

CWD Response to Ammunition Depot Accidents

While casualties inevitably occur during wars as a result of hostilities, munitions explosions are far more dangerous because they can injure or kill thousands of civilians and military personnel in a single incident. These detonations are not a new occurrence; they have happened as far back as World War I.

by COL. George Zahaczewsky [U.S. Army, Retired]



QRF personnel conduct ordnance removal activities in February 2009 following a munitions depot explosion in Chelopechene, Bulgaria.
All photos courtesy of QRF.

On 6 December 1917, during World War I, nearly 2,000 people were killed and an additional 9,000 were injured in one accident, when a French ammunition ship, the SS *Mont Blanc*, collided with a Norwegian cargo vessel, the SS *Imo*, in Halifax Harbor, Nova Scotia, Canada. The collision sparked a fire that ignited over 2,500 tons of munitions aboard the *Mont Blanc*. The cargo included 2,325 tons of picric acid, 225 tons of TNT, 21 tons of guncotton (nitrocellulose) and 35 tons of benzene.¹ Until the advent of nuclear weapons in 1945, this was the largest man-made explosion and is still the world's largest unplanned,

conventional munitions explosion to date, with a force equivalent to 2.9 kilotons of explosives.²

During World War II, on 5 June 1941, several thousand people were killed in a single instance in the city of Smederevo, on the outskirts of Belgrade, when 400,000 tons of ammunition stored in the city center by German occupation forces detonated.³ Additionally, during the war period (1939–1954), there were at least six other major events involving munitions being transported or stored that were not directly attributable to hostile action, which resulted in nearly 2,000 deaths of military and civilian personnel.⁴



The aftermath of a 2012 ammunition depot explosion in Brazzaville, Republic of the Congo.

Between 1995 and May 2010, nearly 218 incidents involving ammunition depots occurred, resulting in at least 4,700 fatalities and 5,700 injuries.^{4,5} These instances can have the same detrimental effects on populations, infrastructure and development as landmines and explosive remnants of war.^{4,5,6} Arguably the largest one of these catastrophes took place in Lagos, Nigeria, on 27 January 2002. An explosion at the Ikeja ammunition depot in the center of Lagos resulted in more than 1,100 civilian and military deaths with an additional 5,000 injured. The accident also displaced 20,000 people and destroyed much of the northern part of the city.^{4,5} A fire near the depot reportedly initiated the explosion; however, other reports attribute the accident's cause to the aged and deteriorated condition of the stored ordnance.^{4,5}

According to the U.S. Department of State (DOS), the U.S. has provided assistance in promoting the safe disposal of surplus weapons and aging munitions since 2001.^{4,5,6} Recognizing the need to respond immediately to emergency situations involving conventional weapons destruction (CWD), the Office of Weapons Removal and Abatement in the U.S. DOS Bureau of Political-Military Affairs (PM/WRA) awarded DynCorp International (DI) a five-year contract in September 2008 to cover recruit-

ment, equipment, training and deployment costs of a quick reaction force (QRF) with worldwide availability.

DI provided the necessary support infrastructure, as well as a team of highly qualified and certified weapons removal and abatement technical specialists, in order to swiftly destroy conventional weapons caches and remove potentially deadly explosive munitions. From September 2008 through September 2013, QRF responded to 25 urgent situations involving CWD, including three post-accident clearance operations in ammunition storage areas in Bulgaria, Democratic Republic of the Congo and Tanzania.

Bulgaria, January 2009

On 3 July 2008, a series of 11 unexplained explosions at the Chelopechene ammunition depot near Sofia, Bulgaria, rocked Chelopechene and the surrounding area. The explosions forced the evacuation of 1,700 of the 2,500 residents that lived in the town, and the airport was temporarily closed.⁷ Most of the approximately 1,600–2,500 tons of obsolete munitions and 15–20 tons of explosives stored at the depot were damaged, constituting a danger.^{7,8} At the request of the Bulgarian government, a two-person QRF team was sent to Sofia on 22 November 2008 to assess the Chelopechene facility. Following discussions with Bulgarian officials, an

additional 12 personnel were dispatched to conduct surface clearance operations only to eliminate the immediate hazard to the civilian population. On 29 March 2009, QRF concluded all site operations and demobilized after clearing 62,022 sq km (38,539 sq mi), recovering 110,416 pieces of ordnance and disposing of 1,079 munitions items.⁹ The total deployment time was 96 days.

Tanzania, February 2011

On 16 February 2011, several explosions destroyed 23 munitions storage structures at the Gongola Mbotto army depot in the Ilala district, a few kilometers from the international airport in Dar es Salam, Tanzania. The detonations killed at least 20 people, wounded more than 100 and displaced thousands of nearby residents.¹⁰ After receiving a request from Dar es Salam, PM/WRA directed the deployment of a six-person QRF team to assist the Tanzanians in conducting CWD operations at the Gongola Mbotto army depot. During the course of the 150-day operation, the QRF team destroyed 13,843 items of hazardous ordnance, collected 349.4 tons of scrap, and identified and consolidated more than 14,000 pieces of ordnance for future disposal by the Tanzanian army.

Republic of the Congo, March 2012

On 4 March 2012, a suspected fire initiated at least five separate explosions at the Regiment Blinde munitions depot in the Mpila neighborhood in the center of Brazzaville, the Republic of the Congo's capital. The explosion scattered thousands of munitions and other weapons stockpiles across an area of 4 to 6 sq km (1.5 to 2.3 sq mi). The blast left 20,000 people homeless, and an estimated 220 people were killed and 2,300 injured.^{11,12} The area where the detonation hit hardest also contained two of

the most populous districts in the city: Ouenzé and Talangai.¹² Upon receiving a request from the Republic of the Congo's government, PM/WRA directed the deployment of a six-person QRF team on 7 March 2012 to conduct an assessment of the explosive hazards in the area, make recommendations for the clean-up, and provide assistance for unexploded ordnance clearance. Each QRF team member supervised a five-man crew in picking up and moving items that were deemed safe to move, and initiated protective works and disposal of items that could not be moved. During its 55-day deployment, the QRF team worked in close coordination and cooperation with U.N. personnel, as well as several non-governmental organizations.

Lessons Learned

Of the CWD responses mentioned previously, lessons learned include

- Large stores of ammunition should be located away from population centers.
- Fire and ammunition do not mix. Human negligence caused many of the fires involving ammunition, but a large number also involved the spontaneous combustion of unstable artillery propellant.
- Ammunition does not age well. A significant percentage of accidents over the years involved old and deteriorated ordnance.
- There should be minimal movement of old or deteriorated ammunition.
- Disassembly of stockpiled ammunition should only be undertaken by highly qualified technical personnel.
- Deteriorating ammunition should be stored separately from serviceable munitions.
- Recycling of old ammunition to recover precious metals should

only be done following a thorough risk assessment.

- Artillery propellant or projectile fuzes should not be underestimated, as they commonly cause serious ammunition accidents.
- White phosphorous munitions should be stored separately from high explosive ordnance.

These lessons can help prevent ammunition depot explosions and the subsequent loss of lives, injuries and property. Preventing ammunition accidents saves lives and is far less expensive than cleaning up the aftermath. ©

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George Zahaczewsky was the director and program manager for DynCorp International's (DI) Weapons Demilitarization, Destruction and Disposal efforts from 2004 to 2013. In that capacity, he oversaw DI's implementation of two PM/WRA program contracts (2005–2012 and 2008–2013), including the QRF program. Previously, between 2003 and 2004, Zahaczewsky was employed in the implementation of the U.S. Government's Captured Enemy Ammunition Program in Iraq. He retired in 2002 from the U.S. Army as a colonel after 30 years of service, having spent his last six years on active duty in the Pentagon where he was the Defense Department's lead for humanitarian demining research and development. He now works as an independent explosive ordnance disposal, demining and defense consultant.

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