BEFORE THE WIND:

A COMPREHENSIVE RAPID DAMAGE ASSESSMENT POLICY AND PROCEDURE FOR THE FIRE-RESCUE DEPARTMENT

EXECUTIVE ANALYSIS OF FIRE SERVICE OPERATIONS
IN EMERGENCY MANAGEMENT

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ABSTRACT

The problem was that prior to this study the City of Fort Lauderdale, Florida Fire-Rescue Department (FLFRD) did not have a strategic comprehensive policy or procedure in place for conducting rapid damage assessment immediately following a hurricane impact or other major weather event.

As a progressive fire service leader charged with fiduciary responsibilities of a senior chief officer, one of the primary concerns is public safety, especially during, and immediately following "extraordinary" weather occurrences such as the imminent impact of a hurricane, tornado, or tropical depression storm upon your community. Having a detailed "plan of action" will lead and guide your department through the steps necessary for recovery from disasters such as these and provide assistance and leadership through the restoration to the public infrastructure of the community. Development of a comprehensive program that facilitates initial "rapid" damage estimates is critical to the organization of recovery measures in the immediate aftermath of a major storm. A quick determination is needed of where damage is most prevalent, damage severity, the kinds of resources needed, and where they are needed the most. "This initial damage estimate is also essential to obtaining a State or Federal emergency declaration and to request external assistance from these sources" (Emergency Management Institute 1995, p. D-13).

The purpose of this research was to provide information from which to develop a solution to the knowledge claims being questioned. This research process included the substantiation of the research of others, the discovery of emergency management practices that were incongruent with the recommendations from the Federal Emergency

Management Agency, including those ancillary emergency management departments at the State and local levels. Terminal purpose objective being the substantiation of credible and empirical data that supported the recommendations contained within this document as legitimate and genuine.

Action and descriptive research methodology was used to answer the following research questions:

1. What is damage assessment as it relates to the contemporary approach of integrated emergency management?
2. What are the benefits to a community of having the ability to perform a rapid situation assessment procedure in place?
3. What components, agencies, organizational concepts, and individual tasks should be considered when developing a rapid damage assessment tool?
4. What is the National standard or program model regarding rapid damage estimate reports?

The procedures used to complete this research consisted of a comprehensive literature review of the subject. The research analysis first examined previous applied research papers (ARP) relating to damage assessment procedures in the fire service. This literature review was then expanded to include local libraries referencing books, periodicals, and journals that supported or refuted the hypothesis in question. In addition, a through search of relating memorandums and archived records from the City fire, police and public works departments was completed. Finally, personal interviews were conducted with respondents responsible for policy making and holding key

positions within the City of Fort Lauderdale, Florida Fire-Rescue Department and the Broward County, Florida Emergency Management Agency.

The results of this analysis supported the theory that a gap regarding the inability to initiate, execute, gather accurate damage estimates, and process this disaster intelligence was not being considered. The recommendations of this research project called for the senior chief officers of the (FLFRD) to review the ARP report. Dedicate the time necessary, and in an appropriate forum discuss the report findings. Afterward, develop a plan for the subsequent training and implementation of the rapid damage assessment model, with the ultimate objective being a seamless integration of modern emergency management philosophy into our standard operating procedures for hurricane response and restoration efforts. "*Let our advance worrying become advance thinking and planning"* (Winston Churchill, n. d.).

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INTRODUCTION

The problem is that the City of Fort Lauderdale, Florida Fire-Rescue Department (FLFRD) does not have a comprehensive policy or program in place to conduct a rapid damage assessment of the community immediately following a hurricane impact or other major weather occurrence. As a result of this, local government officials, the Emergency Operations Centers (EOC), and the Incident Commander do not have a timely and accurate damage analysis snapshot of a post-storm impact, specifically wind and flood intensity damage estimates. Without this critical data they cannot logically assemble and direct local emergency response resources to where they are needed the most. In addition, it will significantly delay the reflex time for State and Federal emergency declaration assistance targeting the recovery and restoration of lifelines and municipal infrastructure (Emergency Management Institute, 1995).

The purpose of this applied research project is to proactively meet this challenge by obtaining sufficient and credible quantitative and qualitative data, which either supports, or refutes the subject hypothesis, and to develop a model assessment policy.

This study uses descriptive and action research methodology to answer the following questions:

1. What is damage assessment as it relates to the contemporary approach of integrated emergency management?
2. What are the benefits to a community of having the ability to perform a rapid damage situation assessment procedure in place?
3. What components, agencies, organizational concepts, and individual tasks should be considered when developing a rapid damage assessment tool?

4. What is the National standard or program model regarding rapid damage estimate reports?

Once the literature review and supporting documentation are carefully analyzed from which to formulate a rationale solution, the final objective was to define a policy that as an organization systemizes to ensure critical damage intelligence reports are promptly and accurately completed by Fire-Rescue Operations personnel which benchmarks the first phase of post-impact recovery.

In summary, the research objectives will primarily focus on changing and educating the culture of the organization to shift from the traditional demand-driven reactionary response mode to catastrophic weather events, to a proactive, strategic disaster-planning mode. Reactionary response planning is a somewhat dated concept and focuses on risk management, and the ideology of coping with crisis. Conversely, modern integrated emergency management planning for disasters is "a responsibility to be taken seriously at all levels of government – Federal, State and local. Disaster plans rely upon a strong supportive partnership beginning at the local level and rising to the highest level necessary to bring about recovery" (Federal Emergency Management Agency, 1997, p. 1). To accomplish these tasks an extensive literature review and analysis of information on the subject including an historical retrospective into the problem was conducted. Program objectives were defined, as was a sequential plan of action incorporating logic and reason. The end product was a Rapid Damage Assessment Policy Model, specific to the needs of the City of Fort Lauderdale, Florida Fire Rescue Department. *"The time to repair the roof is when the sun is shining"* (John F. Kennedy, n.d.).

BACKGROUND AND SIGNIFICANCE

Background

The City of Fort Lauderdale, Florida is a cosmopolitan modest sized oceanfront coastal community located on South Florida's eastern coastline midway between Miami and Palm Beach. It is densely populated with over 185,000 year round residents making it the sixth largest city in the state. The City is just over 41 square miles encompassing seven miles of beachfront and eighty-five miles of inland navigable waterways sometimes referred to as the "Venice of America" (Nova Southeastern University, 1999). The City was established in 1911 and is the largest municipality within Broward County. It is characterized by a wide variety of lifestyles and a socioeconomic diverse population. Its boundaries stretch from the affluent oceanfront neighborhoods to the low-income areas adjacent to the Interstate 95 corridor.

The City of Fort Lauderdale also houses the center of governmental, judicial, and financial activity in Broward County. Fort Lauderdale local government is structured into a manager/council form, and operates on an annual budget of over $170 million dollars, providing a complement of municipal services such as fire & EMS, police, regional water and wastewater systems. Of this the Fire-Rescue Department is given just over $34 million dollars as its fiscal year operating budget. The Fire Department's organizational structure is the traditional and commonly accepted paramilitary rank and order style. It was established in 1912, a year after the incorporation of the City and has been the only provider of fire suppression for the community (Nova, 1999).

With the given geographic coordinates for the City of Fort Lauderdale, Florida at 26 05 degrees latitude North, and 080 06 degrees longitude West, it is situated in a very

vulnerable location for the possible impact of a tropical cyclone or more common term hurricane. Long before Columbus journeyed to the New World, Native Americans were well aware of the great storms. One of their gods, *Huraken*, was believed to cause the cyclones. During that time and all through documented history since the 16th century major hurricanes have changed the landscape, society, and the course of history (Carpenter & Carpenter, 1993). In the late evening hours of September 17, 1926, the lower east coast of South Florida was struck by a devastating hurricane. The City residents had been warned of the storm's approach, but few took the threat seriously. "Buildings crumbled as 100 mile-per-hour winds roared over Fort Lauderdale. The eye of the storm came ashore at 6:30 a.m. followed by even stronger winds. Total destruction to all but a few buildings was the result, along with the death toll between 200 and 300 fatalities" (Dillon & Hobby, 1991, p. 5). This same scenario was repeated only two years later with the "Great Storm" of 1928, and the aftermath left even more destructive and deadly results.

Since the days of those catastrophic storm's experienced by the early settler's, the City has been affected by nine major hurricanes to date. (Carpenter & Carpenter, 1993). However, the landfall frequency projections have decreased according to Roger A. Pielke, Jr. of the National Center for Atmospheric Research in his book *Hurricanes Their Nature and Impacts on Society*. He stated, "Over the past several decades there has been a decrease in major land falling hurricanes upon the U.S." (Pielke & Pielke, 1997, p. 43). Still with this recent declining trend, interesting enough Dr. Max Mayfield, Director of the National Hurricane Center in Miami, Florida and his colleagues commented, "On average, two hurricanes strike the US coast each year, with two

intense hurricanes striking the US coast every three years" Herbert, Jarrell, and Mayfield 1996, National Hurricane Center (Pielke & Pielke, 1997, p. 63).

Authors of the book *Facing the Unexpected, Disaster Preparedness and Response in the United States* noted "Owing to substantial size and intensity hurricanes are the single costliest and most destructive of all atmospheric storms. Of the ten costliest weather disasters in history of the United States, six were the result of hurricanes. Powerful winds of the hurricane produce tremendous damage to natural and man-made structures" (Tierney, Lindell & Perry, 2001, p. 1). This is why each year between the months of June and December it is officially known as the "mean season" for those living on or near coastal communities throughout the North Atlantic basin, Gulf coast, and in and around the Caribbean Sea.

This omen became a reality for the inhabitants of South Florida on August 24, 1992 when a Category 4 Hurricane known as Andrew struck the coastline with winds gusts estimated at 175 miles per hour. The aftermath was of "apocalyptic proportions" with significant damage to 83, 000 structures leaving 160, 000 people homeless. "Four days later the front page of *The Miami Herald* announced to the world through an enormous front-page headline "WE NEED HELP – *Metro blames feds for failure of relief efforts"* (Pielke & Pielke, 1997, p.11). The federal government was sharply criticized for their sluggish response to this disaster; the delay was directly contributed to the lack of early damage intelligence from the regional EOC and State emergency management officials (Pielke & Pielke, 1997).

With the probability of a major hurricane impact in the future upon greater Ft. Lauderdale and the knowledge gained from events from the past, little progress,

abatement planning, or foresight regarding strategic integrated emergency management concepts, specifically rapid damage assessment have been implemented. Hence, the primary reasons that promulgated the initiation of this research project.

After reviewing the synopsis of facts thus far contained in the background analysis, sufficient evidence has been presented to justify a study from both an organizational perspective as well as a student development initiative. Emergency Management planning and response for the City of Fort Lauderdale is the responsibility of the Fire-Rescue Department, and is under the direction and control of the Deputy Chief of Administration. Understanding the totality of consequences for ignoring the topic, and probable future impact on the organization is purely speculative and non-scientific in nature. However, not having a sound policy or plan to execute this component of recovery and relief efforts will only exacerbate the situation as noted on the front-page of *The Miami Herald*, Friday morning August 28, 1992.

Significance

The significance of this study to the City of Fort Lauderdale, Florida Fire-Rescue Department is threefold. First, the information and research will assist the executive chief officers to objectively review the findings as they specifically relate to their organization, and discover the *utility* of damage assessment information as a *tool* and a viable solution to developing a strategy for addressing key short-term recovery issues such as immediate post-storm emergency response and recovery functions. This momentum will follow through and transition seamlessly into more long-term disaster and recovery /restoration efforts which include restarting community systems,

reestablishing community economy and civic life to the municipal and private infrastructure (FEMA-IEMC,1994).

Secondly, the results will develop the framework necessary for future strategic emergency management planning in the FLFRD. The importance of strategic planning for municipal departments was described in a report presented to the Southeastern Conference for Public Administrators by Douglas Yoder. He noted in his Executive Summary “In fact, it is the ‘P’ in POSDCORB – the first function in Luther Gulick’s classic acronym for the functional elements of management. Therefore, we can conclude deductively, that since planning is an element of management, then strategic planning must be an element of strategic management. Planning, it would seem, is the more focused term to describe that portion of the decision making process in management, which includes future considerations” (Yoder, 1994, p. 7).

Third, it will serve as a model for future research at the local level and possibly the national level if indexed into the National Fire Academy’s Learning Resource Center. The Terminal Objective of the project from a student’s perspective is, “being able to design, conduct, and report a research study; evaluate the research of others; and use the products of research to improve the organization and contribute to the fire service body of knowledge” (USFA-EFOP-ED, 1998, pg. SM 3-2).

EFOP Course Linkage

This applied research project on damage assessment is relevant to the course work included in the curriculum of the National Fire Academy’s Executive Fire Officer Program (EFOP), *Executive Analysis of Fire Service Operations in Emergency*

Management (EAFSOEM), R306 course. This researcher noted the five following distinct links.

First, *Unit 1: Introduction* summarized the Importance of Emergency Management preplanning. The Terminal Objective and activity being, “The student will be able to analyze their department’s level of preparedness for fire service operations in emergency management. … Effective emergency management is extremely important to the well-being of our communities. The fire service has been and continues to be a key contributor providing effective emergency management services. Only through-continued training can we improve our responses before, during, and after a large-scale incident occurs in our communities” (USFA-EAFSOEM, 2001, p. SM 1-1,1-5).

Secondly, it relates to *Unit 1: Activity 1.1 EAFSOMEM Profile Chart,* here it stated, “Damage Assessment procedures are in place for immediate and post incident assessments. Forms for conducting damage assessment have been developed, and training for their implementation has been provided” (USFA-EAFSOEM, 2001, p. SM 1-9). The overall tabulated final results of the activity profile for this student’s community (Ft. Lauderdale, Florida) received an overall score of 13, which categorized it as only having “Limited Preparedness”. This below average score was directly contributed to the absence of a Damage Assessment policy (USFA-EAFSOEM, 2001).

Third relation was found in *Unit 5: Incident Documentation*, which outlined the procedures for completing an Incident Action Plan (IAP). An Incident Action Plan documents the actions developed by the Incident Commander and Command General Staffs. They rely on this damage assessment reconnaissance information when making critical strategic and tactical decisions throughout the emergency. A requisite

component of the IAP is the Incident Status Summary (ICS Form 209), which contains the damage assessment information from the event (USFA-EAFSOEM, 2001).

Fourth, the student manual dedicated an entire unit of study on the subject and importance of Damage Assessment. *Unit 8: Damage Assessment* emphasized that "Damage assessment information can be critical both during an incident and after the active phase of an incident has been concluded" (USFA-EAFSOEM, 2001, p. SM 8-3).

The final tie back for this research to the EFOP directly relates to the *Statement of Purpose* for the EFOP itself. Contained within the foundation philosophical principles governing the EFOP program it states, "there is a need to transform fire and emergency service organizations from being reactive to proactive; with emphasis on leadership development, prevention and risk-reduction … the value of research and its application to the profession…the value of lifelong learning … and the enhancement of executive-level knowledge, skills, and abilities necessary to lead these transformations" (EFOP Program Notice, 2001, p. 2).

LITERATURE REVIEW

The literature review is organized around the four specific research questions being investigated, and was initiated at the campus of the National Fire Academy's Learning Resource Center (LRC) in Emmitsburg, Maryland, first in December of 2001, and again in April of 2002. The rationale behind choosing this site first was quite simplistic. After conducting a preliminary study on how to correctly perform research prior to the commencement of this applied research paper (ARP). This author read a book written by Walter R. Borg and Meredith D. Gall titled *Educational Research: An Introduction*. After examining the nine steps identified in Krathwohl's *Model of the Chain*

of Reasoning in Quantitative and Qualitative Studies he suggested starting with the conclusions from previous research studies as the first step (Borg & Gall, 1989).

Therefore, the literature review was promptly conducted during this author's attendance at the National Fire Academy's *Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) R306* course in December of 2001. The LRC was chosen because it has at its disposal, an enormous collection of indexed periodicals relating to emergency services. It also indexes an impressive archive containing previous works from former students and practicum research papers produced as requisite components of the Executive Fire Officer (EFO) program.

Unfortunately, because of the uniqueness of the subject this search of the LRC concluded with disappointing results. Very few resources were recommended on the Display Search using the LRC Starfinder computer program. A total of three short articles in trade journals were cited and only two applied research paper abstracts relating to the subject were listed. However, the information contained within the ARP's revealed research findings that supported the knowledge claim being questioned. Hence, this previous evidence, combined with new evidence, would increase our confidence that the knowledge claim being researched is true (Borg & Gall, 1989).

Researching data supporting the knowledge claim in the first research question; *seeking damage assessment as it relates to the contemporary approach to integrated emergency management,* this author examined previous research suggested by the Starfinder. One was an ARP practicum authored by Eric Smith in October of 2001. Eric is a Captain for the Palm Beach County Fire-Rescue Department in Palm Beach, Florida. In reviewing his research he quoted information from a 1999 Federal

Emergency Management Agency publication *The Emergency Program Manager*; “While damage assessment reports may be used for reports to the news media, or help substantiate insurance claims, the basic purpose of the assessment is to obtain assistance” (FEMA, 1999). This same ideology was found published on a government web page describing the Damage Assessment Process obtained from the State of Florida Department of Community Affairs. Here it emphasized, “One of the most important elements of a county’s response to an emergency or disaster is damage assessment. This process is essential in determining what happened, what the effects are, which areas were hardest hit, what situations must be given priority and what types of assistance are needed such as local, state, or federal” (State of Florida DCA, 2002, p. 2).

Consequently, the same need for a rapid damage assessment was noted in the private business sector as well. This information was discovered in an article written by Frank Donaldson, which appeared in the trade magazine *Disaster Recovery Journal.* In his 1992 article titled “*Putting the Plan in Motion - A Checklist*” he stressed the need for contingency planning and a method to determine the amount of damage sustained to a business or corporation following a disaster such as a flood or hurricane. Donaldson commented, “This process has been called ‘damage assessment’, but it should be more. In the execution of a contingency plan, the assessment should be the transition between the end of the emergency (people safe, assets secured, etc.) and all action to be taken next. The main goal of the damage assessment should be to make sure those activities which are essential to the business are continued in some form and the appropriate actions are taken to ensure this” (Donaldson, p. 20). Mr. Donaldson

expressed how vitally important it is to the solvency of a business to have a contingency plan, and within that plan a method for determining the amount of damage suffered. Regardless of the cause of the event, any loss of facility or equipment such as computers or the unavailability of key personnel will cause a significant business interruption in the wake of the recovery process (Donaldson, 1992).

From a practical viewpoint, the ability and necessity to perform some method of a rapid damage assessment appears to be discussed in most contemporary books on the subject of integrated emergency management. In a book published by the International City Managers Association (ICMA) titled *Emergency Management: Principles and Practices for Local Government* the authors discussed in detail the theory behind the principles of emergency preparedness and emergency management. They offered the suggestion that the goal of emergency management is the rapid restoration of normal routines. “Efforts must be made to anticipate possible impacts of a range of different hazards and to develop countermeasures to neutralize or soften the impacts” (Drabek & Hoetmer, 1991, p. 34). One salient point they made to accomplish this theory was that “Preparedness and improvisation are foundations of emergency management. To prepare is to organize for emergency response before an event. What does this mean? It means that various domains of responsibility such as warning, damage assessment, and other emergency management functions are identified and assigned to entities capable of performing them (Drabek & Hoetmer, 1991).

In all practicality the crisis following an emergency such as a major hurricane impact is no time to initiate the planning, and deciding a method of gathering rapid damage assessment information. The Emergency Management Institute (EMI) has

developed a publication titled *Rapid Assessment Planning Workshop in Emergency Management (WEM).* This is an excellent resource that describes “step-by-step” how local community planners can develop their own rapid assessment procedure. They suggest rapid damage assessment should be incorporated into the community’s Emergency Operations Plan (EOP).

Interesting enough this author discovered information regarding damage assessment in the *City of Fort Lauderdale Emergency Operations Center Handbook.* It stated, “The City of Fort Lauderdale must establish a quick response capability for accurate and timely Damage Assessment after the hurricane strikes. All actions taken within the county, by municipal and county government, must be reported the Governor’s office daily during emergency operations in order to justify any request for State and/or Federal assistance should that become necessary” (City of Ft. Laud. EOC, 1991, p. 36). Unfortunately, there are no clear instructions on who will assume this responsibility, or how it should be executed.

Researching data supporting the knowledge claim in the second research question; *identifying the benefits to a community of having the ability to perform a rapid situation assessment procedure in place.* This author again examined the previous research ARP practicum written by Eric Smith who is employed with the Palm Beach County, Florida Fire and Rescue Department. Eric cited this statement, “Damage Assessment is a key step in caring for the long term needs of the people in the communities of Palm Beach County. Delayed assessments have caused hardship as well as sometimes eroding confidence in the ability of the community to react in time of emergency” (Smith, 2001, p. 2).

Similar to the information discovered in the literature review thus far, the data strongly suggests that the benefits associated with an accurate damage assessment revolve around the ability to request external assistance. Without first surveying the perceived damage and being able to provide credible documentation that the damage has occurred and where, then any external assistance request may be significantly delayed until the damage assessment process has been completed. More importantly the research data implied that without conducting a rapid damage assessment first, local government *itself* could not deploy and respond effectively with its limited resources to the event.

This theory is substantiated in the information found in the Emergency Management Institute Rapid Assessment Planning publication. Here the authors discussed in the Rationale Section “The ability of local governments to perform a local situational (rapid) assessment accurately and within the first few hours after an incident is *critical* to providing an adequate local government response for life threatening situations and imminent hazards”. They further explained, “Correct and effective assessments permit local governments to prioritize response activities, allocate scarce resources, and request mutual aid and State and Federal assistance” (FEMA-EMI, 1995, p. FG iii).

In a book titled “*Comprehensive Emergency Management, A Governor’s Guide”* written and developed by the National Governor’s Association for Policy Research they also provided information on damage assessment. They indicated not only should a rapid damage assessment report be completed but also it needs to be extremely accurate. It was noted in Chapter 5, *Obtaining Federal Assistance in Emergencies*,

“Accuracy is critical to disaster management. Fast, accurate reporting of damage enables the governor to ensure appropriate types and levels of assistance will be provided. - Governors report that this is their most important need” (NGAC, 1979, p. 48).

Rapid Damage Assessment reporting is not an easy task, not only does it need to be initiated within the first hours of post-impact response and recovery, the accuracy and credibility of the information is equally as important. The benefits of early damage reconnaissance and the swift reporting of data to those who can provide recovery assistance was additional information found supporting this claim. It was observed in a 1996 article written by author and Certified Disaster Recovery Professional Pat Moore who wrote in the business trade journal *Contingency Planning & Management, Preparedness and Recovery.* The article titled *“Damage Done… Assessment to Come”* noted,

> Property damage may be a lot worse than it appears – or nowhere near as bad. In the immediate aftermath, the verdict hinges on proper assessment. As anxiety mounts prior to surveying the scene, remember that damage assessment involves more than just evaluating the extent of damage and estimating potential recovery time frames and costs. A proper and through evaluation also ensures safe and healthful re-entry requirements during both the assessment and clean-up phase (p. 18).

During a personal interview with Paulette Kandal (2002) who is the Chief of Operations for the Broward County Emergency Management Agency, she described the benefits and methodology behind the development of their Rapid Impact Assessment (RIA) plan. She was quoted,

> Basically it's getting the response resources to where it needs to go. We are looking at the categories for wind and flood initially on a scale from zero to four. The assessment is general enough in nature that it can be done rather quickly, and gives us an overview of where the most damage occurred (Kandel, 2002).

When this author asked her the specific benefits to the program Kandel's response supported the information that was discovered in the literature review material.

> Specifically if we had another *Hurricane Andrew* up here in Broward, and the RIA Process was implemented properly, we would have a fairly accurate indication to the extent and magnitude of damage sustained, and the catastrophic nature of the event… It was a full day later before the State received any accurate damage assessment reports from the Homestead area where the eye wall of Andrew came ashore (2002).

The content of the literature review thus far has revealed some insight into how the damage assessment relates to comprehensive integrated emergency management concepts and some of the possible benefits to the community for having this policy included in their emergency operations planning.

Research now focused on obtaining data supporting the knowledge claim in the third research question*; identifying what components, agencies, organizational concepts and individual tasks should be considered when developing a rapid damage assessment tool.*

First, this author examined the Emergency Management Institute *Rapid Damage Assessment Planning* publication, it suggested that community planners, senior-level personnel from response agencies such as law enforcement, fire; emergency medical services, and public works should be participants involved in the development phase of the damage assessment policy. It also suggested senior-level personnel from other government agencies that may play a role in gathering damage assessment information such as human services, public heath, and the council on aging may prove helpful. They also included some alternative recommendations such as; local utility companies; voluntary organizations including the Red Cross, Salvation Army, as well as community based organizations such as; RACES (Radio Amateur Civil Emergency Service) and Community Emergency Response Teams (CERT), hospital administrators, school board administrators, and the local media were all suggested participants and should be included in the damage assessment strategic planning (FEMA-EMI, 1995, p. FG-v).

The information contained in the Broward County Emergency Operations Plan (CEOP) stated in their Methodology statement, “In order for a county wide emergency management plan to be effective, it is imperative that all departments, agencies, divisions, and municipalities participate in the development of such a plan” (CEOP, 2001, p. BP-10). Regarding the procurement and delivery of rapid damage assessment post-impact information, they refer to this as Rapid Impact Assessment or RIA. It is the intention of the regional county EOC officials to obtain this data from fire-rescue operations personnel immediately following a major weather event. This theoretical approach has not been field tested since its development, however, the conceptual approach was confirmed during the personal interview with Paulette Kandal, the Chief

of Operations for the Broward County Emergency Management Agency. An interesting finding was that during the personal interviews with the two Deputy Chiefs of the City's fire-rescue department, both were unaware that this RIA task had been arbitrarily assigned to the fire-rescue department and neither of them were familiar with the countywide grid referencing system contained within the new CEOP document.

Obliviously a communication gap exists between the municipal and county emergency management officials regarding assumed, perceived, or tasked lines of authority and those responsibilities associated with post-storm restoration efforts of the public infrastructure. According to the student manual for the Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM), "The responsibility for conducting a damage assessment of large areas can be shared by emergency response agencies. Using this concept, specific agencies can be given responsibility for surveying specific items" (USFA-EAFSOEM, 2001, p. SM 8-6).

Informational comments obtained from a personal interview with the Deputy Chief of Operations for the City of Fort Lauderdale Fire-Rescue Department, Keith P. Allen (2002) regarding who should be involved or considered during the development of the post-impact assessment policy, he was recorded as saying,

> Right now the Fire Prevention Bureau using Fire Investigators and Fire Inspectors have the responsibility for damage assessment.… Operations personnel can also give a situational report from the roof top of the fire stations, a 'bird's eye view' of the surrounding neighborhoods .. But should they be the only ones? Perhaps the police should be considered and trained as well (2002).

Author, Professor of Sociology, and Director of the Disaster Research Center at the University of Delaware, Kathleen J. Tierney made several observations in her co-authored book, *Facing the Unexpected, Disaster Preparedness and Response in the United States* regarding organizational and governmental response to disasters. Her research noted,

> In the absence of prior inter-organizational and community planning, each responding agency will tend to perform its disaster-related tasks in an autonomous, uncoordinated fashion. Indeed, one of the challenges of disaster planning and management is to overcome the natural tendency of organizations to maintain their independence and autonomy and to encourage them to have a broader inter-organizational and community-wide focus (Tierney, Lindell & Perry, 2001, p. 121).

The preliminary research findings suggest and support the theory that the modern approach to solving the dilemma of who should be involved in the assessment process is a multi-agency, multi-jurisdictional, and possibly the not so obvious resources such as private corporations and community based organizations.

Researching data supporting the knowledge claim in research question four; *seeking what the national standard or program models are regarding rapid damage assessment reports*, here are the preliminary research findings. The first source examined in the search for a national model was the Federal Register Part II, 44 CFR Part 206 of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act.* There were no distinguishing references found specifically describing rapid damage assessment. However, there is a *Preliminary Damage Assessment Section (PDA)*

206.33. Within this section it stated “The Preliminary Damage Assessment (PDA) process is a mechanism used to determine the magnitude of damage and the resulting unmet needs of individuals, businesses, the public sector, and the community as a whole” (Federal Register, 1990, p. 2292).

Paulette Kandal, Chief of Operations for the Broward County Emergency Management Agency also mentioned the significance of the Preliminary Damage Assessment (PDA) compared to the rapid damage assessment. She explained that the PDA usually takes place days, and even a week into an event. The PDA and the formal Damage Assessment (DA) have different goals than the Rapid Impact Assessment (RIA) concept. “The rapid assessment only has meaning for a specific geographic area, measuring only gross damage such as wind and flooding, and used for determining search and rescue priorities” (2002). Paulette commented that she was unaware of any national standard for the rapid assessment. However, she suggested that the rapid assessment procedure contained within the Broward County Emergency Operations Plan (CEOP) was an easy to use RIA instrument that should satisfy and comply with any State or Federal guideline policies for conducting this phase of disaster response.

In the search for a national standard or model that described in specific detail the functions, components, or responsibilities of a rapid damage survey, several federal publications including literature obtained from the Emergency Management Institute (EMI), Federal Emergency Management Agency (FEMA), and United States Fire Administration (USFA) were examined. In each companion publication all used the same local situational (rapid) assessment model, this being a copy of the Salt Lake City, Utah Rapid Assessment Procedure.

This author also referenced some of the student manuals obtained while attending two resident courses at the National Emergency Training Center's Emergency Management Institute. Both weeklong programs were Integrated Emergency Management Courses (IEMC), Hurricane: Preparedness and Response, and Hurricane: Recovery and Mitigation, both provided extensive published material on the subject. One student manual ancillary reference book was the Recovery and Mitigation Toolkit, which was an assemblage of various job aids, worksheets and check-off sheet examples. It too used the Utah example as a model policy (EMI – SM Toolkit, 1999).

To summarize the literature review process, once the hypothesis was stated, the design of the study was the first element examined before the initiation of the research began. The literature review was structured around this particular *design* to discover the most reliable and valid findings. A variety of informational resources were examined. Given the nature and time resource constraints, the project primarily involved descriptive studies. Simply stated "what is…", rather than investigating the nature of the relationships between variables. This investigation was targeted at the discovery and interpretation of facts, keeping in mind *"The goal of all scientific endeavors is to explain, predict, and/or control phenomena"* (USFA-ED, 1998, p. SM 3-19).

PROCEDURES

Definition of Terms

Hurricane: "A tropical cyclone storm with a distinct counter-clockwise rotary motion and sustained winds of 74 miles per hour or more, and presents with an eye near the center of rotation" (Carpenter & Carpenter, 1993, p. 121).

Hurricane Season: "Begins June 1st and lasts through November 30th

The strongest storms generally occur in August, September, and early October on the Atlantic Coast. Storms during the early part of the season tend to strike the Gulf Coast" (Carpenter & Carpenter, 1993, p. 121).

Hurricane Warning: "The alert given when a hurricane is expected to strike within 24 hours, with sustained winds of 74 miles per hour or more, accompanied by heavy rain and high winds" (Carpenter & Carpenter, 1993, p. 13).

Hurricane Watch: "The alert given when a hurricane poses a threat to a certain coastal area within 36 hours" (Carpenter & Carpenter, 1993, p. 13).

Internal Barometric Pressure: "One of the most important indicators of hurricane intensity. Hurricane Gilbert, for example, which struck Mexico in 1988 had and observed central pressure of 888 mb (milibars) or 26.22 inches. This was the lowest barometric pressure ever recorded in the Western Hemisphere; Gilbert was a Category 5 storm (FEMA-IEMC, 1999, SM-2-8).

Saffir-Simpson Scale: " Was established to provide standards by which hurricane winds and storm surges could be measured on a Category scale from 1 to 5, with 5 being the most intense. The scale was named for its two developers: Herbert Saffir, a Florida consulting engineer; and Dr. Robert H. Simpson, a former director of the National Hurricane Center" (Carpenter & Carpenter, 1997, p. 25).

Research Methodology

Action and descriptive research methodology that included examining historical perspectives was conducted as well as using the research skills obtained during this author's undergraduate studies from a class taught by Public Administration Professor

Dr. Stephanie Johnson at Barry University, in Miami Shores, Florida, and referring to her lecture notes. Descriptive research methodology focused on studying what the present situation is and attempting to predict future events or suggest a course of action to shape the future. After examining the results of the descriptive research, action research was initiated to solve the perceived problem defined in the hypothesis, and apply new information/theories/methodologies aimed at developing a product to improve organizational performance (USFA-ED, 1998, p. SM 3-28). This researcher executed a variety of scientific methods and philosophical principles widely used and accepted in both the natural and social sciences.

First, the post-positivistic philosophy accepting that science is theory-laden and value-laden, and that it is possible to acquire knowledge about phenomena not directly observed by the senses (Johnson, 1999).

Second, if there is no way to test which theory is more valid we are left with a relativistic view, meaning that what we take to be true is a function of the particular theoretical framework we have chosen to adopt. Gradually, however, the weight of accumulated evidence builds the case for particular knowledge claims and theories. Also, the use of quantitative (statistical) analysis of our data helps researchers stay away from influencing the research results (Johnson, 1999).

Therefore, with the understanding of these principles, one of the major goals of research is to develop new knowledge. The new knowledge is valuable (necessary) because it will eventually lead to the improvement in the practice of public administration. It will make us more effective administrators (Johnson, 1999).

The descriptive function of research is heavily dependent upon instrumentation for measurement and observation. This author's applied research project initiated descriptive methodology in the procurement of credible and reliable information regarding rapid damage assessment planning for the fire service. Several diverse research tools were included in this comprehensive literature review process. These included the review of ARP practicum works of previous researchers, personal interviews with key City and county officials responsible for local emergency management policy making, and a through review of the policies and procedures regarding rapid damage reports of like sized fire departments in the South Florida region.

As mentioned in the literature review section of this report, commencement of the literature review logically began at the NFA LRC for reasons specified earlier. The findings were not as fruitful as initially anticipated. Subsequently, an extensive search of the subject was conducted at the Broward County Main Library located in Fort Lauderdale, Florida. This revealed a small number of damage assessment books and periodicals. Several business and trade journals proved useful. However, most books on the subject related to civil disorder damage surveys, estimation of earthquake losses from seismic activity, damage predictions from thermal impulse of nuclear weapons, or estimates for flood events.

A comprehensive query on the World Wide Web and the Microsoft Internet Explorer search engine using key words "damage assessment", "damage estimates", and "emergency management" revealed over 300 possible sites. However, most of these references were advertisements for corporate business. The remaining sites

again dealt primarily with the insurance industry, flood damage estimates, and tabulated structural data for earthquakes.

Another information resource used during the search for comprehensive emergency management planning concepts as they related to emergency services was the library at the City of Fort Lauderdale Fire-Rescue Department's Training and Special Operation Bureau. Disappointedly, the informational resources were sparse when focusing on rapid damage assessments for the fire service.

Benchmarking was the next choice of gathering data for this research project. Benchmarking is an attractive innovation strategy because is can be relatively easy to understand and apply. It is something that many of us have done. The methodology is flexible and can be modified to fit within a wide range of settings. A pen, notepad, and markers, Post-its, a telephone, a Rolodex, and the key players are all that is responsible for the process. "The objective is to identify the best-in-class and to duplicate or surpass their performance" (Cohen & Eimicke, 1998, p. 75). Therefore, a random solicitation using the telephone to area fire-rescue departments requesting copies of their rapid damage assessment policies was executed.

Interviews were another source of information and were conducted with individuals holding key positions within the City of Fort Lauderdale, Florida Fire-Rescue Department and the Broward County, Florida Emergency Management Agency. Deputy Chief of Operations Keith P. Allen and Deputy Chief of Administration Rhoda M. Kerr were the selected respondents for the fire-rescue department because of their knowledge of emergency management and it is their responsibility to oversee this function of the Department. Ms. Paulette Kandel who is the Chief of Operations for

Broward County Emergency Management Agency was another logical choice because of her role and responsibilities at the regional level. The questions for the interviews were carefully constructed and developed to measure specific aspects of the research objectives. Open–form questions were chosen to enhance the qualitative and accurate nature of the information sought. Before the interview questions were developed this author referenced Borg and Gall's book *Educational Research: An Introduction* following the suggestions outlined under the subtitle *The Interview as a Research Tool* (Borg & Gall, 1989, p. 444).

Administering personal interviews, in order to expose the respondents to a "nearly identical" experience, all statements, interview questions, and closing remarks were structured. This should produce reasonably comparative data (Borg & Gall, 1989).

The advantages cited using personal interviews in the design of the study is that it involves the collection of data through direct verbal interaction, the depth of the information is superior to other tools, and the principal advantage is its adaptability (Borg & Gall, 1989).

These personal interviews were conducted at the FLFRD headquarters during the week of May 6th 2002. Consent to audiotape the conversations was given by each respondent to aid in the accuracy of recorded statements. Refer to Appendix A for an example of the personal interview form used. Confirmation to the authenticity and content of the interviews can be verified by calling the main number of FLFRD Fire Administration at (954) 828-6800 between the weekday hours of 0800 and 1700 EST and ask to speak with any of the listed respondents.

To summarize the research methodology, following the steps of David R. Krathwohl's *Model of the Chain of Reasoning* was the logic behind this author's research approach. Following a model will aid in the replication of future study of the knowledge claim being investigated. He suggested first, study the conclusions from previous research, which includes explanations, rationale, theories or points of view. The second step, develop questions, hypotheses, predictions, or models. Third step involves the design and structure the study. Fourth step is to gather the data researching subjects, situations, observations, and basis of comparison and procedures. The fifth step is to summarize the data. The sixth step recommends determining the significance of the results. The seventh step is developing conclusions of the study. The final step is the beginning of the next study by the same or different researcher (Borg & Gall, 1989).

Assumptions and Limitations

The procedures employed during this research project were based on several fundamental assumptions. It is assumed that all authors referenced in the literature review performed objective and unbiased research. Secondly, it was assumed that all memorandums and recorded meeting minutes obtained from the City of Fort Lauderdale, Florida were accurate.

Third, assumption and possible limitation contained in this research study, relates to data that was obtained in the benchmarking process. During the research and data collection phase random phone calls to fire rescue departments in the region were made in an attempt to solicit information regarding their rapid damage assessment policies for hurricane response. This was a unique opportunity to obtain data with an

immediate response from numerous local departments, to sample agencies of different size, scope, and cultural and/or ethnic diversity. However, this sampling technique was identified in Borg and Gall's book as a common mistake and possible bias of the data collected. "A common mistake in educational research is to investigate persons from the appropriate population simply because they are available" (1989, p. 214). Some educators refer to this as "convenience sampling". A more valid and accurate scientific study would have included more variance within the dependant variable. Perhaps mailing a request to a broader population would have produced more valid results.

Walter R. Borg and Meredith D. Gall further explained that the method of selecting a sample is critical to the whole research process and that "the sample should be a *representative* of the population from which it is drawn" (1989, p. 214). Even with these possible bias or sampling errors the information and data collected was very useful in this authors research. Furthermore, this limited data supported the theory regarding the absence of rapid damage assessment being a global issue throughout many fire rescue departments. This author speculates that government agencies have not embraced the logic and rationale behind rapid damage assessment for unknown reasons. This could be a topic for future study itself.

The fourth assumption regarding this author's research finding relates to the effectiveness and accuracy of data obtained when conducting personal interviews. It was assumed that the respondents answered all the questions fairly and accurately. However, according to Borg and Gall's book, *Chapter 11 The Methods and Tools of Research* it outlined several disadvantages regarding interviews. One of those noted was the fact that "Important limitations of the interview stem from the nature of the

process. The flexibility, adaptability, and human interaction that are unique strengths of the interview also allow for the subjectivity and possible bias that in some research situations are its greatest weakness" (1989, p. 448).

Response Effect of the personal interview was also noted as a potential limitation and refers to the tendency of the respondent to give inaccurate or incorrect responses, or more precisely "is the difference between the answer given by the respondent and the true answer" (Borg & Gall 1989, p. 448).

There are two other potential sources of error associated with interviews to be aware of during the structure phase of the research. First, is the *predisposition of the respondent,* which refers to the respondent being suspicious or hostile to the research, or indifferent or not motivated to cooperate.

The second source of potential error relates to the *predisposition of the interviewer* and includes: 1) Being comfortable with the people which you are interviewing. 2) Being ill at ease in the environment, which you are working. 3) Allowing one's opinions to influence what one hears or records. 4*)* Being able to establish a rapport with the respondents. 5) Having stereotyped expectations of what people are likely to say.

Conversely, with these assumptions and possible limitations, the information gathered from the personal interviews was invaluable to this author's research and gave real insight, and depth into the fire administrator's perspective of the situation. As a point of interest Borg/Gall noted abundantly more advantages to the personal interview that disadvantages. A list of some of these advantages was included in the research methodology section of this study.

Another significant limitation was available information relating to the subject. This was also noted in the research methodology section of this report. Unfortunately, within the vast amount of research information discovered using the keywords “damage assessment” or “damage estimates” the majority related to insurance claim adjustments, or flood damage estimates. This limitation applied to both library queries and searches conducted on the World Wide Web.

The final limitation is *time*. The six-month time limit imposed by the National Fire Academy as it relates to applied research did not allow for a more in depth and comprehensive literature review on the subject. The current career position held where this author is employed demands an inordinate amount of time and dedication as a bureau head. This element of time is further compressed with continuing education requirements and the time investment conducive for family happiness and prosperity. One who strives for excellence and academic achievement must equally manage time. Ultimately success equates as sustained equilibrium between these*. “The executive who works from 8:00 a.m. to 8:00 p.m. every day will be both very successful and fondly remembered by his widow’s next husband”* (Henry Ford, n.d.).

RESULTS

Following an aggressive literature review of the subject, and based on the interpretation of these findings thus far. This researcher is making the following educated conclusions in answering the four research questions.

Research Question 1: What is damage assessment as it relates to the contemporary approach of integrated emergency management?

The discovery and examination of informational resources contained within the literature review, has provided several answers that indicate a commonality of data describing the possible definition of damage assessment and its association with modern emergency management principles. The most prevalent noted common denominators are,

> The ability of local government to perform a rapid damage assessment accurately and within the first few hours after an incident is critical to providing an adequate local government response for life threatening situations and imminent hazards. Coordinated and timely assessments permit local governments to prioritize response activities, allocate scarce resources, and request mutual aid assistance from state and federal sources (USFA-EAFSOEM handout, 2001, p.1).

Consequently, if there is not a comprehensive approach to disaster preparedness and response, a preplanned strategy, a “plan of action” to gather disaster intelligence regarding the severity and location of the areas hardest hit, then our emergency and recovery response is fragmented and compartmentalized. Kathleen J. Tierney, Michael K. Lindell and, and Ronald W. Perry documented this observation in their book *Facing the Unexpected, Disaster Preparedness and Response in the United States*. They noted “Fragmentation is evident across the different phases of the disaster cycle. Response-oriented organizations such as local emergency management agencies frequently lack ties to the community development and building safety departments that have jurisdiction over measures that can mitigate the effects of hazards, as well as to the organizations that would play a role in recovery decision

making should a disaster occur. This compartmentalization blocks the free flow of information among parties responsible for different stages in the disaster management cycle, militating against the kinds of action that are needed to reduce the impacts of disaster" (Tierney, Lindell, & Perry, 2001, p. 257).

In the student manual for the EAFSOEM program in *Chapter 8: Damage Assessment* it described damage assessment as "gathering information related to the impact of an event, or series of events, on life and property within a defined area" (USFA-EAFSOEM, 2001, SM p.8-3). This damage assessment process is a continuum throughout the initial response efforts of the operational (active) phase, and into the demobilization (concluding) phase of the event. However, the research supports the theory that different government agencies each has their own individual description of the types of damage assessments conducted during the disaster cycle each with slightly contrasting missions or goals.

The EAFSOEM student manual defined two distinct types of damage assessments taught in the EFOP curriculum: *immediate* and *post-incident*. "Immediate damage assessments are conducted during the initial stages of the event or incident. The immediate damage assessment determines the amount of damage, or probability of damage, that the event already has caused. This specifically includes the impact on life and property within the incident site or area" (USFA-EAFSOEM, 2001, p. SM 8-4).

Referring to the post-incident damage assessment it stated,

> A post-incident damage assessment is conducted after the emergency response stage has stabilized. The purpose of the post-incident damage assessment is to

> provide detailed information on the total amount and types of damage sustained by the community or area from the event (USFA-EAFSOEM, 2001, p. SM 8-7).

There was a slightly different description of the initial damage assessment contained in the Emergency Management Institute *Rapid Assessment Planning (WEM)* publication. They referred to the initial or immediate damage assessment as a *rapid* assessment, and the theoretical approach is a gross overview of the situation. Fundamentally it is the same conceptual process and objectives as the EAFSOEM assessment, with a different name. This was also very similar to the concept of the Rapid Impact Assessment (RIA) in the Broward County Comprehensive Emergency Operations Plan (CEOP) as recorded during the personal interview with Ms. Paulette Kandal who is the Chief of Operations for the Agency. Ms. Kandal was recorded as stating,

> The RIA actually has two specific functions. First, it provides your department and us at the county EOC with a situation report of your municipal jurisdiction regarding the damage suffered. Secondly, if it indicates that significant damage has occurred... That is if we start getting a large number of grid reports of Category 3's or 4's for wind and flooding then this helps speed up local assistance in the form of mutual aid ,and if serious enough, the request from the county administrator to the Governor of the State requesting State or Federal assistance if necessary (2002).

The EMI (WEM) publication simply defined the rapid assessment as "including all immediate response activities that are directly linked to initial assessment operations when determining lifesaving and life sustaining needs and imminent hazards" (FEMA-

EMI, 1995, p. SM FG-1-3). This definition generally summarizes the characteristics and functions of a "rapid" damage assessment. Each region or state should determine who would be responsible for surveying pre-determined target sites to reduce duplication of effort. The Broward County CEOP clearly defines what agency is responsible for the RIA of specific lifelines or critical infrastructure facilities.

Research Question 2: What are the benefits to a community of having the ability to perform a rapid damage assessment procedure in place?

The discovery and examination of informational resources contained within the literature review has provided several answers that indicate a commonality describing possible benefits and remuneration to communities that have taken a proactive position, and have included rapid damage assessments as part of their strategic emergency management hurricane planning. Among the most frequently indicated were those regarding prompt assistance and coordination of local and mutual aid resources, and expedited reimbursement or eligibility funding during the response and recovery stages.

The State of Florida Department of Community Affairs (DCA) who has the responsibility for the Division of Emergency Management within the State described one benefit as, "Emergency response can be more effective, equipment and personnel can be better used, and help can be provided quicker, if a through damage assessment is performed" (FL-DCA, 2002, da p.1).

The DCA also included a description of other types of assistance that communities could be eligible for if the disaster was a significant event such as a major hurricane or flood. However, it stipulated that damage assessments must be executed

beforehand. The eligible types of assistance were explained as “In the aftermath of a disaster, both public and private non-profit and individual damage assessments must be performed, because of the corresponding types of federal/state assistance available. Each type of assessment is designed to quantify the eligible amounts of damage a community incurred” (FL-DCA, 2002, da p. 1). The DCA website categorized each of the types of assistance benefits into two specific areas, Public Assistance, and Individual Assistance.

The State DCA listed an extensive list of the public assistance eligibility benefit projects in the public assistance group, and they acknowledged, “Public Damages can include any damage incurred by a structure or facility which is owned by a public or private-nonprofit entity. This could include roads, bridges, buildings, utilities, etc. To be eligible the damages must fall into certain categories” (FL-DCA, 2002, da p.1).

Ms. Paulette Kandal confirmed the availability of these assessment benefits during the personal interview conducted as part of the research for this report. She emphasized that there are several different types of damage assessments performed by emergency management staff. The State of Florida has Damage Assessment Teams that respond and closely examine and estimate damages for reimbursement purposes for municipal losses such as fire apparatus, roadways, and public infrastructure. She pointed out not to confuse the *rapid damage assessment process* with the other types of detailed, finite damage assessment reports such as Preliminary Damage Assessments (PDA) and formal Damage Assessments (DA) using project work sheets going “item by item, or building by building”. Ms. Kandal also stated that the RIA process actually speeds up the arrival of the more detailed PDA and DA assessment

teams, "…[so] indirectly the RIA is important to disaster response and long-term recovery, especially when time is critical and the disaster is of a serious nature" (2002).

Deputy Chief Kerr during her interview provided this answer regarding rapid damage assessment benefits:

> The rapid damage concept will benefit the community in several ways, it will at a glance indicate where we need to focus our resources and our efforts city-wide, it provides information whether or not mutual aid is needed, also it may indicate the necessity for move-ups and the activation of staging or standby points for a task force or strike force. It may speed up the notification process for hospitals to expect an influx of patients. It's a 'quick' comprehensive regional look at the disaster and indicates the impact on the City, how we should respond, and with what (2002).

Another benefit discovered is the assessment of damage sustained the business community, utilities and lifeline infrastructure. The quicker that we can open up roadways and clear debris, the quicker the restoration process can begin. Researching the damage reports from Hurricane Andrew, this author found a report titled *Impact of Hurricane Andrew on Performance, Interaction, and Recovery of Lifelines* published by the EQE International. They noted some post-storm impact logistical problems during the damage assessment of the electrical transmission grids for the Florida Power and Light Company.

> Not until the hurricane had actually passed by was the magnitude of its fury understood and even then it took several days to come to terms with the utter destruction that was left in its wake. While damage estimates in the fossil plants

> crept up into the tens of millions of dollars, this was small in comparison to the hundreds of millions of dollars in damage to the transmission and distribution system, and insignificant when compared to the tens of billions of dollars of damage to the entire community (EQE, 1996, p. 7).

The prompt restoration of electrical power, hard wire telephone system and domestic water and sewer systems cannot be over emphasized. Not only to the residents but also to the business community who's services support the quality and necessities of life. Early RIA reports again will assist in the evaluation of lifelines and critical facilities. Another observation noted in the EQE report was,

> Looters preyed upon the damaged and destroyed homes and businesses. This necessitated that most of the people remain close to their homes to protect and defend the property. The effectiveness of police and fire rescue had been badly impacted by the loss of all services and the impassability of the roads (1996, p. 8).

With the lessons learned from Andrew and the "helter skelter" damage assessment reporting commonly accepted during that period of time (1992), and with many emergency management theories not yet field tested and still in developmental stages, we now have the knowledge that timely Federal and State assistance can possibly prevent situations like this from reoccurring by judiciously embracing the rapid damage assessment principles by providing early situation reports.

Research Question 3: What components, agencies, organizational concepts, and individual tasks should be considered when developing a rapid damage assessment tool?

The discovery and analysis of informational resources contained within the literature review, has provided several answers that indicate a commonality of data that suggests the inclusion of interagency, interdepartmental, and community based organizations, and some private resources working together in a collaborative effort to accomplish the task of conducting a through and complete rapid damage assessment of the disaster event.

The Emergency Management Institute (EMI) publication, *Rapid Assessment Planning Workshop in Emergency Management* recommended the team approach. Especially in situations where the City has some pre-warning such as the case for hurricanes.

> When communities have a warning of an impending event, local, State and Federal assessment teams pre-deploy and work together to conduct situation assessment. For events that occur without warning, such as earthquakes, rapid assessment must be conducted, at least initially with local resources only…In any event, rapid assessment information lays the foundation for determining immediate response efforts and later Preliminary Damage Assessments (PDA) (FEMA-EMI, 1995, p. FG-1-3).

The Broward County Comprehensive Emergency Operations Plan (CEOP) also endorses this pre-storm deployment approach. However, it suggests that the lead assignment be given to the fire rescue department. Described in the CEOP RIA procedures it states,

> Each jurisdiction is responsible for coordinating and reporting the RIA of grids within their jurisdiction. The jurisdiction should assign in advance the responsible agency or agencies to perform the RIA. It is encouraged that the lead agency be the local fire service (CEOP, 2001, p. 3.0).

Before the initiation of research for this paper, the planned assignment of RIA was an unknown to the majority of Operations and Administration personnel in the City fire-rescue department.

Some authors who conducted research in emergency management planning have contrasting points of view regarding the disaster response capabilities of the local law enforcement and fire rescue departments. Environmental, Health and Safety Consultant and author of *Emergency Response Planning for Corporate and Municipal Managers,* Mr. Paul A. Erickson expressed his concerns on page 51 of his book. He wrote,

> Although their main interest was in response activities rather than preparedness, researchers Wenger, Quarantelli, and Dynes (1989) did reach some general conclusions about police departments, they concluded -- they tend to devote few resources to emergency planning, although they may be assigned responsibilities in community-wide disaster plans…The police appear to believe that disasters can be handled through the expansion of everyday emergency

> procedures - that is, they do not consider the qualitative difference between disasters and everyday emergencies. Fire Departments have improved their preparedness levels and expanded their disaster-and-crisis-related tasks beyond firefighting…Nevertheless, like police departments fire departments show a tendency to plan internally (1999).

This traditional autonomy nature of public safety agencies was also noted as a common fault in the literature review of this paper by authors Kathleen J. Tierney, Michael K. Lindell and Ronald W. Perry and mentioned in their book *Facing the Unexpected, Disaster Preparedness in the United States.*

The DCA Emergency Management Plan for the State of Florida recognized the efficiency of the team concept and encouraged local governments to perform the damage surveys. The document stated, “To conduct an accurate damage survey, local governments must have capable Damage Assessment Teams. These teams should be identified and trained in advance of the disaster so they will be ready when needed” (FL-DCA, 2002, p. 2).

The composition of the rapid Damage Assessment Teams will vary with each municipality. What works well in Miami, Florida is not necessarily ideal for Charleston, South Carolina. Other aspects that may affect the agencies or individuals assigned to rapid damage assessments is the type of disaster assessment being surveyed. Certainly the response and rapid damage assessment functions performed following a seismic event will contrast that of a post-impact hurricane assessment. A majority of the principles and organizational concepts for conducting the assessment remain unchanged, but the delivery method and event specific considerations may differ.

Research Question 4: What is the National standard or program model regarding rapid damage estimate reports?

As mentioned in the literature review section of this paper, this author was unsuccessful discovering the known existence of a National model or program during the research phase of the project other than the Salt Lake City, Utah example. This sample was found in the appendices of several FEMA, EMI and USFA publications that are primarily intended to educate and assist individual communities to design, develop, and implement their own rapid damage assessment policies and procedures specific to their personal needs.

The Emergency Management Institute publication titled *Integrated Emergency Management Course Recovery and Mitigation Toolkit* also used this Utah illustration in Appendix D, and the entire manual proved to be an invaluable resource guide. They provide an assortment of worksheet examples such as data management job aids including; Sector Life Safety and Lifeline Status Checklist, Facilities and Imminent Hazards Sector Status Worksheet, Resource Allocation Status Report and Situation Report Forms to aid in the design process of the damage assessment procedures.

They also recommend exercising the document before making it policy. It stated in the EMI Rapid Assessment Planning Workshop in Emergency Management (WEM) publication,

> Before finalizing the rapid damage assessment procedures, it will be necessary to test the draft procedures thoroughly. The planning process for testing the rapid assessment procedures should include; making assignments, developing an

action plan, briefing all personnel from all participating agencies involved in the process, and developing specific training (FEMA-EMI, 1995, p. FGIV-1).

DISCUSSION

The intention of this report was to initiate descriptive and action research methodology in the study of what is happening now, to try and predict future events, or establish a course of action to shape the future (USFA-ED, 1998). The hypothesis being that the presence of a rapid damage assessment plan for an organization would significantly enhance the outcome of post-storm emergency response and recovery efforts, thereby providing a foundation for sound, logical decision making and the facilitation of a coordinated emergency response effort. Conversely, the absence of rapid damage assessment intelligence would adversely impact the organization as a whole; government capabilities would be stretched beyond their limits. Recovery programs would be put into place rapidly, but not rapidly enough to assist all the people with immediate needs following a hurricane. The null hypothesis being there is no relationship between seamless comprehensive emergency management planning and the success of an organization's response to post-impact hurricane recovery by having an effective rapid damage assessment plan or policy in place.

Researchers tell us that before we are able to explain a set of phenomena, it means that we can describe, predict, and control the phenomena with a high level of certainty and accuracy. Research explanations take the form of theories about the phenomena being investigated. The factors involved (known as "theoretical constructs") refer to elements common in many different phenomena. Theoretical knowledge is important because it provides a succinct formula for predicting and controlling many

different phenomena involving different persons and settings and occurring at different times (Johnson, 1999).

One such theoretical construct, which both supported the hypothesis and was frequently, mentioned by many of the author's works listed in the reference section of this report, was the element of *strategic emergency management planning.* The roots of strategic planning are in the military decision-making process. This technique enables one to build a plan around the mission of the organization itself. Each one of the objectives and specific steps of your idea must fit into the overall mission of the organization, as well as the political, economic, and other environmental factors that may come into play.

In particular, strategy is about setting priorities and defining, developing, and defending organizational capacities that society value enough to pay for. You must prove to skeptics that your plan is beneficial and possible. Remember that the mission of the organization is relatively fixed – you can't change it to fit your ideals. So strategic planning is about presenting your ideas in a way that they coincide with the mission. The primary benefit of strategic planning is that it forces one to examine what you are doing comprehensively, the "big picture" (Johnson, 1999).

One of the fundamental assumptions that this author brings out in this report is that improving policies in response to the hurricane problem first requires that the hurricane problem (the big picture) be well understood and defined. The approach was to quantify the uncertainty, assuming that developing more effective solutions depend upon first understanding the problem being faced. Therefore, understanding some of the characteristics, meteorological nomenclature, and climatological features associated

with a hurricane may help, but remember a hurricane has also a great deal of uncertainty involved with the phenomena which makes it difficult to predict where it will make landfall, when will it hit, and how intense will it be, there are no guarantees. The following descriptions were taken from the student manual of the Integrated Emergency Management Course (IEMC) *Hurricane: Preparedness and Response* (FEMA-IEMC, 1999, SM).

A hurricane begins over warm ocean waters as an area of thunderstorms in the tropics and subtropics near the equator off the northwest coastal continent of Africa, this is known as a *Tropical Disturbance*. As the area become more defined, a counterclockwise or cyclonic flow begins to form at the surface. Winds increase in speed and the storm becomes better defined. As intensification continues the internal barometric pressure decreases. With storm winds from 39 – 74 miles per hour (mph) it is known as a *Tropical Storm*. When sustained wind speed exceeds 74 mph, the storm is classified as a *Hurricane*. It may take several days for this formation process to be completed.

Hurricanes are very large weather systems possessing enormous destructive capacity. A hurricane is classified on the Saffir-Simpson scale into one of five categories, with Category 1 being the weakest hurricane and a Category 5 being the strongest in terms of wind speed and storm surge. The high pressure winds of a hurricane, coupled with the forward movement of the low pressure at the center, produce a dome of water ahead and to the right of the center know as the *storm surge*. In very intense hurricanes, the surge can reach more than 20 feet above existing tides. This storm surge is the primary source of destruction associated with a hurricane.

As a hurricane approaches land, heavy rainfall arrives in *bands*. These bands of rain may pass through any given area in a matter of an hour or two and then let up for a length of time, followed by another band of rain. It is suggested to coordinate your pre-impact efforts between these bands as the storm approaches. Expect moderate to severe flooding conditions long before the storm actually strikes (FEMA-IEMC, 1999).

The hurricane's cyclonic flow also produces what is referred to as the "*dirty side*" of the storm. As landfall occurs, the highest winds are associated with the portion of the storm ahead and to the right of the center. These are produced by the counterclockwise flow coupled with the storm's forward movement. The highest storm surge is also associated with the storm's dirty side. The most destruction will occur in the areas affected by this portion of the storm (FEMA-IEMC, 1999).

In the center of the storm exists an area where the winds are actually calm and the sky is blue. This is known as the *eye* of a hurricane. If the eye passes over a particular location is can be both a blessing and a curse. It allows emergency personnel a few minutes to do a quick damage assessment and to perform emergency repairs before the opposite wall of the eye arrives. Those unaware of the eye phenomenon may gain a false sense of security thinking the storm has suddenly passed, when it is actually only half over (FEMA-IEMC, 1999).

Hurricanes are large-scale meteorological phenomena with effects that can reach 200 miles from the center of the storm. These are known as *Wind Fields* and contain gale force winds. Hurricane force winds can extend 50 miles from the eye center. They are associated with many sources of destruction, including the storm surge, high winds, tornados, lighting, and freshwater flooding. It is very difficult to predict hurricane

probability for landfall. Within 24 hours, the forecast position of a hurricane could be off as much as 100 miles. Forward speed and intensity are the most difficult to predict. “Given these difficulties emergency management personnel need to be prepared to live with some uncertainty when they are dealing with a hurricane threat, and immediate response and recovery plans should one make landfall” (FEMA-IEMC, SM, 1999, p. 2-11).

The claim of just how destructive a hurricane can be, and how this frequency and dollar amount is ever increasing is supported in a book written by scientist and professor at the University of Colorado, author Rodger A. Pielke Jr, and his father Rodger A. Pielke Sr. who is also a scientist with the National Oceanographic and Atmospheric Administration (NOAA). In their book: *Hurricanes, their Nature and Impacts on Society*, it was noted, “Damages averaging over $6 billion annually for the period from 1989 – 1995 as compared to $1.6 billion annually from the period 1950 –1989” (1997, p. xiv). They attribute this increase not because of monetary inflation or storm frequency, but to the increased development and population density of the coastal regions. Simply more people and property exposed. This may be a comparative, similar to the growth pattern and developmental prosperity of Fort Lauderdale.

Refocusing back on the theoretical construct of strategic emergency management planning now after having an understanding of the destructive nature and unpredictability of a tropical cyclone, we can appreciate the dogmatic approach of many emergency managers, who are faced with the dilemma of convincing municipal government officials that the theory of *preparedness* is the key. In the book from the International City Management Association (ICMA) titled *Emergency Management:*

Principles and Practice for Local Government it defined the preparedness planning process. Damage assessment information is critical to the recovery process, and deeply rooted in modern emergency management planning as described in the answers to research question 1. The ICMA book provided additional evidence supporting the pre-planning theory, and noted,

> Preparedness is a continuous process. The development of a written plan at a specific time is only a small part of the total preparedness process. It is a serious mistake to assume that preparedness is complete merely because a written document has been produced. Plans need to be kept up to date. And must change to meet new conditions and requirements. An out of date plan may be worse than no plan at all if time is wasted trying to put to work (1991, p. 34).

This author examined both the City of Fort Lauderdale Fire-Rescue Hurricane Plan, which was revised in 1993 (nine years ago), and the City of Fort Lauderdale Comprehensive Emergency Management Plan, which was revised in 1995. Both manuals could be updated to reflect and align with the new Broward County Comprehensive Emergency Operations Plan (CEOP), which was revised in 2001. Both City documents address the requirement of performing a damage assessment, but they lack clearly defined lines of authority of whom, and when, the task will, be performed. Rapid damage assessment was not mentioned or a concern in either plan.

Smith provided research in his 2001 ARP *The role of Palm Beach County Fire Rescue in Post Disaster Assessment* that agreed with the periodic update of policies to keep up with the changes at the State and Federal levels and he noted that the plans should be similar in nature to those as well.

> Local CEMPs are not required to mirror the State CEMP, but should identify the organizational structure and resources available to the jurisdiction to prepare for, respond to, recover from, and mitigate identified hazards. The local CEMP is designed to parallel the Federal Response Plan's 12 Emergency Support Functions (ESF) and the State Plan's 17 ESF functions (Smith, 2001, p. 7).

During the personal interviews with both Deputy Chief Officers from the City of Fort Lauderdale (Allen & Kerr), they agreed with the need to update our current department Hurricane Response Plan and include a rapid damage assessment policy consistent with what the county EOC officials had developed. Deputy Chief Rhoda Kerr commented,

> This information can go to the county so they in turn know what resources they will need to send. Important information such as the streets are totally impassable for blocks, or minor flooding and debris in the area around the station would certainly be helpful in making those kinds of decisions (2002).

Another theoretical construct that supported the knowledge claims being researched and demonstrated frequency within the literature review was the element of benefits associated with rapid damage assessment, both direct and indirectly to the initial response and recovery operations. The most outstanding "direct" benefit of the rapid damage assessment is "The ability of local governments to perform a rapid assessment accurately and within the first few hours after an incident is critical to providing an adequate local government response to life-threatening situations and to manage scarce resources wisely" (FEMA-EMI, 1995, FG p. 1.1).

An example of an indirect benefit was found in the literature inside a FEMA publication describing the *Federal Response Plan Executive Overview.* It listed some of the benefits that the federal government can provide. However, damage assessment reports must precede this request of State or Federal assistance.

> Local government is primarily responsible for preparing for disasters that might affect a community and for helping residents recover from such events. Most disasters are handled successfully at the local level. State and Federal resources are available to assist the community only when local resources are overwhelmed (FEMA, 1999, p.1).

In contrast, also within the research discovery of possible benefits, were the consequences for the lack of rapid damage assessment reports following disasters. These notes made by Rodger A. Peilke Jr. and Rodger A. Pielke Sr. in their book *Hurricanes, their Nature and Impacts on Society*. Pielke's research supported the theory of poor post-disaster damage reports, and documented the delay in the federal response to Hurricane Andrew as;

> Hurricane Andrew was the first time that the federal government's 'Federal Response Plan' had been used since it had been extensively modified following hurricane Hugo in 1989. The federal government's response to Andrew was widely criticized. A General Accounting Office evaluation of the response found a number of flaws, which stated; the plan lacks among other things, provisions for a comprehensive assessment of damages and the corresponding needs of disaster victims. In addition, the response in South Florida suffered from miscommunication and confusion of the roles and responsibilities at all levels of

government - which slowed the delivery of services to disaster victims (2001, p. 177).

They went on to further quote some of the local emergency management officials at the time. “The official assessment of the federal response were aptly summarized by a frustrated Dade County Official who characterized the federal response as ‘a whole lot of resources but no coordination’” (Pielke & Pielke, 2001, p. 177).

To summarize the report discussion of the subject, this author has provided credible, verifiable, and accurate data that support the hypothesis. Even with the possible biases and remote data contamination described within the limitations section of this report. The information profoundly substantiated the argument raised and illustrated a true need for the City of Fort Lauderdale Fire-Rescue Department, to transition from its current reactionary “demand-response” mode following a hurricane impact. To a more progressive ideology incorporating some of the ideas and components inherent to modern emergency management concepts regarding the importance of a systematic and rapid method to report damage severity.

“So when the devil wishes to terrify them, he promises them the Huracan, which means ‘tempest” (Captain Fernando de Oviedo, n. d.).”

RECOMMENDATIONS

The hurricane is one of nature’s most intense phenomena and one of the coastal resident’s greatest fears. Through coastal development and significant growth, the City of Fort Lauderdale has become more vulnerable to the impacts of hurricanes than at any time since it’s incorporation in 1911. In spite of the remarkable scientific and

technical advances made in this century, it is due in significant part to luck that there has not been a large loss of life as this region had experienced during it's early development. "Hurricanes have not recently struck our most vulnerable places. As society's vulnerability continues to grow, hurricane impacts will become a more important policy problem" (Pielke & Pielke, 2001, p. vi).

One of the terminal objectives of this research paper was to provide a framework and highlight the interrelated, interagency, and intergovernmental aspects of hurricane response and recoveries hoping that others with authority and responsibility for decision-making might better understand the nature and destructive impact that hurricanes bring. This author considers this paper a success if it stimulates debate, discussion, and further reflection on the hurricane problem within our City, and if this dialogue has a positive influence in the policy process. Another spin-off benefit is to be innovative, or at least have the perception of innovativeness and to comprehend and understand contemporary approaches to problem solving in public administration.

To be innovative means simply to try something new. But to do something new implies taking risks. Innovative communities are those that do things first, that are receptive to creative solutions to problems. "Studies of structural innovations in government suggest that if important communities adopt a new structure, other communities are more receptive to it" (Bowman & Kearney, 1990, p. 361).

Some communities specialize, that is, they develop reputations for innovativeness in certain areas, such as environmental protection or government structure. This author is presenting a unique opportunity for our Department and

community to experience change, and hope that the Senior Staff of the Fort Lauderdale Fire-Rescue Department will champion these “innovative” policy change ideals.

The recommendations of this report are designed to be a guide to the consensus-building requirement necessary to facilitate policy change within the City of Fort Lauderdale Fire-Rescue Department. It is important to recognize that there is no one correct model for integrated emergency management planning regarding rapid damage assessments. However, this author chose to use benchmarking as the innovation tool of choice for the design and structure of this damage assessment tool. “Benchmarking is basically applied common sense. You pay attention to what your peers are doing and search for the best way to do things (Johnson, 1999).” The Broward County Emergency Management Agency has already developed a Rapid Impact Assessment (RIA) as part of their Comprehensive Emergency Operations Plan (CEOP) and it was their intention, and is mandated through State legislation pursuant to Chapter 252 of the Florida State Statutes *State Emergency Management Act* for the twenty-seven municipalities within the county to adopt and use the same instrument. (Broward County CEOP, p. BP-4).

Florida State Statute 252 specifically cites; “the State Emergency Management Act requires that political subdivisions develop emergency plans, which are consistent and coordinated with the emergency planning of State government (Broward County CEOP, p. BP-4).” Furthermore, it is clearly specified within the Federal Emergency Management Agency (FEMA) federal register 44 CFR *(Code of Federal Regulations)* Part 206 of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act; Implementation, etc; Final Rules*, *1. Preliminary Damage Assessment – Section 206.33*;

Public Law 93-288, as amended by Public Law 100-707 (“the Stafford Act”) “As part of a continuing efforts to streamline the disaster declaration process, FEMA is encouraging one combined damage assessment by State and Federal officials prior to a Governor’s request for assistance” (1990, p. 2285). Therefore if our City expects to be eligible for any State and/or Federal recovery assistance or funding, a damage assessment must be completed prior to requesting this assistance.

With the requisite conditions contained within these State statutes and the FEMA Federal Register, it appears that the City of Fort Lauderdale is not only *obligated* to perform a rapid damage assessment, it is mandated through legislation and has a legal responsibility, … a *“commandment”* that this function be completed in a timely manner to facilitate response and recovery assistance.

The research data presented vigorously supports the theory and indicates that progress is taking place at the Federal, State, and county level of emergency management government to provide assistance and support to local municipal government. However, much of our City policy for hurricane response and recovery remains unchanged through time. Similar in respect to the theoretical works of Charles Lindblom’s “disjointed incrementalism” or “muddling through” theory. He suggested that “City planners and policy makers should be strongly influenced by precedent, and by experience, and that they should recognize the advantages in many cases of policy options that represent marginal or incremental changes from previous policies (Levy, 1997). While this thought process is the safe conservative posture, this researcher is suggesting a more radical and contemporary approach. Based upon this research, the following three recommendations are being made to support the argument raised.

First, this author is respectfully requesting that the information presented in this proposal be given serious review and that the executive senior staff officers examine the contents of the draft policy and move to approve the recommendations within this paper. Senior staff must have read the research findings of this report and achieve consensus that improvement of the current (reactive) method of post-impact emergency operations which are an emergency “call-demand” basis only should be phased into a strategically planned (proactive) integrated, interdepartmental emergency management mode of rapid damage assessment in a synchronized culmination of emergency response. Both vital functions can be accomplished simultaneously if we simply manage the resources wisely.

Second recommendation is to review and implement the draft damage assessment procedure found in the appendices of this paper. The model policy in Appendix B that this author chose to develop uses similar nomenclature, delivery, structure, and is inclusive of all the content used in the Broward County Rapid Impact Assessment (RIA) CEOP example. However, it was not the intent to replicate it. The final draft procedure underwent a fundamental and necessary metamorphosis. This policy proposal is a more comprehensive and multi-dimensional document. An amalgamation of various theoretical constructs and suggestions made after the careful examination and analysis of information contained in the literature review of this paper, and a result of the benchmarking process. This reengineering was deliberately designed to improve our operations and problems specific to the City of Fort Lauderdale. The majority of the information was a derivative from the model “Rapid Assessment Procedure (Salt Lake City, Utah)” in the appendices of the Emergency Management

Institute publication *Rapid Assessment Planning Workshop in Emergency Management (WEM) Resource Guide* 1995.

Third recommendation is development of a detailed implementation strategy, which should include a training module outlining the objectives of the new policy. The ideal plan would be for everyone employed (internal stakeholders) within the City of Fort Lauderdale Fire-Rescue Department, from the Fire Chief/Director to the Firefighter/Paramedic, to have an understanding of the organizational concepts and objectives of the regional Broward County Comprehensive Emergency Operations Plan (CEOP) and its consistency and close association with the State Comprehensive Emergency Management Plan (CEMP). This author is suggesting that a viable starting point focus on educating the rank of Battalion Chief and above before it is presented to the Operations Division and Support Bureau personnel. The program can be incrementally expanded to include the subordinate members after discussions and dialogue between the managers and executive senior staff.

The final recommendation being, it is recognized that more continuous research is needed in the area of emergency management, and it is encouraged that members of the City of Fort Lauderdale Fire-Rescue Department, City governmental officials, City council leaders, and those individuals charged with policy making continue to do more research and improvements in the subject of integrated emergency management to enhance our service level and uphold our commitment to the public in which we serve.

Of, course research is of little value unless its results can be incorporated into *actual* decisions. To be made useful, research must be integrated with the needs of people seeking to address problems or opportunities that they face. Future research

efforts should concentrate on the development of an updated and comprehensive Hurricane Response and Recovery Plan for change in accordance with the regional Broward County Comprehensive Emergency Operations Plan (CEOP), new technology, and lessons learned from past.

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APPENDIX A

CONDUCTED BY: _____ DATE: _____

INTERVIEW OF: _____ TIME: _____

REASON SELECTED: _____ PLACE: _____

INTRODUCTION: My name is Robert F. Hoecherl. I am an executive fire officer program participant in the Executive Analysis of Fire Service Operations in Emergency Management course. I am conducting an applied research project on Rapid Damage Assessment. Thank you for agreeing to this interview. In an effort to save time and assure accuracy, may I have your consent to record this interview? You are welcome to a copy of this recording if you wish.

☐ Yes ☐ No

1. What is damage assessment as it relates to the contemporary approach of integrated emergency management?
2. What are the benefits to a community of having the ability to perform a rapid situation assessment procedure in place?
3. What components, agencies, organizational concepts, and individual tasks should be considered when developing a rapid damage assessment tool?
4. What is the National standard or program regarding damage assessment?

This concludes this interview. You are also welcome to a copy of the completed research paper.

☐ Yes ☐ No

If so, MAILING ADDRESS:

I sincerely appreciated you taking the time from your business schedule to assist me with this research.

Before we close this interview, do you have any questions or requests of me?

Thank you.

APPENDIX B

DRAFT

CITY OF FORT LAUDERDALE FIRE-RESCUE DEPARTMENT

RAPID DAMAGE ASSESSMENT PROCEDURES

I. INTRODUCTION:

The Rapid Impact Assessment (RIA) is a quick survey to determine the gross amount of damage sustained and to identify the support and resources needed for a particular geographic area. The RIA may be followed by an Initial Damage Assessment Survey to confirm if the City of Fort Lauderdale has suffered significant damage as to require a Federal disaster assistance declaration. This policy will only apply to the Rapid Impact Assessment (RIA) procedures and does not refer to Snapshot Assessment Surveys (SAS), Preliminary Damage Assessments (PDA), or in depth Damage Assessment (DA).

II. PURPOSE:

The ability of the City of Fort Lauderdale Fire-Rescue Department to perform a Rapid Impact Assessment accurately and within the first few hours immediately following a hurricane impact, tornado, or other major weather event is critical to providing adequate emergency response to life-threatening situations and imminent hazards that may impact the City of Fort Lauderdale. Rapid Impact Assessment (RIA) will provide government officials and the Incident Commander damage assessment intelligence reports. This RIA information will assist the Incident Commander (IC) and Emergency Operations Center (EOC) officials in prioritizing response activities, determine available resources, allocation of resources, and request mutual aid and/or State and Federal assistance.

III. AUTHORITY:

The authority vested in the Fire Chief by Florida State Statute 125.01; Sections 4.01 and 4.02 of the City of Fort Lauderdale Charter; Section 2-181 of the Code of Broward County, Florida.

IV. SCOPE

This policy and procedure outlines Rapid Impact Assessment (RIA) guidelines and shall serve as a tool to provide Fire-Rescue personnel clear direction and post-impact assignments immediately following a major catastrophic storm. The primary goal being an accurate and through RIA of all grids within the City, four (4) hours or less following the event or as soon conditions permit. Only the designated Incident Commander has the authority to deviate or modify this plan of action. If the RIA is postponed, both the City and county EOC and the Fire-Rescue representatives at both locations shall be consulted beforehand.

V. RESPONSIBILTY

It shall be the responsibility of all Fire-Rescue personnel to familiarize themselves with these procedures and guidelines established in this RIA policy. Furthermore it shall be the responsibility of all Fire Officers and Chief Officers to enforce and adhere to the following procedures maximizing safety and assistance during these extraordinary, and sometimes emotionally charged emergency situations. The RIA shall take priority over routine responses and/or assignments of the five (5) RIA pre-established teams.

VI. SITUATIONS AND ASSUMPTIONS

A. Situation:

The primary risks faced by the City of Fort Lauderdale community are hurricanes, tornado, and flooding from tropical depression storms. Additional significant hazards include transportation accidents such aircraft, vehicles, or vessels, terrorist activity, urban fire, or civil disturbance. Ancillary concerns as a result of these can be hazardous materials release and mass causality.

B. Assumptions:

The City of Fort Lauderdale is, in general well prepared to respond to disasters incidents or major weather events and has the full support of available resources through first the Broward County Mutual Aid Plan, and if needed to State-wide Mutual Aid Plan coordinated by the Florida Fire Chief Association regional officers. Also available is the Broward County Emergency Management Agency, State of Florida Office of Emergency Management in Tallahassee, and Federal assistance from the Federal Emergency Management Agency (FEMA) region IV office in Atlanta, Georgia.

However, the best use can be made of the available resources (both internal to the City and external through requests for assistance made through the Broward County Emergency Management Agency) only when the magnitude, severity, and precise nature of the event and the resulting damage are known. Thus, it is of critical importance that damage assessment be conducted that is quick (within four hours or less of the event) and of the appropriate detail (generalities are unhelpful, yet too much detail will actually slow down the collection and interpretation process).

The City's RIA plan is designed to be used in a major event with massive damage. Under these circumstances, it must be anticipated that normal operation of the City and its usual priorities will be suspended in order to do the most good for the most citizens in as little time as possible.

The following list of assumptions and concerns are to be expected, and will affect the ability for Fire-Rescue Operations and Prevention Bureau personnel to execute the RIA assignment within the four hour or less window.

Any major event can be expected to seriously disrupt, if not totally curtail, communications via landline telephone. Even if the telephone lines and switching equipment are not physically damaged, severe overloading will occur, which will result in telephone service becoming extremely slow and unreliable. In the event of a hurricane, the effect will be intensified by the fact that many telephone instruments will be physically knocked off-hook due to wind damaging windows, and/or roofs failing and ceiling debris falling. This will be interpreted by switching equipment as requests for dial tone.

Cellular service is also dependant upon the landline telephone system in some measure. Additionally, cellular towers, and particularly interconnection microwave equipment, are subject to physical damage. Moreover, cellular service is at least as prone to overloading as is the basic landline service.

A major event will also certainly heavily load, often to the point of overloading the in-house 800 MHz communications systems of police, fire-rescue, and public service dispatch systems. Those systems are also subject to physical damage and consequent reduced capability, or outright failure, particularly in the event of a Category 3, 4, or 5 hurricane or F3, F4, or F5 tornado.

A disaster will also impact transportation. A major hurricane event can realistically be expected to result in a significant number of failed power poles and utility lines. Some bridges may also suffer structural damage or have their structural integrity compromised. Debris from

damage buildings, vegetation and trees will also likely block roads. Floodwaters and residual storm surge, and beach erosion will further exacerbate the impact to transportation corridors. Transportation blockages impact not only the ability to respond to the situation, but also the ability to assess the damage.

The majority of street signs and traffic signals will not be in place, familiar landmarks will be non-existent or in an altered state. Even those familiar with City geography will find difficulty determining exact locations and addresses.

A major disaster will also have a very significant and varying impact on all of the city's utilities. Disruptions are to be expected and could result, either directly or indirectly, in situations that threaten life and property. Downed power lines are considered energized. Expect a significant number of natural gas line grids will be broken and exposed due to the uprooting of trees. Liquid Petroleum Gas (LPG) cylinders will break away from their bases tearing pipes and float in floodwaters. Underground storage tanks will leak. Standing water will become contaminated with sewage, hazardous materials and chemicals.

The resources available to be used in the RIA process with the exception for hurricanes will, and may, in significant measure, be dependant upon the time of day, day of the week, and even time of year that the vent occurs. The City's RIA plan is designed to work effectively as possible under any combination of these factors.

A key philosophy regarding effective disaster management lies in the effective use of as many resources as possible and the use of available resources in the most effective manner possible. Thus, the RIA should be performed, when possible, by personnel who can be deployed rapidly and by those personnel who can best be spared from other tasks.

The safety of those fire-rescue personnel, police officers, public services personnel, and those housed at, and assigned to City fire stations is paramount. Before the order for the RIA Operations is given by the IC, a role call and RIA damage/situation assessment report shall be given by each fire station commander. This Situation Status (SITSTAT) report shall first include; the status and physical/mental condition of the crews, specifically injuries, if any and severity; the status of the facility; and status of the Apparatus and equipment; general conditions of the neighborhood adjacent to the station (flood or debris) and/or any damage, injury or condition which would prevent the RIA from being initiated.

VII. ORGANIZATION AND OPERATIONAL RESPONSIBILTIES

City Departments

A. Fire-Rescue Department

Assist with the RIA through the use of on-duty Battalion Chief Officers and implement a policy of giving priority, post-event, to assessing damage, rather than the management of firefighting and rescue efforts, until Phase One operations are completed and confirmation orders from the IC to terminate are given. A Fire-Rescue Officer and assistant will staff a position at the City EOC and assume the role of RIA Coordination Officer.

RIA team selection for hurricane response shall be decided on or before May 15th of each year and those names submitted to the Office of the Fire Chief.

RIA teams shall remain as a unit and shall consist of the on-duty Battalion Chief, a Firefighter/Paramedic, a Fire Inspector, a Police Officer, and a Supervisor from Public Services. The RIA team shall be assigned to, and use the 4-wheel drive Suburban Command Vehicles. The RIA will consist of “windshield surveys” of predetermined grids.

Ancillary equipment on board the RIA vehicles shall include but not be limited to; grid maps, zone maps, 800 MHz portable radios, one (1) for each discipline represented; back up VHF CERT radio; chainsaw, ALS & BLS first-aid equipment; Delsar Hot-Stick to confirm if power lines are energized; flashlights; tire repair kits, SCBA spare cylinders and regulator for tire repair inflation.

B. Police Department

Assist with the RIA assessment through the use of on-duty personnel assigned to RIA teams and on-duty personnel checking pre-designated key facilities within specific districts. Until Phase One operations are terminated, maintain a policy of giving priority to assessing damage, rather than law enforcement and crowd and traffic control functions. Provide communications personnel (ideally two) to “staff damage control” positions to receive and input data entry to a

computer the information received via radio from the PU/PS/Community Resources described below.

C. Public Utilities

Assist with RIA through the use of on-duty personnel. Water Treatment Plant personnel will be responsible for self-assessment of those facilities. Any disruption of the domestic water supply to a specific area shall be cause to immediately notify the Fire Incident Commander, with a description of the problem and estimated time the system will be out of service.

D. Public Services

Assist with RIA through the use of on-duty personnel. Provide a heavy equipment front-end loader and operator at each of the five (5) designated RIA team fire station locations to assist with debris removal if necessary to facilitate the RIA assignment. The Heavy Equipment Operator will maintain radio communications with and follow the RIA team assisting when necessary to clear a path for the Command Vehicle.

Supervisory personnel will coordinate the Department's response and off-duty personnel will report for duty as soon as conditions permit, conducting assessment to transportation corridors enroute. Police and Fire will coordinate and process the transportation corridor information.

E. Business Services/Licensing

For hurricane response, during the issuance of a hurricane watch by the National Hurricane Center, personnel will be pre-assigned to deployment stations.

Community Resources

Pursuant to pre-arranged agreements, businesses and organizations with significant in-place 24-hour work forces, with radios, collect damage information relevant to their

facilities. Each of these will then via radio or if telephones are operational notify their respective Emergency Services Function (ESF) at City EOC or county CEOC. Participating businesses and organizations will ideally include, but are not limited to:

Broward County Transit Authority
Florida Power and Light
Teco Gas
Security Companies
Port Everglades Fuel & Chemical Companies
Taxi Cab Companies
Galleria Shopping Mall
Coral Ridge Mall
Homeowners Associations
Amoco Oil
Chevron Oil
Shell Oil
Broward County School District
Broward County Convention Center
WTVJ Channel 4
WSVN Channel 7
WPLG Channel 10
The Miami Herald
The Sun-Sentinel
Fort Lauderdale International Airport
Fort Lauderdale Executive Airport

Hospitals

Pursuant to pre-arranged agreements through the Broward County North and South Hospital districts they shall report RIA information directly to the City EOC ESF-8 (Health and Medical Services). Each medical facility shall collect their in-house damage data and use either the Medcom channels or VHF radio back up. ARES/RACES routinely staff hospitals during the Hurricane Warning phase and is an alternative communication route to the EOC.

VIII. CONCEPT OF OPERATIONS

The basic concept of Rapid Impact Assessment (RIA) is to do the most good, for the greatest number, with fewer resources, in the least amount of time. To accomplish this purpose, certain policies must be implemented and followed. It is critical to determine a fairly accurate overview of the full extent and nature of the situation during the hours immediately following storm impact in order that the most beneficial and effective decisions can be made in regard to event priorities, deployment of available resources, and requesting of additional outside resources.

Every City employee and every citizen has a role in RIA. Each must first assess his or her personal situation and take whatever steps may be immediately necessary for their personal safety and that of those around them. In terms of the formal RIA, the Fire-Rescue and Police Departments, together with the Public Services and Public Utilities Departments play the lead roles, with critical input from Community Resources, which include businesses, organizations, and volunteers.

There are several important uses of the intelligence gathered during the RIA process. Initially, the Incident Commander (IC) uses the information to make tactical and strategic decisions, and for logical deployment of rescue and fire suppression resources. The EOC officials also use this data to assess the impact of the event to make policy decisions and determinations, formulate effective and realistic goals, and initiate the request of external assistance if necessary. At all levels, relevant accurate information is essential for effective decision-making.

The RIA process is very different from the other forms of damage assessment that come later in the event such as Preliminary Damage Assessments (PDA), Damage Assessment (DA) which are primarily used to determine “eligible damages” in the estimation of cost recovery for capital municipal and county losses such as damages to the transportation system such as bridges, restoration of non-federal waterways, debris removal costs etc.

The purpose of the RIA is not to estimate the dollar value of the damage or fine details. It is, rather, to assess the nature, magnitude and scope of the event so that decision makers can assign the appropriate priorities to their response, utilizing the available resources most effectively, and requesting outside resources of the most appropriate types that are most needed.

To accomplish this important task, it is necessary to obtain information that is geared to disclose the type of damage that has occurred, where it has occurred, what resources are realistically available, and the transportation limitations and capabilities that will affect the response. Specifically, what roads are blocked, where, and by what? What utilities are functional and what

utilities need to be shut down to protect life or property? Where is the largest number of victims trapped, in need of medical care, or in need of shelter? What significant buildings or lifelines were damaged?

A. RIA Team Deployment and Mission

To facilitate the quick gathering of this critical information under conditions far from ideal five (5) RIA teams will been staffed and shall initiate the RIA process as soon as the IC gives the "Resume Response" order which will immediately follow the station role call. These RIA teams are not considered as part of the post-impact emergency response profile. They have specific mission instructions, within an assigned area of the City to observe and record damage sustained to those assigned geographical zones. The entire county has been mapped into ¼ square mile grids, including those within the City.

The information gathered through the RIA should be referenced in relation to the fire service grid mapping system for Broward County. The information will then be placed on a Geographic Information System (GIS) map via colors indicating the degree of wind and water damage sustained within the City. The GIS component of this assessment will be conducted and data entries made by designated RIA Coordination Officer at the City EOC. Once reports are received and all grids have been surveyed the information shall then be forwarded to the County EOC (CEOC) for regional damage assessment.

The desired grid information contains a broad overview of the grid and does not include individual assessments of homes or businesses. This is not a detailed assessment of situation and needs. It was designed to permit all initial reports to be made using a common measuring device. The information to be reported is:

- RIA Team reporting information
- Grid map number surveyed
- Category of damage that best describes flood damage
- Category of damage that best describes wind damage

Example*: "Battalion 2 reporting RIA for grid 931 …Category three for flood damage, and four for wind damage consistent throughout grid."*

"EOC copy Battalion 2 report for grid 931 … three for flood and four for wind damage."

B. Damage Categories

Category 0 - No Damage

No significant wind or flood damage observed. Roadways and transportation corridors are relatively clear of debris and standing water.

Category 1 – Minor

FLOOD: Minor street flooding, can discern roadways and where they end, water is not entering structures, no obvious erosion of roadways or landscape.

WIND: Small branches, small signs, some power lines down, minor amounts or debris and no significant signs of structural damage.

Category 2 – Moderate

FLOOD: Moderate street flooding, impassable by standard car. Flooding of yards and minor home flooding. There may be areas where roadways, landscape, and bodies of water such as canals or lakes cannot be discerned due to flooding.

WIND: Moderate damage to structures, shingles missing from roofs, some roof failures. Infrastructure such as electric, telephone, water systems, and roadways sustained moderate damage. Most small and some larger trees down and substantial debris present.

Category 3 – Severe

FLOOD: Severe street flooding, impassable by vehicle and substantial flooding of many homes causing structural damage or collapse from water. Road signs and similar landmarks may not be visible due to flooding.

WIND: Most structures sustaining damage with many sustaining heavy damage to include total building collapse and many structures without roofs or windows. Much of the foliage has been destroyed. Extensive damage to infrastructure and extensive debris present. Emergency vehicles may not be able to navigate immediately after the storm under these conditions.

Category 4 – Catastrophic

FLOOD: Extensive flooding. Streets impassable by any type vehicle, most homes have substantial flooding.

WIND: Total building collapses, structures with extensive damage, foliage and infrastructure destroyed, extensive debris throughout area.

Depending of the category of damage, a vehicle survey may be impossible. If your RIA observes severe to catastrophic damage from your assigned station, report as such. Remember this is an initial impact assessment and the earlier the areas that have sustained the worst damage are reported to the EOC, the sooner the CEOC can request assistance from the State and Federal resources.

The RIA process should be initiated when conditions are safe. Usually after confirmation that the eye wall or northeast side of the storm has passed and sustained winds have significantly decreased and are below 39 mph. The RIA teams should not observe a large number of civilians outside during these early post-impact hours, due primarily to tropical storm conditions still remaining. The RIA should not deviate from their RIA mission to render aid to civilians in distress unless it is a life-threatening condition needing immediate intervention. Request emergency fire-rescue resources, and upon their arrival and transfer of care and/or treatment resume the RIA assignment.

Remember courtesy is a must when dealing with our citizens who will be in a state of duress from post-impact shock. At no time shall any team member treat any civilian in a rude or deviant manner. If the face-to-face report from the citizen is not an immediate emergency, assurance that emergency services will be dispatched to render aid should provide some level of comfort.

C. RIA Coordination Officer at EOC

As soon as the RIA Coordination Officer and RIA Assistant have recorded the RIA reports for each RIA team and have confirmed that Phase One for each grid in the City has been examined, this information shall be promptly forwarded to the CEOC using the following procedure.

The information should be reported to the CEOC through Emergency Services Function 2 (ESF-2) who is Communications. This report shall be sent by radio (mutual aid channel 12-I if the grid is north of Broward Boulevard, or channel 12-J if the grid is south of Broward Boulevard.) or by telephone (954) 831-3854 or (954) 831-3858, or by fax (954) 382-5839 or through the municipal emergency coordinator at the CEOC who should forward the information to ESF-5 (Information & Planning).

IX. LOGISTICS AND ADMINISTRATION

The apparatus and equipment that is essential to the City's RIA program is largely already in place and can be made available without significant expense.

Existing Items

Fire-Rescue Communications

Fire communications will allocate at least one tactical channel, monitored by dedicated dispatcher for use during the RIA Phase One process.

Fire Stations

Will be prepared during the month of May prior to hurricane season as part of the annual Hurricane Preparedness efforts. During the Hurricane Warning phase as part of pre-impact planning, the RIA teams will assemble and remain at their assigned RIA location. There are five (5) designated RIA team locations geographically distributed throughout the City.

Fire Vehicles

RIA Teams will utilize the 4 wheel-drive Suburban Command vehicles and shall not be considered, or included in the post-impact emergency response profiles until Phase One is completed.

Police Communications

Shall allocate two tactical channels for RIA communications and dedicate one dispatcher to assist with the RIA Phase One process.

Police RIA Team Representatives

Police will provide five (5) uniformed FLPD officers and assign them to each of the RIA teams. They will assist in RIA surveys and provide a law enforcement presence during the RIA missions.

Police Road Patrol

Designated on-duty police officers will respond and assess their assigned districts if conditions permit. RIA report for City jail, Police station and substations, dispatch center and communications towers. The remainder of the road patrol shall refer to the City Hurricane Plan for additional assignments and areas of responsibilities.

Public Services

Shall allocate a radio channel with dispatcher for damage assessment information during RIA surveys of assigned facilities.

Public Services Heavy Equipment

Shall provide five (5) enclosed cab front end loaders, or backhoe with front end bucket and heavy equipment operators to each RIA fire station location to assist with RIA team roadway access and debris removal.

Other on-duty personnel shall initiate debris removal and RIA of their predestinated major transportation corridors.

Public Utilities

Shall allocate one radio channel with a dispatcher for RIA information and coordination of assigned facility surveys and initiate surveys of domestic water system and drainage systems noting any significant blockages.

Public Services Vehicles

Staff heavy equipment and apparatus with crews to expedite debris removal and RIA survey of assigned facility surveys.

Building Department/Code Enforcement

Code enforcement officers and Fire Inspectors shall assemble into their predestinated Damage Assessment team assignments. They will not be needed during RIA Phase One operations. However, will be needed for a more through and detailed Damage Assessment structural surveys.

Building Department Vehicles

Building Inspectors shall be deployed as described in the City Hurricane Plan and report structural conditions. Structural engineers may be needed for consult and assistance of fire-rescue operations.

Procurement Items

Forms

Grid worksheet overlays for our existing fire-rescue zone map system need to be developed and are needed for the one-hundred and seventy (170) ¼ square mile grids within the corporate City limits. RIA teams can easily and quickly record the necessary information on these hard copies, and will be input into the computer base by the RIA Coordination Officer. These grids should be universal for each City department to correspond with the CEOC master at the regional and City EOC.

Training

The successful implementation of the RIA policy is heavily dependant upon adequate and effective training. The training modules should be joint efforts between the City departments listed within the plan, the participating Community Resources, and the City Emergency Manager. The training must be sufficiently detailed to be useful, but simple enough to be understood and executed by the City personnel to whom it is delivered, and short enough to be fiscally reasonable.

The training modules should be as 'hands on" as possible with emphasis on the participation in drills and exercises following the cognitive lecture and overview. Annual refresher training during the Hurricane Preparedness efforts should also be considered.

X. IMPLEMENTATION AND ACTIVATION

The RIA plan is activated by the on-duty Division Chief of Operations as described completely in the Activation and Priorities section.

The Emergency Manager of the Fire-Rescue Department shall have the responsibility for maintaining the currency of this plan and submitting it for approval to the Fire Chief and the Emergency Manager for the City.

The Emergency Manger of the Fire-Rescue Department shall also have the responsibility for conducting, with active cooperation and participation of all participating City Departments and Community Resources outlined in the policy, training, drills and exercises designed to successfully implement and replicate an emergency to evaluate the efficacy of this plan. Any City Department or participating Community Resource that wishes to suggest, or request, changes or modifications to this plan shall submit them in writing to the Fire-Rescue Emergency Manager for consideration and review.

NOTE: The majority of the information contained within this policy draft was a derivative from the model "Rapid Assessment Procedure" (Salt Lake City, Utah) found in the appendices of the Emergency Management Institute publication *Rapid Assessment Planning Workshop in Emergency Management (WEM) Resource Guide* 1995.
It also contains information taken from the Broward County, Florida Comprehensive Emergency Operations Plan 2001 Edition, as well as information taken from the various research sources listed within the Reference section of this research paper.