

# Emergencies

## Houston - A City Prepared

By Cheryl Gajeske

### LOOKING TOWARD THE FUTURE

Slow response times and misdirection of emergency calls is a common dilemma many American cities face with emergency response systems and programs. Outdated equipment, lack of trained personnel, and stretched-to-the-limit resources are common contributors to these problems. This, when coupled with changing technology that often renders expensive equipment obsolete and overloaded systems and power outages that hinder communications, can significantly stress a city's ability to respond in times of crisis.

When the City of Houston was faced with this scenario, which was amplified by the fact that police and fire dispatchers and 911 call-takers were located in three separate facilities, City leaders responded with a vision for a new Houston Emergency Operations Center (HEC) to consolidate services under one roof and provide state-of-the-art emergency response capabilities.

The urgent need for a new consolidated facility drove the exploration of alternative delivery methods for design and construction. To expedite funding for the project, the City determined that a lease-purchase, design-build option provided the most value and allowed for a fast-track approach to complete an operational facility in a short time-frame. A Houston developer, The Keystone Group, the architectural/engineering firm PGAL, and general contractor Gilbane worked closely with members of the mayor's office on Public Safety, the City of Houston Building Services Department, Houston Fire Department, Houston Police Department, Houston Office of Emergency Management, and the Greater Harris County 9-1-1 Emergency Network to develop a modular, expandable facility to consolidate the city's emergency systems and personnel. This innovative approach provided a state-of-the-art emergency center in the shortest amount of time possible, at a substantially reduced cost to the City.

The \$53 million, 128,000 square foot HEC facility combines four agencies and creates a common communication protocol for interagency exchange. Consolidation of the center and systems improves citizen safety and reduces response time resulting in savings to the city totaling more than \$7 million annually. As an added benefit to the city, design and construction of the HEC was completed in 2003 under budget, as \$1 million earmarked for construction was returned to the city's coffers.

The HEC is second only to Chicago in terms of services provided but is soon expected to be the number one Public Service Answering Point System (PSAP) in the nation. Houston, with its premiere equipment and system integration is a model template for other cities to adopt in regards to developing comprehensive emergency response systems. To that end, there appears to be a growing trend among larger cities moving toward consolidated centers following Houston's example.

### WHAT IS THE HEC EQUIPPED TO HANDLE?

As the fourth largest city in the United States, encompassing an area of over 600 square miles, Houston's emergency response and dispatch is a complex and crucial operation. The City's 9-1-1 call-takers and police/fire dispatchers respond to over 3.6 million emergency calls yearly; 10,000+ calls per day are processed and forwarded to the appropriate area in response to requests for police, fire and medical emergencies within the City of Houston. From heart attacks to gunshot wounds, downed electrical wires, apartment fires and chemical spills, 9-1-1 call-takers field a wide range of emergency situations for dispatch.

Houston's Fire Dispatch maintains constant communication with emergency personnel and 85 fire stations throughout 850 square miles, dispatching 270 emergency vehicles to an estimated 75,000 fires and 180,000 medical incidents annually. Police dispatchers maintain the location and status of 1,800 vehicles and direct officers to 1.5 million incidents each year. Combining all systems in one 24/7 operation allows emergency personnel to coordinate all communication and information management systems. Other benefits include upgrade and standardization of Houston's dispatch and record management hardware and software.



Houston Emergency Center

Photo by Jud Haggard



HEC Response Center

Photo by Jud Haggard





The call center is the functional heart of the facility. Robust technology is essential to enable call-takers to handle the estimated 10,000+ daily 9-1-1 and non-emergency calls. The 29,000 square foot control room houses 107 call-take/dispatcher consoles, each equipped with four computer screens displaying response forms, maps and emergency data. Similar information can be projected from three giant projector screens that line the front wall.

Non-emergency calls are handled via a system known as Interactive Voice Recognition (IVR). IVR allows non-emergency calls such as reporting an accident or filing a police report to be handled without operator assistance. This system was enacted in the wake of Hurricanes Rita and Katrina to keep lines open for true emergency calls.

Although still in its initial stages, a new technology is being pursued by HEC that will aid alarm monitoring companies. This technology is unofficially referred to as Web-Alternative Reporting Mechanism (WebARM). Alarm monitoring companies, which are often not located in Houston and therefore unable to utilize the 9-1-1 emergency line, would use WebARM to route alarm calls for dispatch via the internet. The alarm companies themselves are now able to file a report for dispatch. This will allow the system to create verifiable records and to assign a line of accountability for the alarm monitoring firms.

The Office of Emergency Management and Emergency Operations Center (EOC) are also located within the HEC. Key decision makers such as the mayor, county judge and representatives from critical

companies such as Entex, Reliant Energy and the Texas Medical Center are routinely stationed here during emergency situations or significant events that involve the community (e.g. NFL Super Bowl, MLB World Series, NBA All Star Games, etc.). In a large-scale emergency situation, such as a natural disaster or terrorist attack, HEC coordinates with Houston TranStar, the regional traffic management center and Harris County's Office of Emergency Management and Homeland Security. PGAL's Technology Planning Group provided significant leadership in the programming, planning, design, construction and integration of this complex facility and continues to serve as a technology consultant for implementation of enhanced technologies.

### **HOW HAVE THE SEPTEMBER 11, TROPICAL STORM ALLISON AND HURRICANES RITA AND KATRINA AFFECTED MODIFICATIONS TO THE SYSTEM'S RESPONSES?**

The national alarm generated by the terrorist attack of September 11 confirmed the necessity of on-going communications and interoperability between emergency response units. Emergency first responders must be able to communicate with other responding emergency personnel at all times and a consolidated response during the first hour is critical. Through the Office of Homeland Security and with the Office of Emergency Management, 800 megahertz radios are now standard issue among the police and fire response units.

After Tropical Storm Allison crippled Houston's emergency operations, one key element determined that communications equipment should

### FOR FURTHER INFORMATION AND ASSISTANCE:

Visit City of Houston's website [www.houstontx.gov/oem](http://www.houstontx.gov/oem).

Click on the The Hurricane Transportation Registration Form online.  
Citizens are encouraged to pre-register.

Houston Emergency Management: 713-884-4500

be relocated to upper levels of buildings for protection. HEC was designed to be self-sustaining and can maintain ongoing operations for three weeks with contingency plans for many more weeks after that. The structure is designed to withstand the stresses of natural disasters ranging from power surges during lightning strikes to hurricane-force winds. The building is served by two separate power grids, additional generators, and a 26,000-gallon water tank. PGAL's design integrates noise control, dispatcher comfort and optimized workspace configuration. Ergonomic needs of all personnel are addressed through consoles designed with full sit-to-stand capabilities to accommodate individual ergonomic needs. The strategic use of natural lighting also aids in reducing workplace tension, as does individual climate control units.

In retrospect, the state's plan for handling emergency evacuations did not have contingencies for what occurred during Rita, originally a Category 5 hurricane. The following items required attention: contra flow for outgoing traffic, streamlining evacuation routes that typically handle 1,200 cars/ hour to prepare for an overload of fleeing cars that could increase the amount to about 8,000 cars/ hour and the lack of fuel, food and water for fleeing occupants. City of Houston emergency management planners have worked closely with regional municipalities to include major players and outside agencies in the plans. Additionally, great planning has taken place to create networks with businesses located at key exits along the evacuation routes to commit to staying open to evacuees for the provision of services for fuel, water and food.

Redefining the term "essential" personnel also became a pivotal factor when determining who would staff an emergency. Among others, essential personnel are now considered people who routinely care for the HEC and allow for its smooth operation. To encourage the required personnel to show up, arrangements have been made with an area school to allow for overflow sheltering of staff family. They are now assured that they know where their family is and that they are safe.

To provide assistance to disabled citizens during an emergency evacuation, citizens are encouraged to pre-register with the OEM. Although there have been a low number of people who have registered in the past, Houston has made contingencies for 40,000 people; the number that required assistance during Hurricane Rita. Some local schools will be designated as shelters of last resort. While food and supplies are not provided at these shelters, they will serve as a safe haven for those who otherwise cannot leave or who get caught in a severe storm's approach.

A plan has also been put into place to safeguard the animal population as well. Companion animals may now be taken to a designated location where they will be housed and given basic care until their owners return.

All of these items address how Houston can service its citizens. But, the citizenship must do their part. They should have in place an emergency plan, emergency supply kit, food and water, and an emergency destination. Further, in order to keep some of those 8,000 cars/ hour off the road at this critical time, it is suggested that cars be used to transport neighbors and provide other assistance to those in need. Citizens, who decide to shelter in place, should alert the EOC so that they can be checked on after the imminent danger has passed.

The Houston Emergency Operations Center continues to positively impact the Greater Houston Area and serves as a model to the nation for emergency response services.

As a result of recent past disasters, Houston is more prepared than ever to keep its citizens safe and employ response plans that truly work. **N**

*Cheryl Gajeske, AIA, LEED AP is a licensed architect and interior designer. She is a principal with the Houston-based architecture/engineering firm, PGAL specializing in commercial architecture and interiors. She is LEED Accredited through the US Green Building Council and actively engages in design for the sustainable environment. Cheryl can be reached via email at [cgajeske@pgal.com](mailto:cgajeske@pgal.com) or visit [www.pgal.com](http://www.pgal.com).*