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Emergency Responders

Federal authorities coordinating the Space Shuttle Columbia search called on the TCEQ Strike Team for help with hazardous materials. The team has specialized training and equipment to deal with a prolonged environmental crisis.

TCEQ crews assisted in space shuttle recovery

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When Space Shuttle Columbia broke up over the Texas skies Feb. 1, the TCEQ soon realized that a hazardous materials (hazmat) event was in the making. Within a few hours, members of the agency's Strike Team were headed to the communities where orbiter parts had rained down.

About 20 state and federal agencies converged on East Texas to work with local law enforcement and rescue groups, which were soon overwhelmed by the magnitude of the event.

The TCEQ would play a lead role in the hazmat response. In all, about 50 agency employees aided with various recovery assignments -- in the field or at the state's emergency operations center in Austin.

The Columbia tragedy was one of unusual proportions, with the demise of the seven-member crew and the massive search effort. Thousands of sites that contained potential or actual shuttle materials had to be evaluated. More than 60 counties in Texas were affected.

Responding to disasters, however, is not unusual for many TCEQ staffers. In fact, emergency response personnel at each of the 16 regional offices are trained to react quickly to industrial accidents or natural disasters that spawn an environmental crisis or pose a significant hazard to the public (see [On the Front Lines](#)).

Moreover, the TCEQ's 14-member Strike Team has taken emergency response further with additional training and specialized equipment that enable them to react to just about any environmental crisis.

"When we arrived in East Texas to help with the shuttle recovery, we were ready to deal with the issues and the problems we encountered," recalled Strike Team Coordinator Jeff Lewellin, who is based in Corpus Christi. "This team knows how to fit into an overall response action. We are highly trained and have experience working within an incident command system, which organizes and coordinates resources at the scene of an emergency."

Specialists Needed

More than two years ago, the TCEQ decided to take its emergency response program to a higher level. The agency is charged with dealing with environmental crises -- be it natural or manmade. That means responding to emergencies stemming from tornadoes and hurricanes, as well as hazardous discharges, spills, and toxic air releases.



The TCEQ Strike Team sometimes wears protective suits and breathing apparatus to sample for the presence of hazardous materials. Pictured are Chris Caudle of Harlingen (left) and Robert Reed of San Antonio, who are trained on how to enter hazmat scenes and gather information necessary for the protection of the public and the environment./ TCEQ photo by Douglas Falls

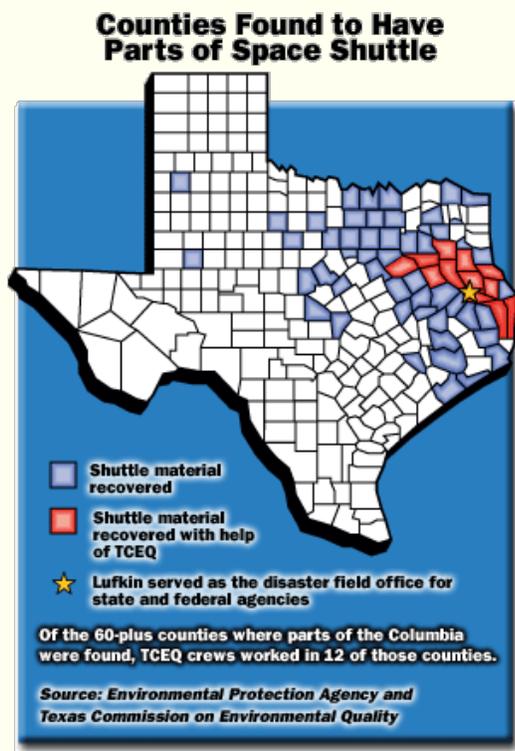


Strike Team members say the highly volatile fuel components contained in shuttle containers such as this one were the most dangerous materials they had ever worked around. This sphere, found in remote East Texas, was flushed of its contents and returned to NASA./ photo by EPA/FEMA

"The agency realized it didn't have the ability to place specialized emergency response equipment and the required trained personnel in every regional office," said Dale Vodak of Tyler, who is assistant coordinator of the Strike Team. "Management recognized the need to be able to quickly move additional resources to any part of the state having a high-priority emergency. This means moving specialized equipment and trained people to the scene in a hurry."

TCEQ staffers from various regional offices and professional backgrounds were chosen for the Strike Team. On average, each member had 14 years of experience with the agency in areas such as petroleum storage tanks, industrial and hazardous waste, municipal solid waste, scrap tire management, air monitoring, drinking water, wastewater treatment, stream monitoring, and water rights.

Training has been a priority. Strike Team members have trained with the 6th Civil Support Team (CST) based in Austin. This National Guard unit, which specializes in response to weapons of mass destruction, can assist with threats posed by hazardous materials, including chemical, biological, and radiological threats. The 6th CST has instructed the Strike Team on countering terrorism and detecting threats to state infrastructure, such as refineries and public water systems, that are regulated under environmental laws.



Other training missions have paired the Strike Team with Environmental Protection Agency (EPA) units to run safety drills at the state's largest scrap tire site, and included sessions on dealing with rail tanks carrying hazardous materials.

Individuals on the Strike Team have been deployed to emergencies throughout the state: a tire fire in Stamford, flooding in Houston, a hydrofluoric acid release at a Three Rivers refinery, a suspected anthrax release in Palestine, a tornado cleanup in Thornton, a warehouse fire in Pearland, a pipeline leak in Texas City, and a PCB cleanup and groundwater sampling in San Angelo.

Crisis in East Texas

The aftermath of the Columbia accident demonstrated the resources the TCEQ brings to an emergency situation. Soon after the shuttle disappeared from radar screens, agency toxicologists were called to the governor's Division of Emergency Management in Austin to advise on the potential health effects of crash-related hazardous materials. Residents near Toledo Bend Reservoir, a major source of drinking water, had reported seeing large pieces of the shuttle fall into the lake.

The TCEQ consulted with NASA on the types and amounts of chemicals that were on the orbiter. Through analysis of this information and coordination with EPA, staff determined there were no significant risks to public drinking water sources and systems. Water sampling by the state of Louisiana later corroborated this assessment.

Meanwhile, the Strike Team converged on Lufkin to assist in identifying potentially hazardous shuttle materials and mitigating hazards created by the accident. Some of the shuttle components included toxic and corrosive fuels, pyrotechnic devices, pressure vessels, and radiological and biological hazards.

In Lufkin, which served as the disaster field office for federal, state, and local agencies, the TCEQ worked most closely with EPA, but also coordinated with the Federal Emergency Management Agency (FEMA), FBI, NASA, and the Coast Guard. NASA and the FBI handled the recovery of human remains. For three weeks, TCEQ staff also operated out of regional command centers in Palestine, Hemphill, Jasper, Nacogdoches, San Augustine, and Fort Worth.

The TCEQ's first assignment came the day after the tragedy, when the Governor's Office announced that shuttle materials had been discovered on school grounds.

Priority was given to clearing school properties and keeping the public from potentially dangerous materials. At the



The TCEQ's Don Naylor of Waco (center, in civilian clothes) goes over hazmat safety plans with members of the National Guard's 6th Civil Support Team of Austin. The TCEQ supervised removal of many containers and pressure vessels found from the Columbia. /photo by EPA/FEMA

same time, it was important to recover all debris -- no matter how small -- as evidence critical to NASA's investigation.

TCEQ and EPA teams evaluated and removed shuttle materials from 39 public and private schools. Heat-shield tiles and pieces of hose, metal, and wiring were typical of the recovered items, but the TCEQ's Raymond Marlow of Beaumont remembers one surprise discovery.

"One of the shuttle parts was found inside a kindergarten room," he said. "A six-inch piece of metal went through the roof of the school and landed on the floor of the classroom. Fortunately, the accident occurred on a Saturday and the school was empty."

Hazardous Duty

The disintegration of the Columbia occurred 40 miles over Earth, so the debris field covered thousands of square miles in Texas and Louisiana. Parts of the craft ended up in cow pastures and dense forests, as well as on front porches and parking lots.



Before approaching hazardous shuttle materials, state and federal hazmat specialists donned protective suits and breathing gear. A surprising number of the shuttle's tanks and pressure vessels landed intact, but many were leaking. / photo by EPA/FEMA

The TCEQ teamed up with National Guard CST crews from Texas, Oklahoma, Arkansas, and New Mexico in evaluating hundreds of shuttle-related objects. The teams worked with NASA engineers to help identify various hazardous components. Some of the pyrotechnic devices on board included conduits filled with detonation cords, explosive charges, and bolts -- all part of the emergency escape system.

A surprising number of the shuttle's 64 tanks and pressure vessels survived the breakup and landed intact. Many contained the fuel components monomethyl hydrazine (MMH) and nitrogen tetroxide, which power the shuttle's maneuvering rockets and auxiliary power unit. Both materials are corrosive and toxic; MMH is a powerful oxidizer and is extremely flammable.

The TCEQ and National Guard CST teams were designated by NASA as the hazardous materials response teams for neutralizing or abating vessels containing hazardous fuel components. The pressure vessels were used to store oxygen, helium, hydrogen, and other gases. Any of these vessels could have ruptured or begun leaking at any time. Teams had to be alert for radiological and biological hazards associated with the shuttle payload.

"Approaching shuttle materials required our

recovery teams to use safety training and hazard assessment usually associated with chemical spills or hazardous fires," Lewellin recalled. He said the situation called for a cautious approach from upwind and the use of portable instruments to screen for volatile organic chemicals and radiation.

From an appropriate distance, the teams would record the physical location, photograph the material, and note the global positioning system coordinates. If no hazard was detected, the crews bagged each item. With materials deemed hazardous, special procedures for safe collection and transportation were used.

In one incident, a TCEQ-National Guard team was called to a pine plantation in San Augustine County after discovery of a large fuel tank that was emitting MMH fumes. The recovery took several days due to the remoteness of the area and the complexity of the tank construction. After a road was built to the location, Guardsmen in protective hazmat suits neutralized and flushed the container. All rinse water and neutralizing agents were treated as hazardous waste and disposed of by EPA.

Planning Ahead

In just two years, the TCEQ Strike Team has accrued a wide variety of experiences. The shuttle recovery introduced members to the complexities of working a large-scale emergency over a vast geographic area. It was a challenge to communicate and coordinate activities over 12 counties.

As with every emergency, the team had to quickly assess the situation and determine the highest priorities.

"The TCEQ was on the ground first with our cleanup crews, and we ended up doing some of the high-priority hazmat



A trailer-mounted mobile command post, which often serves as a base of operations for the TCEQ, carries computers, communications gear, and other emergency response supplies. This enables the Strike Team to use two-way radios, a satellite telephone, and a two-way satellite transmitter/receiver. Also on board are a portable gas chromatograph/mass spectrometer for rapid field analysis of unknown chemicals, an X-ray fluorescence meter for detecting metals in soil, volatile organic compound meters with telemetry, and a thermal imaging camera.

events," said Lewellin. "Initially, it was chaotic, but our team showed their professionalism. We got the job done."

FEMA Coordinator Scott Wells called the TCEQ's participation "invaluable."

"These guys are good at what they do -- they are technically proficient," said Wells. "More importantly, they're team players. They helped to bridge the local, state, and federal assets and to ensure the public's safety."

Meanwhile, the Strike Team continues to prepare for other possible large-scale disasters, including acts of terrorism. Six members work full-time on planning and training, while the remainder split their work week between the Strike Team and duties in regional offices. Four other TCEQ staffers provide operational and computer support. Consideration is being given to adding toxicologists to the team.

Reporting for Duty

The state emergency response plan designates the TCEQ as the primary agency responsible for hazardous materials recovery. In the shuttle disaster, the governor's Division of Emergency Management deployed the Strike Team to work with NASA and EPA on the cleanup.

Many other state agencies and institutions were involved with the recovery. Among those were: the Texas Department of Public Safety, Texas Army National Guard, Texas Task Force One, Texas Forest Service, Texas Parks and Wildlife Department, Texas Department of Health, Texas Department of Mental Health and Mental Retardation, Texas Animal Health Commission, Attorney General's Office, Civil Air Patrol, University of Texas at Austin, Stephen F. Austin State University, and Sabine River Authority.

On the local level were fire departments, law enforcement agencies, EMS, and search-and-rescue units.

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