

**QUICK RESPONSE GRANT FIELD REPORT
HURRICANE ANDREW**

**ORGANIZING FOR RESPONSE:
COMPARING PRACTICE, PLAN, AND THEORY**

By

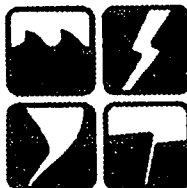
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QUICK RESPONSE RESEARCH REPORT #61

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The views expressed in this report are those of the authors and not necessarily those of the Natural Hazards Center or the University of Colorado.

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INTRODUCTION

This field report is a summary of the research activities performed and observations made by a team funded by the Natural Hazards Research and Applications Information Center to evaluate the organizational response of The American Red Cross and FEMA to Hurricane Andrew. Our activities focused primarily on the mass care response, a Red Cross responsibility under the Federal Response Plan (Emergency Support Function 6). We arrived in the affected area on Thursday, 28 August, 1992. This was the second functional day of the federal Disaster Field Office (DFO), and the day that federal troops were dispatched to the area by President Bush. We had excellent access to Red Cross Disaster Operations Headquarters and personnel; field operations of the Red Cross, Southern Baptists, and the U.S. Military; and the federal Disaster Field Office. We departed the area on Wednesday, 2 September; a synopsis of our activities is contained in Appendix II to this report.

During the response we interviewed a number of individuals at Red Cross headquarters and at the Federal Disaster Field Office. We conducted follow up interviews with key personnel in Florida and in Washington. These individuals are listed in Appendix III. These interviews helped us to piece together the timeline in Appendix I. They also provided insight into the interlinkages among organizations. These interviews also led us to the conclusion that the media was playing a major role in the response to Hurricane Andrew.

DISCUSSION

The objective of our quick response grant was to observe the organizational evolution of the response structure to Hurricane Andrew, to see where and how decisions were made in the response organization, and to compare these empirical observations with

plans other policy and procedure documents. The comments that follow are based on this experience; we make no claim to have seen everything and talked to everybody. A week is a relatively brief period in a heavily affected area and, although we had excellent access to relief operations at all levels, we chose not to attempt in depth interviews with personnel during the operation. This was a very severe disaster and the federal, state, local, and volunteer response was extensive and complex. We focused our attention on the response of the Federal Government and the American Red Cross in the critical area of mass care as it related to the intentions of the Federal Response Plan (Emergency Support Function 6) and internal Red Cross plans.

Hurricane Andrew was the first real test of the Federal Response Plan and it was obvious to all observers that the response did not go according to plan. On Sunday night hundreds of thousands of Floridians were evacuated from coastal areas based on storm surge predictions. Early Monday morning Andrew hit South Dade County where most of the residents rode out the storm in their homes. By mid morning the residents were picking through the ruins of what had been Homestead, Florida City, Cutler Ridge and other South Dade communities. Entire communities were smashed into piles of tree limbs, twisted metal and rubble. Most of the damaged homes were not in the area evacuated and most were damaged by wind, not the storm surge. It was estimated that over approximately 75,000 homes were heavily damaged and approximately 1/3 of these dwellings were destroyed. Approximately 150-200,000 people were left at least temporarily homeless. In addition, shopping centers, public buildings and schools were hard hit.

A federal disaster was declared almost immediately, but county, state and local organizations had to face the overwhelming immediate response needs. The Red Cross had moved its operations headquarters to Miami from a pre-staging site in

Orlando on Tuesday and a national recruiting effort was initiated that brought over 2,000 trained staff to the area to augment the local chapter and volunteers (over 500 people had arrived within four days of the disaster). By Wednesday, however, it was apparent that the situation was beyond the control of local and volunteer agencies and was, in fact, the largest disaster in U.S. history. Shortages of water and food and health supplies were critical. By Thursday, local government regulations began to be enforced, thus closing down local and church group efforts that did not have health permits or failed to meet health standards. The Federal Disaster Field Office was established at Miami airport on Thursday, the Director of FEMA region IV Philip May assumed the role of Federal Coordinating Officer (FCO), and the Federal Response Plan was activated. By Friday a Department of Defense Joint Task Force under the command of LTGEN Samuel Ebbeson was established and thousands of troops began arriving in South Florida. Secretary of Transportation Andrew Card was dispatched to the scene by President Bush and established a presence that evolved into a formal organization called the Presidential Task Force. On the same day the Red Cross staffed the mass care emergency support function (ESF 6) element of Disaster Field Office. By Monday, one week after Andrew struck, tent cities were set up for victims. On Tuesday, President Bush toured south Florida and promised millions in aid.

By this point it was clear that several of the fundamental assumptions of the Federal Response Plan had been shown to be invalid. The plan assumes that affected jurisdictions will be capable of assessing damage and estimating response requirements and that the Federal support organization will react to these requests for resources. In reality, Dade County and the State of Florida emergency personnel were overwhelmed and exhausted after the evacuation and initial response effort and this detailed assessment and communication of needs did not occur. The plan also assumes that the organizations tasked by the Federal

Response Plan have the capacities to execute the responsibilities assigned by the plan. The Red Cross mobilized more trained people in a week than it was able to muster in a month after Hurricane Hugo. The ARC and other volunteer agencies, however, have not yet developed the logistical, communications, and coordination capabilities required to provide immediate and sustained mass care for 200,000 people. Similarly, the General Services Administration is not capable of providing emergency resource support and mobilization for such a massive relief effort. Finally, the Federal Response Plan assumes that the national response effort will support the state and will be coordinated by the Catastrophic Disaster Response Group (CDRG) in Washington and by the Federal Coordinating Officer (FCO) at the Disaster Field Office (DFO). In reality, the state government was never in charge once the Presidential Task Force and the DOD Joint Task Force were created. Secretary Card, not the FCO, was directing DOD efforts. ESF 6, mass care, was never fully activated in the sense that mass care activities were coordinated by the DFO. The requirements of the federal plan for state reimbursement of federal costs (10% during the response phase and 25% during the recovery phase) was an impediment to the activation of the plan until these provisions were waived by President Bush.

The inability to rapidly capture and transmit information from the disaster area affected estimates of the severity of the disaster and the deployment of resources. The Red Cross detailed damage assessment process, although very accurate, moved slowly. It was only 75% completed by Saturday, August 29, five days after the disaster. FEMA's independent damage assessment process moved even more slowly. It took days before the sheer magnitude of the destruction was fully appreciated. Local conditions made it difficult to assess damage, to determine the needs of victims and to effectively respond. Streets were impassable until cleared of trees and debris, power and water were cut off, and most relieve

workers did not speak Spanish and Creole, the dominant language in many areas. One week after Andrew, many senior managers in the relief operation had not visited the affected area and their lack of a good mental picture of the scope and location of the disaster affected resource allocation decisions. Nevertheless, the scope and magnitude of the damages created an awareness that the response was going to take a long time and that response and recovery efforts were probably going to merge.

Feedback of information from the affected area was also impeded by poor communications, incompatible communications systems, and lack of expertise. Display technology was not made available to federal and Red Cross decision makers and decision makers did not have a common view of disaster situation. Information that should have existed before the disaster (e.g. reliable maps, demographic information, structural information) was not available to responders in the days immediately after Andrew. Dade County, however, made use of their pre-existing ARC-INFO based geographic information system (GIS) and eventually some of this information was available at the DFO. Relief organizations were not prepared to communicate essential information to victims: e.g. where relief supplies and medical facilities were located; where and how to apply for Red Cross or FEMA aid. Innovative communications methods employed included the use of Goodyear blimp to inform South Dade residents of the location of federal centers and assistance claims procedures.

South Florida was at this time only one of several disaster sites. Andrew relief efforts were being provided in Louisiana. Later in the week Typhoon Omar hit Guam, followed by Hurricane Iniki in Hawaii. Response efforts by national groups were thus soon spread quite thin. The devastation of south Florida, however continued to hold the media's and so the nations interest. One of the major reasons that this occurred was that Florida is a key state in the upcoming presidential election.

Thus, the perceived success of the disaster response became a potential political issue.

The media, rather than the Federal Response Plan or criteria specified by response organizations, defined what was sufficient help and what help was needed. Unfortunately, the media was often wrong. Perceptions of the disaster and of critical needs lagged and did not match reality. This perception lag increased with organizational and physical distance from the disaster site. Rumor travelled further and faster than fact. This led to situations such as bottled water being delivered long after water distribution had been solved, unneeded food and clothes stockpiling and rotting, and the myth that there was rampant looting. Looting was a problem since the area was accessible from the outside, but social order was never a serious issue even before thousands of armed troops started to patrol the area. Many looters were commuting from outside of the disaster area ; most affected residents were creatively and willingly helping each other. The perception of rampant social disorder and looting, however, influenced the initial federal deployment of and guidance to troops. The initial objective stated by the Army Chief of Staff General Gordan Sullivan to "establish a military structure in every neighborhood" did not appear to be directed at the primary needs of the victims.

Despite all this, the response effort was not as disorganized and ineffective as one might think after viewing or reading the early press reports. Lessons had been learned by those involved in the Hurricane Hugo response. Coordination of volunteer groups both at the administrative and service delivery level was very positive. For example, several poor minority areas did not receive adequate service after Hurricane Hugo because they were missed during the initial Red Cross and FEMA damage assessments. During Andrew, the Red Cross was able to enlist the help of 43 AME ministers to assess the status of their

communities and to coordinate the allocation of Southern Baptist feeding units to the hardest hit areas. Organizational response groups formed, reformed, and dissolved in the span of hours as new needs arose that required inter-organizational cooperation. Local church and community groups provided vital lifeline support in the first 76 hours until they were augmented or replaced by national groups. Emergent groups and actions solved unanticipated problems. Volunteer groups took over traffic direction so that police could be deployed elsewhere. Newspapers created a system for locating missing persons, supplementing the cumbersome Red Cross disaster welfare inquiry (DWI) program. Inter-faith coordination of relief efforts was achieved on the fly as leaders worked hard to avoid doctrinal controversy and maximize service to the victims. The Marines in Homestead worked closely with elected officials. Navy SeaBees assisted victims filling out forms at Red Cross service centers. The response of South Florida corporations was also noteworthy. Florida Light and Power restored power to over 2.4 million customers. Southern Bell was able to restore telephone services to most areas and provided free voice mail to many customers without telephone service. Hard hit corporations such as Burger King took care of the needs of their own employees.

FACTORS CAUSING ORGANIZATIONAL TURBULENCE

The organizational structure prescribed by the Federal Response plan was never fully implemented. By the time the DFO was established in Dade County, Secretary Card had assumed control of the federal response. With the presence on scene of a cabinet officer reporting to the White House and a military joint task force reporting through the DOD chain of command, the coordination mechanisms became superfluous. The CDRG did not meet after Thursday, August 27. The EST never became the clearing house for interagency coordination envisioned by the plan. The Red Cross deployed its designated EST representatives

to Dade County, realizing that they no longer needed them in Washington. In our opinion, three primary factors influenced the failure of the planned organizational response.

1. Public and media expectations, not the plan, defined success and failure.

The criteria for success defined by the Federal Response Plan is the provision of adequate support of state efforts. This is not a criteria that can be tied to observable output, nor can it provide the basis for action. More importantly, it is not the criteria used by the media. Headlines in Miami papers and lead stories on television news established the measurement criteria. The media, in addition to providing needed information to victims and response units, defined criteria for evaluating organizational performance. The local and national media defined new evaluation criteria almost every day, defined what was sufficient help, defined what help was needed, and collected money. The media, not the federal plan, was the primary influence in establishing organizational goals and evaluating organizational performance. The response organization was reacting to national as well as local media coverage of their actions. Factors which made the national media particularly interested in Andrew's impact on Miami were: (1) the scope of the disaster, (2) the apparent ad hoc nature of the organizational response (e) the rapidity with which the area was declared a national disaster are, and (4) the deployment of over 30,000 troops, (5) the preponderance of low income households that were affected (6) the vocalness of the affected minorities, and (7) the climate of the national election, which was closely contested in Florida. The media picked up on all of these factors and created new criteria for evaluating the success and failure of the organizational response on a daily basis.

2. The response organizational structure and responsibilities diverged from plan due to the presence of powerful, unanticipated stakeholders; the creation of emergent organizations; and the sheer number of formal and informal organizations involved in disaster relief efforts.

The emergence of unanticipated stakeholders is a common feature in disaster response. In this case, President Bush became a stakeholder: Florida was a key state in the 1992 Presidential election and the rapid and direct White House intervention changed the scope and organization of the federal response. As shown in Figure 1, the media interpreted the Presidential intervention into the response efforts in a political context.

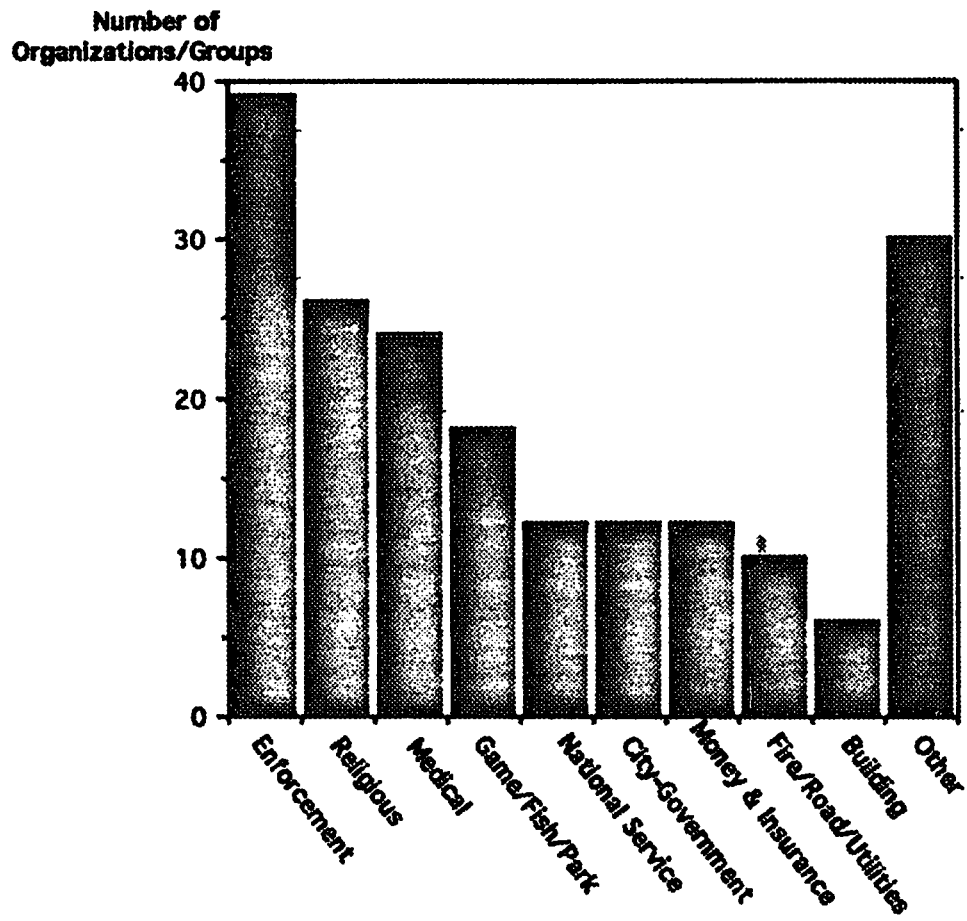
After Hurricane Andrew, emergent organizations solved problems not adequately addressed by formal response organizations. This is a common phenomena, observed after most major disasters. For example, we participated in an interfaith council meeting that established an organization to transition the relief efforts into a coordinated recovery program. The AME church help the Red Cross coordinate the allocation of Southern Baptist feeding units. Volunteer groups took over traffic management in Miami since traffic lights were out and Police were deployed elsewhere.

The response effort was made more complex by the presence of many organizations not anticipated in the Federal Response Plan. We gathered copies of the local newspapers for the first two weeks after the disaster (Miami Herald and Miami Sun-Sentinal.) Preliminary analysis, based on the newspaper accounts, suggests that there were over 180 organizations involved in responding to the Hurricane. The distribution of organizations by type is shown in Figure 2. The most common type of response organizations were those that were capable of being involved in



FIGURE 1

Source: Miami Herald, Miami Sun Sentinel

Figure 2: Distribution of Response Organizations

civil defense and or law enforcement: military units, national guard, police, and crossing guards. These groups were involved in many tasks other than civil defense and law enforcement, however, such as road clearance and debris removal. The second most common type of organization was religious, e.g. various churches, religious coalitions, and national groups such as the Church World Service. The third most common type of response organization was medical; e.g. hospitals, clinics, and medical alert units.

2. FEMA attempted to execute the organizational and procedural requirements of the Federal Response Plan as it was written rather than to attempt to determine and meet the needs of the disaster.

The following actions were taken either immediately before or within 24 hours of Andrew's landfall in accordance with the procedures and policies specified by the Federal Response Plan:

- The Catastrophic Disaster Response Group, The Emergency Information Coordination Center, Emergency Support Team, and the Joint Information Center (CDRG/EICC/EST/JIC) were activated in Washington
- The FEMA region IV Regional Operations Center (ROC) was activated
- The advance Emergency Response Team (ERT-A) was dispatched to Tallahassee
- Agencies responsible for ESF'S were notified.
- The Federal Disaster Declaration was Drafted and submitted to President Bush
- Liaison with the State of Florida was established.

However, the quality of information flowing out of the disaster area through official channels was poor and FEMA did not react to the problem at hand. The inability to rapidly capture

and transmit disaster intelligence affected estimates of the severity of the disaster and the deployment of resources. The SITREPS from the field for the first four days reflect grossly erroneous information that contributed to the slow federal reaction. Table 1 compares the information provided by the sitreps to the estimates of the situation that were being made by the press by Friday, August 28.

TABLE 1
FEMA DAMAGE ESTIMATE VS ACTUAL SITUATION

FEMA INITIAL DAMAGE REPORT (REPORTED IN SITREPS THROUGH DAY FOUR)	ACTUAL SITUATION (AS ESTIMATED BY THE RED CROSS AND BY THE PRESS)
400,000 WITHOUT POWER	2,500,000 WITHOUT POWER
10 DEATHS	11 DEATHS
50,000 HOMELESS	250,000 HOMELESS
6,000 HOMES AFFECTED	75,000 HOMES AFFECTED
2,000 MOBILE HOMES DESTROYED, 1,400-2,600 HOMES/APTS DESTROYED OR MAJOR DAMAGE	20-30,000 DWELLINGS DESTROYED/MAJOR DAMAGE

The estimates of homes destroyed and temporary homeless were constantly revised. The Miami Herald, in a February 21, 1993 reprise of Hurricane Andrew, state that the best statistics available came from Red Cross counts: 25,524 destroyed homes and 50,016 damaged homes. The Herald concluded that approximately 150,000 people were made temporarily homeless by the storm. Clearly, if senior managers were reacting to the FEMA sitreps during the first three days of the disaster response, they were responding to the wrong disaster!

3. *The Federal Response Plan was used as the basis for DOD activity, but DOD activity rapidly evolved beyond the guidelines of the plan.*

DOD is designated as a key agency in two places in the plan. In ESF 3 (Public Works and Engineering), the Army Corps of Engineers is tasked with debris removal, emergency demolition and construction, and the emergency restoration of critical services. These are traditional roles for the Corps and it fulfilled them after Andrew as it had after Hugo and the Loma Prieta earthquake.

DOD is also mentioned in ESF 9, Urban Search and Rescue. Under this ESF, the DOD Director of Military Support (DOMS) is tasked as the DOD command to respond to a request for assistance from FEMA. The plan calls for the DOMS to designate an appropriate support Commander in Chief (CINC) for assignment. The support CINC is to then designate a Defense Coordinating Officer (DCO) to work for the FEMA FCO. The support CINC is to then assemble resources and deploy a Joint Task Force (JTF). The JTF is envisioned by the plan as a support unit for urban search and rescue. The Federal Response Plan specifically states that, "The Joint Task Force will receive mission direction from the DCO", a chain of command that would have the JTF working directly for the FEMA FCO.

After Hurricane Andrew, the provisions of ESF 9 were used to execute the White House directed military intervention within the framework of the Federal Response Plan. The Director of Military Support, MGEN Heldstab, recommended to General Colin Powell that General Burba, Commander Forces Command be assigned as CINC. General Burba assigned a Defense Coordinating Officer (COL Philip Lay) when the disaster was declared. When President Bush directed the military to respond in force, DOMS and Commander Forces Command created a joint task force consisting of the Second Army, the XVIII Airborne and other DOD units. The

Commander of the Second Army, LTGEN Ebbeson, was designated as commander of the JTF. By the time the military units arrived on scene (Friday), Secretary Card had established the Presidential Task Force. LTGEN Ebbeson, of course, reported to Secretary Card not to the DCO (Colonel Lay). FEMA's control over DOD resources envisioned in the plan never occurred.

THE AD HOC RESPONSE ORGANIZATION

As a result of these factors, the response organization rapidly evolved and diverged from that envisioned by the Federal Response Plan. The Federal Response Plan calls for coordination of national response effort by Catastrophic Disaster Response Group (CDRG) in Washington and by Federal Coordinating Officer (FCO) at the Disaster Field Office (DFO). This national organization is supposed to act in support of the affected state's disaster relief efforts. However, the state government was never in charge once the Presidential Task Force headed by Secretary of Transportation Card and the DOD Joint Task Force headed by LTGEN Ebbeson were created. Secretary Card, not the FCO, was directing DOD efforts. Red Cross senior managers, led by General Manager of Disaster Services Donald Jones, were deployed to provide an ad hoc coordinating group between the Presidential Task Force, the DOD command, and the traditional Red Cross disaster relief operation.

Figures 3,4 and 5 illustrate that organization of the federal response as defined by the Federal Response Plan. Figure 6 represents the organization of the mass care response that evolved during Hurricane Andrew as developed by the authors from observation and interviews. This ad hoc organization functioned well in some areas, but there were significant problems. Prior agreements about financial and organizational responsibility were ignored, leading to much confusion at the working level over what parts of the plan were in force. There was a disconnect between

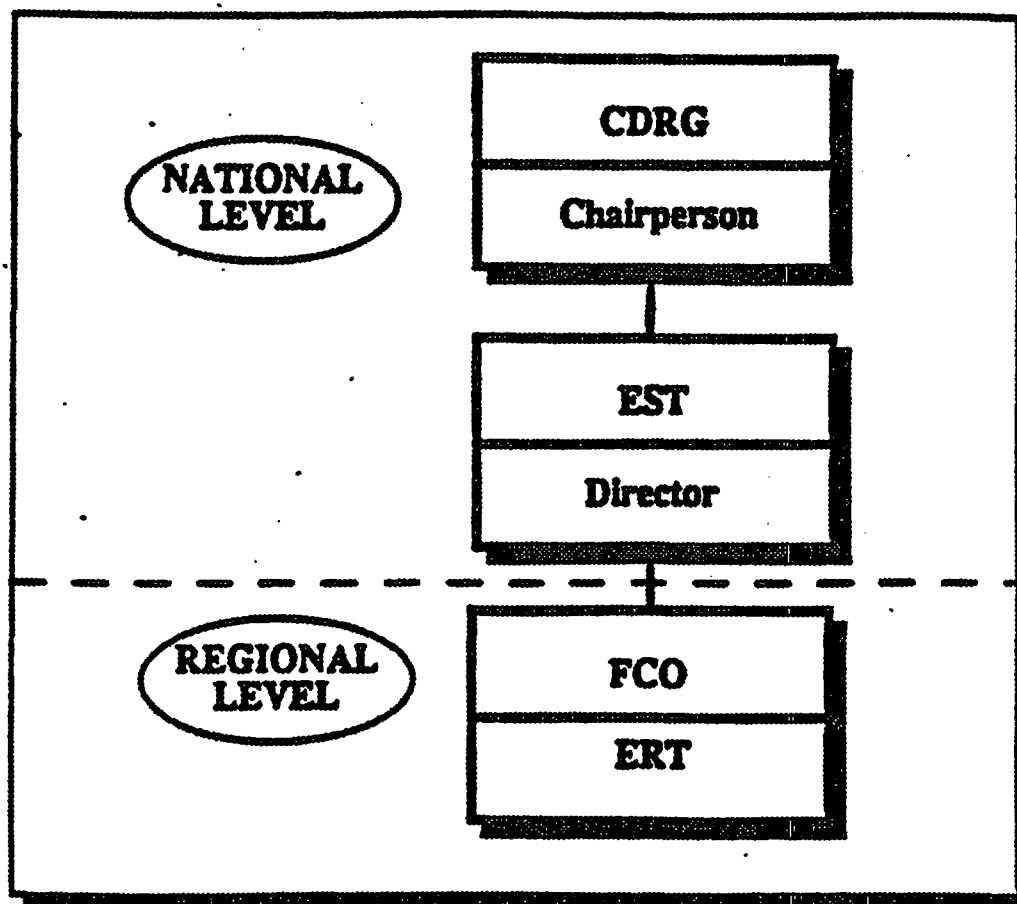


Figure 3 - Federal Response Structure

Source: Federal Response Plan

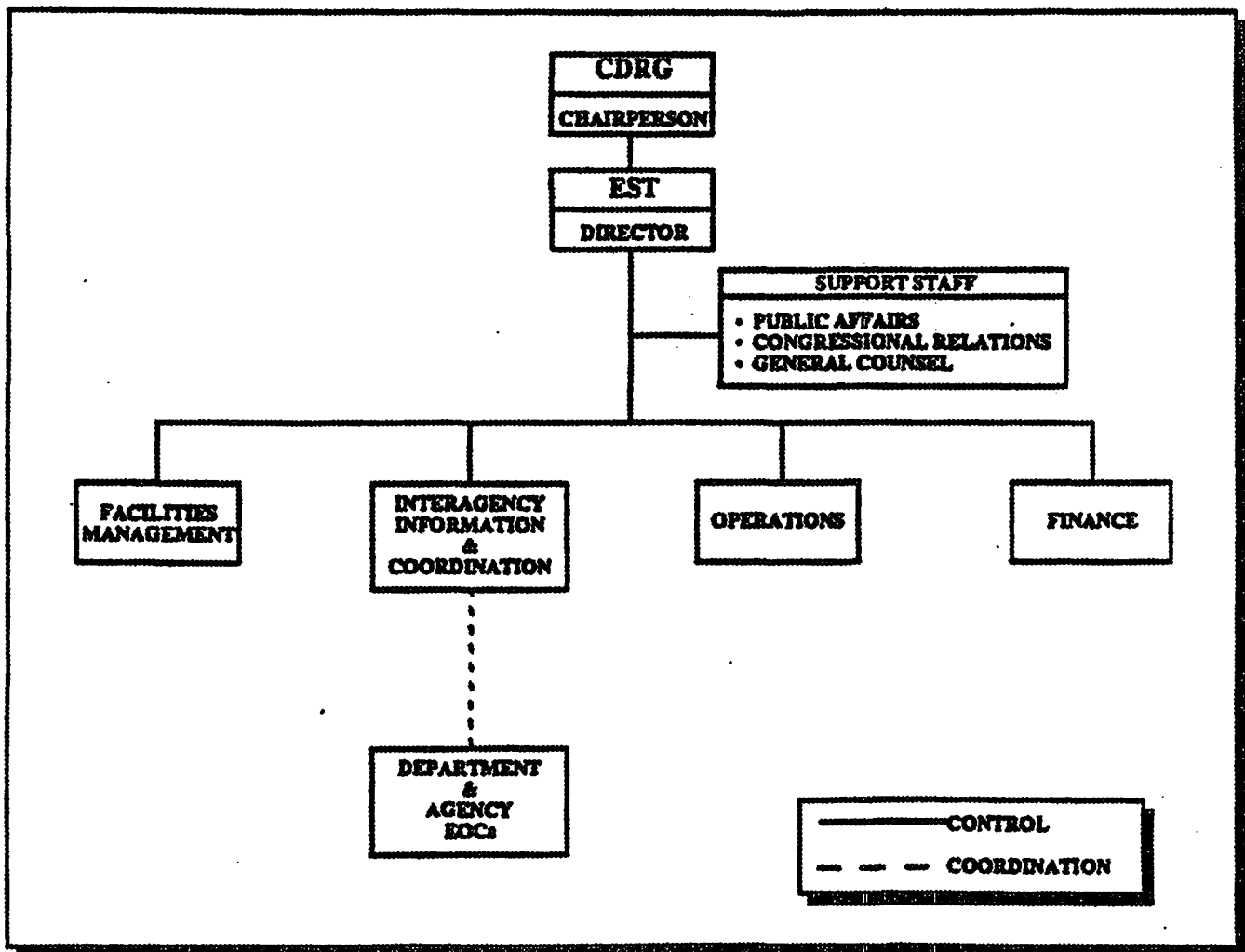
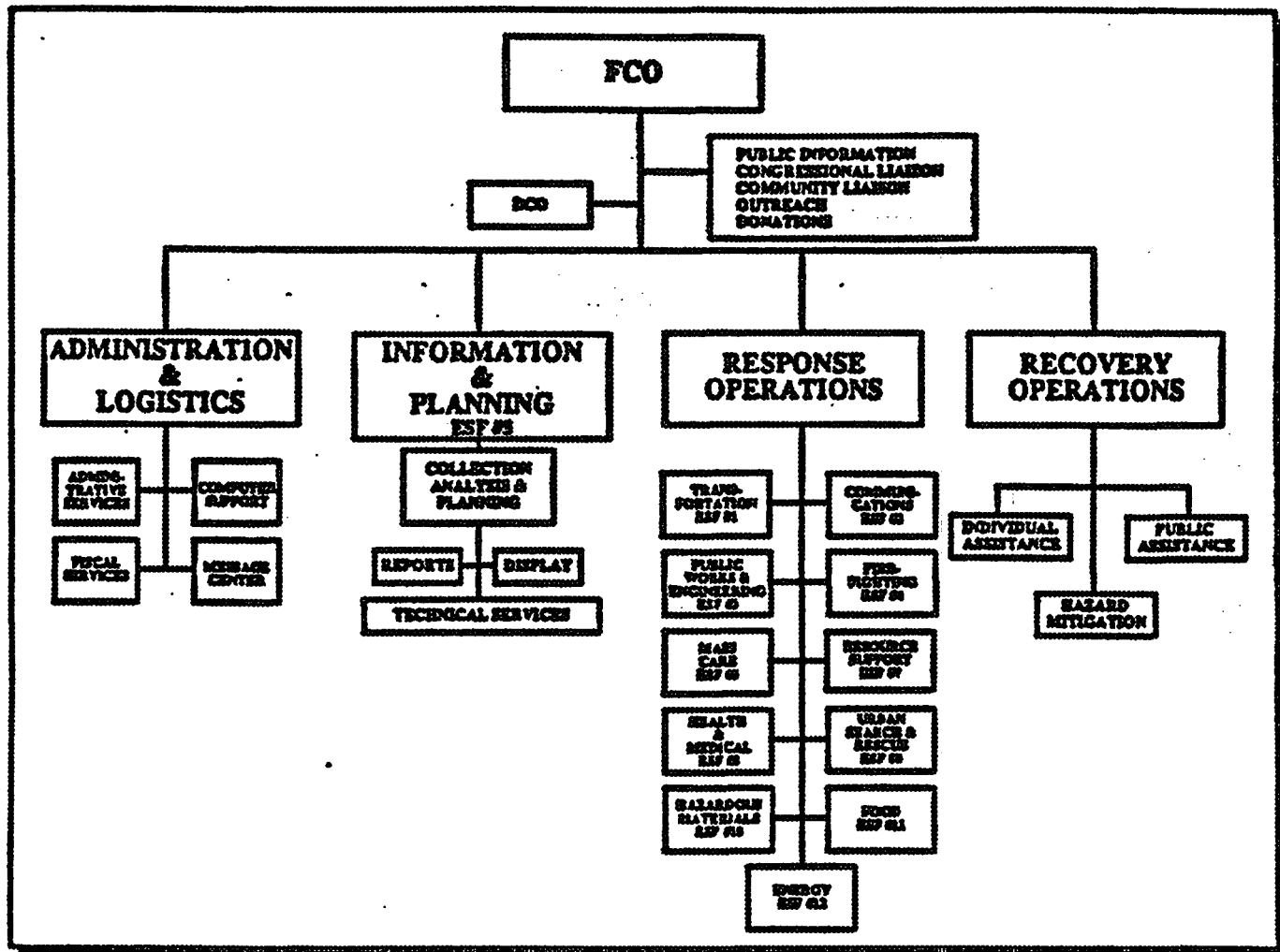


Figure 4 - National-Level Organization Structure

Source: Federal Response Plan

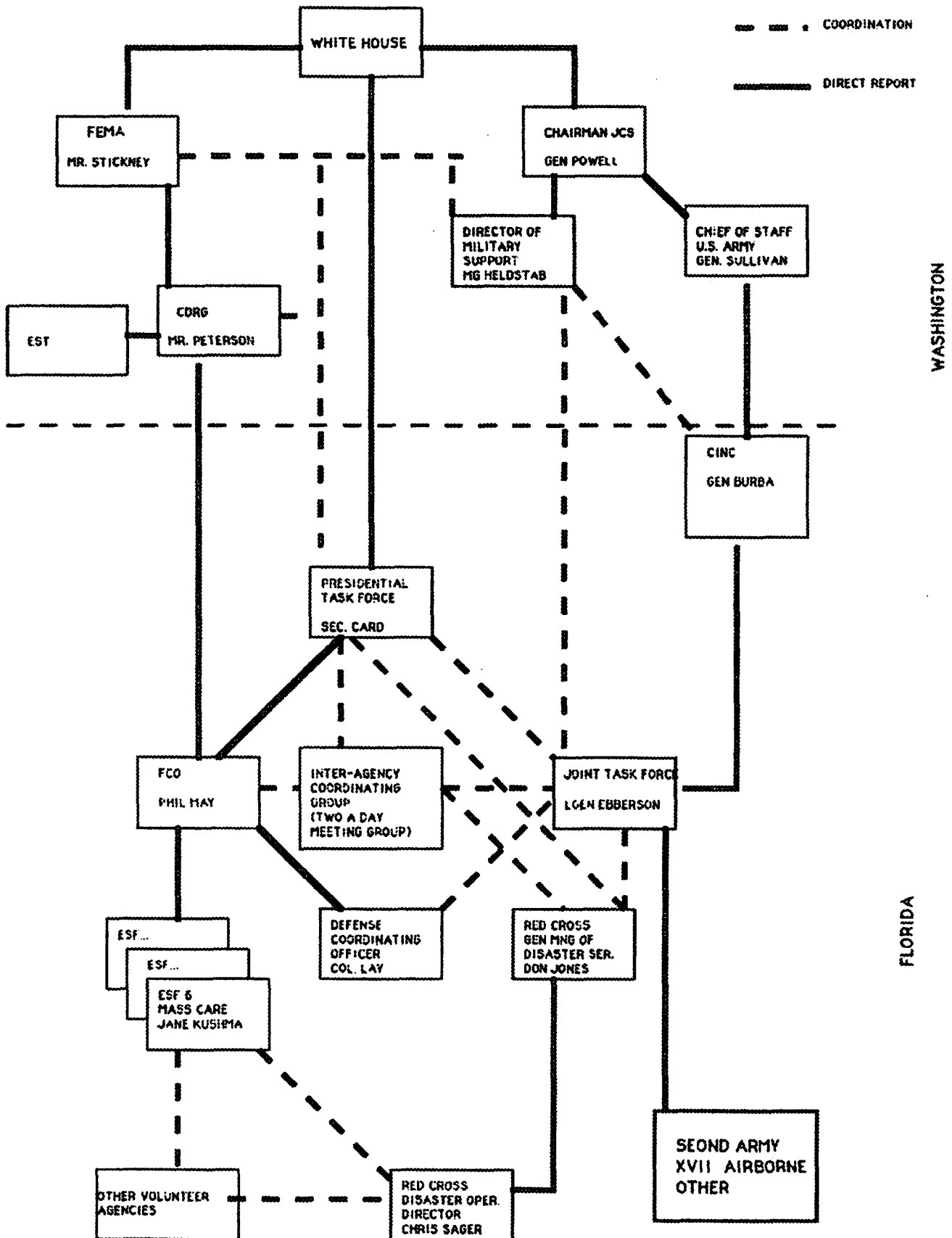


**Structure of the Emergency Response Team
(ERT) for Full Response and Recovery**

FIGURE 5

Source: Federal Response Plan

FIGURE 6
HURRICANE ANDREW MASS CARE ORGANIZATION CHART



information and decision making. Information and communications support systems designed to support decision making at the DFO was not easily accessed by the Presidential Task force.

CONCLUSIONS

We conclude by concurring with those who have observed that the Federal Response Plan and the Federal Response Organization specified by the plan have serious flaws that were made obvious during the response to Andrew. The direct involvement of the White House and the Department of Defense in a catastrophic disaster are predictable. Why not include them in the plan? Why hold to the pretense that states must request federal assistance before critical response actions can be taken? Volunteer Organizations such as the Red Cross, Southern Baptists, Salvation Army, Second Harvest, Habitat for Humanity, Church of the Brethren, Church World Service and others once again demonstrated that they have the capability to respond rapidly with significant resources. The Red Cross served over 4 million meals...many of them prepared at Southern Baptist field kitchens. The Salvation Army and Southern Baptists also served millions of meals. The ARC processed over 35,000 individual assistance cases. These organizations also provide the kernel of the long term recovery capability and should be better integrated into the federal plan. They will be on the scene long after the troops go home. In spite of obvious improvement since Hurricane Hugo and Loma Prieta, however, these organizations must be augmented and supported if they are to meet immediate needs following a catastrophic disaster. Relief workers functioned under extreme conditions immediately after Andrew; long hours, heavy work, heat, humidity, inadequate shelter were the rule. Why do we rely on volunteer workers with an average age of 50+ to provide our first line of mass care response and only bring in the 18-25 year old troops when the volunteers are overwhelmed? When the 18-25 year old troops arrive, do they all have to be carrying weapons

and wouldn't it be nice if they or their leaders were trained and equipped for the disaster relief task ahead?

Hurricane Andrew may be the catalyst for the re-evaluation of the process of planning and preparing for natural disasters in the way the EXXON VALDEZ incident and the resulting Oil Pollution Act of 1990 revamped the national response system for technological disasters. Once again we see that paper plans are a necessary, but not a sufficient, condition for successful organizational response to a crisis. First, FEMA and other federal and volunteer agencies must develop a consensus definition of success and clearly articulate the goals and objectives of a federal disaster response. However it is defined, achieving success will require a significant investment in infrastructure, people and training. The matching of organizational responsibilities and capabilities must occur if plans are to guide response actions. This will require a re-evaluation of the operational role of FEMA, an improvement of the federal/Red Cross/volunteer agency relationship, and the definition of the role of DOD in disaster response.

A new response paradigm must be found and it must be based on realistic scenarios, not on bureaucratic memoranda of understanding that read like treaties between competing powers. The state-federal relationships and the relationship between DOD and FEMA must be examined and defined. The Hurricane Andrew experience may, if organizations honestly review their performance, provide an opportunity for organizational learning that leads to a new paradigm and to the improvement of response plans and organizations.

Table 2 provides a summary of the conceptual framework for organizational for the organizational planning--response--learning cycle.

TABLE 2

THE ORGANIZATIONAL PLANNING, RESPONSE, AND LEARNING CYCLE

PRE-EVENT	EVENT	POST EVENT
PLANNING PHASE	RESPONSE PHASE	RECOVERY PHASE
TASK: SPECIFY ACTION PLAN, RESOURCE REQUIREMENTS AND RESPONSE ORGANIZATION	TASK: EXECUTE THE PLAN, MOBILIZE RESOURCES, CREATE RESPONSE ORGANIZATION, MEET DEMANDS CREATED BY EVENT	TASK: RETURN SYSTEM TO NORMAL AND DE-MOBILIZE
ORGANIZATIONAL GOAL: SELECT A PARADIGM FOR ORGANIZATIONAL RESPONSE	ORGANIZATIONAL GOAL: ADJUST ORGANIZATION TO ACTUAL SITUATION	ORGANIZATIONAL GOAL: LEARN FROM EVENT, SHIFT PARADIGM
METHOD: <ul style="list-style-type: none"> • BASE ON SCENARIOS • INVOLVE EXPERTS AND RESPONDERS • ANTICIPATE DISTRIBUTED DECISION MAKING 	METHOD: <ul style="list-style-type: none"> • COLLECT AND DISTRIBUTE APPROPRIATE INFORMATION • REACT TO STAKEHOLDER NEEDS AND EMERGING ORGANIZATIONS • ADJUST STRATEGY AND TACTICS • PROMOTE SHARED VIEW OF DECISION MAKERS 	METHOD: <ul style="list-style-type: none"> • STUDY UNANTICIPATED ACTIONS AND CONSEQUENCES • USE EXPERTS TO EVALUATE RESPONSE • RE-THINK THE MODEL

The typology shown in Table 2 leads to several interesting research questions:

1. How can we design effective, flexible, distributed response organizations that can react to stakeholders and adjust to unanticipated emergent organizations without losing their ability to function? The emergency management community is converging on the incident command system as a

uniform response structure and system. Use of the ICS resolves many organizational issues, but it may actually inhibit the flexibility and adaptability required during catastrophic disasters.

2. How can we improve our ability to determine the impact of a disaster and to estimate the response required. How do we define and size the response problem? The solution to this problem is critical and involves organizational and technological issues.

3. How do we provide better information management and decision support to these flexible, distributed response organizations? Although centralized organizational control of all response actions may not be desirable or achievable, some centralized control and support of the processing and distributing of information is absolutely essential.

4. How can we improve our ability to learn from these low probability, high impact events? The lifeblood of public sector organizations is appropriated funds; not for profit organizations need public donations to survive. Public criticism, therefore, can directly affect the viability and even the survival of these organization. As a result, they resist outside, public criticism and are reluctant to employ outside experts to examine their performance.

Two final observations should be made. Hurricane Andrew has reaffirmed the validity of prior of disaster research. The observed emergent organizations, unanticipated stakeholders, proactive behavior by victims, and impacts of inadequate feedback on management and decision making all were predicted by disaster research. Finally and most importantly, we must note that the people that were there to help, civilian and military, volunteer and bureaucrat, functioned well under very adverse circumstances in spite of the planning and organizational problems we describe.

APPENDIX I TIMELINE OF EVENTS DURING HURRICANE ANDREW

DAY	DATE	EVENT
-7	MON., 8/17	<ul style="list-style-type: none"> • HURRICANE ANDREW TRACKED BY NWS • FEMA AND MILITARY DISASTER RELIEF ACTIVATED
-3	FRI., 8/21	<ul style="list-style-type: none"> • RED CROSS ACTIVATES HURRICANE WATCH TEAM, DEPLOYS TO ORLANDO AIRPORT
-2	SAT., 8/22	<ul style="list-style-type: none"> • NATIONAL VOLUNTEER GROUPS MOBILIZE • HURRICANE WATCH SET FOR DADE COUNTY
-1	SUN., 8/23	<ul style="list-style-type: none"> • APPROXIMATELY 1 MILLION PEOPLE EVACUATED IN AREAS THREATENED BY STORM SURGE • FEMA ACTIVATES FEDERAL RESPONSE PLAN • EICC/EST/JIC ACTIVATED IN WASHINGTON • CDRG HOLDS FIRST MEETING • FEMA REGION IV ROC ACTIVATED FOR 24HR OPS • ERT-A ACTIVATED • GOV CHILES REQUESTS FEDERAL AID FOR DADE, BROWARD, AND MONROE COUNTIES • GOV. CHILES ACTIVATES NATIONAL GUARD • STATE EOC IN TALLAHASSEE ACTIVATED • PHIL MAY, FEMA REGION IV ASSUMES FCO, ARRIVES AT STATE EOC • RED CROSS MIAMI OPENS DADE COUNTY OC • RED CROSS OPENS SHELTERS IN DADE COUNTY
0	MON., 8/24	<ul style="list-style-type: none"> • HURRICANE ANDREW HITS DADE COUNTY AT 5 A.M. • PRESIDENT BUSH SIGNS FEDERAL DISASTER DECLARATION • ERT-A DEPLOYS TO TALLAHASSEE • PRESIDENT BUSH VISITS MIAMI • LOCAL CHURCH GROUPS RESPOND • EVACUEES BEGIN TO RETURN TO HOMES
+1	TUE., 8/25	<ul style="list-style-type: none"> • FEMA/STATE ISSUE INITIAL DAMAGE REPORT ESTIMATING 50,000 HOMELESS • RED CROSS OPENS HQ IN DADE COUNTY IN IBEW UNION HALL, • COL BOB LAY, 2ND ARMY APPOINTED DCO
+2	WED., 8/26	<ul style="list-style-type: none"> • SECRETARY OF TRANS CARD NAMED AS DIRECTOR OF PRESIDENTIAL TASK FOR ON HURRICANE ANDREW RECOVERY. • FEMA DIRECTOR STICKNEY, GRANT PETERSON BRIEF SECTY CARD. • FEMA LOCATES SITE IN MIAMI FOR DFO • SECOND ARMY TASKED TO PROVIDE MRE'S, TENTS

- KATE HALE, DADE COUNTY EMER. DIR. CRITICIZES
FEDERAL RESPONSE AT PRESS CONFERENCE
 - CHRIS SAGER RED CROSS RELIEF OPERATION
DIRECTOR MOVES FROM ORLANDO TO DADE
 - NAVY SEABEAS ARRIVE IN DADE COUNTY
- +3 THU., 8/27
- FEDERAL RESPONSE MOVES TO DADE COUNTY
 - ERT MOVES FROM TALLAHASSEE TO DADE DFO
 - FCO PHIL MAY ARRIVES AT DFO
 - CDRG HOLDS SECOND MEETING IN WASHINGTON
 - RED CROSS STAFFS ESF 6 IN DFO, MS. JANE
KUSHMA ASSIGNED AS ESF 6 COORDINATOR
 - DON JONES, RED CROSS GENERAL MANAGER
OF DISASTER SERVICES ARRIVES IN DADE
 - RED CROSS TELEPHONE NUMBERS PUBLISHED
IN PRESS
 - HEALTH DEPARTMENT STOPS SOME VOLUNTEERS
AND LOCAL CHURCH GROUPS FROM DISTRIBUTING
FOOD WITHOUT PERMITS
 - PRESS HEADLINES: "WHERE IS EVERYBODY"
 - LIGHTS AND PHONES INSTALLED IN DFO
- +4 FRI., 8/28
- DOD MOVES IN STRENGTH
 - SECRETARY CARD AND PTF ARRIVE IN DADE
 - PRES. BUSH PROMISES FEDERAL TROOPS FOR
EMERGENCY ASSISTANCE
 - LT.GEN EBBESON SECOND ARMY ESTABLISH
DOD JOINT TASK FORCE.
 - STATE EOC MOVED TO DADE COUNTY
 - ESF 6 FUNCTIONING AT DFO, BUT NOT "OFFICIALLY
ACTIVATED"
 - RED CROSS HOLDS COORDINATION MEETING WITH
NATIONAL AND LOCAL CHURCH GROUPS
- +5 SAT., 8/29
- RED CROSS OPENS ITS FIRST 6 SERVICE CENTERS
 - VOLUNTEER GROUPS HOLD COORDINATING MEETING
WITH RED CROSS
 - DFO/ESF DISCUSSIONS--WHO WILL PAY FOR WHAT?
 - RED CROSS CLOSES ORLANDO STAGING AREA
 - SOME VOLUNTEER AND CHURCH GROUPS TURNED BACK
AT MILITARY CHECK POINTS
 - GOVERNOR CREATES FIVE INTERAGENCY TEAMS
 - FEDERAL RESPONSE PLAN AND ESF 6 ACTIVATE
FOR GUAM.
 - RED CROSS DAMAGE ASSESSMENT 75% COMPLETE
- +6 SUN., 8/30
- JESSE JACKSON VISITS DFO, DISASTER AREA
 - ROAMING DOG PACKS REPORTED
- +7 MON., 8/31
- TENT CITIES ESTABLISHED BY MILITARY
 - INTERFAITH GROUP MEETS AT ARC HQ TO DISCUSS
COORDINATION

+8 TUE., 9/1

- PRESIDENT BUSH TOURS DISASTER AREA.
- RED CROSS DAMAGE ASSESSMENT COMPLETE

+9 WED. 9/1

- PRESIDENT BUSH WAIVES REQUIREMENT FOR PARTIAL STATE REIMBURSEMENT FOR FEDERAL AID
- PRESIDENT BUSH PROMISES MORE FEDERAL AID

APPENDIX II

SUMMARY OF ACTIVITIES: Hurricane Andrew Quick Response Grant

Friday, August 28, 1992

Located and visited the American Red Cross Disaster Relief Operations Headquarters. Met with Mr. Chris Sager, Director of the Relief Operation, Mr. Michael Carroll, Manager of the Greater Miami Red Cross Chapter, and Mr. Donald Jones, General Manager of American Red Cross Disaster Services. Attended the evening staff meeting of all Red Cross functional chiefs during which the status of relief operations was reviewed.

Saturday, August 29, 1992

Met with Mr. Greg Johnson, Chief of Damage Assessment for the Red Cross to determine extent of damage and the status of the damage assessment effort. Met with Ms. Carolyn Carlson, assistant chief of Red Cross Mass Care to discuss mass care status and plans. Attended meeting of approximately 20 voluntary agencies that were attempting to coordinate their relief efforts and to set the stage for recovery efforts. Located and visited the Federal Disaster Field Office and the state of Florida EOC. Met with personnel staffing the ESF 6(Mass Care) ESF 5 (information) and ESF (XX) Transportation. Attended the Red Cross evening staff meeting.

Sunday, August 30, 1992

We met with the research team from the University of Delaware Disaster Research Center and compared notes. Visited Red Cross Miami Chapter and Disaster Welfare Information Center. Visited the Red Cross Logistics Center and Warehouse. Returned to the federal Disaster Field office and observed the functions of ESF 6, ESF 5 and the evolving role of the FCO and the ESFs, the Presidential Task Force and the DOD Joint Task Force. Attended Red Cross evening staff meeting.

Monday, August 31, 1992

We spent the day attempting to get a first hand impression of service delivery within the affected area. Dr. Carley accompanied Red Cross Damage assessment teams and visited Red Cross and Federal facilities in the Cutler Ridge Area. Dr. Harrald and Mr. Fouladi accompanied an American Red Cross emergency response vehicle, assisted a Southern Baptist feeding unit, and visited Red Cross and Federal facilities in the affected area. Attended the Red Cross evening staff meeting.

Tuesday, September 1, 1992

Spent the first half of the day on an American Red Cross emergency response vehicle in the affected area making supply runs and providing emergency food service. Visited Red Cross service centers in Cutler Ridge and Homestead. Toured area to locate and observe FEMA DACS and salvation Army centers. Returned to DFO for further observation and discussion. Attended Red Cross evening staff meeting.

Wednesday, September 2 1992

Made final visits to Red Cross headquarters and to DFO. Interviewed officers and obtained status reports. Departed Miami.

September/October 1992

Interviewed American Red Cross and DOD personnel involved in mass care response.

Performed preliminary analysis of press information

APPENDIX III Persons Interviewed for this Report

American Red Cross

LTGEN (ret) Don Jones	General Manager, Disaster Services; Red Cross Representative to Presidential Task Force, Hurricane Andrew
Mr. Joe Terry	Manager, Planning and Evaluation, Disaster Services; Assistant to Don Jones, Hurricane Andrew
Mr. Chris Sager	Disaster Associate; Director, Hurricane Andrew Disaster Relief Operation
Mr. Michael Carrol	Manager, Greater Miami Red Cross Chapter
Mr. Greg Johnson	Disaster Volunteer, Damage Assessment Officer, Hurricane Andrew DRO
Ms. Carolyn Carlson	Disaster Associate, Assistant Mass Card Officer, Hurricane Andrew DRO
Mr. Don Conners	Government Liaison, Hurricane Andrew DRO
Mr. Vince Costello	Disaster Welfare Inquiry Officer, Hurricane Andrew DRO

Red Cross National Headquarters

Mr. Armond Mascelli	Manager, Disaster Operations, Disaster Services
Mr. Wadi Gonzalez	Disaster Associate, Damage Assessment

Disaster Field Office, Hurricane Andrew

Mr. Dale Petranek	Red Cross FEMA Liasons
Ms. Jane Kushma	Disaster Associate, ESF 6 Coordinator
Ms. Dee Angleton, Coordinator	Senior Disaster Volunteer, ESF 6
FEMA Manager	Supervisor, ESF 5

Volunteer Agencies**Mr. William Nix****Disaster Response Consultant, Church
World Service****Supervisor****Southern Baptist Liaison to Red Cross****Department of Defense****MGEN John Heldstab****Director of Military Support (DOMS)**