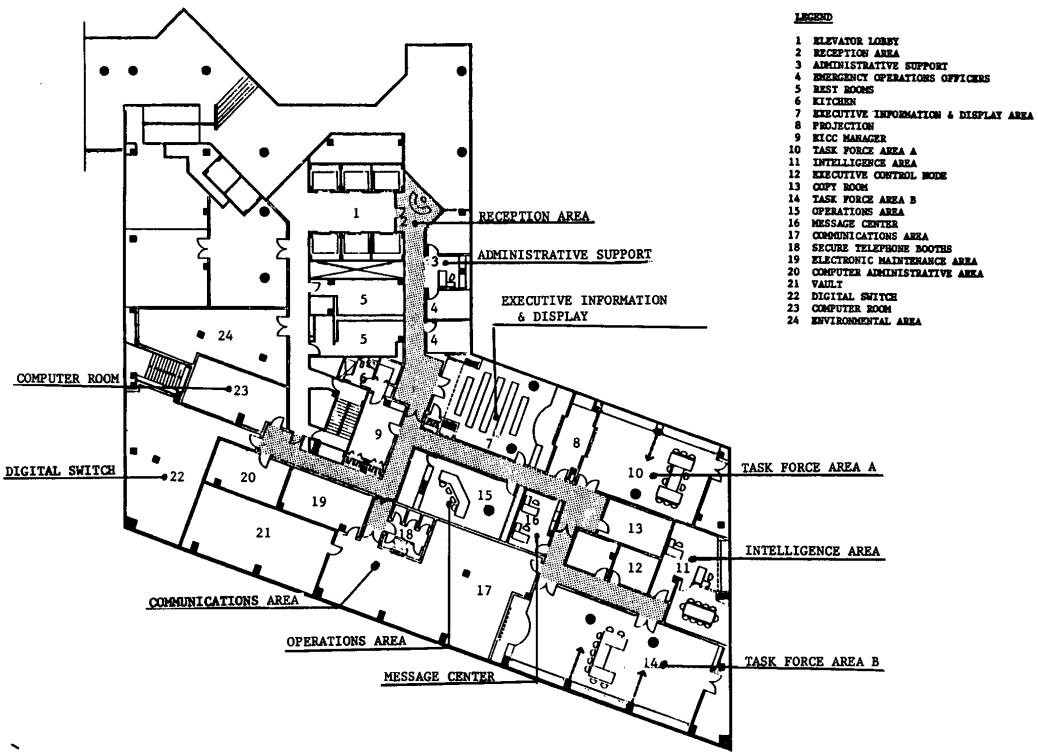

FIGURE 4-1
PHYSICAL LAYOUT OF THE EICC

FIGURE 4-2. OVERALL VIEW OF EXECUTIVE INFORMATION AND DISPLAY AREA SHOWING USE OF TWO FRONT-PROJECTION DEVICES

FIGURE 4-3. CONFERENCE IN SESSION IN EXECUTIVE INFORMATION AND DISPLAY AREA. NOTE THE TWO FRONT-PROJECTION DEVICES MOUNTED ON CEILING

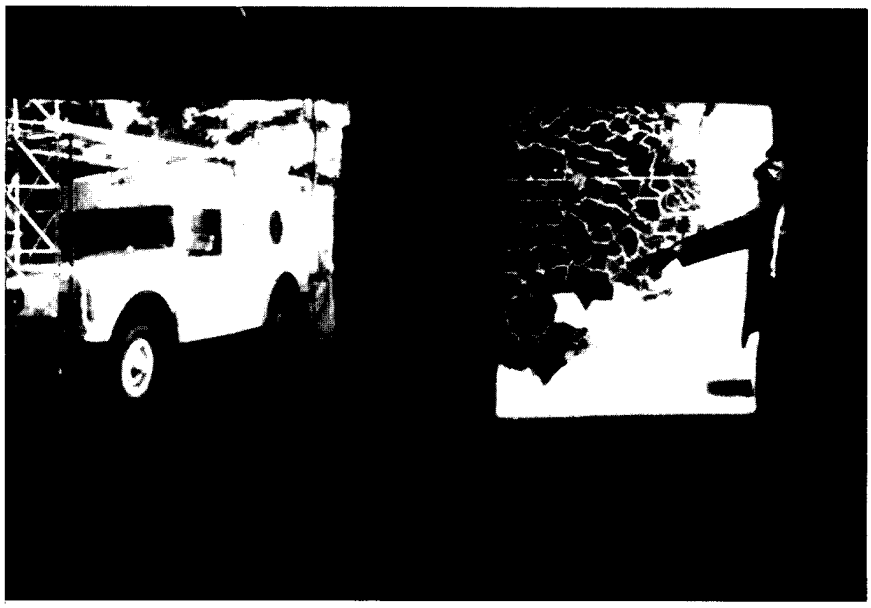

FIGURE 4-4. FRONT-PROJECTION CAPABILITY IN EXECUTIVE INFORMATION AND DISPLAY AREA, SHOWING SIMULTANEOUS USE OF TV TAPE AND COMPUTERIZED GRAPHIC MAP DISPLAY IMAGES

FIGURE 4-5. EXECUTIVE INFORMATION AND DISPLAY AREA: BRIEFING IN PROGRESS USING REAR-SCREEN PROJECTION

FIGURE 4-6. EXECUTIVE INFORMATION AND DISPLAY AREA: COMPUTER GRAPHICS WORK STATION IN OPERATION

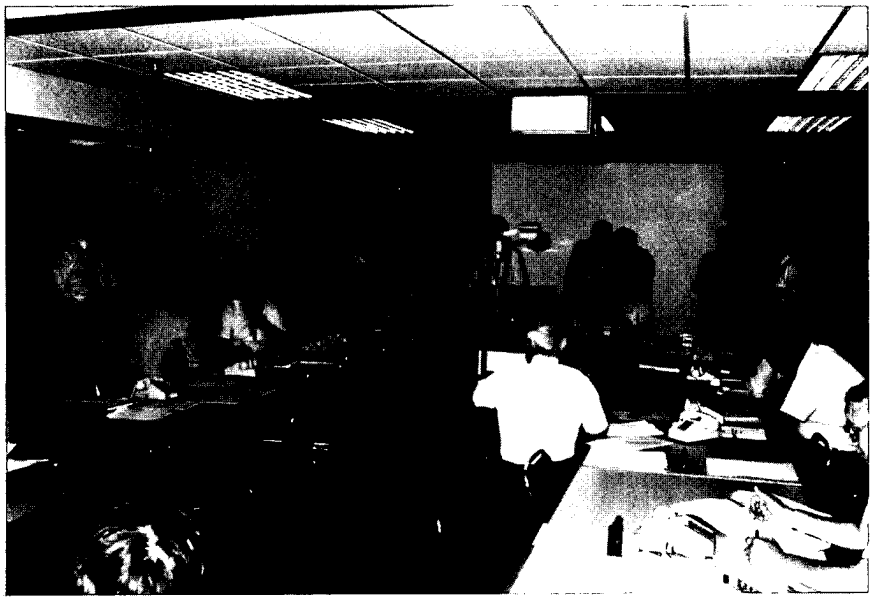

FIGURE 4-7. TASK FORCE AREA A IN OPERATIONAL USE. FRONT-PROJECTION DEVICE MOUNTED ON CEILING

FIGURE 4-8. OPERATIONS IN TASK FORCE AREA A

FIGURE 4-9. COMPUTER WORK STATION IN TASK FORCE AREA A

FIGURE 4-10. TASK FORCE AREA B: OVERALL VIEW OF TWO OF THREE ROOMS

FIGURE 4-11. TASK FORCE AREA B-2 IN CONFERENCE ROOM CONFIGURATION, SHOWING THREE OF SIX COMPUTER WORK STATIONS

FIGURE 4-12. OPERATIONS IN TASK FORCE AREA B

FIGURE 4-13. TASK FORCE AREA B IN AUDITORIUM CONFIGURATION

- Operations Area
  The Operations Area is the nerve center of the entire EICC operation. It is outfitted with an extensive array of equipment, including secure and non-secure computer terminals, a voice-generating computer, five television monitors, video recorders, a video printer, a state-of-the-art telephone system, and a flexible wall display system comprised of map, magnetic, porcelain, and tack boards (Figures 4-14 through 4-16).

- Communications Area
  The Communications Area covers 6,600 square feet and contains a great variety of communications equipment. This includes five secure telephone booths. Adjacent to this area are other rooms for Electronic Maintenance, a Telephone Frame, a Vault, and a Digital Switch.

- Computer Room
  The Computer Room contains two VAX computers that drive the EICC Decision Support System and the graphic system and visual displays in the Executive Information and Display Area and in Task Force Area A (Figure 4-17).

- Environmental Area
  The Environmental Area contains microprocessors that control the air conditioners, heaters, and circulation system. Two 400 kW generators and an uninterruptible power source provide emergency power. The entire EICC facility is environmentally self-contained. It has its own power, heating, ventilation, air conditioning, and circulating systems—all independent of the building and the city.

FIGURE 4-14. EICC OPERATIONS AREA

FIGURE 4-15. OPERATIONS AREA CONSOLE POSITION, SHOWING USE OF STAND-ALONE MICROCOMPUTER

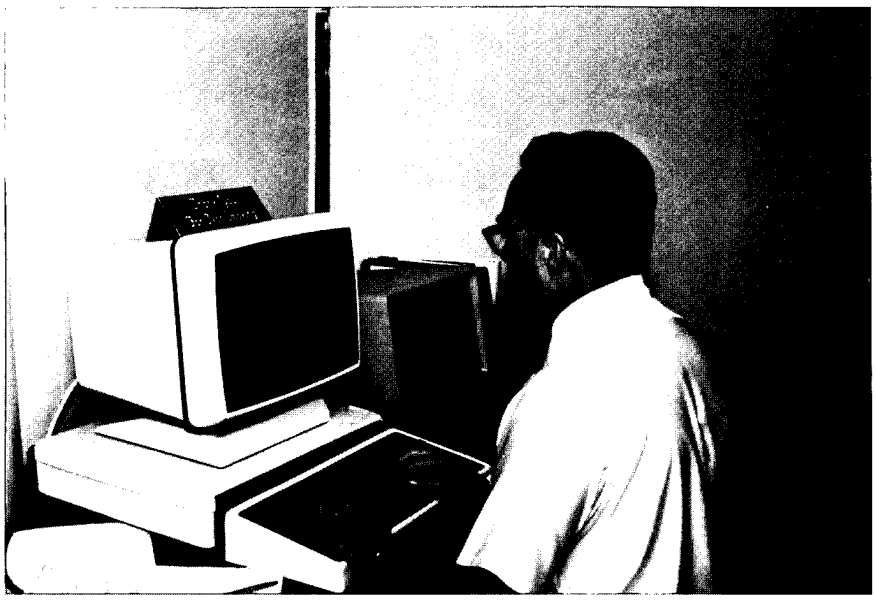

FIGURE 4-16. OPERATIONS AREA COMPUTER TERMINALS CONNECTED TO VAX AND SPERRY MAINFRAME COMPUTERS

FIGURE 4-17. EICC COMPUTER ROOM

5. MULTI-MEDIA TELECOMMUNICATIONS SYSTEM (MMTS)

As a part of FEMA's National Emergency Management System (NEMS), the EICC has access to a comprehensive telecommunications system comprised of communication subsystems which can access multiple networks. The subsystems include telecommunications owned and operated by FEMA; those belonging to other U.S. government agencies but accessible to FEMA; and the commercial services used by FEMA. These various subsystems are briefly described in the following subsections.

5.1 Existing FEMA-Controlled Subsystems

5.1.1 Digital Switch

The EICC has its own 250-line private, electronic telephone exchange system. The Digital Switch is currently being expanded to its full 2,500-line capacity in order to provide voice and data communications for the entire FEMA Headquarters building.

5.1.2 Warning Systems

The EICC also has access to three FEMA-controlled telecommunications systems devoted to emergency warnings:

- National Warning System (NAWAS): A voice system, utilizing commercial circuits, covering about 2,400 drops in federal agencies, military departments, state governments, and local political subdivisions. The primary means for issuing attack warnings and advisories on special emergencies, the NAWAS is controlled by FEMA's National Warning Center (NWC), collocated with the North American Air Defense Command (NORAD) at Colorado Springs, Colorado, or from the Alternate National Warning Center (ANWC) at Olney, Maryland. The EICC has two dedicated circuits connected to NAWAS--a warning circuit and a control circuit. The latter provides a direct voice link between the two National Warning Centers, the FEMA EICC, AEICC, and ten REICCs.

- Decision Information Distribution System (DIDS): A low frequency, one-way radio communications network to warn and inform public officials of a nuclear attack or major peacetime disaster. It permits the selective distribution of emergency warnings to different groups of federal, state, and local officials or simultaneous communication to all warning points in the system. Designed as a prototype to augment or replace the present NAWAS system, the DIDS network coverage is currently limited to the Middle Atlantic states, where it is used both for prototype test purposes and for operational use. The system is controlled by the FEMA Alternate National Warning Center, collocated with FEMA Region III, in Olney, Maryland.

- Washington Area Warning System (WAWAS): A voice system, utilizing commercial circuits and controlled by the Alternate National Warning Center, it provides attack warning and emergency information to federal agencies, political jurisdictions, and police and fire departments throughout the Washington, D.C. metropolitan area.

The receipt and dispatch of warning messages via all three of these networks are handled by the Emergency Action Officer in the Operations Area.

5.1.3 Other FEMA Systems

There are nine other FEMA-controlled telecommunication systems that can be accessed in the EICC:

- Emergency Broadcast System (EBS): Provides the President with a means of communicating with the American public in the event of a war, a threat of war, or grave national crisis. It is comprised of more than 9,500 participating radio and television stations linked by commercial circuits for simultaneous broadcasts. Portions of the system also may be used by state and local authorities for peacetime emergencies. FEMA has oversight responsibility for the EBS and provides the circuits for its use.

- FEMA National Teletype System (FNATS): A dedicated, 100 words-per-minute teletype network for transmitting record communications between FEMA national headquarters, the AEICC, regional offices, states and territories, and selected Canadian civil defense locations (Figure 5-1).

- FEMA National Voice System (FNAVS): Dedicated wireline voice communications from each FEMA regional office to the respective state emergency management or civil defense offices and their emergency operating centers (EOCs). Provides reliable voice communications when commercial direct distance dial (DDD) networks may be overloaded during or after a disaster. Uses Defense Communications Agency's AUTOVON long lines, the Federal Telecommunications System voice network, commercial telephone service, and FNARS to the regions and for interregional voice communications.

- FEMA National Radio System (FNARS): A high-frequency radio system that provides voice and radio teletype record communication backup to FNATS and FNAVS. It permits communication between FEMA Headquarters and the regions, between regions, and between regions and the associated state EOCs. It also provides communications between remote disaster sites or field offices and the fixed network stations.

- FEMA Mobile Air Transportable Telecommunications System (FMATTS): FEMA currently possesses two air transportable telecommunications units for use in disaster field operations. One of these units consists of two vehicles--a communications van and a support van--normally positioned at the FEMA Special Facility. Flown to the disaster site via Air Force cargo aircraft, this FMATTS unit contains high-frequency single sideband radio with portable antennas and a capability for secure FAX, secure voice, and commercial telephone communications contact, via landlines, with the EICC, AEICC, and the appropriate REICC. The other FMATTS unit, normally positioned at FEMA Region V in Battle Creek, Michigan, consists of a single communications van.

- Interagency Communication System (ICS): A secure record and voice system for communicating within the components of FEMA, including the ten REICCs, and between FEMA and other federal agencies.

- Secure and Nonsecure Facsimile Communications (FAX): The EICC has the capability for transmitting and receiving facsimile communications in both unclassified and secure modes, using high-speed digital FAX machines (Figure 5-2).

FIGURE 5-1. MESSAGE CENTER COMMUNICATIONS EQUIPMENT: OPERATOR USING FEMA NATIONAL TELETYPE SYSTEM (FNATS) MACHINE

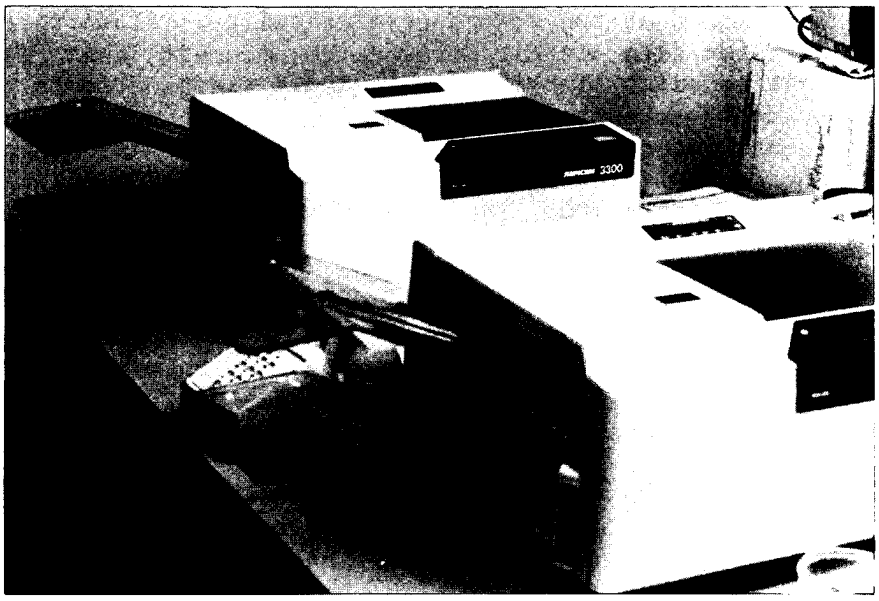

FIGURE 5-2. HIGH-SPEED DIGITAL FACSIMILE MACHINES IN MESSAGE CENTER

- o VAX Electronic Mail System (VEMS): The mainframe VAX computer located in the EICC provides electronic mail capability among the EICC, AEICC, FEMA Headquarters offices, and the ten FEMA REICCs.

- o Sperry Electronic Mail System (SEMS): The mainframe Sperry 1100/61 computers, located at the Olney, Maryland, and Special Facility Computer Centers, also provide an electronic mail capability among FEMA Headquarters offices, the EICC, AEICC, National Warning Center, Alternate National Warning Center, the FEMA Computer Centers at Olney, Maryland, the Special Facility, and Charlottesville, Virginia.

5.2 Existing U.S. Government Subsystems Used by or Accessible to the EICC

A wide range of government telecommunications systems belonging to other federal departments and agencies are used by or available to the EICC. The major ones are listed below according to the agency having primary jurisdiction.

5.2.1 Federal Telecommunications Systems (FTS) of the General Services Administration

- o FTS Voice Network: Provides local and long distance voice-grade communications for federal government departments and agencies on a day-to-day basis as well as for emergency purposes. The intercity portion allows calls to be made to government agencies at over 2,000 locations in about 500 cities that are connected directly to the network.

- o Federal Secure Telecommunications System (FSTS): Provides secure voice capability to federal government departments and agencies over standard, unconditioned, narrow-band, commercial telephone lines.

5.2.2 Defense Communications System (DCS):

- o AUTOVON: A worldwide automatic switched voice network for the Department of Defense and other government agencies primarily concerned with national security. It provides direct distance dialing, station-to-station service through a system of government-owned and leased automatic switching and transmission facilities.

- AUTODIN: The Defense Communications System's automatic digital network. The system is a worldwide, high-speed, computer-controlled, secure, digital communications system for exchange of record and data traffic between government departments and agencies. The system services approximately 1,200 terminals worldwide.

- AUTOSEVOCOM: The principal DCS long-haul, secure voice communications system. It provides secure voice service for traffic of all security classifications and for special intelligence information to appropriately cleared subscribers. The system enables the EICC to participate in secure wide-band, voice-mode conferences with the command centers of the NMCC, CINCLANT, CINCSAC, CINCNORAD, the ANMCC, and the Canadian Defense Staff in Ottawa.

- Worldwide Military Command and Control System/National Military Command System (WWMCCS/NMCS): As the major component of the WWMCCS, the NMCS network is linked directly to the White House Communications Agency (WHCA). The WHCA provides NMCS connectivity to the President and to civil departments and agencies, including the Department of State and Central Intelligence Agency.

5.2.3 NATO Integrated Communications System (NICS)

The NICS consists of a variety of manual and automated communications capabilities that connect NATO military command headquarters and the political elements of the member nations.

5.2.4 Federal Aviation Administration (FAA) Communications

The combined communications systems owned and operated by the FAA include five major networks containing more than 40,000 terminals and drops connected to landlines, LF, HF, VHF, UHF, and SHF systems, to provide total nationwide service. Under special arrangements or emergency conditions, the FAA can extend the EICC circuits to the desired location or party via their switchboard.

5.2.5 Interagency Dedicated Telephone Circuits

The EICC has direct hotline service to a number of other emergency operating centers, including the FEMA Special Facility and AEICC, the National Military Command Center (NMCC), and the Nuclear Regulatory Commission (NRC) Operations Center.

5.3 Existing Commercial Communications Services Used by or Accessible to FEMA

The EICC also utilizes a number of utility-type commercial communications generally serving the public at large. These include:

- o Direct Distance Dialing (DDD)
- o Wide-Area Telecommunications System (WATS)
- o Teletypewriter Exchange Service (TWX)
- o News Wire Service Networks
- o Electronic Message Distribution
- o Broadcast and TV News Media

5.4 Summary of Telecommunications Subsystems

For ready reference, each of the multi-media telecommunications subsystems discussed previously are summarized in Table 5-1.

TABLE 5-1. SUMMARY INFORMATION ON EICC MULTI-MEDIA TELECOMMUNICATIONS SUBSYSTEMS

SUBSYSTEM NAME	TYPE OF SYSTEM	CONTROLLED ACCESS	ACCESS LOCATION	ASSISTANCE IN USE	COMMENTS
FEMA SUBSYSTEMS					
DIGITAL SWITCH	V&R	NO	ALL AREAS	EOO & EAO	ALSO ACCESSED FROM HQ. BLDG
NAWAS	V	YES	OA	EAO	
DIDS	V	YES	OA	EAO	
WAWAS	V	YES	OA	EAO	
EBS	B	YES	OA	EAO	
FNATS	R	NO	1/2/3	CA	
FNAVS	V	NO	ALL PHONES	CA	DIAL 7 & THEN AUTOVON NUMBER
FNARS	V	NO	MC	CA	PHONE ACCESS IN TF AREAS A & B
*FMATTS	V&R	YES	OA	OA	
*ICS	V&R	YES	CA&TF AREA B	CA	
*FAX	R	NO	1/2/3	MC	CONTROLLED ACCESS FOR SECURE
VEMS	R	YES	ALL AREAS	EAD	
SEMS	R	YES	ALL AREAS	EAD	
OTHER U.S. GOVT. SUBSYSTEMS					
FTS	V	NO	ALL PHONES	CA	DIAL 8 & THEN FTS NUMBER
*FSTS	V	YES	CA & TF AREA B	CA	SECURE PHONES IN BOTH AREAS
AUTOVON	V	NO	OA	CA	DIAL 7 & THEN AUTOVON NUMBER
*AUTODIN	R	YES	1/2/3	CA	
*AUTOSEVOCOM	V	YES	CA & TF AREA B	EAO	
*NICS	V&R	YES	CA	CA	
FAA	V	YES	OA	MGR. & EOO	
INTERAGENCY HOT LINES	V	YES	OA	EAO	
COMMERCIAL					
DDD	V	YES	ALL PHONES	CA	DIAL 9 & LONG-DISTANCE NUMBER
WATS	V	YES	ALL PHONES	CA	ACCESSED VIA SPEC. FAC. OPERATOR
TWX	R	NO	1/2/3	CA	
NEWS WIRE	R	NO	OA	EAO	
ELECTRONIC MAIL	R	YES	ALL AREAS	EAO	
AM/FM RADIO	B	NO	OA	EAO	
TELEVISION	B	NO	OA/EIDA/TF A&B	EAO	

LEGEND

* = Has secure comm. capability
B = Broadcast mode
R = Record (hard copy) mode
V = Voice mode
V&R = Voice and Record modes

1/2/3 = Delivery points for hard copy messages:
1 = Delivery to Adm. Support office (duty hours)
2 = Delivery to Reception Desk & Phone Comm. Center (nonduty hours)
3 = Delivery to Comm. Coordinator in Msg. Center during exercises & real emergencies

OA = Operations Area
MC = Message Center
CA = Comm. Area
TF = Task Force
EAO = Emergency Action Officer
EOO = Emergency Operations Officer
Mgr. = EICC Manager
EIDA = Executive Information and Display Area

6. EXECUTIVE DISPLAY SYSTEM (EDS)

A second major component of the EICC's Decision Support System (DS^2) is an executive display system based on a comprehensive audiovisual production and video distribution network. The EDS permits all forms of audiovisual presentations and programs to be transmitted to large screen projectors and TV monitors throughout the Center and to over 40 points within the FEMA Headquarters building. The Center has its own audiovisual production staff who develop and present these materials, in collaboration with emergency management officials.

6.1 Audiovisual Master Control Center

The central production and control facility for the EDS is the Audiovisual Master Control Center (as shown in Figure 6-1). This control center incorporates the following features:

- A TV production console with special effects generator. This console permits the production of video tape programs compatible with broadcast industry standards (National Television Standard and Code, 525 scan lines).
- Video tape editing
- Stereo-audio console
- Video sources for:
  - 16 mm movie film
  - 35 mm slides
  - VuGraph camera
  - Studio camera
  - Graphics generator
  - Video still storage (with capacity for sequential and random callup of over 1,000 images)

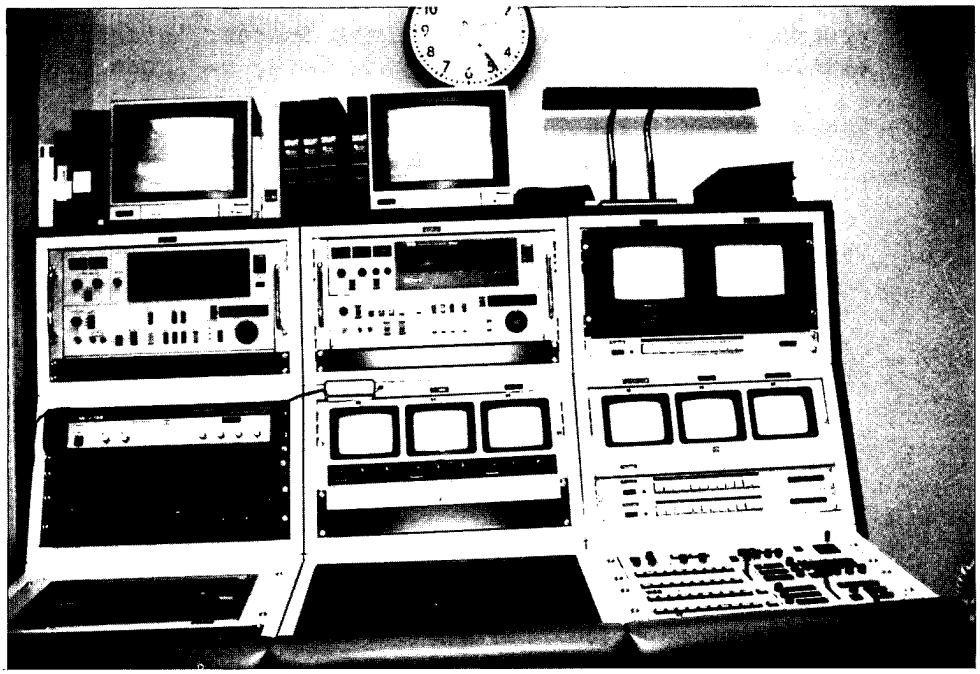

FIGURE 6-1. AUDIOVISUAL MASTER CONTROL CENTER

- Audio recording/playback, using both reel-to-reel tape and audio cartridges.

6.2 Other Executive Display System Components

This Master Control Center is connected with, and augmented by, the following additional components:

- A routing and distribution system in the Operations Area that permits switching of audiovisual materials to various EICC areas and to TV monitors in the Headquarters building. It includes 9 TV monitors, used for monitoring commercial and cable news programs, and 5 TV tape recorders, used for air checks--i.e., off-the-air recording of newsworthy items and recording these for later playback--and for reproducing other tapes (Figure 6-2). The 5 recorders are in 3 different formats: 1/2-inch Betamax; 1/2-inch VHS; and 3/4-inch Unmatic.

- A custom-made electronic lecturn in the Executive Information and Display area, containing controls that permit the person who is speaking or presenting a briefing to access the EDS and to call up the desired visual images either in sequential order or at random.

- Two Aquastar TV color projectors located in the Executive Information and Display Area, and one Aquastar projector in Task Force Area A--used for large-screen video and computer graphic projection.

- Dedicated power outlets for cameras and audio equipment in the Executive Information and Display Area.

- Studio and portable television cameras for live TV recording in the EICC, Headquarters building, and field sites (Figures 6-3 and 6-4).

- Regular TV color monitors in the various EICC areas and over 40 offices and conference rooms throughout the FEMA Headquarters building.

- A 20-channel, closed circuit television network for transmitting live or taped TV images throughout the EICC and Headquarters building. The network has several scrambled channels for use in transmitting agency-sensitive information.

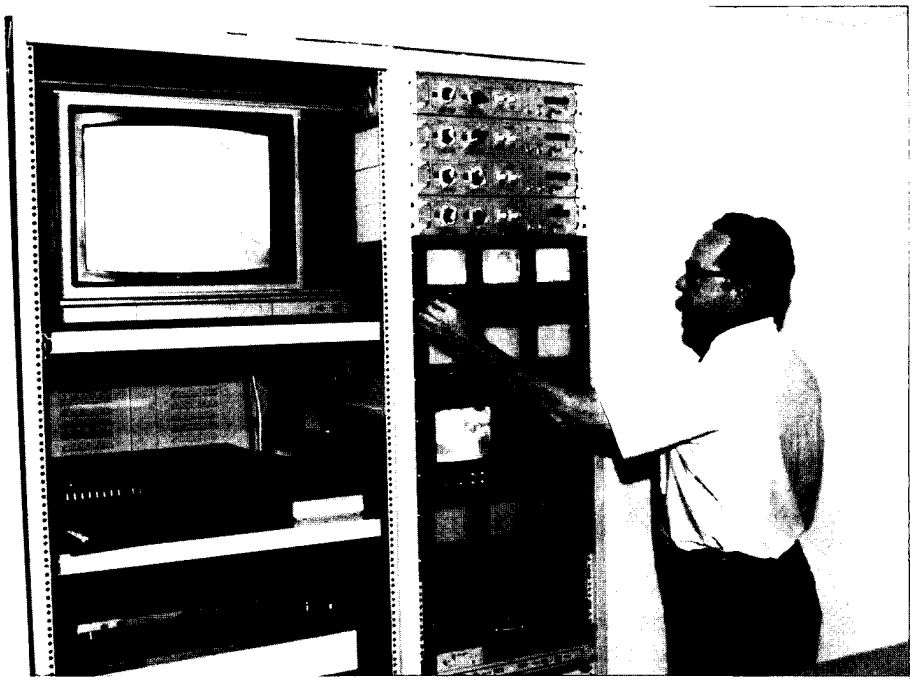

FIGURE 6-2. TELEVISION MONITORS AND VIDEO RECORDERS IN OPERATIONS AREA

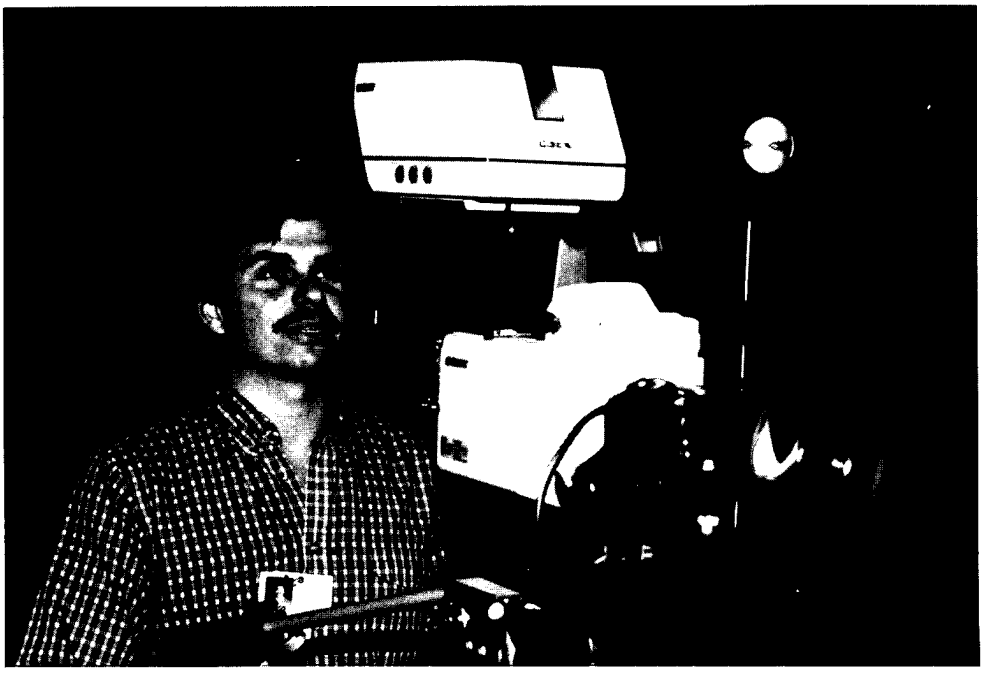

FIGURE 6-3. STUDIO TELEVISION CAMERA FOR USE IN EICC AND HEADQUARTERS BUILDING

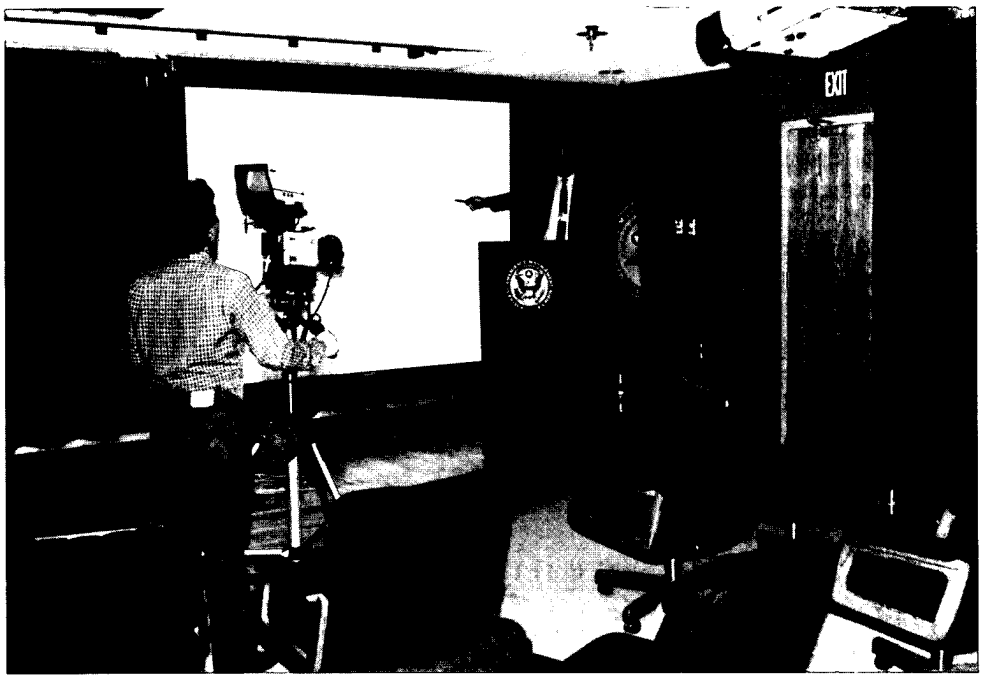

FIGURE 6-4. STUDIO TELEVISION CAMERA RECORDING A BRIEFING HELD IN THE EXECUTIVE INFORMATION AND DISPLAY AREA

- o VAX computers and Ramtek graphic display systems which, with associated software, can quickly process data and create and display high-resolution graphics via the Aquastar color projectors or on high-resolution color TV monitors. The computer-generated graphics can be permanently recorded by using a color hardcopy printer/plotter. They can also be converted into 8"x10" and 4"x5" color prints, 8"x10" transparencies, and 35 mm color slides by use of a terminal color camera system.

- o A video conferencing network connecting the EICC with the AEICC, the White House, National Military Command and Control Center, and other key federal centers can be rapidly configured during an emergency or crisis period and future plans call for its permanent installation.

6.3 EDS Operational Capabilities

The flexibility and versatility of the EDS can be illustrated by reference to some of its operational capabilities. The system can:

- o Present materials in any type of still or in-motion visual format, from any video source--live TV; commercial TV; TV tape (in 3 formats and 2 sizes); 16 mm motion pictures; 35 mm slides; VuGraphs; black and white and color photographs, maps, charts, diagrams, and other illustrations; and computer graphics.

- o Switch back and forth among all types of visual materials, mixing and matching them in accordance with the particular needs of the decision makers or the dictates of the situation.

- o Selectively transmit or withhold transmission of visual imagery and sound to any Aquastar projector or TV monitor in the EICC or Headquarters building.

- Transmit commercial and cable TV broadcasts in real time or record them on tape for later playback. It is possible to monitor up to 9 television channels simultaneously and to tape 5 of these channels at the same time. It is also possible automatically to record (via timeset on the video receivers) TV newscasts on each of the 3 major commercial networks (ABC, CBS, and NBC) and 2 local TV newscasts.

- Display damage assessment video tapes of disaster sites within a few hours after a disaster has occurred. The EICC can dispatch an electronic news gathering crew to make on-site assessments of disaster damage and quickly return the video tapes to the EICC for viewing by emergency management officials.

- Display large-scale maps of any part of the U.S. together with a great variety of geocoded data drawn from computerized files.

- Provide a visual means of displaying and correlating relevant emergency management information simultaneously and in an interactive mode. The combined visual display of maps, computerized graphics, and geographic-based data relating to the demographic characteristics of an area, the available life support system, transportation system, and other resources provides emergency managers with a unique tool for improving the timeliness and effectiveness of their decisions.

7. INTEGRATED EMERGENCY MANAGEMENT INFORMATION SYSTEM (IEMIS)

The making of effective emergency management decisions is critically dependent on the ability to acquire data/information and present it in an accurate and timely manner. Thus, the third essential component of the EICC's Decision Support System is the Integrated Emergency Management Information System (IEMIS). It consists of two basic parts:

- o Automated and manual data bases and files. These consist of stored information, located in the EICC and elsewhere in FEMA, pertaining to key emergency management variables (e.g., the location of major hazards throughout the Nation, the previous history of different types of disaster by geographic area, the location of critical rescue, relief, and recovery resources, etc.).

- o Current information gathering, analysis, and dissemination capabilities. These consist of those EICC activities that pertain to hazard monitoring, warning, alerting, and notification functions, and to decision support activities involving damage assessments, impact projections, situation monitoring and status reporting, response operations monitoring, requirements estimates, and decision implementation. All of these are rapid response activities oriented to current or immediate future events.

Each of these are discussed in more detail below.

7.1 Automated Information Systems, Data Bases, and Files

FEMA possesses a large number of automated information systems, data bases, and files relating to many facets of emergency management in both peacetime and wartime contexts. Among those relevant to EICC operations are:

- o Disaster Management Information System (DMIS): Contains obligation and disbursement data for each disaster; demographic data on the areas affected; and a record of Presidential declarations and turndowns.

- Public Assistance Automated System (PAAS): Contains data on public agency (e.g., state and local government) requests for funds to repair roads and bridges and other public facilities after a Presidential disaster declaration. Included are data on repair costs, progress to date, and names of contractors.

- National Flood Insurance Program System (NFIPS): Provides information and technical assistance to the Federal Insurance Administration and the State and Local Programs & Support Directorate regarding flood plain management activities.

- Dam Safety Inventory System (DSIS): Provides an inventory of dams with related information including state, dam type, year completed, size and capacity codes, and certain demographic information.

- Radioactive Materials Inventory System (RMIS): Provides status of all radioactive sources and materials, including an inventory of radioactive sources and materials on loan.

- Radiological Emergency Response Plans System (RERPS): Provides current status of radiological response plans for fixed nuclear facilities and transportation.

- Radiological Defense Station Inventory System (RDSIS): Provides location of RADEF instrument sets for state inventories.

- Emergency Broadcast Station Protection System (EBSPS): Provides descriptive identification and capabilities information on EBS stations in the Broadcast Station Protection Program.

- Damage and Casualty Estimation System (DCES): Projects effects of nuclear detonations on critical resources and population centers.

- National Shelter and Relocation Planning System (NSRPS): Inventories buildings in the nation that will provide fallout protection for the population in case of a nuclear attack; also locates structures outside target areas capable of providing temporary shelter for those who must be moved.

- National Defense Executive Reserve System (NDERS): Provides an inventory of National Defense Executive Reservists.

- Continuity of Government Emergency System (COGES): Provides emergency actions guidance and messages in support of continuity of government mission.

Some of the automated FEMA information systems contain voluminous files. For example, the FEMA Resource Management Data Base contains over 100 separate automated files covering virtually every category of national resources (e.g., population; raw materials; manufacturing, wholesale, and retail trade establishments; transportation, communication, and other lifeline systems; protective facilities and organizations; military establishments; etc.). These files cover the responsibilities of many different federal departments and agencies.

These and other FEMA automated information systems, data bases, and files are available through the Sperry 1100/61 mainframe computers located at the computer centers in the Special Facility and in Region III, Olney, Maryland.

7.2 Special DS^2 Automated Information Systems

The EICC is currently developing a number of automated information systems especially tailored to the requirements of the Decision Support System. These include:

- Computerized Graphics: High-resolution color graphics provide a useful means for presenting and examining information in a manner which can be quickly and easily comprehended. Based on the use of VAX computers, Ramtek graphic display devices, and associated peripheral equipment and software programs, both the EICC and AEICC can produce and display many kinds of computerized data in graphical form via the high-resolution audiovisual equipments (Aquastar projectors and high-resolution TV

monitors) described earlier. One of the central uses of this capability is to present geographically distributed information (map-based data) derived from the National Map Display System, to be described later. A specific application of this capability is the development of a management tool for deciding what actions to take to protect the populace in the event of a nuclear power plant accident involving the release of radioactive materials. By combining the map display with current meteorological data and a model of the time-phased progression of radioactive cloud (plume) development, the graphics can portray the population at risk at various points in time and, using other data characterizing the area, can help in formulating the decisions regarding evacuation, shelter, and other actions needed to protect the affected populace. A similar map portrayal of meteorological data can also be used in facilitating management decisions for protective actions and emergency responses in severe weather disturbances (e.g., hurricanes, tornadoes, floods, tidal surges, etc.). The graphics capabilities include TELL-A-GRAF and CUECHART software packages, which permit the conversion of digitized data into a variety of graphical forms, including word charts, pie charts, bar charts, and line graphs. A choice of 255 different colors is available for computerized graphic displays and 16 of these colors can be used at any given time. The EICC has dot-matrix color hardcopy printer/plotters which allow the hard-copy reproduction of any graphic display. It also has a terminal color camera system (film recorder) with the capability of producing 8"x10" and 4"x5" color prints, 8"x10" transparencies, and 35 mm color slides. For assistance in preparing, interpreting, and ordering computerized graphics, the IEMIS System Manager should be contacted via the Operations Area switchboard (Phone: (202) 646-2400).

- National Map Display System: The EICC currently has a computerized national map display system based on a 1:2 million-scale digitized map of the United States, prepared by the U.S. Geological Survey (USGS). This relatively small-scale map is being supplemented by a larger-scale, 1:100,000-scale digitized map file, also being developed by USGS under special commission from the FEMA EICC. A USGS cartographer is assigned to the EICC on a full-time basis to further develop the National Map Display System and to provide other cartographic services to the EICC and its users. When

fully developed, this map display system, in combination with the computer graphic capability and the audiovisual system, will be able to display geographically, in color, any area in the U.S. in large-scale detail (Figure 7-1). It will also be able to overlay and display various attributes of the area (e.g., location of towns, airfields, highways, hospitals, etc.) and of the critical resources in or near the area. By updating and geocoding (by latitude and longitude) the files in FEMA's Resource Management Data Base, the key resources available and needed for emergency mitigation, preparedness, response, and recovery can be quickly displayed visually in juxtaposition with their geographic location. This capability, together with the ability graphically to display current dynamic conditions affecting the area (e.g., wind speeds, river stage levels, hurricane movements, hazardous material cloud movements, etc.), provides a unique decision support tool for emergency managers. As in the case of other computer graphics, any map displays can be reproduced in dot-matrix color hardcopy reproductions and 8"x10" and 4"x5" color prints, 8"x10" color transparencies, and 35 mm color slides. Persons who need assistance in preparing, interpreting, or ordering map display materials should contact the EICC/USGS Cartographer via the Operations Area switchboard (Phone: (202) 646-2400).

- o Other EICC Automated Information Capabilities: The EICC possesses a number of microcomputers that can be utilized as stand-alone units to support operations as needed or to access the mainframe VAX computers. Among the VAX files that can be accessed via the microcomputers are:

  - Emergency Action Officer Logs
  - FEMA Staff Officers Meeting Calendars
  - Items of Interest
  - Disaster Summaries
  - Weather Reports
  - Incident Reports
  - Disaster Situation Summary.

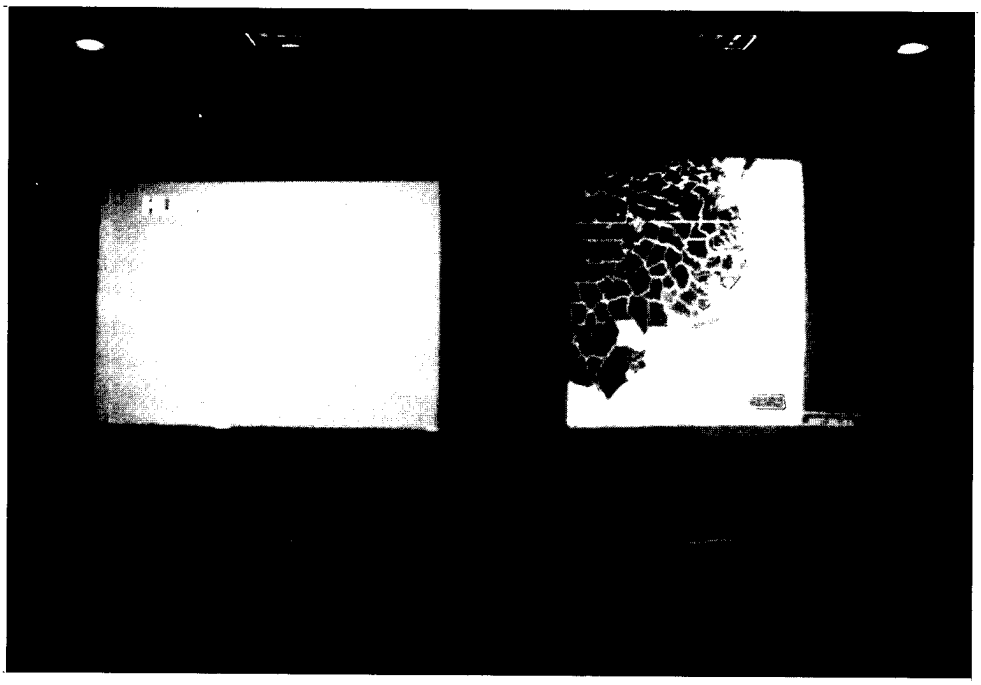

FIGURE 7-1. COMPUTERIZED NATIONAL MAP DISPLAY SYSTEM IN OPERATION

The microcomputers, utilizing the VAX mainframe computers, can also be used for sending and receiving electronic mail within FEMA Headquarters offices, the EICC, FEMA computer centers (at the Special Facility; Olney, Maryland; and Charlottesville, Virginia), and the FEMA Regional Offices and the FEMA REICCs. Assistance in using the microcomputers and in accessing the VAX files can be obtained by contacting the Emergency Action Officer on duty in the Operations Area (Phone: (202) 646-2400).

7.3 Current Information Gathering, Analysis, and Dissemination Capabilities

The focal point of the EICC's current information gathering, analysis, and dissemination capabilities is in the Operations Area.

- o Hazard Monitoring, Warning, Alerting, and Notification Functions: The hazard monitoring and warning functions involve continuous scanning of the entire U.S. and its possessions for signs that foretell serious danger and hazards. Based on prior agreements and understandings, the EICC Operations Area receives alerts and warnings concerning a broad spectrum of emergencies and disasters from sensor stations, warning centers, and command centers throughout the U.S. The emergencies and disasters range from natural and technological hazards and emergencies to those involving domestic security and national defense. The EICC also initiates queries to these centers about possible or potential dangers and requests reports from them on developments relating to a given crisis or emergency.

Natural Hazards

Earthquakes
National Earthquake Information Center; Golden, Colorado

Floods
National Weather Service Forecast Offices
U.S. Army Corps of Engineers, Washington, D.C.

Hurricanes
National Hurricane Center; Coral Gables, Florida
Central Pacific Hurricane Center; Honolulu, Hawaii
Eastern Pacific Hurricane Center; San Francisco, California
Joint Typhoon Warning Center; Guam

Severe Storms and Tornadoes
National Severe Storms Forecast Center; Kansas City, Missouri

Tsunami
NOAA Pacific Tsunami Warning Center; Honolulu, Hawaii
National Earthquake Information Service; Golden, Colorado
Alaska Tsunami Warning Point; Palmer, Alaska

Volcanos
USGS Cascade Volcano Observatory, Vancouver, Washington
Volcano National Park, Oahu, Hawaii

Technological Hazards

Fires
Boise Fire Information Center, Boise, Idaho

Major Civil-Aircraft Crashes
Federal Aviation Administration Operations Center, Washington, D.C.

Hazardous Materials
U.S. Coast Guard/Environmental Protection Agency National Response Center; Washington, D.C.
Department of Transportation National Response Center for Oil and Chemical Spills; Washington, D.C.
Chemical Transportation Emergency Center (CHEMTREC); Washington, D.C.

Nuclear Incidents and Accidents
Nuclear Regulatory Commission Operations Area; Washington, D.C.
Department of Energy Operations Center, Germantown, Maryland

Domestic Security and National Defense

Nuclear Weapons and Nuclear Reactor Incidents and Accidents
National Military Command Center; Washington, D.C.
Joint Nuclear Accident Coordinating Center, Albuquerque, New Mexico

Civil Disturbances
Federal Bureau of Investigation; Washington, D.C.
National Military Command Center; Washington, D.C.
Army Operations Center; Washington, D.C.
Mayor's Command Center; Washington, D.C.

Defense Emergencies
National Warning Center; Colorado Springs, Colorado
Alternate National Warning Center; Olney, Maryland
National Military Command Center; Washington, D.C.

Terrorist Activity
Federal Bureau of Investigation, Washington, D. C.
Department of Justice, Washington, D. C.

Extraordinary Events
Appropriate Federal Agencies

Alerting and warning information on many of the foregoing emergencies—as well as supplementary information--may also come from the Operations Area monitoring of commercial TV and radio newscasts and AP and UPI news wire service dispatches.

- o Emergency Alerting and Notification Functions: The Operations Area possesses detailed notification check lists for each type of emergency, for Presidential declarations of a major disaster, and for task force augmentation of the EICC.
  - Semi-Automatic Emergency Notification System: In an effort to relieve the Emergency Action Officers and Specialists from a time-consuming process and to speed the notification, the EICC has developed a Semi-automatic Emergency Action Notification System. This system utilizes computerized telephone lists of persons to be notified and a digitized voice system. It automatically dials each number and delivers a computer-programmed voice notification message to the person answering the telephone.
- o Other Decision Support Capabilities: The current information gathering, analysis, and dissemination capabilities of the EICC are augmented by two other supporting services:

- Hydrological/Meteorological Analysis Services: Floods, hurricanes, tornadoes, severe thunderstorms, winter storms, droughts, and other weather-related hazards produce a major share of all U.S. emergencies each year. Over 60 percent of federal disaster relief expenditures have been directed toward flood-related declarations. The frequency of weather-related emergencies and disasters dictates a major emphasis on this class of events in the EICC. Accordingly, the EICC has added a National Weather Service Hydrologist/Meteorologist to its staff. It also has a direct link to the NWS computer to speed acquisition of weather information. The EICC has developed special computer programs to access the latest site-specific weather information. Thus, the EICC has the expertise to translate and interpret weather information effectively to support the decision making process for emergency managers. Using the NWS family of services, special information, guidance, and forecasts furnished by the National Meteorological Center, the Climate Analysis Center, the National Hurricane Center, and the National Severe Storm Forecast Center, the EICC can provide briefings--utilizing computer graphics--on all types of hazardous weather conditions.

- Video-Taped Damage Assessments: The EICC can have special electronic news gathering crews dispatched to make on-site assessments of disaster damage and quickly return the video tape to the EICC for viewing by emergency management officials.

8. FUTURE EICC SYSTEM DEVELOPMENT

The philosophy guiding the design and development of the EICC is one of planned evolution. This philosophy makes it impossible to project the exact form that will characterize the EICC several years hence. The Center is continually undergoing transformation as it acquires new missions and as officials from FEMA and other agencies become aware of and utilize its capabilities.

8.1 Telecommunications Developments

As a part of the overall FEMA effort to improve the National Emergency Management System (NEMS), the following changes in the telecommunications system affecting the EICC and its counterparts are planned:

- Radio Amateur Civil Emergency Services (RACES): RACES consist of radio communication networks that are organized by radio amateur operators within states to support federal, state, or local authorities in emergencies. Each state sponsors a network and provides a net control station. Amateurs use personally-owned or club-owned radio equipment and operate on frequencies authorized by the Federal Communications Commission. A radio transmitter to access RACES and other similar networks will be installed in the EICC Message Center.

- Direction, Control, and Warning (DC&W) Communications System (Under Development): FEMA is currently developing a major new communications system that will not depend solely on commercial common carriers, and will be capable of operating for a protracted period of time in extremely stressed environments, including large-scale peacetime and national security-related disasters. Intended to be the survivable backbone system for the National Emergency Management System (NEMS), the DC&W System is being designed to provide emergency telecommunications services between officials of FEMA Headquarters, Alternate FEMA National Headquarters, Regional Headquarters, other critical Executive Branch departments and agencies, state and local EOCs, and Canadian, Mexican, and NATO emergency management organizations.

The DC&W System will be a multi-media, multi-mode system, employing low frequency (LF), high frequency (HF), very high frequency (VHF), and meteor-burst radio networks, satellite communications (SATCOM), and Federal Mobile Elements (FMEs) that are self-contained, self-deployable communications modules for linking federal, regional, state, and local authorities. It will also expand the current NAWAS system to include meteor-burst links; develop a second-generation Emergency Broadcast System, based on SATCOM, HF, and/or LF radio links; and develop secure video communications for conferencing throughout FEMA Headquarters and with other federal agencies. The EICC, AEICC, and ten REICCs will be integral parts of this new DC&W system when it becomes operational.

- Secure Facsimile Communications System: A secure FAX communications system for use in FEMA Headquarters, the EICC/AEICC, and the 10 REICCs, is being acquired. This will improve and speed the exchange of classified materials and messages throughout the system.

8.2 Executive Display System Developments

Various efforts to improve and extend the audiovisual capabilities of the EICC and AEICC are currently planned:

- Headquarters Building Closed-Circuit Television Network: The planned 20-channel, closed-circuit TV network used for transmitting live or taped TV images throughout the EICC and Headquarters building will be completed and used for both operational and training purposes.

- Interagency Video Teleconferencing Network: The proposed video teleconferencing network connecting the EICC and the AEICC, the White House, the NMCC, and other key federal centers will be permanently established and utilized for high-level interagency conferences among key emergency management officials.

- Extension of Audiovisual Display Capabilities to REICCs: Plans call for the eventual linking of the Audiovisual Display System in the EICC and AEICC with the 10 FEMA REICCs. This will permit the real-time exchange of the full range of audiovisual materials among all of these centers. At present, only hardcopy visuals can be

transmitted via telecommunications and video tapes must be physically transported from the EICC/AEICC to the REICCs, and vice versa.

8.3 Information Systems Developments

Future plans to improve elements of the Integrated Emergency Management Information System (IEMIS) include:

- Updating and Geocoding the Resource Management Data Base: Existing resource management data bases will be updated and geocoded (by latitude and longitude) for entry into the EICC's computers and for use in the computerized graphics display system.

- National Map Display System Development: The 1:100,000-scale digitized U.S. map file currently being developed by the U.S. Geological Survey will be completed. The system will include many additional geographic features of importance to emergency management decision making that need to be visually displayed. This computerized map system will be shared with other federal agencies having a role in emergency management, with a view towards establishing a uniform, government-wide system of coding, storing, and displaying geographic and demographic data.

9. CONCLUSION

The EICC was designed to provide the National Emergency Management Authority and other key emergency managers with major, state-of-the-art improvements in decision support and implementation capabilities. Those improvements are now in being--ready to be fully utilized, exercised, and tested in carrying out the Nation's mitigation, preparedness, response, and recovery programs and operations. The staff seeks to make the EICC's capabilities readily available and thoroughly responsive to user needs throughout the spectrum of emergency functions and conditions. Looking to the future, it will also strive continually to improve and refine these capabilities and to enlarge and extend its contacts and cooperative efforts with the entire emergency management community.

APPENDIX A

GLOSSARY

ADP	Automatic Data Processing
AEICC	Alternate Emergency Information and Coordination Center
ANMCC	Alternate National Military Command Center
ANWC	Alternate National Warning Center
AUTODIN	Automatic Digital Network
AUTOSEVOCOM	Automatic Secure Voice Communications
AUTOVON	Automatic Voice Network
CINCLANT	Commander-in-Chief, Atlantic
CINCNORAD	Commander-in-Chief, North American Aerospace Defense Command
CINCSAC	Commander-in-Chief, Strategic Air Command
COE	Corps of Engineers
COGES	Continuity of Government Emergency System
DC&W	Direction, Control, and Warning
DCES	Damage and Casualty Estimation System
DCS	Defense Communications System
DDD	Direct Distance Dialing
DIDS	Decision Information Distribution System
DMIS	Disaster Management Information System
DOE	Department of Energy
DS^2	Decision Support System
DSIS	Dam Safety Inventory System
EBS	Emergency Broadcast System
EBSPS	Emergency Broadcast Protection System
EDS	Executive Display System
EICC	Emergency Information and Coordination Center
EIDA	Executive Information and Display Area
EOC	Emergency Operating Center
FAA	Federal Aviation Administration
FAX	Facsimile

GLOSSARY

(Continued)

FEMA	Federal Emergency Management Agency
FMATTS	FEMA Mobile Air Transportable Telecommunications System
FME	Federal Mobile Elements
FNARS	FEMA National Radio System
FNATS	FEMA National Teletype System
FNAVS	FEMA National Voice System
FSTS	Federal Secure Telecommunications System
FTS	Federal Telecommunications Systems
HF	High Frequency
ICS	Interagency Communication System
IEMIS	Integrated Emergency Management Information System
JCS	Joint Chiefs of Staff
LF	Low Frequency
MMTS	Multi-Media Telecommunications System
NATO	North Atlantic Treaty Organization
NAWAS	National Warning System
NDERS	National Defense Executive Reserve System
NEMS	National Emergency Management System
NFIPS	National Flood Insurance Program System
NFIRS	National Fire Incident Reporting System
NICS	NATO Integrated Communications System
NMCC	National Military Command Center
NMCS	National Military Command System
NORAD	North American Air Defense Command
NRC	Nuclear Regulatory Commission
NSRPS	National Shelter and Relocation Planning System
NWC	National Warning Center
NWS	National Weather Service

GLOSSARY

(Concluded)

PAAS	Public Assistance Automated System
RACES	Radio Amateur Civil Emergency Services
RDSIS	Radiological Defense Station Inventory System
REICC	Regional EICC
RERPS	Radiological Emergency Response Plans System
RMIS	Radioactive Materials Inventory System
SATCOM	Satellite Communications
SHF	Super High Frequency
TWX	Teletypewriter Exchange Service
UHF	Ultra High Frequency
USGS	U.S. Geological Survey
VHF	Very High Frequency
WATS	Wide-Area Telecommunications System
WAWAS	Washington Area Warning System
WHCA	White House Communications Agency
WHSR	White House Situation Room
WWMCCS	Worldwide Military Command and Control System

APPENDIX B

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