

Diver Detectives

Deep Ocean Engineering ROV Helps Security Teams Investigate Water-Borne Terrorist Attacks

A new training course undertaken by the **FBI** and **LAPD** addresses the situations that divers will confront when called in to retrieve evidence from an underwater crime scene resulting from an explosion at or near the waterline. **FBI Special Agents Robert Chacon** and **Greg Rabinovitz** describe the unique approach processing an underwater post-blast incident requires and how it differs from investigating more routine underwater crime scenes.

Kelly Sandell (left), of the LAPD Dive Team, and Bob Scheerle (right), of the FBI's LA Dive Team, watch as instructor Greg Everett, of the LA Sheriff's Department Arson Explosives Detail, offers insight into the exploded IED using items located and recovered by the student divers.



A super-tanker is moored offshore at an offloading facility delivering fuel to the thirsty automobiles of Southern California. The facility is located in the Pacific Ocean, a short distance off the runways of Los Angeles International Airport (LAX).

As the tanker is offloading fuel, a commuter pulled over along a nearby roadside observes several men unloading a small motor boat from a trailer parked illegally along the beach. He watches as the boat speeds out to sea in the direction of the tanker.

A short time later the commuter sees an explosion offshore and notifies the authorities using his cell phone. Authorities determine that the tanker has not been hit but there is some debris on the surface of the water in the area pointed out by the first witness, whose story is later corroborated by the statements of other witnesses.

It is quickly determined that a vessel has exploded but the circumstances are unknown. All activity at the fueling station is halted, as is incoming traffic at the nearby Port of Los Angeles/Long Beach. Air traffic at LAX is interrupted. Authorities at large commercial ports all around the US are notified of the incident and placed on high alert.

A thorough and proper underwater investigation must commence immediately in order to reopen the fueling station and return the ports and airports to normal operating conditions.

Terrifying Precedent

Despite the significant resources and attention that are focused on port security today, the above scenario (taken from a training scenario based on the USS *The Sullivans* and USS *Cole* incidents in Aden, Yemen) cannot be overlooked. This terrorist tactic has been tried repeatedly and proven effective, suggesting it will likely be tried again.

Should a similar attack occur again, the ensuing underwater investigation will need to determine several very important things fairly quickly:

1. Was the explosion of the small boat an innocent accident, or did it result from explosive materials intentionally placed onboard the vessel?
2. Did the operators of the vessel intend to attack the super-tanker?
3. What type and quantity of explosives, if any, were aboard the vessel?
4. What type of device was intended to trigger the explosion at the tanker?

These and many other questions will be asked in the aftermath of such an incident, and their answers demanded quickly.

Preparing Dive Teams For Major Investigations

Law enforcement dive teams must be trained and equipped specifically for this type of complex underwater crime scene investi-



Students used ROVs deployed from the beach to search for evidence lying on the lake-bed.

gation. This was the idea behind a first-of-its-kind course developed and taught jointly by bomb technicians from the Los Angeles Federal Bureau of Investigation (FBI), Los Angeles Police Department Bomb Squad, Los Angeles Sheriff's Department Arson Explosives Detail, and the US Navy Explosive Ordnance Disposal (EOD) unit at Point Mugu, California.

The week-long course was introduced October 4-8, 2004, at Castaic Lake, California. During their course planning, instructors recognized that while many public safety divers are well-trained in processing routine underwater crime scenes, most lack a robust training curriculum or certification for the specialized skills associated with major underwater crime scenes like those resulting from the use of an explosive device.

The course would partner public safety divers with diver/bomb technicians so that evidence collected or located by divers could be quickly and adequately analyzed by the bomb techs – both in the water and along shore – in order to advance the work of the investigators and resolve the situation.

Attending the 40-hour course were public safety and military divers from numerous agencies, including the Los Angeles Police Department, the Los Angeles Sheriff's Department, the FBI, the Orange County Sheriff's Department, and the United States Coast Guard (USCG).

Classroom Training and Field Work

During the course divers were introduced to concepts related to underwater bomb scenes through both lecture and practical exercises. The lectures provided an introduction to basic underwater explosives theory, training on the recognition and identification of manufactured limpet and sea mines as well as improvised explosive devices (IEDs), an introduction to the DC electronics commonly employed in IEDs, and crime scene management. Divers were also introduced to an overview of skills used in fragmentation analysis.

By Tuesday afternoon the divers were in the water applying what they had learned in the classroom. Divers from several different agencies and departments were purposely placed together in teams of six to eight in order to foster inter-team working relationships. Over the next three days the divers were put through a series of exercises

of increasing complexity leading to the final all-day scenario.

On Wednesday each of the teams was given an underwater area to search for evidence of an exploded device. Course instructors had detonated a series of IEDs underwater in a controlled environment (a large concrete tank) prior to the class. The location and pattern of debris was recorded for each device and items of evidence (fragmentation) were placed into the lake in the exact condition and pattern they had taken when exploded in the controlled environment.

Each team was then tasked with locating the exploded device and its components. The teams were required to process the device components distributed across the bottom as though they were working a real crime scene. They used video and still photographs where visibility would permit and documented debris patterns through a sketch on an underwater slate – a drawing that might later prove crucial to bomb technicians conducting the post-blast fragmentation analysis.

Finally, after the documentation and recovery phase of the operation, the teams then took the evidence into the classroom lab, where they were required to develop a reconstruction of the device from the recovered components and describe the manner in which it had functioned, causing the explosion.

During this phase of the course the



The student divers arranged items of evidence in the configuration in which they were located on the bottom. Additional photos and sketches of this layout provide clues to the function of this IED.

divers learned valuable lessons on approaching such an underwater crime scene, as well as what to look for and how to handle, recover, and analyze it. Not only is each recovered item of evidence important, but its location and position relative to the other items is also extremely relevant to the reconstruction of such devices. The teams presented their findings to the instructors and class, with their conclusions supported by recovered items of evidence as well as appropriate and logical analysis.

A Simulated Attack

On the final day the divers arrived at the

site and were immediately confronted with several witnesses who began to outline the details of the scenario described at the beginning of this article. With only general prompting from the instruction staff, the divers were required to set up a multi-agency Unified Command and begin the process of assigning tasks and meeting the requirements of the scenario – as though it were a real crime scene.

Since the divers did not know the exact location or condition of the sunken boat described by witnesses, the team leaders decided to organize an underwater search operation based on witness information.

During the search, teams launched two remotely-operated vehicles (ROVs), which were operated by the Los Angeles Sheriff's Department and the FBI's Underwater Search and Evidence Response Team. Divers eventually located the sunken boat using a Kongsberg Simrad 650 sector scanning sonar deployed aboard the FBI's Deep Ocean Engineering (DOE) Phantom 2+2 ROV.

After locating the sunken boat, the Phantom ROV was used to conduct a video survey of the boat and the surrounding area. By beaming the video image topside to the team's support vessel, the team was able to determine that the vessel was laden with



Paul Hardy, of the LA Sheriff's Dept. Pyramid Lake Dive Team, operates the ROV from the improvised command center.

additional undetonated explosives, and that there was at least one victim still onboard.

After conferring with bomb technicians who were viewing the ROV's video topside, the team used the ROV's manipulator arm to recover what appeared to be one piece of explosive material that had been thrown clear of the vessel during the explosion.

The ROV then returned to the surface. While the bomb technicians examined the unexploded material, the divers reviewed the ROV's videotape and telemetry data and formulated a dive plan to recover the victim, process the scene and recover the explosive material and the boat.

The ROVs proved extremely valuable in providing an accurate and detailed site survey to the divers, as well as serving as a remote means of recovering potentially hazardous materials and devices – including two unexploded backpack-borne IEDs that presented an obstacle to dive operations and had to be rendered safe prior to divers entering the water.

During the IED recovery operation, the ROV attached cables to the devices. The cables were used to drag each backpack near shore where bomb technicians were able to retrieve the cable end while the IED was safely underwater at the opposite end of the cable. The IED was then rendered safe by a waiting PAN disruptor, a device developed by bomb-disablement expert Chris Cherry in the early 1990s to help keep bomb technicians safe and disable bombs nonexplosively so that valuable evidence can be retained.

The divers then executed a dive plan to recover the victim, the unexploded material, and the boat. Still photographs and sketches were used to further document the scene and the locations of relevant items of evidence.

Finally, the divers used lift bags to raise the vessel and had it towed to shore where a more detailed examination of the blast damage could be conducted.

Improving the Curriculum

Overall, both the instructors and students believe this pilot course was a success and were very happy with the level of instruc-

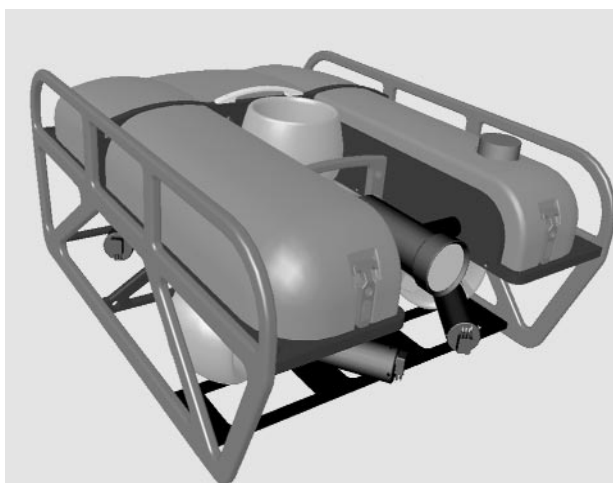
tion that was provided. Instructors have already begun with modifications to the existing curriculum in order to take into account the comments of students who attended the first course.

If you have any questions about the course or are interested in attending, contact FBI LA Special Agent Bomb Technician Greg Rabinovitz (grabinov@leo.gov), Special Agent Robert Chacon (robert.chacon@ic.fbi.gov or 310-996-4397), FBI USERT Team Leader Special Agent George Carr (geocarr@earthlink.net or 818-779-3190), or Los Angeles County Sheriff's Department Detective Bomb Technician Greg Everett (562-946-7222). *UWV*



Special Agent Bobby Chacon is an Assistant Team Leader for the FBI's Underwater Search & Evidence Response Team in Los Angeles, and a frequent contributor to UnderWater.

Greg Rabinovitz is a Special Agent and Bomb Technician operating out of the FBI's Los Angeles Field Office. He has training in Hazardous Devices and Materials, Biology, Weapons of Mass Destruction, Evidence Collection, and Sampling Protocols.



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