

The state of Texas employed EPC Gen 2 tags, GPS and bar-coding to monitor the process of evacuating individuals—particular the elderly, sick or disabled—who lacked access to transportation during the storms.

By Mary Catherine O'Connor

Nov. 12, 2008—Living through a hurricane is a traumatic, emotionally taxing experience for anyone—especially those who lack the means to flee from its path. This became glaringly obvious as the world watched and read about the aftermath of Hurricanes Katrina and Rita in 2005. And it was one of the main drivers behind an emergency program spearheaded in 2006 by Texas Governor Rick Perry.

The system employs a combination of RFID, GPS and bar-code technology, and was designed to simplify and automate the evacuation process of elderly, sick, disabled or able-bodied individuals or families who have no access to transportation during an emergency (see [An RFID Port in a Storm](#)). This summer, the system was deployed to help the state's [Division of Emergency Management](#) evacuate 34,800 residents during Hurricanes Gustav and Ike.



A portable RFID portal captures the ID number of the wristband tag of an evacuee fleeing Hurricane Ike.

"From the standpoint of what the state was looking to achieve, the system was very successful," says Kenneth Ratton, cofounder of [Radiant RFID](#), which provides the RFID hardware and software for the

system.

During Hurricane Katrina, many Louisiana residents were transported—often without any identification—to Texas. But then, close on Katrina's heels, Hurricane Rita bore down on regions of that state, requiring the movement of many Katrina evacuees once more. By that point, however, keeping tabs on who was being evacuated, and to where, was so complex that in many cases, emergency personnel effectively lost track of evacuees for days—particularly special-needs individuals who were disabled or sick and, thus, could not easily provide their identifies to the medical teams.

"Not all people think about, or have the capacity to call, their next of kin to let them know where they are going during an evacuation," Rattan says. "During Hurricane Rita, it sometimes took [relatives] weeks to find [evacuated] people. In Gustav, it took minutes or seconds to find people [who were being tracked with the new system]."

The system was tested during simulated emergencies, then deployed in preparation for Hurricane Dean during 2007, but that storm ultimately changed course, resulting in no evacuations in the Gulf Coast cities where the system would have been employed. Consequently, Hurricanes Gustav and Ike provided the first real test of the system, which includes wristbands containing an [Alien Technology](#) Higgs 2 EPC Gen 2 inlay and a custom antenna codeveloped by Radiant and [RCD Technology](#). Printed in bar-code form on each wristband is the same ID number encoded to the RFID inlay. Radiant also created custom RFID portals designed to be easily transported and set up at evacuation centers. The portals, which contain [Motorola](#) interrogators, capture the ID number encoded to each wristband as evacuees pass through them on foot, in wheelchairs or on gurneys.

The evacuees meet at central locations known as embarkation centers, located in towns and cities. At these centers, each adult and child is issued a wristband—and pets receive special tags affixed to their collars. The IDs issued to the pets and children are associated in a back-end database with those of their guardians.

According to Rattan, the manner in which the system has thus far been deployed is to use bar-code scanners to read the wristbands of evacuees boarding buses at the various embarkation centers. Because emergency personnel already need to interview each evacuee before they board, in order to assign each a wristband and ID, it's a simple process to use a handheld bar-code scanner to read the ID at the same time, rather than send that individual through an RFID reader portal to log him or her into the system. But during future evacuations, emergency personnel will likely use RFID to log them in instead of scanning the bar code, so as to speed the process and ensure each wristband is read.

The buses are equipped with GPS receivers used to track the whereabouts of the vehicles, and the evacuees inside them, until they arrive at the central evacuation hub, or reception point. Here, RFID portals are stationed to read the tags as the evacuees exit the bus, so that the master database shows who has disembarked at that site. Based on their individual condition and needs, evacuees are then assigned a final location, which might be in a shelter at this reception point, or at another location.

Those bound for a different location are again tracked on a second bus, and at their final destination.

Hurricane Ike came very quickly after Gustav, Rattan says, presenting several logistical challenges. "We were coming back from Gustav when we learned that Ike was on the way," he explains. "We evacuated Corpus Christi, and the storm chased us up the coast until we came so close to the evacuation deadline that we had to stop issuing the wristband at the embarkation points and instead did so at the reception points, assigning wristbands to people as they arrived there."

The tracking process is repeated after the storm as evacuees are returned to their original embarkation center.

Using RFID to identify evacuees, Rattan says, has allowed emergency personnel to collect data more quickly and accurately than relying on bar-code scans, because the latter is hampered by human errors (personnel occasionally miss a wristband). What's more, using a bar-code scanner requires that an evacuee present his or her wrist. This takes time and can be difficult for people who don't understand verbal instructions, or who are wearing layers of clothing over the wristband.

Radiant is subcontracted for the emergency system by [AT&T](#), which Texas contracted to deploy the system, and whose cellular data and voice network is used as the telecommunications platform to link the RFID readers to the back-end database. According to Rattan, Radiant is also discussing the value of the RFID wristband system with other state and city governments looking for ways to improve their emergency response operations. "We are hitting every state that will listen to us," he asserts.

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