Critical Business/ Government Impact Assessment

(An Assessment of the Effects of Hurricane Ivan on Large Employers in Escambia County, Florida) September 2005

Introduction

As part of the post-storm assessment of the effects of the very active 2004 Hurricane Season in the Atlantic and Gulf of Mexico regions, the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE) tasked Dewberry to assess the impacts that Hurricane Ivan had on the business community in Escambia County, Florida. This project studied the economic effects of Hurricane Ivan on the top six government and private industry employers in the selected county. These post-storm assessments will allow FEMA and the USACE to calibrate, correct, and improve the models and products that serve as primary preparedness, assistance and mitigation tools for emergency managers. This portion of the Ivan post-assessment examines mitigation, preparation and evacuation activities, storm impact on facilities, operations and employees, and documents the recovery process eight months after Hurricane Ivan.

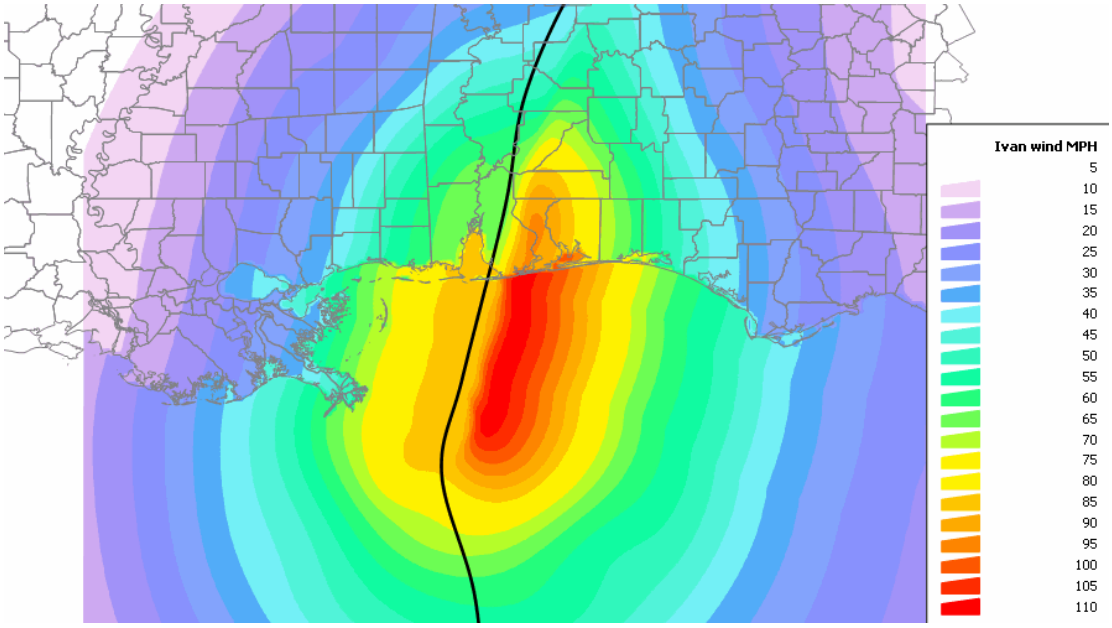
The Setting

Escambia County is located in the extreme Northwestern corner of Florida, bordered on the West and North by Alabama, on the East by Santa Rosa County, and on the South by the Gulf of Mexico. The County encompasses 661 square miles, or 420,480 acres, with an additional 64,000 acres of water area. From the Gulf of Mexico north to Alabama is a distance of approximately 50 miles. According to 2004 Census estimates, the population of Escambia County is approximately 298,859.

Several things make the area unique. First is its history. A half-century before the arrival of the Pilgrims at Plymouth, the original residents of Escambia County—the Creek and Poarch Indians—were on hand for the first landing of Europeans anywhere on the American mainland. Ironically, the first settlement in 1559 failed largely because of a hurricane that crossed the area just days after the settlers arrived. Over the course of the next 400 years, the flags of five nations flew over this area on one or more occasions. Another factor which identifies this area is the Pensacola Naval Air Station – the oldest in the U.S. It is a key component of the area's economics and identity. And, lastly, Escambia County, along with its neighbor Santa Rosa County, has some of the most beautiful beaches in the nation, making it a prime tourist destination.

The Storm

The eye of Hurricane Ivan came ashore at Gulf Shores, Alabama at about 2 AM on Thursday, September 16, 2004 as a Category 3 storm on the Saffir-Simpson Scale with maximum winds exceeding 140 mph and producing a 10-15 foot storm surge.



The most severe impacts of Hurricane Ivan were in the northeast quadrant of the storm that went through Escambia and Santa Rosa counties causing widespread beach erosion. Fourteen people were killed, mostly by tornadoes during the storm. The Pensacola area experienced about 16 inches of rainfall in 48 hours and major inland flooding occurred throughout the area. A quarter-mile section of the I-10 bridge was destroyed. Ivan was the most destructive hurricane to impact this region in more than 100 years.[1]

Of the four 2004 hurricanes to hit Florida, Ivan was the worse. President George Bush declared the County a federal disaster area and the response and recovery resources of the Federal Government were made available. FEMA and the National Guard airlifted water, ice and food and the U.S. Army Corps of Engineers distributed more than 120,000 blue tarps for damaged roofs.

---

[1] National Weather Service. National Hurricane Center. *Tropical Cyclone Report: Hurricane Ivan*. 2-24 September 2004. www.nws.noaa.gov.

Approximately 75,000 homes were damaged and 50,000 people displaced. More than half of the damaged homes were households with annual incomes of less than $30,000. According to Rebuild Northwest Florida, a non-profit organization set up to handle donations and recovery activities, "thousands of families do not have the financial means, government assistance, or insurance proceeds to repair their homes."[2] Nearly 150,000 Panhandle homeowners, renters and businesses applied for FEMA assistance and more than $100 million in low-interest loans were approved.

Many public buildings and facilities were damaged or destroyed, including the Pensacola City Hall, local hospitals, and the airport. The main wastewater treatment plant was flooded, spilling 12 million tons of raw sewage in downtown Pensacola. Most of the area was without power for one to three weeks and many had no running water for several days.

General Government/Business Impacts

Data collection began with executives from the Pensacola Chamber of Commerce providing an overview of business impacts and recovery progress. The economy of the area consists almost entirely of small businesses. According to the Chamber of Commerce, between 70-80% of the businesses have fewer than 25 employees. Other than government, health organizations and utility companies, only five county businesses have over 500 employees. Yet, it is interesting to note that, in 2005, *Inc.* rated this municipal area as No. 33 in its annual listing of Best Places for Doing Business in America. *Forbes* rated it No. 76 in the top 150 places to jumpstart a business or career.

Hurricane Ivan impacted nearly all businesses in Escambia County. Those that escaped unscathed lost business due to loss of utilities and communications, displaced clients, loss of stock, transportation problems and other deterrents to business continuity. During the month after the storm the Chamber of Commerce made over 1,700 calls, attempting to contact each member to see what was needed in order to reopen. They recognized the importance of getting them back in operation as soon as possible. "Small businesses lost a tremendous amount of business. And once you lose your drycleaners, for example, you have to find someone else. When your old guy gets back up and running, you've already established a pattern. He ultimately loses your business," remarked a Chamber VP. In some cases the Chamber facilitated getting generators, water, ice, and other supplies to local businesses. Through a state-funded program they were able to provide bridge loans of up to $25,000 to 270 businesses to help them get back into operation. A consortium of local bankers reviewed the applications and Florida First Finance underwrote and handled the paperwork. The applications were fast-tracked, often completed within a week or less.

[2] *Rebuild Northwest Florida*. www.rebuildnorthwestflorida.com/the_story.asp.

Some businesses were without electric power for two weeks. A problem that received less attention, according to our sources, was lack of communications. In this technology age, when phone and broadband lines are interrupted, businesses lose their ability to operate. Pharmacies could not get insurance or Medicare approval for prescriptions; franchises could not get in touch with parent companies; credit cards could not be approved. Businesses have come to depend on these services, yet restoration sometimes took weeks.

Tourism took a major hit. Homes, hotels, condominiums and apartments in the beach areas sustained heavy damage, many completely destroyed. For several months, available rooms were down to 20% of their former number and were estimated to be a little more than 40% at the time of the interview.

The conversion from beach homes to large developments already underway was accelerated by the storm. According to a Chamber executive,

> We are seeing that some of the hotels are not going to come back on the beach. The landscape of the beach was changing and Ivan helped it. I think you are going to see a significant acceleration of turnover from small condo units to large mega complexes. A major real estate company has already come in and purchased significant areas to redevelop.

Several previously discussed public projects, such as replacement of the auditorium and water treatment plant, were subjects of public controversy before the storm. That argument went away when they sustained major damage. Speaking of the water treatment plant, a Chamber official remarked, “So what could have hindered us in growth 10 years down the road, we should have a new system in place and be a much better community for it.”

On a positive note, tourist-related businesses that could operate were doing extremely well providing housing and services for the hundreds of workers responding to the disaster. Even with fewer units on line, bed tax revenues were significantly higher than previous years. Similarly, any business providing supplies and services for rebuilding was doing well. “People like Home Depot, they did great. Business was like gang-busters. They had to have police to monitor the people. They couldn’t get stuff here fast enough. You could find out where people were in the recovery process by what was in demand. First chain saws, then a progression,” remarked a Chamber official.

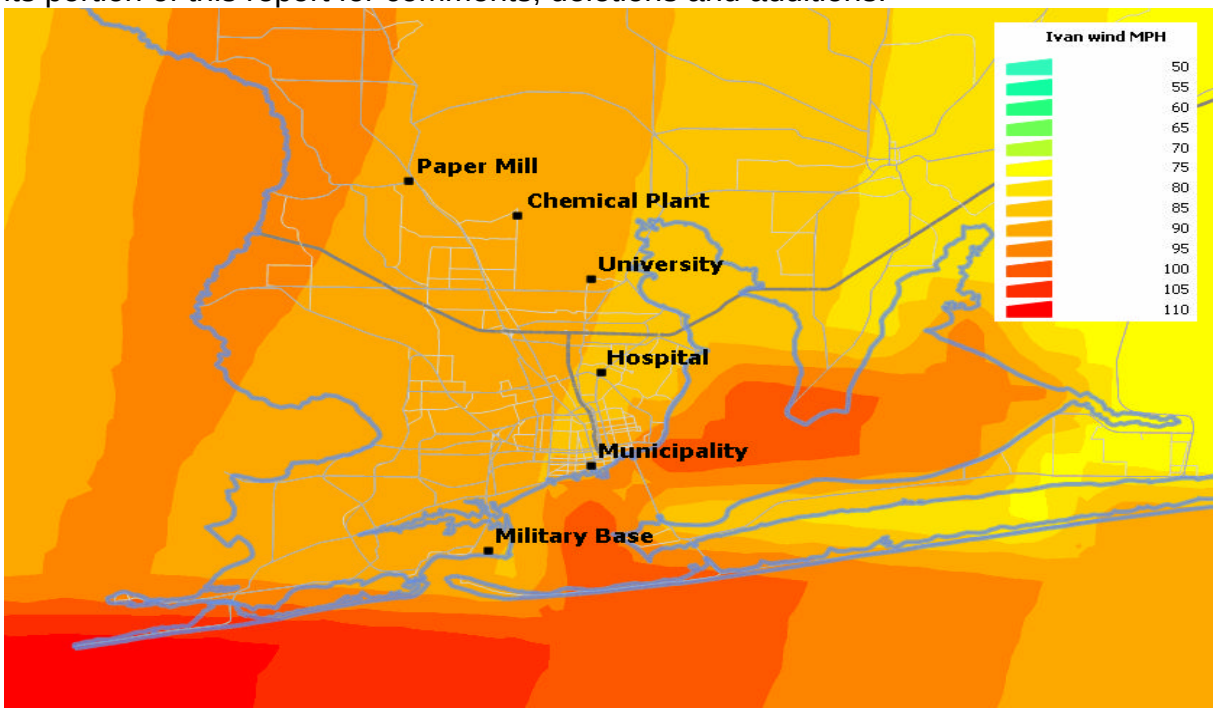
Access to help from outside the area, such as a parent company, was a major factor in getting a business back in operation. “Banks with home offices in other areas reopened a lot quicker. Starbucks was up within a week. They said they would have opened sooner, the home office had sent free coffee, but they didn’t have water to make it with.”

Chamber membership is down; they are beginning to experience non-renewals. They attributed this to closed businesses, but also to those struggling to rebuild having to cut discretionary spending at least in the short term. They are conducting a survey of 400 businesses. When the results are available, probably in July 2005, they will share them as an addendum to this report.

The Chamber leadership provided a list of the largest employers in Escambia County and recommended six organizations to serve as case studies for this project. A Chamber vice president also provided valuable service in connecting us with executives at each place.

Case Studies

Data collection for this project consisted of in-depth face-to-face interviews with executives from one municipality, a university, one hospital and health system, a military base and two industrial plants. Interviewing took place the week of May 16, 2005. Interview data were supplemented with various reports, documents and photos provided by the organizations. Each organization was sent a draft of its portion of this report for comments, deletions and additions.



The figure above shows the location of each of the case studies in relation to the windfields from Hurricane Ivan.

CASE ONE: A MUNICIPALITY

Our first case study examines the impact of Hurricane Ivan on a municipality in the Florida panhandle. Its estimated population in 2003 was nearly 55,000, about 3,000 less than a decade ago and the annual budget is in excess of $190 million. There are 18 miles of shoreline within the city limits. The modern multi-story City Hall has large windows facing the bay and the municipality has a council-manager form of government. The elected council sets policies and the City Manager is the top administrative officer. The council consists of a mayor and nine members, seven elected by districts and two at-large. The city has 1000 full-time and 400 part-time employees. For purposes of this study, the City Manager was interviewed.

Mitigation. Over the last few years this area has experienced the effects of several hurricanes and tropical storms. With the possibility of hurricane damage to city buildings in mind, at least one new building was designed to be multi-functional should City Hall or other vulnerable city buildings sustain damage. All of the fire stations, the Fire Administration Building and police headquarters have hurricane shutters. Most city departments are connected via a fiber optic network that allows flexibility in computer connectivity. Each office in the new Fire Administration Building has four Ethernet connections and four telephone lines, allowing for additional work stations should they be needed. The goal of having all documents and records optically scanned has been largely met. Data are backed up and stored off-site. The computer servers were located in City Hall but within a well-protected area.

Preparation. The city had emergency plans with timelines for approaching hurricanes. These plans had been used several times in recent years and revised after each event. According to the City Manager, the preparation for Hurricane Ivan went according to plan, beginning on Monday before the hurricane and being completed by the end of the day on Tuesday. Essential employees were released about 72 hours ahead of the storm to prepare their homes before returning to work. Non-essential employees were sent home to report after the storm. Generators were staged at crucial facilities throughout the city.

Impacts. The city experienced severe storm surge as well as hurricane-force winds. Over $40 million of damage occurred to city facilities and an additional $30 million was spent on debris removal and cleanup expenses. The City Hall sustained major roof and window damage from hurricane force wins and projectiles which crashed through windows. Substantial storm surge caused severe flooding and extensive water damage to the facility. Much of the building was uninhabitable and all offices had to be relocated wherever space could be found throughout the city. The City Manager and several departments moved into the Fire Administration Building where several people occupied various

offices in the facility. While the computer servers were not damaged, staff could not access them so they had to be moved to a new location.

Power was out from one to three weeks, depending upon location within the city. The city was without water for several days and the Main Street Wastewater Treatment Plant was not operational for four days. The homes of about a dozen employees were completely destroyed and many other employees were dislocated due to major damage.

Problems and Issues. The Continuity of Government (COG) plans did not account for the level of destruction the city experienced. Communication was down for 48-72 hours, including most cell phones, making it difficult to coordinate work in the field. Some employees reported to work but to various locations that had not been well planned, making work assignments difficult. Emergency workers, including contractors, were available from outside the area, but housing was not available. Finding work space for dislocated employees was a major problem. The city had a serious cash flow problem. At one time the city had used $38 million from internal sources with none of it reimbursed.

The City Manager expressed dissatisfaction with FEMA's Public Assistance program.

> My biggest frustration with FEMA is their lack of understanding that local government has to respond to community needs but we can't do a good job if we haven't taken care of the facilities that we need to respond. It's fight, fight, fight every step of the way…We're trying to get some restoration of government and how they think we can spend a whole lot of time talking about long-term recovery…I don't think they see the big picture." (City Manager)

They had dealt with six different FEMA Public Assistant people just on the City Hall issue. "They still haven't signed off on costs to get back into City Hall. Delay, delay, delay…We'll get some agreement on what's going to happen and then that person is gone and someone new will come in and say that person didn't know what he was talking about. We start all over again." Similarly, they still had not received any insurance payout.

Effective Strategies. Critical staff remained on the job during the storm and went into action immediately after the storm, joined by regular employees reporting for work. The City Manager expressed satisfaction with their flexibility and adaptability to meet the emerging problems. He praised the level of coordination in the county's Emergency Operations Center. To meet the housing shortage for emergency workers, campers and trailers were allowed to park in public areas. Employees could bring their children to work until the schools reopened three weeks later. A recreation center was opened for their use and

operated special programs during the event. When the schools reopened, people still requiring shelter were transferred to a recreation center.

Recovery Progress. The general administrative functions of government were back in operation within a few days. Most departments were fully functional a week later. By the time of the interview much of the repair work had been completed. The restoration of City Hall, however, had not begun. It is projected that City Hall will not be ready for occupation before March or April 2006, about 18 months after the storm. At the time of our interview the City Manager predicted revenues were going to be about even. “We had experienced growth the prior year which offsets what we’ve lost. We should have grown 9-10% but we’re even.”

Outcomes. The new City Hall is planned to be more storm resistant. The lower area will have storm curtains to resist surge and the windows will be retrofitted with impact windows or film. The computer servers will be re-located permanently to a safer location.

Lessons Learned. It is important to have redundancy of communication modes, both internally, and with the outside. Equipment for emergency operations, such as generators, and for cleanup activities should be pre-staged before the storm.

CASE TWO: A UNIVERSITY

The university impacted by Hurricane Ivan is on a 1600-acre nature preserve about 10 miles north of the city and about one mile from a bay. The institution has over 1,500 employees, including faculty, staff and administrators. Student enrollment at the time of the storm was 9,800, and had been growing modestly each year. About 1,300 students are housed on campus. The President came to the university three years ago from North Carolina. Three key administrators were interviewed for this project.

Mitigation. Shutters were added to the Commons building prior to this hurricane season. The building used for public shelter has impact resistant windows.

Preparation. The university had a Response Plan for Specific Emergencies including hurricanes, a Crisis Management Plan, and a Continuity of Operations Plan (COOP) and these plans are revised on a regular basis. Campus preparations began as soon as Hurricane Ivan threatened. The President, who had previous hurricane experience from his years in North Carolina, closed the campus on Monday to allow plenty of time for evacuation, campus preparation, and for employees to prepare their homes. The campus was prepared – traffic signals taken down, a generator rented for the Commons area, supplies obtained for the shelter for employees and students remaining on campus, and offices and

equipment protected as much as possible. Approximately $20,000 was spent on preparation activities.

Critical employees were identified to remain throughout the storm. A shelter was prepared in the Commons for employees and about 200 students and the American Red Cross opened a public shelter on campus. Several administrators were sent out of the area before the storm to provide contacts for assistance in the aftermath.

Impacts. The wind and rain caused a great deal of damage, especially to the natatorium and field house. Buildings were compromised by roof and window damage, and by windblown rain coming in around windows and doors. About 3000 trees were lost and the University had the only drinkable water in the area following the storm. Power was off for 12 days and the campus was closed for three weeks.

More than 400 students dropped out of school after the storm. According to one administrator, "I think their personal lives were affected in ways that school could no longer be a priority." Also many found employment in the trades and did not return to school. "They'll eventually go back to school," she felt. Lost income from lower enrollment and campus closure was estimated at $800,000. Over $2 million was needed for debris removal and emergency protective measures. Damage to buildings and property totaled nearly $11 million. A total of 83 employees lost their homes.

Problems and Issues. Communication problems made it very difficult to locate contractors to help with the cleanup. While 200 students were sheltered during the storm they had to be evacuated afterward due to unsafe conditions and lack of utilities. Diesel fuel was available on campus, but there was no good way to transport it to run the generators around campus. Spoiled food left in dormitory rooms created serious cleanup problems.

The university has taken a severe financial hit – 6% of its operating budget, to be exact. As part of the state's self-insurance plan, it is estimated that only 20% of the outlay will be covered. In spite of extensive documentation the payout has been extremely slow. To date less than $l million has been received. This was attributed in large part to the staff shortages in the state Risk Management division where only five persons are handling all state claims for the four 2004 hurricanes. Said one administrator, "…if they had hired additional temporary employees to assist in processing the claims, this would have been of great benefit to all state agencies. We feel this was a severe management oversight." They were told recently that any funds received from FEMA may have to go to the state.

Debris cleanup was not completed before the FEMA deadline due to the need to work carefully to preserve the natural habitat. An extension has been requested.

Student discipline problems and counseling issues have increased since the storm. In spite of fewer students, counseling center and health center visits have been about 9% higher than for the same months last year. Teachers and students report problems focusing on their work.

Effective Strategies. The officials interviewed for this study praised the leadership for closing early, providing for students' safety and time to prepare the campus. Out-of-area administrators were able to coordinate relief in the immediate aftermath. The campus radio station stayed on the air and provided the major means of communication with students and the public. Outside architectural engineers were hired right after the storm to assess and document building damage along with their Office of Architectural and Engineering Services. A triage team was set up to interview all students who planned to withdraw, lowering the number considerably. Grants of $300 were made to students in
need of extra financial help to stay in school. Outside agencies and volunteers provided assistance with campus cleanup. Employees needing time off to deal with damaged homes were given administrative leave. No one lost pay.

Recovery Progress. At the time of the interview, eight months after Hurricane Ivan, it was estimated that the campus was about 40% recovered.

Outcomes. The costs not covered by insurance or FEMA had to be taken from funds intended for other purposes, such as new computers. This will have a long-term financial effect on the institution. Student enrollment is expected to be down for several years, due in large part to fewer transfers given the large dropout rate at the local community college. On the positive side it is expected that several buildings will be more hurricane resistant when repairs are complete. Five mitigation projects are planned. Information Technology will have backup data stored off-site.

Lessons Learned. Closing the campus early was an excellent strategy. Students must clean out all food before leaving the dormitories. It would be beneficial to student retention to be able to provide longer term sheltering for some, such as international students, while the university is closed. Extensive documentation right after the storm is essential. It is important to have contingency contracts with vendors before a storm. As part of preparation, the university may arrange for a tanker truck to transport diesel fuel to campus generators.

CASE THREE: A MILITARY BASE

Our third case is a major military installation in the Florida panhandle occupying over 8,500 acres, most located on a peninsula in the Gulf of Mexico. The base and its subsidiaries have a total population of about 20,000 at peak times during the year. Its operations employ about 5,000 civilians. There are over 2,500 buildings with a 1998 estimated value of nearly $2 billion. Also, between 200-300 prisoners are housed on the base. The base was first established in 1914 and included (before Ivan) a number of historical buildings on the waterfront. The commanding officer was interviewed for this project.

Mitigation. No buildings had hurricane shutters. Plywood was available for boarding some buildings. A supply of sandbags was also on hand. Diesel fuel and generators were available for key installations.

Preparation. Detailed Conditions of Readiness were followed in stages as the storm approached. When the threat reached Stage 2, evacuations began. About 5,000 trainees were evacuated by public school busses to local shelters where they assisted as volunteers. The prisoners were evacuated out of the state and all families and dependents
were evacuated. Airplanes were either moved to hangars or flown out of the area. The windows on selected buildings were boarded with plywood. Senior staff and an emergency crew of facilities, fire and security personnel, numbering between 100-150, remained at the base in protected buildings on higher ground. A Lieutenant was located at the county Emergency Operations Center to coordinate the shelter volunteers and other issues involving the base.

Impacts. The eye of the storm passed about 10 miles to the west of the base and this meant that the worst effects of the storm were felt at the military installation. The Base Commander reported enduring 6-8 hours of the eyewall. In addition to the wind and rain, a 6-7 foot surge extended more than a half mile into the base. Historical buildings on the waterfront, including the homes of seven senior officers, were destroyed by storm surge. Many buildings were badly damaged, roads were cut in half, trees were blown down and the base water plant was under five feet of water.

It was 10 days before the water and sewer treatment facilities were partially operational. The dormitories were damaged and about 50 houses on the base and 180 leased units outside the base were uninhabitable. In total damage losses are estimated at $800-$900 million.

Problems and Issues. Internal communication was good but communication with the outside was a major problem as power was out and cell phone coverage spotty. Federal law required that the recruits cease volunteering in the shelters as soon as the emergency period was over so they had to return before the base

was ready. Recovering habitable housing was a major problem exacerbated by spoiled food left in the dormitories and homes.

Effective Strategies. Setting the early priorities to be: 1) securing the base, 2) establishing access and 3) assessing damage, worked very well. Two days after the storm 200-300 military personnel with heavy equipment arrived from outside the base to assist with cleanup and restoration. “The week they were here they did a tremendous amount of work. The corner turned for me then,” said the commander. “I realized we were going to be okay.” Power was restored to their fence line within 72 hours, even before they could be connected safely. Trainees in the public shelters were praised for the important assistance provided the public. A contingency contractor arrived within a week with 1000 workers and heavy equipment. Some families were housed in FEMA trailers and civilian employees who could not come to work were put on paid administrative leave.

Recovery Progress. The training mission was resumed within 10 days, albeit in temporary spaces. Lack of rain for several weeks after the storm allowed many buildings to be temporarily patched and dried in. Re-occupation of undamaged homes occurred in phases, beginning two weeks after the storm. Approximately 25 families still occupy FEMA trailers as of the date of the interview.

Outcomes. The base received a special Congressional supplement of $600 million to rebuild. Only buildings with a functional reason to be there will be rebuilt on the waterfront. All new buildings will be built to stronger codes and several older unused buildings will not be rebuilt. The water and sewer treatment facility will be built on higher ground and base facilities will be multifunctional and more concentrated. About a
million square feet is not being rebuilt. “We feel that what’s going to come out of here is going to be a base that’s more ready for the future and more storm resistant,” said the Commander.

Lessons Learned. Pre-planning can only take things so far. “...your plan is a point of departure. You can’t plan for everything. Go with your plan and when it doesn’t make sense you have to deviate. You’re going to have to be flexible.” The next time personnel will be ordered to remove food from their dwellings before evacuating. A 1-800 number will be established outside the area to handle emergency communications.

CASE FOUR: A HEALTH CARE SYSTEM

One of the largest employers in the area impacted by Hurricane Ivan was a health care system that includes two hospitals, a nursing home, several ambulatory surgeries and medical centers and a home care division. It employs over 5,000 people (about 3,5000 full-time equivalents), including 100 physicians. The system has nearly doubled in the last six years. Three key administrators were interviewed for this project.

Mitigation. Discussions had occurred with the insurer about replacing several roofs but the work had not been done. Plywood was precut for some critical facilities.

Preparation. The health system had an extensive Emergency Plan that covered hurricanes. The main hospital had been remodeled and the previously cut shutter boards no longer fit. On Friday (five days before the storm), contractors were put on notice and plywood and other supplies were ordered. Boarding of windows in key areas began on Monday.

Chillers and generators were purchased from three vendors and located in critical facilities or pre-staged at strategic locations. A 21-day supply of food and medical necessities was ordered. Roofing materials were pre-ordered. An electrical contractor and five general contractors assisted with the preparation and agreed to have some workers shelter there in order to be available if needed during or after the storm. Where possible, patients were sent home, but many more arrived to stay at the hospital during the storm. On-duty staff could bring their families. About 5,000 people were sheltered at the main hospital during the storm.

The windows of the main hospital had been boarded on one side only. This was explained,

> "We only reinforced the side we knew the storm was coming in. We didn't know where the backside would be. We tried to keep a few people fresh for that hour. We had four go outside and survey the exterior to see if we needed to move anybody because it looked questionable for taking the backside of the storm. There was about an hour and 15 minutes when it was perfectly still. It was pretty eerie. Gulf Power actually called us to tell us how it was coming. We also looked at radar. We put boards up where it would be coming. And they stayed up." (Hospital Administrator)

Impacts. Major damage, mostly caused by wind, occurred to many of the buildings owned by this health system. There was very little window damage at the main hospital, however several roofs were damaged and air conditioning units, cooling towers and elevator shafts on rooftops were damaged or blown off.

With good organization and hard work, most facilities were operational within one week. However, business was only 20% of normal for a month and a half as people postponed elective surgery, doctors visits, and tests due to more pressing demands. Data were not backed up off-site, but fortunately nothing was lost. The homes of 70 employees and 50 doctors sustained heavy damage.

System-wide losses were assessed at over $22 million, including about $9 million to the main hospital and $9 million in business interruption losses.

Problems and Issues. The hospital was without power for about 36 hours. During that time one generator kept tripping off line and had to be monitored. There was a serious water shortage. “The thing we weren’t prepared for was the inability to get water from the utility source. That was our biggest surprise. We had no running water for two days,” reported one administrator. Drinking water was available, but not water to operate the toilets, causing serious problems considering the large number of people there. Communications were spotty at best. Critical employees had difficulty obtaining gas to get to work.

Only about $4 million of the losses were covered by insurance. FEMA is expected to cover much of the remainder. However, this has been a very frustrating process.

> “FEMA has been very slow and we’ve had a lot of turnover. They’re here for three days and then gone and we have to start over. They did a good job of getting here early and telling us what we were going to get…but eight months later we haven’t seen a dime.” (Hospital Administrator)

Said another, “I’m working with our sixth FEMA person and he’s leaving.”

Effective Strategies. Much of the plywood purchased was of a higher grade and could be used for building cabinets later. Arrangements were made with contractors ahead of time. Major equipment was pre-staged just outside the area, ready to be brought in as needed. Personnel were divided into two teams – A Team would stay during the storm and B Team went home to rest in order to report after the storm. During the storm a leadership team met every few hours to discuss impacts and plan responses. According to one executive,

> “We had upwards of 30 people who would meet every 2 hours, sometimes every 4 hours, depending on what was going on …to deal with whatever was needed. As the meetings went on, everyone looked a little rougher and rougher. It was starting to look pretty ugly by the end of the second day!”

When the water treatment plant was inoperable due to power outage, the health system supplied it with diesel fuel in order to get it back into service. Roof repairs began the second day after the storm. There were between 60-70

contracted personnel working each day to clean up and dry in buildings. Funds were on hand to pay workers immediately.

A sister hospital outside the area sent several administrators and 50 nurses and technical staff to assist after the storm.

Their real estate division arranged for roof contractors to repair the roofs of 300 employees' homes. They also fronted the money so employees did not have to wait for insurance payouts to have the work down. They ordered and sold 300 generators to employees at cost. Over $100,000 in donations was raised to assist employees who had heavy losses. More fortunate employees donated leave hours.

Recovery Progress. All facilities are functional. Roofs have been temporarily repaired and several new roofs are expected to be completed during the next six months. Plans are underway to remodel one building.

Outcomes. A double roof system is being installed on critical facilities. The new buildings will be built to stronger codes. A previously underused building will be remodeled and brought into the system.

Lessons Learned. Damages need to be well documented immediately after the storm. Data should be backed up outside the area. A self-pumping gasoline tanker would provide fuel for employee's cars. They are investigating the possibility of drilling wells for an emergency water supply. Another lesson learned is that there are regulations to be followed when disposing of debris.

CASE FIVE: A PAPER MILL

One of the areas largest private employers is a subsidiary of the world's largest paper products company. The mill occupies several hundred acres about 15 miles north of the city. It employs about 800 workers, including management. The mill manager was new and had not been present during Hurricane Ivan, so the human resources director was interviewed for this project.

Mitigation. The administration building was relatively new and had been built to stronger building codes. Some gravel roofs had been replaced with less problematic material and emergency generators were available at key areas in the plant. A Hurricane Plan was revised just months before Hurricane Ivan.

Preparation. The Hurricane Plan laid out stages of readiness depending on the proximity and strength of the storm. At each stage procedures were specified. The mill and union leadership met periodically throughout the planning process to review needs and procedures. Employees who would be on duty during the storm were released early to prepare their homes before the arrival of the storm.

Essential employees were allowed to shelter their families at the mill. The safest part of the main administration building was prepared as a shelter and extra food, air mattresses and other supplies were acquired.

No shutters or boards were placed over windows, however, heavy rolls of paper were placed outside the cafeteria windows to prevent objects from hitting or breaking the glass and only a small group of employees were in this area for food preparation before and after the storm. Approximately 60 people were sheltered in an interior conference room with no windows or exposure to the elements. In the mill itself, key employees sheltered in interior control rooms, connected by radios.

Impacts. The major damage was to the cooling towers, air conditioning units, and anything that was made of sheet metal. There was some roof damage, including a warehouse where there was damage to the contents. Gulf Power was down for five days during which time some internal power was provided by generators. Including the time before and after the storm, the mill was at least partially shut down for about five days. About $5 million damage occurred to the plant with lost business costing another $10 million. Between 30-40 employees' homes sustained major damage and about 150 employees lost an average of about one day's pay.

Problems and Issues. Lack of air conditioning in the cafeteria used as a shelter caused water to accumulate on the walls. Communication with the outside during the storm was a problem. Cell phone connectivity was sporadic.

Effective Strategies. The administrator interviewed felt the Hurricane Plan worked well. There had been a few modifications since Ivan, but nothing major. Employees who stayed in the plant during the storm reported in at regular intervals using radios. Computer data were backed up off-site. After the storm a Hurricane Hotline was established with a recorded message telling employees when to report to work. Anyone who wished could come in immediately after the storm to assist with the cleanup and, thus, lose no pay.

A sister plant sent between 30-40 volunteers to work one week assisting with the cleanup and relieving local employees. Employees with damaged homes were offered plywood at cost. Gas was available for employees' cars. Foundation funds from the parent company were solicited to provide about 25 needy employees with grants from $30,000-$50,000 to repair their homes.

Recovery Progress. All repairs had been completed at the time of the interview. Roof replacements have not been completed.

Outcomes. Better protection for the cooling towers and air conditioning units is planned.

Lessons Learned. The boilers need better protection. A better place needs to be found to shelter during a storm. Better cell phone coverage or other types of communication with the outside are needed.

CASE SIX: A CHEMICAL PLANT

The chemical plant included in this study is part of a large multi-national company with subsidiaries throughout the world. Its product line includes plastic film for glass products, plastics, fibers, pharmaceuticals, and hundreds of chemical products. The Escambia County facility is the company's largest plant, employing 950 full-time workers and 200 contractors. It is located on 2000 acres about 10 miles north of Pensacola. The plant manager was interviewed.

Mitigation. Hurricane mitigation had not been a priority. However, it had been estimated by management that the administration building could sustain winds of 100+ mph.

Preparation. A Hurricane Preparedness Procedure had been revised in August 2004. The primary aim is to set up procedures for protecting personnel and equipment and to assure continuity of operation to the fullest possible extent. It provides detailed, phased preparation for each section of the plant from pre-season preparation through post-hurricane recovery. Each department had to develop its procedures to comply, identify watch crews and "punch list tasks." The monthly safety meeting at the beginning of the hurricane season always focuses on hurricane safety, both for the plant and employees' homes.

A shelter was established in the cafeteria area and conference rooms of the administration building. Employees and contractors were allowed to shelter there with their families during the storm. About 200 people were sheltered from Hurricane Ivan. Key employees remained in interior control rooms in their departments throughout the plant. The goal was to keep parts of the plant on-line throughout the storm.

Impacts. The plant experienced winds of about 95 mph. The buildings remained intact, but sustained roof damage. There was some flooding from the Escambia River. The major destruction occurred to the cooling towers. The plant manager would not share the cost of damages and business interruption. The company is self-insured. About 30 employees lost their homes.

Problems and Issues. The plant kept running at about a 20% level throughout the storm. However, the loss of cooling towers caused it to shut down afterward. Communication with the outside was a major problem as cell phones occasionally worked in certain areas of the plant, providing sporadic communication.

Effective Strategies. The plant has its own power generating equipment. People throughout the plant were connected by radios and reported in at set times. Some people went home after the storm, but then returned to the shelter because there was food, water and air conditioning. A sister plant in Alabama sent food and gasoline. Employees were allowed to purchase gas so they could come to work and any employee who wanted to come to work was paid. The company had contingency arrangements with contractors to assist with the repairs, some even sheltered there. The plant manager meets every month with other plant managers in the area and they have shared their hurricane experiences.

Recovery Progress. Within two weeks the plant was back to 100% production.

Outcomes. The new roofs will be more hurricane resistant.

Lessons Learned. Their hurricane plan did not have different procedures according to the storm severity. "One thing we learned is that we probably need to have something for Cat 1 and 2, and something else for higher ones." Next time they will do more to protect the cooling towers. "I think if you talked to any other facility, they would say that cooling towers are the most vulnerable. We'll have a conversation about how to protect them more the next time, but there's not a whole lot you can do."

SUMMARY OF FINDINGS

While each of these government or business organizations encountered different issues, some common themes emerged.

- **Mitigation has a new priority in these organizations**. This area had not had a storm this severe in over 100 years and its intensity was unexpected. Thus, little if any hurricane mitigation had taken place.
- **Hurricane preparation plans have been improved.** Most of the organizations had some sort of emergency or hurricane plans. However, they all agreed that these plans were inadequate to deal with the severe problems that emerged.
- **Damage to facilities was substantial**. As expected, the most destruction occurred to facilities located close to the waterfront. Roofs and roof structures, such as air coolers and cooling towers were especially vulnerable.
- **Getting back into operation as soon as possible was crucial.** Several had COOP or COG plans, but they were inadequate for the task. Those that had prior arrangements with contractors recovered more quickly.

- **Communication was a serious problem.** Not only were they cut off from outside communication, the loss of phone and cable lines also affected computer connectivity. This was a serious problem for some operations.
- **Flexible and creative leadership were important throughout the process.** Nothing had prepared these executives for this extreme event. In each case they were required to solve new problems with limited resources. Given the amount of damage, most got back into operations remarkably soon.
- **Employee safety and security was a priority.** In all cases employees were allowed time to prepare their homes. In some cases employees' families were sheltered. Several had employee assistance programs in the aftermath, providing supplies and funds for repairs and rebuilding. In most cases employees who could come to work were allowed to do so even if their old jobs were not yet available. Others were given administrative leave. Loss of wages was reported to be minimal in all cases.
- **Evacuation could be a greater issue the next time.** With the exception of the military base and university, it appears that these organizations experienced limited employee evacuation. Some sent their families out of the area. Said one executive, "We used to tell people they'd be safe in their homes. I don't think they'd believe it now…the next time you'll have to get out of the way to keep from getting run over." One official expressed concern that there was no good evacuation route. While the roads are adequate out of the state to the north, there is a 13-mile stretch of road in Alabama that is only two lanes.
- **Having sources of outside help was crucial to recovery.** In all but one case study there were connections to a parent or sister organization outside the area. This was a crucial source of supplies, funds and labor to assist with the cleanup and recovery.
- **Recovery has been hampered by lack of funds.** In order to begin repairs and rebuilding in a timely manner it is necessary for the organization to have an available source of funds. Even in these large organizations this was a problem. Those that were self-insured had to find a permanent source for the money. Those that had insurance and/or were eligible for FEMA assistance were unanimous in their complaints about the process. They encountered insufficient staff at the agencies to deal with the workload, changing personnel, requests for duplicate documentation, and a general lack of understanding about their immediate needs. There frustration with the process was obvious.
- **Recovery is far from complete.** In none of these cases had the rebuilding been completed. Some still face long-term construction projects.
- **Mitigation is incorporated into the rebuilding process.** The new construction will be built to stronger codes and in some cases is being

planned to improve the security of operations. In several cases old or obsolete buildings are being replaced with newer ones more conducive to future operations.

To summarize, it is remarkable how soon these large employers in Escambia County resumed operations, most within days. This is noteworthy given the limited mitigation that had taken place prior to the hurricane. All had extensive emergency and/or hurricane preparation plans. Extensive preparation activities, often requiring creative thinking, probably limited the damage. In cases where evacuation was called for, it appeared to proceed without significant problems. Sheltering was provided as needed, usually without outside help. Given the extent of damage, the cleanup and short-term recovery were accomplished in a relatively short time. Most had some type of COOP or COG, although insufficient for a disaster of this magnitude.

The resiliency of these employers can be explained by their size. Each had extensive resources, both human and material, at its disposal. All but one benefited from an influx of outside resources from parent or sister companies or agencies. Their size also enabled them to assist their employees in important ways, from paid time off to the provision of materials and funds for personal recovery.

Eight months after Hurricane Ivan these government and business organizations are back in full operation, but they have not recovered. Most are experiencing financial problems due in large part to delays with insurance payouts and FEMA assistance payments. Each has rebuilding projects yet to be completed, some quite extensive. In all cases, however, it is clear that they will fully recover, and will, in fact, be stronger as a result of this experience.

Of particular relevance to this study was the numerous ways some had found to help their employees with their personal recovery. Clearly, these employees of large organizations had advantages not likely available to people working for smaller enterprises.

Small businesses have not been so fortunate. It is estimated that at least 10% will not reopen, and the number may be much higher, according to officials interviewed for this project. Their story will be clearer when the Chamber of Commerce study is completed.