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AMERICA'S OPTIONS IF IRAQ USES CHEMICAL WEAPONS

INTRODUCTION

Following the August 2 invasion of Kuwait by Iraq, George Bush ordered American military forces to the Middle East to deter further aggression by the Iraqis. This brought American forces to within range of Iraqi chemical weapons. Since Iraq has used chemical weapons not only against Iran during the 1980-1988 Iran-Iraq War but against its own Kurdish citizens, the Iraqi chemical threat must be taken seriously. United States troops last faced chemical warfare in World War I when chemicals were responsible for 27 percent of all U.S. battlefield deaths. Chemicals were not used widely in battle by any of the combatants in World War II, the Korean War, or in Vietnam.

The Iraqis have both mustard gas and nerve agents. They can deliver these with aircraft, artillery, and rockets. In confronting this threat, military forces now in Saudi Arabia and the Persian Gulf region have a variety of options. These range from passive defenses, such as protective suits and gas masks, to active defenses, such as air defenses and preemptive strikes. Preferable to these, of course, is the option of deterring an Iraqi attack by threatening retaliation against key targets in Iraq, or on the battlefield, with U.S. conventional weapons, chemical weapons, or — in the extreme — tactical nuclear weapons. U.S. air defense missiles, ground-attack aircraft and artillery could all be used in U.S. operations to counter an Iraqi chemical attack.

SADDAM HUSSEIN'S CHEMICAL ARSENAL

Iraq's chemical weapons threat is a diverse one. Iraqi strongman Saddam Hussein has at his disposal mustard gas, used widely in World War I, and two types of nerve agents, called sarin and tabun.

Mustard gas is known as a "blistering agent" that can be inhaled or absorbed through the skin. It causes severe skin irritation and lung damage about two to six hours after exposure. Sarin and tabun interfere with the transmission of nerve impulses to the brain, causing heart failure or asphyxiation. A single drop on the skin can be enough to kill. Reaction to these agents starts within minutes.

It is estimated that Iraq can produce over 700 tons of mustard gas a year and 50 tons a year each of sarin and tabun. This is enough to produce thousands of chemical bombs and artillery shells. A typical shell would kill or injure at least half of all

IRAQI CHEMICAL AGENTS

Agent	Type	Persistence	Production
Mustard	blister	days or weeks	720 tons per year
Tabun	nerve	minutes or hours	50 tons per year
Sarin	nerve	minutes or hours	50 tons per year

Sources: "Chemical Weapons in the Middle East" by W. Seth Carus, December 1988 and *U.S. Soviet Military Balance 1980-1985* by John M. Collins, Senior Specialist, National Defense with the Congressional Research Service.

MAIN IRAQI DELIVERY SYSTEMS FOR CHEMICAL WEAPONS

Delivery System	Payloads	Range
BM-21 rocket	42 lbs.	6 miles
<i>Al Hussein</i> missile	600 lbs.	500 miles*
<i>Scud-B</i> missile	1,200 lbs.	185 miles*
<i>Mirage F-1</i>	7,700 lbs.	265 miles
<i>MiG-23 Flogger</i>	6,600 lbs.	800 miles
<i>Su-25 Frogfoot</i>	9,920 lbs.	350 miles
<i>Tu-22 Blinder</i>	22,000 lbs.	1,800 miles
152mm. artillery		20 miles

*The Iraqis are not known to have armed these missiles with chemical warheads.

Sources: "*The Sword of the Arabs: Iraq's Strategic Weapons*" by Michael Eisenstadt of The Washington Institute for Near East Policy, *The Middle East Military Balance 1987-1988* by Zeev Eytan and Aharon Levran, *Jane's Armour and Artillery* and *Jane's All the World's Aircraft*.

unprotected people over an area about half the size of a football field.¹ Mustard gas is a persistent agent, which can contaminate an area for days or even weeks. Both sarin and tabun are non-persistent and will contaminate an area for minutes or hours.² All three of these agents are debilitating even if not delivered in lethal doses.

Production Facilities. The Iraqis are thought to manufacture chemical weapons at several sites. The main facility is thinly disguised as the State Establishment for Pesticide Production, located in the town of Samarra, northeast of Baghdad. Much of the equipment for the Samarra plant was supplied during the 1980s by the West German firm Karl Kolb GmbH, located in Areieich, outside Frankfurt.

Thiodiglycol, a chemical used in the manufacture of chemical weapons, was supplied to the Iraqis in the early 1980s by the Phillips Petroleum Company. The Bartlesville, Oklahoma, company has a plant in Tessengerlo, Belgium, that produced thiodiglycol for export until the Belgian government blocked chemical exports. The Iraqis continue to obtain chemicals from other sources by clandestine means and on the open market.³

The Iraqis have a multitude of systems for firing their chemical weapons. Chemical ordnance can include bombs dropped by aircraft, artillery shells, and warheads carried by missiles. Chemical agents also can be sprayed from airplanes, or helicopters. Iraq possesses some 4,500 artillery pieces, of which many are known to be capable of firing chemical shells.

Long-Range Delivery. The Iraqi arsenal also includes French and Soviet attack aircraft and bombers which could deliver chemical bombs. These include the French *Mirage F-1* and Soviet *MiG-23 Flogger* and the *MiG-27 Fulcrum* fighter-bombers, the Soviet *Su-25 Frogfoot* ground-attack planes, and the Soviet *Tu-22 Blinder* and *Tu-16 Badger* bombers. Iraqi surface-to-surface missiles include the Soviet-built *FROG-7* and *Scud B* missiles, as well as Iraqi-produced *Al-Abbas* and *Al-Hussein* missiles, which are *Scud Bs* modified by the Iraqis to increase the range from 185 miles to 550 miles and 370 miles, respectively. It is unknown whether the Iraqis have produced or deployed chemical warheads for any of these missiles. Finally, the Iraqis have French- and Soviet-built military helicopters that could spread chemical agents. These include the French *Alouette III* and the Soviet *Mi-24 Hind*.⁴

1 W. Seth Carus, "Chemical Weapons in the Middle East" (Washington, D.C.: The Washington Institute for Near East Policy, 1988), pp. 3-4.

2 John M. Collins, *U.S.-Soviet Military Balance 1980-1985* (Washington, D.C.: Congressional Research Service, 1985) p. 163. The persistence of a chemical agent depends in large part on how thick it is and how fast it evaporates. Agents such as sarin evaporate rapidly, thus losing their lethal effects more quickly than a VX agent, which is a viscous compound and slower to evaporate.

3 Gary Thatcher and Timothy Aepfel, "The Trail to Samarra," *Christian Science Monitor*, December 13, 1988, p. B1.

4 Zeev Eytan and Aharon Levran, *The Middle East Military Balance 1987-1988* (Boulder, Colorado: Westview Press, 1988), pp. 295-305.

The Iraqis could employ chemical weapons under a variety of circumstances. If Iraq anticipates a ground attack by American forces in Saudi Arabia, the Iraqi command could try to create a chemical barrier against U.S. land forces to slow their advance or stop them. If the Iraqis launch an offensive along an established front, they could try to break through by using artillery or aircraft to fire chemical weapons at the American front line forces, although problems would arise since the Iraqis would have to pass through contaminated territory. Finally, the Iraqis could launch missile or air attack on U.S. naval vessels or operational bases, military bases in Saudi Arabia, or even against Saudi cities.

Iraqi scientists also are researching biological weapons at a facility in the town of Salman Pak, 20 miles southeast of Baghdad. It is not known whether they have succeeded in developing a biological weapon. Biological weapons spread microorganisms that cause such diseases as anthrax, botulism, cholera, and typhoid. The only defense against biological weapons is inoculation against the diseases they cause. U.S. forces are not routinely inoculated against all these diseases, although they could be. The fear is that scientists could engineer microorganisms against which there is no known vaccine, although it is unlikely that the Iraqi program has progressed to this point.

AMERICA'S MILITARY RESPONSES

U.S. forces have several options for defending themselves against a chemical attack. The first line of defense is what is known as passive measures. These include protective clothing and masks, cleansers, and antidotes. U.S. soldiers deployed in the Middle East are equipped with protective suits and gas masks. Protective clothing covers a soldier from head to toe. It consists of charcoal-impregnated nylon and cotton trousers and a jacket. The charcoal neutralizes the deadly chemicals. Rubber gloves, boot covers, and hood protect other exposed areas. Protection also includes a mask and a respirator which filters poison gas to allow the soldier to breathe safely.

This protective gear can be effective if worn properly, provided a soldier is washed down with a decontaminating bleach solution, which neutralizes the chemical agents, after exposure to chemicals. Though the suits are not leak-proof, they can be overwhelmed only by massive surface contamination.

The main problem for soldiers wearing protective gear is heat. The suits are designed for combat in Europe and thus intentionally give some insulation against an often chilly or cold European climate. In the desert, where temperatures regularly rise above 100 degrees, soldiers can operate in full protective gear for only short periods before risking heat stroke. The suits also impede vision and movement and make it difficult for soldiers to communicate. American soldiers carry auto-inject syringes containing atropine, an antidote to sarin and tabun. Atropine, however, has its own debilitating effects, including dehydration, nausea, and disorientation.

Highly Trained Americans. American forces train regularly for chemical warfare. A typical U.S. Army division has 215 chemical warfare specialists trained in

UNITED STATES CHEMICAL AGENTS

Agent	Type	Persistence	Production
Binary	nerve	minutes or hours	classified
Mustard	blister	days or weeks	none*
Sarin	nerve	minutes or hours	none*
Tabun	nerve	minutes or hours	none*
VX	nerve	days or weeks	none*

*While the U.S. maintains supplies of these agents, they have not been produced since 1969.
 Source: *U.S.-Soviet Military Balance 1980-1985* by John M. Collins, Senior Specialist, National Defense with the Congressional Research Service.

MAIN U.S. DELIVERY SYSTEMS FOR CHEMICAL WEAPONS

Delivery System	Weapons/Payload	Range
F-15 fighter	24,500 lbs.	790 miles
F-16 fighter	12,000 lbs.	575 miles
FB-111 bomber	29,000 lbs.	1,100 miles
M-55 rocket	10 lbs.	6.75 miles
M-198 howitzer		11 miles

Sources: *Poisoning Arms Control: The Soviet Union and Chemical/Biological Weapons*, Mark C. Storella, Institute for Foreign Policy Analysis, *The Military Balance 1989-90*, by the International Institute for Strategic Studies, *Jane's Armour and Artillery* and *Jane's All the World's Aircraft*.

chemical detection, decontamination, and chemical warfare tactics. A Marine division has from 80 to 90 chemical warfare specialists.

Some American troops in the Persian Gulf area are equipped with British-made mobile alarm units to detect the presence of harmful chemicals. West Germany is rushing to the American troops some of its advanced *Fox* reconnaissance vehicles, which use an instrument known as a "mass spectrometer" to analyze the air for poison gases.

U.S. warships are vulnerable to chemical attacks. Lethal chemicals can be drawn into shipboard ventilation systems and spread quickly. Sailors are issued protective suits, but operating in the suits decreases their fighting ability.

U.S. military forces can defend actively against a chemical attack. Iraqi planes and helicopters attempting to deliver chemical agents can be shot down by U.S.

Army *Patriot* and *Stinger* air defense missiles and the Navy *Aegis* air defense system. U.S. aircraft carrier-based F-14 *Tomcats* F/A-18 *Hornets*, or Saudi Arabia-based U.S. Air Force F-15 *Eagles* and F-16 *Fighting Falcons* can attack Iraqi planes in the air or on the ground. These planes, along with U.S. carrier-based A-6 attack jets and Turkey-based F-111 bombers, could strike preemptively against Iraqi chemical weapon storage sites, production facilities, and delivery systems.

Preemptive attacks on Iraq also can be conducted by American missiles armed with highly accurate conventional munitions. These include the *Tomahawk* cruise missile, with a range of 1500 miles and a 1,000-pound conventional payload, and the Multiple Launch Rocket System, which is able to launch surface-to-surface rockets at enemy targets up to 18 miles away in rapid succession.

THE NEED FOR DETERRENCE

The fact that America possesses chemical agents and corresponding delivery systems is something that Iraqi military leaders must keep in mind. While the U.S. is in the process of destroying its aging stock of chemical munitions, most of which are not considered reliable, the Iraqis know that the U.S. has the capacity to respond in kind to a chemical attack. The U.S. arsenal contains chemically-armed artillery shells, bombs, and rockets including shells for the M-198 155 mm howitzer, a warhead for the M-55 rocket, and Mk-94, Mk-116 and MC-1 aircraft-delivered bombs.⁵ These weapons generally contain nerve agents. The U.S. has started producing a new generation of "binary" chemical weapons, which contain two separate canisters of non-lethal chemicals that become lethal when the contents of the two canisters are mixed after the weapon is fired. These shells are available for use and can be fired by the M-198 howitzer.

It long has been U.S. policy that chemical weapons will not be used unless U.S. forces are first attacked with them. Recent remarks by Defense Secretary Dick Cheney, however, raise questions as to whether U.S. forces in fact will respond in kind to a chemical weapons attack.⁶ Cheney should clarify the U.S. position. The U.S. should not rule out retaliating with chemical weapons if Iraq uses them, particularly since the threat to respond in kind could help deter Iraq from using chemical weapons in the first place. The threat of retaliation also will force Iraqi soldiers to don the same type of bulky protective gear U.S. soldiers will have to wear.

Conventional Retaliation. The U.S., of course, need not automatically use its own chemical weapons to respond to an Iraqi chemical attack on U.S. forces. Conventional military retaliation, however, should make Iraq and Saddam Hussein the main targets. These include Iraqi nuclear research facilities, chemical weapon

5 Mark C. Storella, *Poisoning Arms Control: The Soviet Union and Chemical/Biological Weapons* (Institute for Foreign Policy Analysis: Cambridge, Massachusetts, 1984), pp. 85, 88.

6 Frank J. Murray and Paul Bedard, "Bush Threatens to Block Jordan Port," *The Washington Times*, August 15, 1990, p. A-1.

plants, ballistic missile research centers, as well as the key industrial targets (example: electric generating plants) in and around Baghdad. While it serves no purpose to forswear any response to Iraqi chemical attacks – if only to keep Saddam guessing – the use of U.S. tactical nuclear weapons should be considered only as a last resort if the Iraqi chemical attacks unexpectedly cause massive American casualties and threaten the defeat of U.S. forces on the battlefield.

CONCLUSION

Iraq's arsenal of chemical weapons poses a special threat to the American forces now deployed in the Middle East. But it is a threat that the U.S. may well be able to deter. Iraqi military commanders know that the U.S. can respond to a chemical attack by conventional means and by chemical weapons. The Iraqis also must reckon that American troops are better equipped and vastly better trained to fight in an environment poisoned by chemical weapons than are Iraqi forces.

Main Target: Saddam Hussein. America should be prepared to order a massive conventional military strike at the heart of Iraqi power should chemical weapons be used against U.S. forces. This should include a preemptive strike against the Iraqi Air Force and potential chemical delivery systems such as *Scud B* missiles. Other targets should include Iraqi chemical weapon production facilities and ballistic missile research facilities – to prevent Iraq from building more weapons of mass destruction. The main target of the retaliation should be Saddam Hussein, who must be convinced that he, personally, will not survive a decision to use chemical weapons against American Forces. This is the best deterrent against an Iraqi chemical attack.

Baker Spring
Policy Analyst