Operation Dragon's Den

By Lieutenant Colonel Vasili Karatzas and Sergeant First Class Alejandro Ibarra

While conducting a dismounted patrol in an industrial district of Fallujah, Iraq, on 15 June 2007, 3d Battalion, 2d Brigade, 1st Iraqi Army Division (the 3-2-1 Iraqi Army [IA]), and their military transition team discovered several thousand five-gallon containers of nitric acid—an extremely corrosive, toxic industrial chemical associated with bomb making. The actions that transpired over the next thirty days comprised the largest hazmat remediation mission ever undertaken during Operation Iraqi Freedom.

Discovery and Reconnaissance

The chemical, biological, radiological, and nuclear (CBRN) and staff engineer (C7) environmental cells were perplexed by the magnitude of the discovery. Because previous caches had only yielded as many as 600 containers, this was a very significant find. The Multinational Force–West (MNF-W) wanted the cache removed; so following an initial reconnaissance of the site, the CBRN and C7 environmental cells developed a solution for the final disposition of the nitric acid. In the meantime, local IA patrols kept an eye on the cache until it could be moved.

On 18 June, environmental representatives from the Multinational Force–Iraq (MNF-I) and the Multinational Corps–Iraq (MNC-I) (accompanied by MNF-W environmental and IA security personnel) conducted the first site reconnaissance. The nitric acid had been discovered in a courtyard that was flanked by abandoned courtyards on two sides and a flour factory to the southwest. There was a row of garages and machine shops along the street to the north. Within the courtyard, there were two large stockpiles of nitric acid—the larger pile (along the northeast wall) consisted of about 6,000 containers, and the smaller one (along the north wall) consisted of about 2,000 containers. Both stockpiles were covered with a crude framework of corrugated metal, which was just enough to keep off the sun and rain. In places, the containers had been stacked eight-high. Some of the containers were crushed or tipped, and the leaking nitric acid was reacting with debris in the courtyard. A metal cabinet that had come in contact with the acid was dissolving. The odor was overwhelming. Other mechanical and industrial debris littered the courtyard, making working conditions a challenge.

Complications

On 21 June, MNF-W reported that the cache of nitric acid was on fire. Although nitric acid itself is not combustible, it increases the combustibility of other substances. The nitric acid had apparently reacted with something to generate a large amount of fumes. Iraqi fire department personnel responded and fought the fire. When it became clear that water would not stop the chemical reaction, fire department personnel requested firefighting foam from the military fire department at Camp Fallujah. The Marines responded with the requested foam (along with sand, dump trucks, and bulldozers) and assisted Iraqi firefighters in controlling the chemical reaction.

It took several hours to gain control of the situation. MNC-I CBRN personnel contacted personnel at the Defense Threat Reduction Agency Operations Center, providing them with the information necessary to arrive at a detailed downwind hazard prediction. As a safeguard, MNC-I advised MNF-W to keep all nonessential personnel indoors and to initiate air monitoring. For the next six hours, Dräger tubes were used to monitor the air quality. To secure the nitric acid, Iraqi and Marine firefighters built a four-foot-tall sand berm around a heavily damaged area.

On 27 June, the nitric acid began fuming again. This prompted a second response by the Iraqi fire department and MNF-W Marines. A second reconnaissance team, consisting of personnel from MNF-I and 1st Platoon, 329th Chemical Company (Reconnaissance), was dispatched to the site. The larger stockpile was completely melted together, while the smaller one—though still intact—was sitting in a puddle of acid that was six inches deep.

Plans and Preparation for Operation Dragon's Den

For the larger stockpile, plans were made to remove the overhead cover, place a rubber liner over the stockpile, and raise and reinforce the surrounding berms. Plans were also made to use caustic soda to neutralize the large puddles of acid and remove the undamaged nitric acid before it posed an

active threat to the local population. A fifty-person CBRN team comprised of personnel from the 1st Platoon, 329th Chemical Company, II Marine Expeditionary Force (MEF), and the Multinational Division–Center was formed. It was augmented by three environmental specialists from MNC-I and MNF-I. The IA and II MEF were to provide security; and Regimental Combat Team 6, II MEF, was to provide logistical support.

Cordons were to be established at several key locations. After an explosive ordnance disposal team had swept the site, CBRN and logistics teams were to occupy it on a daily basis. A staging area was to be established, overpack materials and pallets were to be brought in, nitric acid containers and pallets were to be packed, and the packs and pallets were to be loaded onto trucks for removal. A second team of CBRN and environmental personnel was to receive the nitric acid at Camp Fallujah, where it was to be processed for turn-in to the hazmat yard.

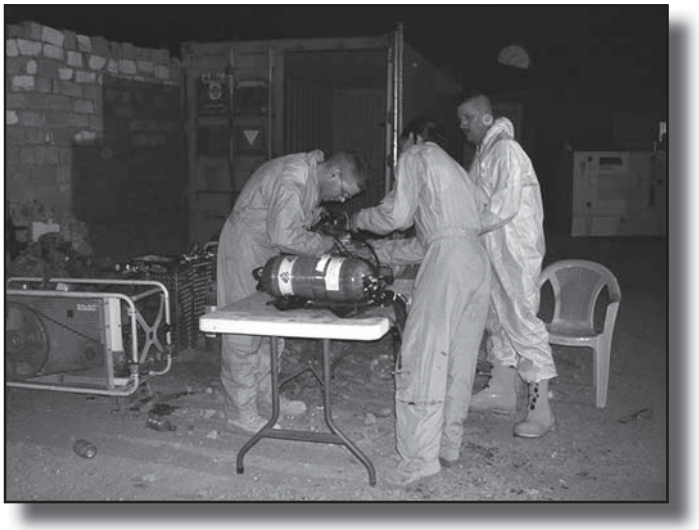
All participating CBRN teams arrived in Fallujah two days before the mission was to be executed. During that time, they integrated and developed standard techniques to be used during the mission. In addition, two operation order briefings were held.

Safety would be one of the keys to a successful mission. Baseline vital signs of all team members would be checked before they entered and after they exited the toxic area. The wear and function of gear would be checked by a full-time safety officer before team members were allowed to enter the contaminated area. A buddy system would be employed; at no time would anyone be allowed to be alone in the toxic area. While downrange, the safety officer and the officer in charge (OIC), noncommissioned officer in charge (NCOIC), or operations NCOIC would continuously monitor team members. Corrections would be made as personnel worked. Anyone who committed a safety violation or premature alarm activation would immediately be removed and refitted. Upon exiting the contaminated area, team members would be decontaminated and medically checked. They would drop off their equipment for refitting, and their tanks would be refilled. Team members would be allowed to rest for about an hour before reentry.

Execution of Operation Dragon's Den

The operation command system closely resembled the National Incident Management System Incident Command System. The CBRN officer served as the on-scene commander. A representative from the security element and the logistics chief were colocated with the on-scene commander. The overall security operation was conducted from a joint security station. This command structure allowed for rapid decision making and problem solving.

The first night of the operation was the longest. The cordon was established, the explosive ordnance disposal team swept the site and staging area, and the logistics and CBRN teams occupied the area. Twenty-seven vehicles transported the personnel and equipment needed to conduct the mission.



A Soldier exiting the hot area drops off his self-contained breathing apparatus for refitting and refilling.

The site and staging area needed to be prepared before work could begin. Bulldozers were used to remove debris from the target and staging areas and to knock out a section of a wall, allowing access from the staging area to the site.

The II MEF provided outstanding logistics support throughout the operation. Items supplied included—

- Bucket loaders, used to remove debris.
- All-terrain forklifts, which provided material-handling capabilities.
- Caustic soda, used to counteract the pH of the nitric acid in the shuffle pits.
- Caustic soda and sand, used to remediate puddles of nitric acid that formed during the movement of the containers.
- Portable lights, which allowed for nighttime visibility.
- A thirty-kilowatt generator, which provided power.
- A toxic industrial chemical protection and detection equipment (TICPDE) shower system, used for decontamination.
- Decontamination water, provided by a seven-ton truck with two 600-gallon containers.
- Two M17A3 lightweight decontamination systems, available in case they were needed.
- A medical container express manned by three Navy medical corpsmen, which served as a triage and treatment facility.
- A refrigerated container express, which contained all Class I items (food and water).

An environmental team conducted quality control checks on the packing and loading operations, ensuring that the hazmat was safe for transportation. Another environmental specialist received the hazmat and supervised marking, labeling, and turn-in to the hazmat yard. Containers that had been damaged

Decontamination shower used by personnel exiting the hot area

during transportation were repacked by a TICPDE team and a decontamination element. The decontamination team at the hazmat yard also decontaminated transport vehicles and loaded replacement overpack containers on returning trucks.

The operation continued for three consecutive nights. Each night, the mission began with an in-depth convoy briefing in the motor pool. The convoy then headed to the staging area. The route and site clearance teams were dispatched, the site was occupied by 2200 hours, and operations were conducted throughout the night. Operations ceased at approximately 0800 hours daily, coinciding with curfews and ending just before the collapse of the outer cordon. Back at Camp Fallujah, the mornings were spent resetting and preparing equipment for the next mission that evening. Operational summaries were completed and submitted to higher headquarters, and the OIC briefed the MNF-W chief of operations on the progress of the mission.

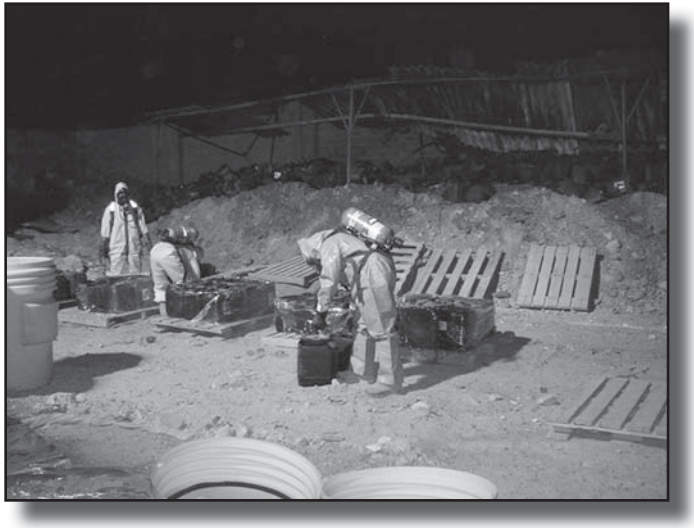
The operation was not without incident. During the first night, two CBRN Marines sustained acid burns. The first occurred when one of the Marine's overboots was cut on some rocks. The Marine continued working until the acid penetrated the boot, causing the burn. This prompted the safety noncommissioned officer to inspect overboots after each use. The second casualty occurred when a Marine brushed a nitric acid container against the zippered area of his Level B suit. The acid penetrated the zipper, causing a burn to the groin area. In response, the length of the Level B zippers—between the legs and up the back—was taped to prevent similar incidents. Both Marines were evacuated and returned to limited duty the following day. Other team members suffered minor burns that were flushed with cool water, but did not require evacuation.

On the third night, a sudden shift in wind direction created a dangerous situation. Two teams were exiting the site through the decontamination line, and a third team was on the ready line. The wind swirled, changing direction from the south-southeast to almost due north, right at the staging area. The cloud of nitric acid fumes was clearly visible in the work lights. Workers were ordered to evacuate the site. Personnel had less than ten seconds to react. Air tank refill systems were moved, and several sets of self-contained breathing apparatuses were retrieved for key personnel. The OIC and members of the ready team entered the hazard area and placed caustic soda and sand on puddles of fuming nitric acid. With the situation under control and a favorable wind shift, the staging area was reoccupied. Two personnel were evacuated for nitric acid inhalation; both were treated and released back to duty the next morning.

After surveying the site, the OIC decided that overpack operations should cease and that limited remediation operations should be conducted. About seventy containers of nitric acid remained in the smaller pile because they were deemed too dangerous to retrieve. Some of these containers were broken, creating a puddle that was about twenty feet long, twenty feet wide, and six inches deep. Bucket loaders were used to push fine sand into the area. After the puddle was filled, a six-foot berm was built against the remaining seventy containers. The existing berm on the large, fire-damaged pile was extended and raised from four to six feet. Six acetylene tanks were removed. However, the collapsed overhead cover on the large pile could not be removed without the risk of damaging the berm.

Close-out operations continued throughout the night. The command and control element and one TICPDE team remained on-site to assist engineers. Nonessential personnel were sent to the joint security station and Camp Fallujah. About thirty minutes before departing from the site, friendly units received

Overpack containers ready to be filled



CBRN personnel pack nonleaking containers of nitric acid on pallets for movement to Camp Fallujah.

fire from an unknown enemy. The Iraqi forces providing security returned fire. The site was closed off with T-wall barriers and concertina wire.

Summary

The scope and scale of Operation Dragon's Den surprised many personnel, including those who participated in the mission. In all, more than 260 toxic entries were made by 44 personnel over the 3 nights, with 4 minor injuries; and 143 ninety-five-gallon overpacks and 43 pallets of nitric acid were transported to Camp Fallujah for turn-in to the hazmat yard. Removing the nitric acid prevented it from being used in homemade explosives.

Keys to the successful mission included the attention to safety, integration of environmental specialists, and can-do attitude of CBRN Soldiers and Marines. Many lessons learned were documented; and tactics, techniques, and procedures were refined. Doctrine and training must be refined to include these types of large-scale hazmat and environmental-remediation missions.

At the time this article was written, Lieutenant Colonel Karatzas was serving as the chief of MNC-I, CBRN Operations, and as the mission commander for Operation Dragon's Den. He is currently serving as the deputy director, Directorate of Training and Leader Development, U.S. Army Chemical, Biological, Radiological, and Nuclear School, Fort Leonard Wood, Missouri.

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