The Use of Riot Control Agents During the Vietnam War

By Mr. Kip Lindberg

"I just wish they were as concerned with our Soldiers who are dying as they are with someone's eyes who watered just a little bit."

—President Lyndon B. Johnson
White House press conference, April 1965

Responding to repeated inquiries concerning the reported use of riot control agents (RCAs) during the Vietnam War, President Johnson stated that the South Vietnamese government had set the policy for their use. Although the U.S. Government supplied RCAs as part of its military assistance program, U.S. advisors had not ordered their use.

The report of RCA use in Vietnam resulted in worldwide protest. The United States was charged with violating the 1925 Geneva Protocol (established by the League of Nations) for its use of gas agents during World War I. The Protocol forbids the use of "asphyxiating, poisonous, or other gases and biological methods of warfare" in international conflicts. Further, by violating this international agreement, the United States was labeled the first nation to engage in chemical-agent aggression since the 1930s.[1] The reports also added fuel to the expanding antiwar movement. To protestors, it was further proof of U.S. barbarism against Vietnamese civilians, akin to the Nazi use of poison gas against death camp inmates.

The immediate and widespread outcry caught the Johnson administration off guard. The Departments of State and Defense felt the use of RCAs was an acceptable form of warfare. Field Manual (FM) 27-10, *The Law of Land Warfare*, specified that the United States was not a party to ". . . any treaty, now in force, that prohibits or restricts the use in warfare of toxic or nontoxic gases . . . ." The United States had not ratified the Geneva Protocol of 1925 and was not bound by its treaties. Further, the U.S. policy of "no first use" of chemical weapons, adopted during World War II, was still secure because RCAs were not chemical weapons.[2]

The use of RCAs in warfare was not a new concept, as they had been used extensively during World War I. Lachrymators (tear-producing agents) like chloroacetone (CA), xylyl bromide (white cross), and chloroacetophenone (CN), along with vomiting agents diphenylaminearsine (DM and adamsite) and chlorpicrin (PS) were used in hand grenades, mortar rounds, and artillery shells. Used by French and German forces as early as 1914, these agents were used for harassment and casualty functions. Even in small quantities, these agents forced Soldiers to don protective masks and, due to agent persistency, wear them for long periods. The tearing, coughing, mucus discharge, and vomiting produced by inhalation often forced previously exposed personnel to remove their protective masks to prevent fouling, thus exposing them to additional toxic gas. This led to decreased Soldier efficiency and increased panic, demoralization, position abandonment, and death.

Following World War I, the United States, under the guidance of the Chemical Warfare Service, developed "harassing agents," with focus on CN and DM lachrymatory and irritant smoke agents. While both types of agents were stockpiled for possible retaliatory use during World War II, neither saw use beyond familiarization exposure for Soldiers undergoing gas warfare training. In the 1950s, the Army upgraded riot control capabilities by initiating a program called *Black Magic*. Under *Black Magic*, new dispersal systems were developed and an additional lachrymatory agent, ortho-chlorobenzylidene-malononitrile (CS), was added. CS quickly became the standard agent in the Chemical Corps' inventory of RCAs.

All RCAs worked in a similar fashion. When released, they resulted in irritation to the eyes, nose, and respiratory tract, causing burning of the eyes, tearing, sneezing, coughing, and mucus and salivation secretions. However, CN and CS also irritated exposed skin and, based on conditions, could produce reactions ranging from a prickly feeling to edema or blisters.

DM was more likely to cause gastrointestinal problems than CN or CS. While the nearly instantaneous reaction to CN and CS exposure was immediately recognizable, exposure to DM was more subtle, taking several minutes to produce sufficient inhalation and physical symptoms.

Also, while the symptoms of CN and CS exposure were short-lived (dissipating 10–15 minutes after source removal), the effects of DM could remain for hours. Although exposure to CS, CN, or DM in sufficient quantities could be fatal, CS was considered the fastest-acting, most effective, and least toxic agent. And it required the shortest recovery time following exposure.

In temperate conditions, CS agent is a fine, white, crystalline powder. When released as an aerosol, as in a pyrotechnic explosion (such as a grenade) or by burning, CS absorbs moisture. The resulting agglomeration and rapid agent breakdown made for a short persistency duration. Improved versions of CS—CS1 (a finer particulate powder blended with silica gel) and CS2 (a powder further refined with a liquid silicone aerosol)—were developed to increase long-term agent effectiveness. Both versions limited moisture absorption and increased agent persistency from hours to weeks for CS1 and nearly a month for CS2.

Beginning in 1962, RCAs were supplied to the government of the Republic of Vietnam for use in civil disturbances and against the insurgent Viet Cong. In fact, the Army of the Republic of Vietnam (ARVN) had been utilizing RCAs in a battlefield role, with the knowledge of U.S. military advisors, for several months prior to the news report which initiated the controversy. Military advisors noted the effectiveness of the agents and the dispersal systems used. Based on these reports, the Chemical Corps initiated a series of tests at Army installations within the continental United States (code name *Water Bucket*) to evaluate RCAs and dispersal systems under battlefield conditions. But a number of problems emerged from these tests, most concerning dispersal systems. Hand grenades and backpack dispersers worked well at short ranges but not at long ranges. Additionally, filling standard munitions with CS was not effective, as the large bursting charges tended to ignite the CS fill, leading to limited dispersal and decreased persistency effectiveness. Finally, weapons systems did not exist to allow effective delivery of RCAs over a large area. The Chemical Corps developmental efforts in these areas continued even as large numbers of U.S. Soldiers were deployed to Vietnam and engaged in combat with the Viet Cong and North Vietnamese Army (NVA) forces.

With the escalation of U.S. involvement in Vietnam came an increase in the battlefield use of RCAs. Initially, any use of RCAs by U.S forces was strictly controlled. Stung by the backlash of protests, the Johnson administration was cautious about providing more ammunition to the antiwar cause. RCAs were authorized only in self-defense situations. In several cases, U.S. forces used CS to separate Viet Cong suspects from women and children being used as human shields. In other instances, enemy combatants were forced from tunnels and hiding spaces by CS grenades. The use of conventional munitions in these situations would have likely resulted in fatalities. Giving the enemy an option of "crying or dying" presented a humanitarian angle to lessen the initial visceral response of the public to RCA use. When additional incidents reported by the press failed to reignite widespread protest, greater latitude was given to field commanders for discretionary offensive use of RCAs in tactical situations.

RCAs were used tactically to accomplish several objectives:

- Force enemy personnel into the open to engage in a battle using conventional operations.
- Disorient enemy assaults.
- Neutralize enemy defenses and suppress enemy fire during assaults.
- Restrict enemy use of terrain, infiltration routes, and tunnel complexes.
- Minimize noncombatant casualties and property destruction by forcing the enemy from built-up areas.

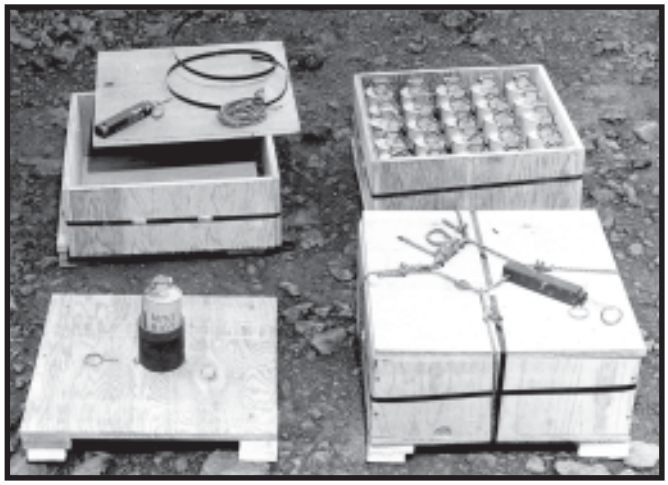
During 1965 and 1966, U.S forces were limited in their use of RCAs, not by policy dictates but by the limited means of deploying CS. Soldiers used CS-filled hand grenades or bulk powder. The M7 series grenade had a cylindrical, "beer can" body and held 3.5 to 4.5 ounces of CN, CS, or CS1. It could be thrown up to 35 meters, remained burning for 45 seconds, and emitted a dense cloud of agent. However, since the grenade body did not fragment, the enemy often recovered the cylinders and reused them as antipersonnel grenades. The M25 CS hand grenade negated this concern, as its baseball-shaped body was manufactured from plastic or compressed fiber and disintegrated on detonation. The M7 and the M25 had roughly the same range and capabilities, but the range on the M7 could be increased by 200 yards when attached to a finned adapter and the grenade launcher on an M14 rifle. However, most CS grenades were used at close range to clear huts, bunkers, and tunnels. CS bulk powder was used in the M3 portable RCA disperser. Using the same fuel and pressure tanks as the M2 flamethrower, the M3 disperser contained 20 pounds of CS or CS1. The backpack type M3 could be used to clear tunnels and buildings, but it was also effective for laying an agent barrier around defensive positions. CS1 sprayed in and around the perimeter aprons of barbwire provided an invisible defense against enemy sappers. Enemy personnel attempting to breach the perimeter would crawl through the

CS1, activate it, and create an immediate physical reaction, alerting U.S. sentries to enemy presence. When firebase positions were abandoned, large amounts of CS1 and CS2 were used to saturate the site, deterring enemy forces from searching for abandoned munitions and equipment.

Powdered CS agent was also sprayed from helicopters using M4 and M5 aerial dispersers, but problems were soon encountered with this method of delivery. If aircraft flew too high, the rotor wash and winds dispersed the agent over an area that was too large; if aircraft flew at optimum altitude for agent delivery, they became vulnerable to ground fire. Helicopter smoke ships accompanying the missions denied the enemy a clear target, but spraying remained a dangerous enterprise.

Small packets of CS1 and CS2 were used by long-range reconnaissance patrols (LRRPs). Often tasked with operating deep within hostile territory, LRRP Soldiers had to secretly dispose of empty ration packets. When burying this trash, CS powder was mixed with the soil to discourage animals from digging and alerting enemy personnel to the presence of forces in the area.

Field-expedient munitions were also devised for operations too large for standard hand grenades and dispersers. Large bunkers were often attacked using the bunker use restriction bomb (BURB). Manufactured in the field using spent 2.75-inch rocket shipping containers, the BURB contained about 1 pound of CS2 and a timed, nonelectric blasting cap detonator. When detonated, the explosion dispersed agent throughout the bunker, where it remained a persistent deterrent for enemy reoccupation for up to a month. Helicopter crews manufactured the "box full of grenades" for aerial delivery of CS on enemy positions. An entire box (25) of M7 CS grenades was prepared by pulling the pins (the spoons were held in place



Improvised CS aerial bomb known as the "box full of grenades"

Chemical Corps Soldier preparing a 55-gallon drum of CS for aerial delivery, Vietnam, 1967

by the bottom half of the shipping tubes), placing the grenades in a plywood box, strapping the box lid in place, and placing a time delay detonator on the closure strap. Upon spotting an enemy target, the crew chief activated the detonator and kicked the box from the aircraft. As the box tumbled through the air, the detonator exploded, releasing a shower of M7 grenades to burst on the target. In similar fashion, large areas of dense jungle suspected of shielding enemy base camps or infiltration routes were bombarded from the air using 55-gallon shipping drums. A length of detonation cord was taped along the tops and sides of the CS-filled drums. The drums were then placed on a specially constructed rack inside the cargo bay of a CH-47 Chinook helicopter, and the detonators were linked to the rack using long, wire lanyards. Over a selected target area, crewmen rolled the drums off the rear cargo ramp. The lanyards ignited the detonators as the drums fell free of the aircraft. Ideally, the detonating cord ruptured the drums just above the jungle canopy and distributed agent over a wide area.

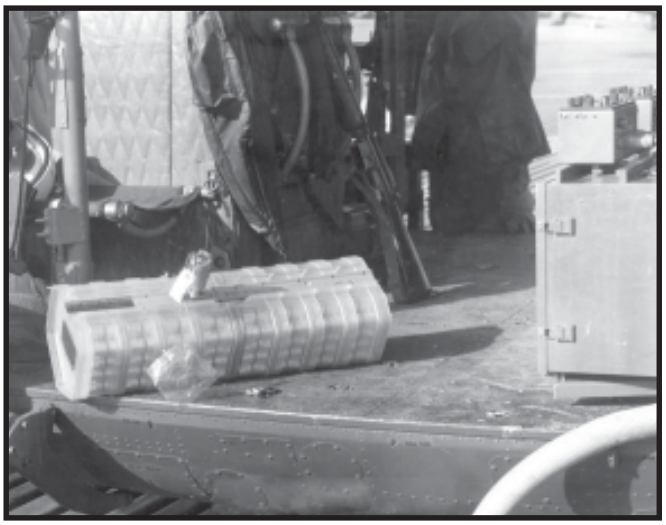
By 1967, the first of the newly designed RCA systems, tested by the Chemical Corps under the *Water Bucket II*

program, began arriving in Vietnam. An improved version of the M7 CS grenade, the XM54, was produced specifically for aerial deployment. A longer fuse provided additional time for the grenade to reach a target before bursting, creating a better concentration of agent. Several versions of a 40-millimeter CS grenade were produced for use in the M79 grenade launchers, providing a rapidity of fire and accuracy unobtainable with previous rifle grenades. The M106 "Mighty Mite" portable blower allowed Chemical Soldiers to disseminate large amounts of CS1 and CS2 through tunnel systems used as sanctuaries and operating bases by the Viet Cong and NVA. The E8 tactical CS launcher—a backpack, multitube CS system—was also used in Vietnam. The E8 could launch 64 cartridges from its 16 tubes within 1 minute and blanket a target area at ranges of 250 yards forward, 40 to 75 yards wide. Offensively, the E8 could be used as a weapon to break away from enemy contact or to clear enemy personnel from a defensive position, as Marines demonstrated during the fighting in Hue following the Tet Offensive in January 1968. However, the best use of the E8 was in perimeter defense where, in overlapping fields of fire, the munition was used to deter infiltration.

Bursters for air-dropped CS drums were more reliable and effective than the jury-rigged, detonation cord-wrapped drums used previously. Standard napalm bombs were adapted to carry several hundred pounds of CS2. Additionally, cluster assemblies for aerial delivery of CS munitions were produced for use with rotary and fixed-wing aircraft. The E158 tactical CS cluster bomb contained 264 CS-filled canisters and could be armed as the munition was released from the aircraft or at a preselected height. The E158 was considered the best system for aerial delivery of CS during Vietnam.

By 1969, a dozen new RCA delivery systems had been developed, tested, and fielded—an impressive statistic given that only four years had passed since the need was identified. Additionally, many other munitions—rocket warheads, mortar rounds, artillery shells, and aerial bombs—were tested and issued for field trials. To counter U.S. efforts, Viet Cong and NVA forces obtained or manufactured protective equipment. Equipment recovered from NVA personnel involved in the Tet Offensive indicated an increased presence of Soviet- and Chinese-developed respirators designed to offer protection against CS. Viet Cong forces were also using self-manufactured masks and respirators, many constructed from spent U.S. equipment.[3]

E8 tactical CS launcher in the firing position



E158 CS cluster munition prepared for deployment from a "people sniffer" helicopter

The Viet Cong and NVA occasionally retaliated by using RCAs against U.S. and South Vietnamese forces but, unable to manufacture RCAs, they were limited to using captured and recovered agent (from unexploded munitions). Unexploded, air-dropped drums provided much of the CS1 used in grenades, rockets, mortar rounds, and booby traps. Enemy forces spread CS along roadways to initiate ambushes. When convoy traffic stirred up the agent, unprotected drivers lost control of their vehicles. During one well-publicized attack on a U.S. firebase, members of the 409th Viet Cong Sapper Battalion used CS grenades to disorient, panic, and overrun its defenders.

An estimated 18 million pounds of RCAs were sent to Vietnam between 1962 and 1972, most in the form of bulk CS1 and CS2. When used effectively, they forced enemy personnel into the open and created disorder in enemy assaults, but some factors of successful dispersal (such as wind and weather) were out of the commander's control. RCAs were an aid in suppressing enemy fire, but the ability to exploit a situation with a quick assault was often limited by the small supply of protective masks.

And the reluctance of Soldiers to carry the "superfluous equipment" led to a reduced use of CS and apprehension about occupying areas saturated by the agent. Evidence suggests that widespread aerial delivery of CS2 did temporarily deny terrain and infiltration routes and canalize enemy movement in selected areas, but it is difficult to evaluate its effectiveness. While an effective CS dispersal could make passage through an area difficult and painful, it would not prevent a determined enemy from making the effort. CS seemed to work best in the close confines and microenvironment of tunnels. In tests, tunnels salted with CS2 and sealed were reopened six months later for evaluation. When the CS was disturbed, it became active again.

Throughout the Vietnam War, CS was used to clear enemy personnel from congested areas, no doubt preventing civilian casualties and unnecessary property destruction. But the use of RCAs in Vietnam remained controversial. Although most of America's military presence was withdrawn from Vietnam in 1973, ARVN forces continued to use CS until the communist victory in April 1975. In the months before the victory, the U.S. Senate, with presidential urging, ratified the Geneva Protocol of 1975. Coupled with President Ford's Executive Order 11850 (8 April 1975), the United States officially acknowledged RCAs as prohibited war gases and renounced their use in Vietnam—with reservations. These reservations included the right to use RCAs in retaliation for enemy use, in defensive modes to save lives, and to quell civil disturbances in U.S lines. The use of RCAs was further limited by prohibiting any use without express advance approval from the President. Thirty years later, RCAs remain in the Army inventory much as they did during World War II, stocked mainly for use in Soldier training and protective mask familiarization.

Mr. Lindberg is the curator of collections at the U.S. Army Chemical Corps Museum.

Endnotes:

[1] During the 1930s, Italy deployed mustard gas in its campaign in Abyssinia. Additionally, Japan used chemical and biological agents against China.

[2] Most RCAs were commercially available and successfully used by civilian law enforcement agencies. The incapacitating effects of these agents were temporary and, when used correctly, nonlethal. Therefore, RCAs were incomparable to vesicant, choking, and nerve agents, all of which were designed to produce casualties and fatalities.

[3] Testing performed on recovered, self-manufactured masks showed that the masks were not effective against CS.

References:

FM 27-10, *The Law of Land Warfare,* 18 July 1956.

Technical Manual 3-500, *Chemical Corps Equipment Data Sheets*, Department of the Army, Washington, D.C., 5 April 1961.

Technical Bulletin 3-1310-255-10, *Launcher and 35-mm Cartridges: Tactical CS, 16-Tube, E8*, Department of the Army, Washington, D.C., 31 August 1966.

"Analysis of Enemy Positions at Khe Sahn and Evaluation of the Effectiveness of Weapons Systems Against Enemy Fortifications," Lessons Learned, Bulletin No. 69, U.S. Military Assistance Command, Vietnam, 10 September 1968.

Sherman L. Davis, "Riot Control Weapons for the Vietnam War," *Historical Monograph AMC 56M*, U.S. Army Munitions Command, Edgewood Arsenal, Maryland, June 1970.

Amos A. Fries and Clarence J. West, *Chemical Warfare*, McGraw-Hill, New York, 1921.

John H. Hay, Jr., *Vietnam Studies: Technical and Material Innovations*, U.S. Government Printing Office, Washington, D.C., 1989, pp. 34–38.

Seymour H. Hersh, *Chemical and Biological Warfare: America's Hidden Arsenal*, Bobs-Merrill Company, New York, 1968, pp. 167–185.

Paul L. Howard, "Technical Report: Operational Aspects of Agent CS," DTC-FR-S700M, Deseret Test Center, Fort Douglas, Utah, April 1973.

M.M. Michie and B. Botwinick (eds.), *Vietnam After-Action Conference, Held 12–13 January 1971 (U)*, EASP 600-13, Edgewood Arsenal, Maryland, October 1971.

Lloyd G. Miller, "The Use of Chemicals in Stability Operations," *Military Review*, December 1966, pp. 43–47.

Operational Employment of Riot Control Munitions, Lessons Learned, Bulletin No. 51, U.S. Military Assistance Command, Vietnam, 24 April 1965.

Operations Against Tunnel Complexes, Lessons Learned Bulletin No. 56, U.S. Military Assistance Command, Vietnam, 18 April 1966.

Frederick R. Sidell et al., Medical Aspects of Chemical and Biological Warfare, Office of the Surgeon General, Borden Institute, Walter Reed Army Medical Center, Washington, D.C., 1997.

VC-NVA CBR Equipment Identification Guide, Combined Intelligence Center, Vietnam, U.S. Military Assistance Command, Vietnam, 22 January 1969.

Viet Cong Base Camps and Supply Caches, Lessons Learned, Bulletin No. 68, U.S. Military Assistance Command, Vietnam, 20 July 1968.

Viet Cong Tunnels, Lessons Learned, Bulletin No. 45, U.S. Military Assistance Command, Vietnam, 12 February 1965.

CCRA 2006 Writing Contest

The 2006 Chemical Writing Contest, sponsored by the Chemical Corps Regimental Association, has been suspended due to ongoing commitments in Operation Iraqi Freedom. Details on the 2007 Writing Contest will be announced in the July–December 2007 issue of *Army Chemical Review*.