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If We Fight Iraq: Iraq’s Military Forces And Weapons of Mass Destruction

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Iraq's Weapons of Mass Destruction – The Summary Conclusions of the British (September 2002) and US (October 4, 2002) White Papers

British Summary

- Intelligence shows that Iraq is preparing plans to conceal evidence of these weapons, including incriminating documents, from renewed inspections. And it confirms that despite sanctions and the policy of containment, Saddam has continued to make progress with his illicit weapons programs.
- As a result of the intelligence we judge that Iraq has:
 - Continued to produce chemical and biological agents;
 - military plans for the use of chemical and biological weapons, including against its own Shia population. Some of these weapons are deployable within 45 minutes of an order to use them;
 - command and control arrangements in place to use chemical and biological weapons. Authority ultimately resides with Saddam Hussein. (There is intelligence that he may have delegated this authority to his son Qusai);
 - developed mobile laboratories for military use, corroborating earlier reports about the mobile production of biological warfare agents;
 - pursued illegal programmes to procure controlled materials of potential use in the production of chemical and biological weapons programmes; tried covertly to acquire technology and materials which could be used in the production of nuclear weapons;
 - sought significant quantities of uranium from Africa, despite having no active civil nuclear power programme that could require it; recalled specialists to work on its nuclear programme;
 - illegally retained up to 20 al-Hussein missiles, with a range of 650km, capable of carrying chemical or biological warheads;
 - started deploying its al-Samoud liquid propellant missile, and has used the absence of weapons inspectors to work on extending its range to at least 200km, which is beyond the limit of 150km imposed by the United Nations;
 - started producing the solid-propellant Ababil-100, and is making efforts to extend its range to at least 200km, which is beyond the limit of 150km imposed by the United Nations;
 - constructed a new engine test stand for the development of missiles capable of reaching the UK Sovereign Base Areas in Cyprus and NATO members Greece and Turkey), as well as all Iraq's Gulf neighbors and Israel;
 - pursued illegal programmes to procure materials for use in its illegal development of long range missiles;
 - learnt lessons from previous UN weapons inspections and has already begun to conceal sensitive equipment and documentation in advance of the return of inspectors.

CIA Summary

- Iraq has continued its weapons of mass destruction (WMD) programs in defiance of UN resolutions and restrictions. Baghdad has chemical and biological weapons as well as missiles with ranges in excess of UN restrictions; if left unchecked, it probably will have a nuclear weapon during this decade.
- Baghdad hides large portions of Iraq's WMD efforts. Revelations after the Gulf war starkly demonstrate the extensive efforts undertaken by Iraq to deny information.
- Since inspections ended in 1998, Iraq has maintained its chemical weapons effort, energized its missile program, and invested more heavily in biological weapons; most analysts assess Iraq is reconstituting its nuclear weapons program.
- Iraq's growing ability to sell oil illicitly increases Baghdad's capabilities to finance WMD programs; annual earnings in cash and goods have more than quadrupled.
- Iraq largely has rebuilt missile and biological weapons facilities damaged during Operation Desert Fox and has expanded its chemical and biological infrastructure under the cover of civilian production.
- Baghdad has exceeded UN range limits of 150 km with its ballistic missiles and is working with unmanned aerial vehicles (UAVs), which allow for a more lethal means to deliver biological and, less likely, chemical warfare agents.
- Although Saddam probably does not yet have nuclear weapons or sufficient material to make any, he remains intent on acquiring them.
- How quickly Iraq will obtain its first nuclear weapon depends on when it acquires sufficient weapons-grade fissile material.
- If Baghdad acquires sufficient weapons-grade fissile material from abroad, it could make a nuclear weapon within a year.
- Without such material from abroad, Iraq probably would not be able to make a weapon until the last half of the decade.
- Iraq's aggressive attempts to obtain proscribed high-strength aluminum tubes are of significant concern. All intelligence experts agree that Iraq is seeking nuclear weapons and that these tubes could be used in a centrifuge enrichment program.
- Most intelligence specialists assess this to be the intended use, but some believe that these tubes are probably intended for conventional weapons programs.
- Based on tubes of the size Iraq is trying to acquire, a few tens of thousands of centrifuges would be capable of producing enough highly enriched uranium for a couple of weapons per year.
- Baghdad has begun renewed production of chemical warfare agents, probably including mustard, sarin, cyclosarin, and VX. Its capability was reduced during the NSCOM inspections and is probably more limited now than it was at the time of the Gulf war, although VX production and agent storage life probably have been improved.

- Saddam probably has stocked a few hundred metric tons of CW agents.
- The Iraqis have experience in manufacturing CW bombs, artillery rockets, and projectiles, and probably possess CW bulk fills for SRBM warheads, including for a limited number of covertly stored, extended-range Scuds.
- All key aspects—R&D, production, and weaponization—of Iraq's offensive BW program are active and most elements are larger and more advanced than they were before the Gulf war.
- Iraq has some lethal and incapacitating BW agents and is capable of quickly producing and weaponizing a variety of such agents, including anthrax, for delivery by bombs, missiles, aerial sprayers, and covert operatives, including potentially against the US Homeland.
- Baghdad has established a large-scale, redundant, and concealed BW agent production capability, which includes mobile facilities; these facilities can evade detection, are highly survivable, and can exceed the production rates Iraq had prior to the Gulf war.
- Iraq maintains a small missile force and several development programs, including for a UAV that most analysts believe probably is intended to deliver biological warfare agents.
- Gaps in Iraqi accounting to UNSCOM suggest that Saddam retains a covert force of up to a few dozen Scud-variant SRBMs with ranges of 650 to 900 km.
- Iraq is deploying its new al-Samoud and Ababil-100 SRBMs, which are capable of flying beyond the UN-authorized 150-km range limit.
- Baghdad's UAVs—especially if used for delivery of chemical and biological warfare (CBW) agents—could threaten Iraq's neighbors, US forces in the Persian Gulf, and the United States if brought close to, or into, the US Homeland.
- Iraq is developing medium-range ballistic missile capabilities, largely through foreign assistance in building specialized facilities.

Iraq's Weapons of Mass Destruction – The Content of the British (September 2002) and US (October 4, 2002) White Papers Reporting on Key Developments Since UNSCOM Activity Halted in 1998

British Summary of Developments Since in 1998

- Iraq has a useable chemical and biological weapons capability, in breach of UNSCR 687, which has included recent production of chemical and biological agents;
- Saddam continues to attach great importance to the possession of weapons of mass destruction and ballistic missiles which he regards as being the basis for Iraq's regional power. He is determined to retain these capabilities;
- Iraq can deliver chemical and biological agents using an extensive range of artillery shells, free-fall bombs, sprayers and ballistic missiles;
- Iraq continues to work on developing nuclear weapons, in breach of its obligations under the Non-Proliferation Treaty and in breach of UNSCR 687. Uranium has been sought from Africa that has no civil nuclear application in Iraq;
- Iraq possesses extended-range versions of the SCUD ballistic missile in breach of UNSCR 687 which are capable of reaching Cyprus, Eastern Turkey, Tehran and Israel. It is also developing longer-range ballistic missiles;
- Iraq's current military planning specifically envisages the use of chemical and biological weapons;
- Iraq's military forces are able to use chemical and biological weapons, with command, control and logistical arrangements in place. The Iraqi military are able to deploy these weapons within 45 minutes of a decision to do so;
- Iraq has learnt lessons from previous UN weapons inspections and is already taking steps to conceal and disperse sensitive equipment and documentation in advance of the return of inspectors;
- Iraq's chemical, biological, nuclear and ballistic missiles programmes are well-funded.

CIA Estimate of Developments Since 1998

Since December 1998, Baghdad has refused to allow UN inspectors into Iraq as required by the Security Council resolutions. Technical monitoring systems installed by the UN at known and suspected WMD and missile facilities in Iraq no longer operate. Baghdad prohibits Security Council-mandated monitoring overflights of Iraqi facilities by UN aircraft and helicopters. Similarly, Iraq has curtailed most IAEA inspections since 1998, allowing the IAEA to visit annually only a very small number of sites to safeguard Iraq's stockpile of uranium oxide.

In the absence of inspectors, Baghdad's already considerable ability to work on prohibited programs without risk of discovery has increased, and there is substantial evidence that Iraq is reconstituting prohibited programs. Baghdad's vigorous concealment efforts have meant that specific information on many aspects of Iraq's WMD programs is yet to be uncovered. Revelations after the Gulf war starkly demonstrate the extensive efforts undertaken by Iraq to deny information.

Limited insight into activities since 1998 clearly show that Baghdad has used the absence of UN inspectors to repair and expand dual- use and dedicated missile development facilities and to increase its ability to produce WMD.

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Iraq's Weapons of Mass Destruction – The Key Contents of the British (September 2002) and US (October 4, 2002) White Papers dealing with Chemical Weapons

UK: Chemical Weapons

Since the withdrawal of the inspectors the JIC has monitored evidence, including from secret intelligence, of continuing work on Iraqi offensive chemical and biological warfare capabilities. In the first half of 2000 the JIC noted 17 intelligence on Iraqi attempts to procure dual-use chemicals and on the reconstruction of civil chemical production at sites formerly associated with the chemical warfare programme.

In mid-2001, the JIC assessed that Iraq retained some chemical warfare agents, precursors, production equipment and weapons from before the Gulf War. These stocks would enable Iraq to produce significant quantities of mustard gas within weeks and of nerve agent within months. The JIC concluded that intelligence on Iraqi former chemical and biological warfare facilities, their limited reconstruction and civil production pointed to a continuing research and development programme. These chemical and biological capabilities represented the most immediate threat from Iraqi weapons of mass destruction. Since 1998 Iraqi development of mass destruction weaponry had been helped by the absence of inspectors and the increase in illegal border trade, which was providing hard currency.

In the last six months the JIC has confirmed its earlier judgments on Iraqi chemical and biological warfare capabilities and assessed that Iraq has the means to deliver chemical and biological weapons.

Subsequently, intelligence has become available from reliable sources which complements and adds to previous intelligence and confirms the JIC assessment that Iraq has chemical and biological weapons. The intelligence also shows that the Iraqi leadership has been discussing a number of issues related to these weapons. This intelligence covers:

- Confirmation that chemical and biological weapons play an important role in Iraqi military thinking: intelligence shows that Saddam attaches great importance to the possession of chemical and biological weapons which he regards as being the basis for Iraqi regional power. He believes that respect for Iraq rests on its possession of these weapons and the missiles capable of delivering them. Intelligence indicates that Saddam is determined to retain this capability and recognizes that Iraqi political weight would be diminished if Iraq's military power rested solely on its conventional military forces.
- Iraqi attempts to retain its existing banned weapons systems: Iraq is already taking steps to prevent UN weapons inspectors finding evidence of its chemical and biological weapons programme. Intelligence indicates that Saddam has learnt lessons from previous weapons inspections, has identified possible weak points in the inspections process and knows how to exploit them. Sensitive equipment and papers can easily be concealed and in some cases this is already happening. The possession of mobile biological agent production facilities will also aid concealment efforts. Saddam is determined not to lose the capabilities that he has been able to develop further in the four years since inspectors left.
- Saddam's willingness to use chemical and biological weapons: intelligence indicates that as part of Iraq's military planning Saddam is willing to use chemical and biological weapons,

including against his own Shia population. Intelligence indicates that the Iraqi military are able to deploy chemical or biological weapons within 45 minutes of an order to do so.

UK: Chemical agents: surviving stocks

When confronted with questions about the unaccounted stocks, Iraq has claimed repeatedly that if it had retained any chemical agents from before the Gulf War they would have deteriorated sufficiently to render them harmless. But Iraq has admitted to UNSCOM to having the knowledge and capability to add stabilizer to nerve agent and other chemical warfare agents which would prevent such decomposition. In 1997 UNSCOM also examined some munitions which had been filled with mustard gas prior to 1991 and found that they remained very toxic and showed little sign of deterioration.

Iraq has claimed that all its biological agents and weapons have been destroyed. No convincing proof of any kind has been produced to support this claim. In particular, Iraq could not explain large discrepancies between the amount of growth media (nutrients required for the specialized growth of agent) it procured before 1991 and the amounts of agent it admits to having manufactured. The discrepancy is enough to produce more than three times the amount of anthrax allegedly manufactured.

UK: Chemical agent: production capabilities

Intelligence shows that Iraq has continued to produce chemical agent. During the Gulf War a number of facilities which intelligence reporting indicated were directly or indirectly associated with Iraq's chemical weapons effort were attacked and damaged. Following the ceasefire UNSCOM destroyed or rendered harmless facilities and equipment used in Iraq's chemical weapons programme. Other equipment was released for civilian use either in industry or academic institutes, where it was tagged and regularly inspected and monitored, or else placed under camera monitoring, to ensure that it was not being misused.

This monitoring ceased when UNSCOM withdrew from Iraq in 1998. However, capabilities remain and, although the main chemical weapon production facility at al-Muthanna was completely destroyed by UNSCOM and has not been rebuilt, other plants formerly associated with the chemical warfare programme have been rebuilt. These include the chlorine and phenol plant at Fallujah 2 near Habbaniyah. In addition to their civilian uses, chlorine and phenol are used for precursor chemicals which contribute to the production of chemical agents.

Other dual-use facilities, which are capable of being used to support the production of chemical agent and precursors, have been rebuilt and re-equipped. New chemical facilities have been built, some with illegal foreign assistance, and are probably fully operational or ready for production. These include the Ibn Sina Company at Tarmiyah (see figure 1), which is a chemical research centre. It undertakes research, development and production of chemicals previously imported but not now available and which are needed for Iraq's civil industry. The Director General of the research centre is Hikmat Na'im al-Jalu who prior to the Gulf War worked in Iraq's nuclear weapons programme and after the war was responsible for preserving Iraq's chemical expertise.

Parts of the al-Qa'qa' chemical complex damaged in the Gulf War have also been repaired and are operational. Of particular concern are elements of the phosgene production plant at al-Qa'qa'. These were severely damaged during the Gulf War, and dismantled under UNSCOM

supervision, but have since been rebuilt. While phosgene does have industrial uses it can also be used by itself as a chemical agent or as a precursor for nerve agent.

Iraq has retained the expertise for chemical warfare research, agent production and weaponisation. Most of the personnel previously involved in the programme remain in country. While UNSCOM found a number of technical manuals (so called “cook books”) for the production of chemical agents and critical precursors, Iraq’s claim to have unilaterally destroyed the bulk of the documentation cannot be confirmed and is almost certainly untrue. Recent intelligence indicates that Iraq is still discussing methods of concealing such documentation in order to ensure that it is not discovered by any future UN inspections.

UK: Dual-Use Chemical Facilities

Almost all components and supplies used in weapons of mass destruction and ballistic missile programmes are dual-use. For example, any major petrochemical or biotech industry, as well as public health organizations, will have legitimate need for most materials and equipment required to manufacture chemical and biological weapons. Without UN weapons inspectors it is very difficult therefore to be sure about the true nature of many of Iraq’s facilities.

For example, Iraq has built a large new chemical complex, Project Baiji, in the desert in north west Iraq at al-Sharqat (see figure 2). This site is a former uranium enrichment facility which was damaged during the Gulf War and rendered harmless under supervision of the IAEA. Part of the site has been rebuilt, with work starting in 1992, as a chemical production complex. Despite the site being far away from populated areas it is surrounded by a high wall with watch towers and guarded by armed guards. Intelligence reports indicate that it will produce nitric acid which can be used in explosives, missile fuel and in the purification of uranium.

Chemical agents: delivery means

Iraq has a variety of delivery means available for both chemical and biological agents. These include:

- free-fall bombs: Iraq acknowledged possession of four types of aerial bomb with various chemical agent fills including sulphur mustard, tabun, sarin and cyclosarin;
- artillery shells and rockets: Iraq made extensive use of artillery munitions filled with chemical agents during the Iran-Iraq War. Mortars can also be used for chemical agent delivery. Iraq is known to have tested the use of shells and rockets filled with biological agents. Over 20,000 artillery munitions remain unaccounted for by UNSCOM;
- helicopter and aircraft borne sprayers: Iraq carried out studies into aerosol dissemination of biological agent using these platforms prior to 1991. UNSCOM was unable to account for many of these devices. It is probable that Iraq retains a capability for aerosol dispersal of both chemical and biological agent over a large area;
- al-Hussein ballistic missiles (range 650km): Iraq developed chemical agent warheads for al-Hussein. Iraq admitted to producing 50 chemical warheads for al-Hussein which were intended for the delivery of a mixture of sarin and cyclosarin. However, technical analysis of warhead remnants has shown traces of VX degradation product which indicate that some additional warheads were made and filled with VX;

- al-Samoud/Ababil-100 ballistic missiles (range 150km plus): it is unclear if
- chemical and biological warheads have been developed for these systems, but given the Iraqi experience on other missile systems, we judge that Iraq has the technical expertise for doing so;
- L-29 remotely piloted vehicle programme : we know from intelligence that Iraq has attempted to modify the L-29 jet trainer to allow it to be used as an Unmanned Aerial Vehicle (UAV) which is potentially capable of delivering chemical and biological agents over a large area.

Chemical and biological warfare: command and control

The authority to use chemical and biological weapons ultimately resides with Saddam but intelligence indicates that he may have also delegated this authority to his son Qusai. Special Security Organization (SSO) and Special Republican Guard (SRG) units would be involved in the movement of any chemical and biological weapons to military units. The Iraqi military holds artillery and missile systems at Corps level throughout the Armed Forces and conducts regular training with them. The Directorate of Rocket Forces has operational control of strategic missile systems and some Multiple Launcher Rocket Systems.

Chemical weapons: summary

Intelligence shows that Iraq has covert chemical and biological weapons programmes, in breach of UN Security Council Resolution 687 and has continued to produce chemical and biological agents. Iraq has:

- chemical and biological agents and weapons available, both from pre-Gulf War stocks and more recent production;
- the capability to produce the chemical agents mustard gas, tabun, sarin, cyclosarin, and VX capable of producing mass casualties;
- a variety of delivery means available; military forces, which maintain the capability to use these weapons with command, control and logistical arrangements in place.

CIA: Chemical Warfare Program

Iraq has the ability to produce chemical warfare (CW) agents within its chemical industry, although it probably depends on external sources for some precursors.

Baghdad is expanding its infrastructure, under cover of civilian industries, that it could use to advance its CW agent production capability. During the 1980s Saddam had a formidable CW capability that he used against Iranians and against Iraq's Kurdish population. Iraqi forces killed or injured more than 20,000 people in multiple attacks, delivering chemical agents (including mustard agent¹ and the nerve agents sarin and tabun²) in aerial bombs, 122mm rockets, and artillery shells against both tactical military targets and segments of Iraq's Kurdish population. Before the 1991 Gulf war, Baghdad had a large stockpile of chemical munitions and a robust indigenous production capacity.

Although precise information is lacking, human rights organizations have received plausible accounts from Kurdish villagers of even more Iraqi chemical attacks against civilians in the 1987

to 1988 time frame—with some attacks as late as October 1988—in areas close to the Iranian and Turkish borders.

UNSCOM supervised the destruction of more than 40,000 chemical munitions, nearly 500,000 liters of chemical agents, 1.8 million liters of chemical precursors, and seven different types of delivery systems, including ballistic missile warheads. More than 10 years after the Gulf war, gaps in Iraqi accounting and current production capabilities strongly suggest that Iraq maintains a stockpile of chemical agents, probably VX,3 sarin, cyclosarin, 4 and mustard.

Iraq probably has concealed precursors, production equipment, documentation, and other items necessary for continuing its CW effort. Baghdad never supplied adequate evidence to support its claims that it destroyed all of its CW agents and munitions. Thousands of tons of chemical precursors and tens of thousands of unfilled munitions, including Scud-variant missile warheads, remain unaccounted for.

UNSCOM discovered a document at Iraqi Air Force headquarters in July 1998 showing that Iraq overstated by at least 6,000 the number of chemical bombs it told the UN it had used during the Iran-Iraq War—bombs that remain unaccounted for.

Iraq has not accounted for 15,000 artillery rockets that in the past were its preferred means for delivering nerve agents, nor has it accounted for about 550 artillery shells filled with mustard agent.

Iraq probably has stocked at least 100 metric tons (MT) and possibly as much as 500 MT of CW agents.

Baghdad continues to rebuild and expand dual-use infrastructure that it could divert quickly to CW production. The best examples are the chlorine and phenol plants at the Fallujah II facility. Both chemicals have legitimate civilian uses but also are raw materials for the synthesis of precursor chemicals used to produce blister and nerve agents. Iraq has three other chlorine plants that have much higher capacity for civilian production; these plants and Iraqi imports are more than sufficient to meet Iraq's civilian

VX is a V-series nerve agent that is similar to but more advanced than G-series nerve agents in that it causes the same medical effects but is more toxic and much more persistent. Thus, it poses a far greater skin hazard than G-series agents. VX could be used for long-term contamination of territory.

Of the 15 million kg of chlorine imported under the UN Oil for-Food Program since 1997, Baghdad used only 10 million kg and has 5 million kg in stock, suggesting that some domestically produced chlorine has been diverted to such proscribed activities as CW agent production.

Fallujah II was one of Iraq's principal CW precursor production facilities before the Gulf war. In the last two years the Iraqis have upgraded the facility and brought in new chemical reactor vessels and shipping containers with a large amount of production equipment. They have expanded chlorine output far beyond pre-Gulf war production levels—capabilities that can be diverted quickly to CW production. Iraq is seeking to purchase CW agent precursors and applicable production equipment and is trying to hide the activities of the Fallujah plant.

Iraq's Weapons of Mass Destruction – The Key Contents of the British (September 2002) and US (October 4, 2002) White Papers dealing with Biological Weapons

UK: Biological Weapons

Since the withdrawal of the inspectors the JIC has monitored evidence, including from secret intelligence, of continuing work on Iraqi offensive chemical and biological warfare capabilities. In the first half of 2000 the JIC noted intelligence on Iraqi attempts to procure dual-use chemicals and on the reconstruction of civil chemical production at sites formerly associated with the chemical warfare programme.

Iraq had also been trying to procure dual-use materials and equipment which could be used for a biological warfare programme. Personnel known to have been connected to the biological warfare programme up to the Gulf War had been conducting research into pathogens. There was intelligence that Iraq was starting to produce biological warfare agents in mobile production facilities. Planning for the project had begun in 1995 under Dr Rihab Taha, known to have been a central player in the pre-Gulf War programme. The JIC concluded that Iraq had sufficient expertise, equipment and material to produce biological warfare agents within weeks using its legitimate bio-technology facilities.

In mid-2001, the JIC concluded that intelligence on Iraqi former chemical and biological warfare facilities, their limited reconstruction and civil production pointed to a continuing research and development programme. These chemical and biological capabilities represented the most immediate threat from Iraqi weapons of mass destruction. Since 1998 Iraqi development of mass destruction weaponry had been helped by the absence of inspectors and the increase in illegal border trade, which was providing hard currency.

In the last six months the JIC has confirmed its earlier judgments on Iraqi chemical and biological warfare capabilities and assessed that Iraq has the means to deliver chemical and biological weapons.

Subsequently, intelligence has become available from reliable sources which complements and adds to previous intelligence and confirms the JIC assessment that Iraq has chemical and biological weapons. The intelligence also shows that the Iraqi leadership has been discussing a number of issues related to these weapons. This intelligence covers:

- Confirmation that chemical and biological weapons play an important role in Iraqi military thinking: intelligence shows that Saddam attaches great importance to the possession of chemical and biological weapons which he regards as being the basis for Iraqi regional power. He believes that respect for Iraq rests on its possession of these weapons and the missiles capable of delivering them. Intelligence indicates that Saddam is determined to retain this capability and recognizes that Iraqi political weight would be diminished if Iraq's military power rested solely on its conventional military forces.
- Iraqi attempts to retain its existing banned weapons systems: Iraq is already taking steps to prevent UN weapons inspectors finding evidence of its chemical and biological weapons programme. Intelligence indicates that Saddam has learnt lessons from previous weapons inspections, has identified possible weak points in the inspections process and knows how to exploit them. Sensitive equipment and papers can easily be concealed and in some cases this

is already happening. The possession of mobile biological agent production facilities will also aid concealment efforts. Saddam is determined not to lose the capabilities that he has been able to develop further in the four years since inspectors left.

- Saddam's willingness to use chemical and biological weapons: intelligence indicates that as part of Iraq's military planning Saddam is willing to use chemical and biological weapons, including against his own Shia population. Intelligence indicates that the Iraqi military are able to deploy chemical or biological weapons within 45 minutes of an order to do so.

UK: Biological agents: surviving stocks

Iraq has claimed that all its biological agents and weapons have been destroyed. No convincing proof of any kind has been produced to support this claim. In particular, Iraq could not explain large discrepancies between the amount of growth media (nutrients required for the specialized growth of agent) it procured before 1991 and the amounts of agent it admits to having manufactured. The discrepancy is enough to produce more than three times the amount of anthrax allegedly manufactured.

Biological Weapons Programs

We know from intelligence that Iraq has continued to produce biological warfare agents. As with some chemical equipment, UNSCOM only destroyed equipment that could be directly linked to biological weapons production. Iraq also has its own engineering capability to design and construct biological agent associated fermenters, centrifuges, sprayer dryers and other equipment and is judged to be self-sufficient in the technology required to produce biological weapons.

Dual-Use Chemical and Biological Facilities

Almost all components and supplies used in weapons of mass destruction and ballistic missile programmes are dual-use. For example, any major petrochemical or biotech industry, as well as public health organizations, will have legitimate need for most materials and equipment required to manufacture chemical and biological weapons. Without UN weapons inspectors it is very difficult therefore to be sure about the true nature of many of Iraq's facilities.

Experienced personnel who were active in the programme have largely remained in the country. Some dual-use equipment has also been purchased, but without monitoring by UN inspectors Iraq could have diverted it to their biological weapons programme. This newly purchased equipment and other equipment previously subject to monitoring could be used in a resurgent biological warfare programme. Facilities of concern include:

- The Castor Oil Production Plant at Fallujah: this was damaged in UK/US air attacks in 1998 (Operation Desert Fox) but has been rebuilt. The residue from the castor bean pulp can be used in the production of the biological agent ricin;
- The al-Dawrah Foot and Mouth Disease Vaccine Institute: which was involved in biological agent production and research before the Gulf War;
- The Amariyah Sera and Vaccine Plant at Abu Ghraib: UNSCOM established that this facility was used to store biological agents, seed stocks and conduct biological warfare associated genetic research prior to the Gulf War. It has now expanded its storage capacity.

UNSCOM established that Iraq considered the use of mobile biological agent production facilities. In the past two years evidence from defectors has indicated the existence of such facilities. Recent intelligence confirms that the Iraqi military have developed mobile facilities. These would help Iraq conceal and protect biological agent production from military attack or UN inspection.

Biological agents: delivery means

Iraq has a variety of delivery means available for both chemical and biological agents. These include:

- free-fall bombs: Iraq acknowledged to UNSCOM the deployment to two sites of free-fall bombs filled with biological agent during 1990–91. These bombs were filled with anthrax, botulinum toxin and aflatoxin.;
- artillery shells and rockets: Iraq is known to have tested the use of shells and rockets filled with biological agents. Over 20,000 artillery munitions remain unaccounted for by UNSCOM;
- helicopter and aircraft borne sprayers: Iraq carried out studies into aerosol dissemination of biological agent using these platforms prior to 1991. UNSCOM was unable to account for many of these devices. It is probable that Iraq retains a capability for aerosol dispersal of both chemical and biological agent over a large area;
- al-Hussein ballistic missiles (range 650km): Iraq told UNSCOM that it filled 25 warheads with anthrax, botulinum toxin and aflatoxin.;
- al-Samoud/Ababil-100 ballistic missiles (range 150km plus): it is unclear if chemical and biological warheads have been developed for these systems, but given the Iraqi experience on other missile systems, we judge that Iraq has the technical expertise for doing so;
- L-29 remotely piloted vehicle programme : we know from intelligence that Iraq has attempted to modify the L-29 jet trainer to allow it to be used as an Unmanned Aerial Vehicle (UAV) which is potentially capable of delivering chemical and biological agents over a large area.

Chemical and biological warfare: command and control

The authority to use chemical and biological weapons ultimately resides with Saddam but intelligence indicates that he may have also delegated this authority to his son Qusai. Special Security Organization (SSO) and Special Republican Guard (SRG) units would be involved in the movement of any chemical and biological weapons to military units. The Iraqi military holds artillery and missile systems at Corps level throughout the Armed Forces and conducts regular training with them. The Directorate of Rocket Forces has operational control of strategic missile systems and some Multiple Launcher Rocket Systems.

Biological weapons: summary

Intelligence shows that Iraq has covert chemical and biological weapons programmes, in breach of UN Security Council Resolution 687 and has continued to produce chemical and biological agents. Iraq has:

- chemical and biological agents and weapons available, both from pre-Gulf War stocks and more recent production;
- the capability to produce the chemical agents mustard gas, tabun, sarin, cyclosarin, and VX capable of producing mass casualties;
- a biological agent production capability and can produce at least anthrax, botulinum toxin, aflatoxin and ricin. Iraq has also developed mobile facilities to produce biological agents;
- a variety of delivery means available; military forces, which maintain the capability to use these weapons with command, control and logistical arrangements in place.

CIA: Biological Warfare Program

Iraq has the capability to convert quickly legitimate vaccine and biopesticide plants to biological warfare (BW) production and already may have done so. This capability is particularly troublesome because Iraq has a record of concealing its BW activities and lying about the existence of its offensive BW program.

After four years of claiming that they had conducted only “small-scale, defensive” research, Iraqi officials finally admitted to inspectors in 1995 to production and weaponization of biological agents. The Iraqis admitted this only after being faced with evidence of their procurement of a large volume of growth media and the defection of Husayn Kamil, former director of Iraq’s military industries.

Iraq admitted producing thousands of liters of the BW agents anthrax, 6 botulinum toxin, (which paralyzes respiratory muscles and can be fatal within 24 to 36 hours), and aflatoxin, (a potent carcinogen that can attack the liver, killing years after ingestion), and preparing BW- filled Scud-variant missile warheads, aerial bombs, and aircraft spray tanks before the Gulf war.

Baghdad did not provide persuasive evidence to support its claims that it unilaterally destroyed its BW agents and munitions. Experts from UNSCOM assessed that Baghdad’s declarations vastly understated the production of biological agents and estimated that Iraq actually produced two-to-four times the amount of agent that it acknowledged producing, including *Bacillus anthracis*—the causative agent of anthrax—and botulinum toxin.

The improvement or expansion of a number of nominally “civilian” facilities that were directly associated with biological weapons indicates that key aspects of Iraq’s offensive BW program are active and most elements more advanced and larger than before the 1990-1991 Gulf war.

The al-Dawrah Foot-and-Mouth Disease (FMD) Vaccine Facility is one of two known Biocontainment Level-3—facilities in Iraq with an extensive air handling and filtering system. Iraq admitted that before the Gulf war Al-Dawrah had been a BW agent production facility. UNSCOM attempted to render it useless for BW agent production in 1996 but left some production equipment in place because UNSCOM could not prove it was connected to previous BW work. In 2001, Iraq announced it would begin renovating the plant without UN approval, ostensibly to produce a vaccine to combat an FMD outbreak. In fact, Iraq easily can import all the foot-and mouth vaccine it needs through the UN.

The Amiriyah Serum and Vaccine Institute is an ideal cover location for BW research, testing, production, and storage. UN inspectors discovered documents related to BW research at this facility, some showing that BW cultures, agents, and equipment were stored there during the

Gulf war. Of particular concern is the plant's new storage capacity, which greatly exceeds Iraq's needs for legitimate medical storage.

The Fallujah III Castor Oil Production Plant is situated on a large complex with an historical connection to Iraq's CW program. Of immediate BW concern is the potential production of ricin toxin. Castor bean pulp, left over from castor oil production, can be used to extract ricin toxin. Iraq admitted to UNSCOM that it manufactured ricin and field-tested it in artillery shells before the Gulf war. Iraq operated this plant for legitimate purposes under UNSCOM scrutiny before 1998 when UN inspectors left the country.

Since 1999, Iraq has rebuilt major structures destroyed during Operation Desert Fox. Iraqi officials claim they are making castor oil for brake fluid, but verifying such claims without UN inspections is impossible. In addition to questions about activity at known facilities, there are compelling reasons to be concerned about BW activity at other sites and in mobile production units and laboratories. Baghdad has pursued a mobile BW research and production capability to better conceal its program.

UNSCOM uncovered a document on Iraqi Military Industrial Commission letterhead indicating that Iraq was interested in developing mobile fermentation units, and an Iraqi scientist admitted to UN inspectors that Iraq was trying to move in the direction of mobile BW production.

Iraq has now established large-scale, redundant, and concealed BW agent production capabilities based on mobile BW facilities.

Iraq's Weapons of Mass Destruction – The Key Contents of the British (September 2002) and US (October 4, 2002) White Papers Dealing with Nuclear Weapons

UK: Nuclear Weapons Programs

Since 1999 the JIC has monitored Iraq's attempts to reconstitute its nuclear weapons programme. In mid-2001 the JIC assessed that Iraq had continued its nuclear research after 1998. The JIC drew attention to intelligence that Iraq had recalled its nuclear scientists to the programme in 1998. Since 1998 Iraq had been trying to procure items that could be for use in the construction of centrifuges for the enrichment of uranium.

Iraqi nuclear weapons expertise

It is clear from IAEA inspections and Iraq's own declarations that by 1991 considerable progress had been made in both developing methods to produce fissile material and in weapons design. The IAEA dismantled the physical infrastructure of the Iraqi nuclear weapons program, including the dedicated facilities and equipment for uranium separation and enrichment, and for weapon development and production, and removed the remaining highly enriched uranium. But Iraq retained, and retains, many of its experienced nuclear scientists and technicians who are specialized in the production of fissile material and weapons design. Intelligence indicates that Iraq also retains the accompanying programme documentation and data.

Intelligence shows that the present Iraqi programme is almost certainly seeking an indigenous ability to enrich uranium to the level needed for a nuclear weapon. It indicates that the approach is based on gas centrifuge uranium enrichment, one of the routes Iraq was following for producing fissile material before the Gulf War. But Iraq needs certain key equipment, including gas centrifuge components and components for the production of fissile material before a nuclear bomb could be developed.

Following the departure of weapons inspectors in 1998 there has been an accumulation of intelligence indicating that Iraq is making concerted covert efforts to acquire dual-use technology and materials with nuclear applications. Iraq's known holdings of processed uranium are under IAEA supervision. But there is intelligence that Iraq has sought the supply of significant quantities of uranium from Africa. Iraq has no active civil nuclear power programme or nuclear power plants and therefore has no legitimate reason to acquire uranium.

Intelligence shows that other important procurement activity since 1998 has included attempts to purchase:

- vacuum pumps which could be used to create and maintain pressures in a gas centrifuge cascade needed to enrich uranium;
- an entire magnet production line of the correct specification for use in the motors and top bearings of gas centrifuges. It appears that Iraq is attempting to acquire a capability to produce them on its own rather than rely on foreign procurement;
- Anhydrous Hydrogen Fluoride (AHF) and fluorine gas. AHF is commonly used in the petrochemical industry and Iraq frequently imports significant amounts, but it is also used in

the process of converting uranium into uranium hexafluoride for use in gas centrifuge cascades;

- one large filament winding machine which could be used to manufacture carbon fibre gas centrifuge rotors;
- a large balancing machine which could be used in initial centrifuge balancing work.

Iraq has also made repeated attempts covertly to acquire a very large quantity (60,000 or more) of specialized aluminium tubes. The specialized aluminium in question is subject to international export controls because of its potential application in the construction of gas centrifuges used to enrich uranium, although there is no definitive intelligence that it is destined for a nuclear programme.

Nuclear weapons: timelines

In early 2002, the JIC assessed that UN sanctions on Iraq were hindering the import of crucial goods for the production of fissile material. The JIC judged

- Iraq's long-standing civil nuclear power programme is limited to small scale research. Activities that could be used for military purposes are prohibited by UNSCR 687 and 715.
- Iraq has no nuclear power plants and therefore no requirement for uranium as fuel.
- Iraq has a number of nuclear research programmes in the fields of agriculture, biology, chemistry, materials and pharmaceuticals. None of these activities requires more than tiny amounts of uranium which Iraq could supply from its own resources.
- Iraq's research reactors are non-operational; two were bombed and one was never completed.
- that while sanctions remain effective Iraq would not be able to produce a nuclear weapon. If they were removed or prove ineffective, it would take Iraq at least five years to produce sufficient fissile material for a weapon indigenously. However, we know that Iraq retains expertise and design data relating to nuclear weapons. We therefore judge that if Iraq obtained fissile material and other essential components from foreign sources the timeline for production of a nuclear weapon would be shortened and Iraq could produce a nuclear weapon in between one and two years.

CIA: Nuclear Weapons Program

More than ten years of sanctions and the loss of much of Iraq's physical nuclear infrastructure under IAEA oversight have not diminished Saddam's interest in acquiring or developing nuclear weapons.

• Iraq's efforts to procure tens of thousands of proscribed high-strength aluminum tubes are of significant concern. All intelligence experts agree that Iraq is seeking nuclear weapons and that these tubes could be used in a centrifuge enrichment program. Most intelligence specialists assess this to be the intended use, but some believe that these tubes are probably intended for conventional weapons programs.

Iraq had an advanced nuclear weapons development program before the Gulf war that focused on building an implosion-type weapon using highly enriched uranium. Baghdad was attempting a variety of uranium enrichment techniques, the most successful of which were the

electromagnetic isotope separation (EMIS) and gas centrifuge programs. After its invasion of Kuwait, Iraq initiated a crash program to divert IAEA-safeguarded, highly enriched uranium from its Soviet and French-supplied reactors, but the onset of hostilities ended this effort. Iraqi declarations and the UNSCOM/IAEA inspection process revealed much of Iraq's nuclear weapons efforts, but Baghdad still has not provided complete information on all aspects of its nuclear weapons program.

- Iraq has withheld important details relevant to its nuclear program, including procurement logs, technical documents, experimental data, accounting of materials, and foreign assistance.
- Baghdad also continues to withhold other data about enrichment techniques, foreign procurement, weapons design, and the role of Iraqi security services in concealing its nuclear facilities and activities.
- In recent years, Baghdad has diverted goods contracted under the Oil-for-Food Program for military purposes and has increased solicitations and dual-use procurements—outside the Oil-for-Food process—some of which almost certainly are going to prohibited WMD and other weapons programs. Baghdad probably uses some of the money it gains through its illicit oil sales to support its WMD efforts.

Before its departure from Iraq, the IAEA made significant strides toward dismantling Iraq's nuclear weapons program and unearthing the nature and scope of Iraq's past nuclear activities. In the absence of inspections, however, most analysts assess that Iraq is reconstituting its nuclear program—unraveling the IAEA's hard-earned accomplishments.

Iraq retains its cadre of nuclear scientists and technicians, its program documentation, and sufficient dual-use manufacturing capabilities to support a reconstituted nuclear weapons program. Iraqi media have reported numerous meetings between Saddam and nuclear scientists over the past two years, signaling Baghdad's continued interest in reviving a nuclear program.

Iraq's expanding international trade provides growing access to nuclear-related technology and materials and potential access to foreign nuclear expertise. An increase in dual-use procurement activity in recent years may be supporting a reconstituted nuclear weapons program.

·The acquisition of sufficient fissile material is Iraq's principal hurdle in developing a nuclear weapon. Iraq is unlikely to produce indigenously enough weapons-grade material for a deliverable nuclear weapon until the last half of this decade. Baghdad could produce a nuclear weapon within a year if it were able to procure weapons-grade fissile material abroad.

Baghdad may have acquired uranium enrichment capabilities that could shorten substantially the amount of time necessary to make a nuclear weapon.

Iraq's Weapons of Mass Destruction – The Key Contents of the British (September 2002) and US (October 4, 2002) White Papers Dealing with Missile Programs

UK: Missile Programs

In mid-2001 the JIC drew attention to what it described as a “step-change” in progress on the Iraqi missile programme over the previous two years. It was clear from intelligence that the range of Iraqi missiles which was permitted by the UN and supposedly limited to 150kms was being extended and that work was under way on larger engines for longer-range missiles.

In early 2002 the JIC concluded that Iraq had begun to develop missiles with a range of over 1,000kms. The JIC assessed that if sanctions remained effective the Iraqis would not be able to produce such a missile before 2007. Sanctions and the earlier work of the inspectors had caused significant problems for Iraqi missile development. In the previous six months Iraqi foreign procurement efforts for the missile programme had been bolder. The JIC also assessed that Iraq retained up to 20 al-Hussein missiles from before the Gulf War.

The Iraqi ballistic missile programme since 1998

Since the Gulf War, Iraq has been openly developing two short-range missiles up to a range of 150km, which are permitted under UN Security Council Resolution 687. The al-Samoud liquid propellant missile has been extensively tested and is being deployed to military units. Intelligence indicates that at least 50 have been produced. Intelligence also indicates that Iraq has worked on extending its range to at least 200km in breach of UN Security Resolution 687. Production of the solid propellant Ababil-100 is also underway, probably as an unguided rocket at this stage. There are also plans to extend its range to at least 200km. Compared to liquid propellant missiles, those powered by solid propellant offer greater ease of storage, handling and mobility. They are also quicker to take into and out of action and can stay at a high state of readiness for longer periods.

According to intelligence, Iraq has retained up to 20 al-Hussein missiles in breach of UN Security Council Resolution 687. These missiles were either hidden from the UN as complete systems, or re-assembled using illegally retained engines and other components. We judge that the engineering expertise available would allow these missiles to be maintained effectively, although the fact that at least some require re-assembly makes it difficult to judge exactly how many could be available for use. They could be used with conventional, chemical or biological warheads and, with a range of up to 650km, are capable of reaching a number of countries in the region including Cyprus, Turkey, Saudi Arabia, Iran and Israel.

Intelligence has confirmed that Iraq wants to extend the range of its missile systems to over 1000km, enabling it to threaten other regional neighbors. This work began in 1998, although efforts to regenerate the long-range ballistic missile programme probably began in 1995. Iraq's missile programmes employ hundreds of people. Satellite imagery (Figure 6) has shown a new engine test stand being constructed (A), which is larger than the current one used for al-Samoud (B), and that formerly used for testing SCUD engines (C) which was dismantled under UNSCOM supervision. This new stand will be capable of testing engines for medium range ballistic missiles (MRBMs) with ranges over 1000km, which are not permitted under UN Security Council Resolution 687. Such a facility would not be needed for systems that fall

within the UN permitted range of 150km. The Iraqis have recently taken measures to conceal activities at this site. Iraq is also working to obtain improved guidance technology to increase missile accuracy.

The success of UN restrictions means the development of new longer-range missiles is likely to be a slow process. These restrictions impact particularly on the:

- availability of foreign expertise;
- conduct of test flights to ranges above 150km;
- acquisition of guidance and control technology.

Saddam remains committed to developing longer-range missiles. Even if sanctions remain effective, Iraq might achieve a missile capability of over 1000km within 5 years (Figure 7 shows the range of Iraq's various missiles).

Iraq has managed to rebuild much of the missile production infrastructure destroyed in the Gulf War and in Operation Desert Fox in 1998. New missile-related infrastructure is also under construction. Some aspects of this, including rocket propellant mixing and casting facilities at the al-Mamoun Plant, appear to replicate those linked to the prohibited Badr-2000 programme (with a planned range of 700–1000km) which were destroyed in the Gulf War or dismantled by UNSCOM.

A new plant at al-Mamoun for indigenously producing ammonium perchlorate, which is a key ingredient in the production of solid propellant rocket motors, has also been constructed. This has been provided illicitly by NEC Engineers Private Limited, an Indian chemical engineering firm with extensive links in Iraq, including to other suspect facilities such as the Fallujah 2 chlorine plant. After an extensive investigation, the Indian authorities have recently suspended its export license, although other individuals and companies are still illicitly procuring for Iraq.

Despite a UN embargo, Iraq has also made concerted efforts to acquire additional production technology, including machine tools and raw materials, in breach of UN Security Council Resolution 1051. The embargo has succeeded in blocking many of these attempts, such as requests to buy magnesium powder and ammonium chloride. But we know from intelligence that some items have found their way to the Iraqi ballistic missile programme. More will inevitably continue to do so.

Intelligence makes it clear that Iraqi procurement agents and front companies in third countries are seeking illicitly to acquire propellant chemicals for Iraq's ballistic missiles. This includes production level quantities of near complete sets of solid propellant rocket motor ingredients such as aluminium powder, ammonium perchlorate and hydroxyl terminated polybutadiene. There have also been attempts to acquire large quantities of liquid propellant chemicals such as Unsymmetrical Dimethylhydrazine (UDMH) and diethylenetriamine. We judge these are intended to support production and deployment of the al-Samoud and development of longer-range systems.

CIA: Ballistic Missile Program

Iraq has developed a ballistic missile capability that exceeds the 150km range limitation established under UNSCR 687. During the 1980s, Iraq purchased 819 Scud B missiles from the USSR. Hundreds of these 300km range missiles were used to attack Iranian cities during the

Iran-Iraq War.

Beginning in 1987, Iraq converted many of these Soviet Scuds into extended-range variants, some of which were fired at Tehran; some were launched during the Gulf war, and others remained in Iraq's inventory at war's end. Iraq admitted filling at least 75 of its Scud warheads with chemical or biological agents and deployed these weapons for use against Coalition forces and regional opponents, including Israel in 1991.

Most of the approximately 90 Scud-type missiles Saddam fired at Israel, Saudi Arabia, and Bahrain during the Gulf war were al-Husayn variants that the Iraqis modified by lengthening the airframe and increasing fuel capacity, extending the range to 650 km. Baghdad was developing other longer-range missiles based on Scud technology, including the 900km al-Abbas. Iraq was designing follow-on multi-stage and clustered medium-range ballistic missile (MRBM) concepts with intended ranges up to 3,000 km.

Iraq also had a program to develop a two-stage missile, called the Badr-2000, using solid propellants with an estimated range of 750 to 1,000 km.

Iraq never fully accounted for its existing missile programs. Discrepancies in Baghdad's declarations suggest that Iraq retains a small force of extended-range Scud-type missiles and an undetermined number of launchers and warheads. Further,

Iraq never explained the disposition of advanced missile components, such as guidance and control systems, that it could not produce on its own and that would be critical to developmental programs.

Iraq continues to work on UN-authorized short-range ballistic missiles (SRBMs)—those with a range no greater than 150 km—that help develop the expertise and infrastructure needed to produce longer-range missile systems.

The al-Samoud liquid propellant SRBM and the Ababil-100 solid propellant SRBM, however, are capable of flying beyond the allowed 150km range. Both missiles have been tested aggressively and are in early deployment.

Other evidence strongly suggests Iraq is modifying missile testing and production facilities to produce even longer-range missiles.

The Al-Rafah-North Liquid Propellant Engine Research, Development, Testing, and Evaluation (RDT&E) Facility is Iraq's principal site for the static testing of liquid propellant missile engines. Baghdad has been building a new test stand there that is larger than the test stand associated with al-Samoud engine testing and the defunct Scud engine test stand. The only plausible explanation for this test facility is that Iraq intends to test engines for longer-range missiles prohibited under UNSCR 687.

The Al-Mutasim Solid Rocket Motor and Test Facility, previously associated with Iraq's Badr-2000 solid-propellant missile program, has been rebuilt and expanded in recent years. The al-Mutasim site supports solid-propellant motor assembly, rework, and testing for the UN-authorized Ababil-100, but the size of certain facilities there, particularly those newly constructed between the assembly rework and static test areas, suggests that Baghdad is preparing to develop systems that are prohibited by the UN.

At the Al-Mamoun Solid Rocket Motor Production Plant and RDT&E Facility, the Iraqis, since

the December 1998 departure of inspectors, have rebuilt structures damaged during the Gulf war and dismantled by UNSCOM that originally were built to manufacture solid propellant motors for the Badr-2000 program. They also have built a new building and are reconstructing other buildings originally designed to fill large Badr-2000 motor casings with solid propellant.

Also at al-Mamoun, the Iraqis have rebuilt two structures used to “mix” solid propellant for the Badr-2000 missile. The new buildings—about as large as the original ones—are ideally suited to house large, UN-prohibited mixers. In fact, the only logical explanation for the size and configuration of these mixing buildings is that Iraq intends to develop longer-range, prohibited missiles.

Iraq has managed to rebuild and expand its missile development infrastructure under sanctions. Iraqi intermediaries have sought production technology, machine tools, and raw materials in violation of the arms embargo.

The Iraqis have completed a new ammonium perchlorate production plant at Mamoun that supports Iraq’s solid propellant missile program. Ammonium perchlorate is a common oxidizer used in solid propellant missile motors. Baghdad would not have been able to complete this facility without help from abroad.

In August 1995, Iraq was caught trying to acquire sensitive ballistic missile guidance components, including gyroscopes originally used in Russian strategic nuclear SLBMs, demonstrating that Baghdad has been pursuing proscribed, advanced, long range missile technology for some time. Iraqi officials admitted that, despite international prohibitions, they had received a similar shipment earlier that year.

CIA: Unmanned Aerial Vehicle Program and Other Aircraft

Iraq is continuing to develop other platforms which most analysts believe probably are intended for delivering biological warfare agents. Immediately before the Gulf war, Baghdad attempted to convert a MiG-21 into an unmanned aerial vehicle (UAV) to carry spray tanks capable of dispensing chemical or biological agents.

UNSCOM assessed that the program to develop the spray system was successful, but the conversion of the MiG-21 was not. More recently, Baghdad has attempted to convert some of its L-29 jet trainer aircraft into UAVs that can be fitted with chemical and biological warfare (CBW) spray tanks, most likely a continuation of previous efforts with the MiG-21.

Although much less sophisticated than ballistic missiles as a delivery platform, an aircraft—manned or unmanned—is the most efficient way to disseminate chemical and biological weapons over a large, distant area.

Iraq already has produced modified drop-tanks that can disperse biological or chemical agents effectively. Before the Gulf war, the Iraqis successfully experimented with aircraft-mounted spray tanks capable of releasing up to 2,000 liters of an anthrax simulant over a target area. Iraq also has modified commercial crop sprayers successfully and tested them with an anthrax simulant delivered by helicopters.

Baghdad has a history of experimenting with a variety of unmanned platforms. Iraq’s use of newer, more capable airframes would increase range and payload, while smaller platforms might be harder to detect and therefore more survivable. This capability represents a serious threat to Iraq’s neighbors and to international military forces in the region.

Iraq used tactical fighter aircraft and helicopters to deliver chemical agents, loaded in bombs and rockets, during the Iran-Iraq War. Baghdad probably is considering again using manned aircraft as delivery platforms depending on the operational scenario.

Iraq's Weapons of Mass Destruction – The Key Contents of the British (September 2002) and US (October 4, 2002) White Papers Dealing with Procurement

UK: Procurement and Funding

The UN has sought to restrict Iraq's ability to generate funds for its chemical, biological and other military programmes. For example, Iraq earns money legally under the UN Oil For Food Programme (OFF) established by UNSCR 986, whereby the proceeds of oil sold through the UN are used to buy humanitarian supplies for Iraq. This money remains under UN control and cannot be used for military procurement. However, the Iraqi regime continues to generate income outside UN control either in the form of hard currency or barter goods (which in turn means existing Iraqi funds are freed up to be spent on other things).

These illicit earnings go to the Iraqi regime. They are used for building new palaces, as well as purchasing luxury goods and other civilian goods outside the OFF programme. Some of these funds are also used by Saddam Hussein to maintain his armed forces, and to develop or acquire military equipment, including for chemical, biological, nuclear and ballistic missile programmes. We do not know what proportion of these funds is used in this way. But we have seen no evidence that Iraqi attempts to develop its weapons of mass destruction and its ballistic missile programme, for example through covert procurement of equipment from abroad, has been inhibited in any way by lack of funds. The steady increase over the last three years in the availability of funds will enable Saddam to progress the programmes faster.

Iraq's illicit earnings

Year	Amount in \$US billions
1999	0.8 to 1
2000	1.5 to 2
2001	3
2002	3 (estimate)

CIA: Procurement in Support of WMD Programs

Iraq has been able to import dual-use, WMD-relevant equipment and material through procurements both within and outside the UN sanctions regime. Baghdad diverts some of the \$10 billion worth of goods now entering Iraq every year for humanitarian needs to support the military and WMD programs instead. Iraq's growing ability to sell oil illicitly increases Baghdad's capabilities to finance its WMD programs. Over the last four years Baghdad's earnings from illicit oil sales have more than quadrupled to about \$3 billion this year.

UN monitors at Iraq's borders do not inspect the cargo—worth hundreds of millions of dollars—that enters Iraq every year outside of the Oil- for-Food Program; some of these goods clearly support Iraq's military and WMD programs. For example, Baghdad imports fiber-optic communication systems outside of UN auspices to support the Iraqi military.

Iraq imports goods using planes, trains, trucks, and ships without any type of international inspections—in violation of UN Security Council resolutions.

Even within the UN-authorized Oil- for-Food Program, Iraq does not hide that it wants to

purchase military and WMD-related goods. For example, Baghdad diverted UN approved trucks for military purposes and construction equipment to rehabilitate WMD-affiliated facilities, even though these items were approved only to help the civilian population.

Iraq has been able to repair modern industrial machine tools that previously supported production of WMD or missile components and has imported additional tools that it may use to reconstitute Baghdad's unconventional weapons arsenal.

On several occasions, Iraq has asked to purchase goods—such as neutron generators and servo valves—that the UN Monitoring, Verification, and Inspection Commission (UNMOVIC) views as linchpins for prohibited Iraqi programs; alternative, non-dual use items would serve the civilian purpose purportedly intended for this equipment.

UNMOVIC began screening contracts pursuant to UNSCR 1284 in December 1999 and since has identified more than 100 contracts containing dual-use items as defined in UNSCR 1051 that can be diverted into WMD programs. UNMOVIC also has requested that suppliers provide technical information on hundreds of other goods because of concerns about potential misuse of dual-use equipment. In many cases, Iraq has requested technology that clearly exceeds requirements for the stated commercial end-use when it easily could substitute items that could not be used for WMD.

- On some UN contracts, Baghdad claimed that the requested goods are designed to rehabilitate facilities—such as the Al Qa'im phosphate plant and Fallujah—that in the past were used to support both industrial and WMD programs.

Overview of Iraq: NBC and Missile Programs

Nuclear

- Had comprehensive nuclear weapons development program prior to Operation Desert Storm. Infrastructure suffered considerable damage from Coalition bombing and IAEA dismantlement.
- Retains scientists, engineers, and nuclear weapons design information; without fissile material, would need five or more years and significant foreign assistance to rebuild program and produce nuclear devices; less time would
- be needed if sufficient fissile material were acquired illicitly.
- Ratified the NPT; has not signed the CTBT.

Biological

- Produced and weaponized significant quantities of biological warfare agents prior to Desert Storm.
- Admitted biological warfare effort in 1995, after four years of denial; claimed to have destroyed all agents, but
- offered no credible proof.
- May have begun program reconstitution in absence of UN inspections and monitoring.
- Acceded to the BWC.

Chemical

- Rebuilt some of its chemical production infrastructure allegedly for commercial use.
- UNSCOM discovered evidence of VX persistent nerve agent in missile warheads in 1998, despite Iraqi denials for
- seven years that it had not weaponized VX.
- May have begun program reconstitution in absence of UN inspections and monitoring.
- Has not signed the CWC.

Ballistic Missiles

- Probably retains limited number of SCUD-variant missiles, launchers, and warheads capable of delivering
- biological and chemical agents. Retains significant missile production capability.
- Continues work on liquid- and solid-propellant SRBMs (150 kilometers) allowed by UNSCR 687; likely will use
- technical experience gained for future longer range missile development effort.
- Not a member of the MTCR.

Other Means of Delivery Available

- Land-launched anti-ship cruise missiles; air-launched tactical missiles; none have NBC warheads; stockpile likely
- is very limited.
- Air systems: fighters, helicopters, UAVs.
- Ground systems: artillery, rockets.

Iraqi Covert Break Out Capabilities

- UNSCOM and the IAEA's success have created new priorities for Iraqi proliferation. The UN's success in destroying the large facilities Iraq needs to produce fissile materials already may well have led Iraq to focus on covert cell-like activities to manufacture highly lethal biological weapons as a substitute for nuclear weapons.
- All of the biological agents Iraq had at the time of the Gulf War seem to have been "wet" agents with limited storage life and limited operational lethality. Iraq may have clandestinely carried out all of the research necessarily to develop a production capability for dry, storage micro-power weapons which would be far easier to clandestinely stockpile, and have much more operational lethality.
- Iraq did not have advanced binary chemical weapons and most of its chemical weapons used unstable ingredients. Iraq has illegally imported specialized glassware since the Gulf War, and may well have developed advanced binary weapons and tested them in small numbers. It may be able to use a wider range of precursors and have developed plans to produce precursors in Iraq. It may have improved its technology for the production of VX gas.
- Iraq is likely to covertly exploit Western analyses and critiques of its pre-war proliferation efforts to correct many of the problems in the organization of its proliferation efforts, its weapons design, and its organization for their use.
- Iraq bombs and warheads were relatively crude designs which did not store chemical and biological agents well and which did a poor job of dispersing them. Fusing and detonation systems did a poor job of ensuring detonation at the right height and Iraq made little use of remote sensors and weather models for long-range targeting and strike planning. Iraq could clandestinely design and test greatly improved shells, bombs, and warheads. The key tests could be conducted using towers, simulated agents, and even indoors. Improved targeting, weather sensors, and other aids to strike planning are dual-use or civil technologies that are not controlled by UNSCOM. The net impact would be weapons that could be 5-10 times more effective than the relatively crude designs Iraq had rushed into service under the pressure of the Iran-Iraq War.
- UNSCOM and the IAEA's success give Iraq an equally high priority to explore ways of obtaining fissile material from the FSU or other potential supplier country and prepare for a major purchase effort the moment sanctions and inspections are lifted and Iraq has the hard currency to buy its way into the nuclear club. Iraq could probably clandestinely assemble all of the components of a large nuclear device except the fissile material, hoping to find some illegal source of such material.
- The components for cruise missiles are becoming steadily more available on the commercial market, and Iraq has every incentive to create a covert program to examine the possibility of manufacturing or assembling cruise missiles in Iraq.
- UN inspections and sanctions may also drive Iraq to adopt new delivery methods ranging from clandestine delivery and the use of proxies to sheltered launch-on-warning capabilities designed to counter the US advantage in airpower.
- Iraq can legally maintain and test missiles with ranges up to 150 kilometers. This allows for exoatmospheric reentry testing and some testing of improved guidance systems. Computer simulation, wind tunnel models, and production engineering tests can all be carried out clandestinely under the present inspection regime. It is possible that Iraq could develop dummy or operational high explosive warheads with shapes and weight distribution of a kind that would allow it to test concepts for improving its warheads for weapons of mass destruction. The testing of improved bombs using simulated agents would be almost impossible to detect as would the testing of improved spray systems for biological warfare.
- Iraq has had half a decade in which to improve its decoys, dispersal concepts, dedicated command and control links, targeting methods, and strike plans. This kind of passive warfare planning is impossible to forbid and monitor, but ultimately is as important and lethal as any improvement in hardware.
- There is no evidence that Iraq made an effort to develop specialized chemical and biological devices for covert operations, proxy warfare, or terrorist use. It would be simple to do so clandestinely and they would be simple to manufacture.

Iraqi Ballistic Missile Program

Item	Initial Inventory	Comments
Soviet supplied Scud Missiles (includes Iraqi Modifications of the Al-Husayn with a range of 650 km and the Al-Abbas with a range of 950 km)	819	<p>UNSCOM accepts Iraqi accounting for all but two of the original 819 Scud missiles acquired from the Soviet Union. Iraq hasn't explained the disposition of major components that it may have stripped from operational missiles before their destruction, and some Iraqi claims-- such as the use of 14 Scuds in ATBM tests- are not believable.</p> <p>Inspectors indicate that at least 60 of the 817 total were not Really accounted for.</p> <p>Gaps in Iraqi declarations and Baghdad's failure to fully account for indigenous missile programs strongly suggest that Iraq retains a small missile force.</p>
Iraqi-Produced Scud Missiles	Unknown	Iraq denied producing a completed Scud missile, but it produced/procured and tested all major subcomponents.
Iraqi-Produced Scud Warheads	120	Iraq claims all 120 were used or destroyed. UNSCOM supervised the destruction of 15. Recent UNSCOM inspections found additional CW/BW warheads beyond those currently admitted.
Iraqi-Produced Scud Airframes	2	Iraq claims testing 2 indigenous airframes in 1990. It is unlikely that Iraq produced only 2 Scud airframes.
Iraqi-Produced Scud Engines	80	Iraq's claim that it melted 63 engines following acceptance tests--53 of which failed quality controls-- are unverifiable and not believable. UNSCOM is holding this as an open issue.
Soviet-Supplied Missile Launchers	11	UNSCOM doubts Iraq's claim that it unilaterally destroyed 5 launchers. The Soviet Union may have sold more than the declared 11 launchers.
Iraqi-Produced Missile Launchers	8	Iraq has the capability to produce additional launchers.

Adapted by Anthony H. Cordesman from material provided by the NSC on February 19, 1998.

Iraqi Chemical Warfare Program

CW Agent Stockpiles (In Metric tons)

CW Agent	Chemical Agents Declared by Iraq	Potential CW Agents based on	Comments	Unaccounted Precursors ¹⁾
VX	At least 4		Iraq denied producing VX until Husayn Kamil's defection in 1995	200
G-agents (Sarin)	100-150		Figures include both weaponized and bulk agents	200
Mustard	500-600		Figures include both weaponized and bulk agents.	200

CW Delivery Systems (In Numbers of Weapons Systems)

Delivery System	Estimated Numbers Before the Gulf War	Munitions Unaccounted for ^{2.)}	Comments
Missile Warheads Al-Husayn (Modified Scud B)	75-100	45-70	UNSCOM supervised the destruction of 30 warheads
Rockets	100,000	15,000-25,000	UNSCOM supervised the destruction of
Aerial bombs	16,000	2,000	
Artillery Shells	30,000	15,000	
Aerial Spray Tanks	Unknown	Unknown	

1.) These estimates are very rough. They are derived from reports provided by UNSCOM to the Security Council and to UNSCOM plenary meetings. Gaps in Iraqi disclosures strongly suggest that Baghdad is concealing chemical munitions and precursors. Iraq may also retain a small stockpile of filled munitions. Baghdad has the capability to quickly resume CW production at known dual-use facilities that currently produce legitimate items, such as pharmaceuticals and pesticides. UNSCOM has supervised the destruction of some 45 different types of CW precursors (1,800,000 liters of liquid and 1,000,000 kg of solid).

2.) All these munitions could be used to deliver CW or BW agents. The numbers for missile warheads include 25 that Iraq claims to have unilaterally destroyed after having filled them with biological agents during the Gulf war. UNSCOM has been unable to verify the destruction of these warheads.

Adapted by Anthony H. Cordesman from material provided by the NSC on February 19, 1998.

Iraq's Major Uses of Chemical Weapons 1983-1988

<u>Date</u>	<u>Area</u>	<u>Type of Gas</u>	<u>Approximate Casualties</u>	<u>Target</u>
August 1983	Haij Umran	Mustard	Less than 100	Iranians/Kurds
October-November 1983	Panjwin	Mustard	3,000	Iranians/Kurds
February-March 1984	Majnoon Island	Mustard	2,500	Iranians
March 1984	Al Basrah	Tabun	50- 100	Iranians
March 1985	Hawizah Marsh	Mustard/Tabun	3,000	Iranians
February 1996	Al Faw	Mustard/Tabun	8,000-10,000	Iranians
December 1986	Umm ar Rasas	Mustard	1,000s	Iranians
April 1987	Al Basrah	Mustard/Tabun	5,000	Iranians
October 1987	Sumar/Mehran	Mustard/Nerve Agents	3,000	Iranians
March 1988	Halabjah	Mustard/Nerve Agents	Hundreds	Iranians/Kurds

Note: Iranians also used poison gas at Halabjah and may have caused some of the casualties.

Source: Adapted from material provided by the NSC on February 19, 1998.

CIA Estimate of Iraqi Use of Chemical Weapons: October 4, 2002

<u>Date</u>	<u>Place</u>	<u>Weapon</u>	<u>Casualties</u>
Aug 1983:	Hajj Umran	Mustard	fewer than 100 Iranians/Kurds
Oct-Nov 1983	Panjwin	Mustard	3,000 Iranian/Kurds
Feb-Mar 1984	Majnoon Island	Mustard	2,500 Iranians
Mar 1984	al-Basrah	Tabun	50 to 100 Iranians
Mar 1985	Hawizah Marsh	Mustard/Tabun	3,000 Iranians
Feb 1986	al-Faw	Mustard/Tabun	8,000 to 10,000 Iranians
Dec 1986	Umm ar Rasas	Mustard	thousands Iranians
Apr 1987	al-Basrah	Mustard/Tabun	5,000 Iranians
Oct 1987	Sumar/Mehran	Mustard/nerve agents	3,000 Iranians
Mar 1988	Halabjah	Mustard/nerve agents	hundreds Iranians/Kurds

Iraqi Biological Warfare Program

BW Agent Production Amounts

BW Agent	Declared Concentrated Amounts	Declared Total Amounts	Comments
Anthrax (Bacillus anthracis)	8,500 liters (2,245 gallons)	85,000 liters (22,557 gallons)	UNSCOM estimates production amounts were actually 3-4 times more than the declared amounts, but is unable to confirm.
Botulinum toxin (Clostridium Botulinum)	19,400 liters (10x and 20x concentrated) (5,125 gallons)	380,000 liters (100,396 gallons)	UNSCOM estimates production amounts were actually 2 times more than the declared amounts, but is unable to confirm.
Gas Gangrene (Clostridium perfringens)	340 liters (90 gallons)	3,400 liters (900 gallons)	Production amounts could be higher, but UNSCOM is unable to confirm.
Aflatoxin (Aspergillus flavus and Aspergillus parasiticus)	N/A	2,200 liters (581 gallons)	Production amounts and time frame of production claimed by Iraq do not correlate.
Ricin (Castor Bean plant)	N/A	10 liters (2.7 gallons)	Production amounts could be higher, but UNSCOM is unable to confirm.

BW-Filled and Deployed Delivery Systems

Delivery System	Anthrax	Botulinum Toxin	Aflatoxin	Comments
Missile warheads Al-Husayn (modified Scud B)	5	16	4	UNSCOM cannot confirm the unilateral Destruction of these 25 warheads due to conflicting accounts provided by Iraq.
R-400 aerial bombs	50	100	7	Iraq claimed unilateral destruction of 157 Bombs, but UNSCOM is unable to confirm this number. UNSCOM has found the remains of at least 23.
Aircraft aerosol spray tanks may F-1 Mirage modified fuel drop tank	4			Iraq claims to have produced 4, but Have manufactured others.

BW Agent Growth Media

Media	Quantity Imported	Unaccounted For Amounts
BW Agent Growth Media	31,000 kg (68,200 lbs.)	3,500 kg (7,700 lbs.)

Total refers to the amount of material obtained from production process, while *concentrated* refers to the amount of concentrated agent obtained after final filtration/purification. The *concentrated* number is the amount used to fill munitions.

Media refers to the substance used to provide nutrients for the growth and multiplication of micro-organisms.

Adapted by Anthony H. Cordesman from material provided by the NSC on February 19, 1998.

Iraqi Open air testing of Biological Weapons: As Acknowledged to UNSCOM

- Al Muhammadiyat – Mar 1988 *Bacillus subtilis* 250-gauge bomb (cap. 65liters)
- Al Muhammadiyat – Mar 1988 *Botulinum toxin* 250-gauge bomb (cap. 65liters)
- Al Muhammadiyat – Nov 1989 *Bacillus subtilis* 122mm rocket (cap. 8 liters)
- Al Muhammadiyat – Nov 1989 *Botulinum toxin* 122mm rocket (cap. 8 liters)
- Al Muhammadiyat – Nov 1989 Aflatoxin 122mm rocket (cap. 8 liters)
- Khan Bani Saad – Aug 1988 *Bacillus subtilis* aerosol generator – Mi-2 helicopter with modified agricultural spray equipment
- Al Muhammadiyat – Dec 1989 *Bacillus subtilis* R-400 bomb (cap. 85 liters)
- Al Muhammadiyat – Nov 1989 *Botulinum toxin* R-400 bomb (cap. 85 liters)
- Al Muhammadiyat – Nov 1989 Aflatoxin R-400 bomb (cap. 85 liters) Jurf al-Sakr Firing Range – Sep 1989
- Ricin 155mm artillery shell (cap. 3 liters)
- Abu Obeydi Airfield – Dec 1990 Water Modified Mirage F1 drop-tank (cap. 2,200 liters)
- Abu Obeydi Airfield – Dec 1990 Water/potassium permanganate
- Modified Mirage F1 drop-tank (cap. 2,200 liters)
- Abu Obeydi Airfield – Jan 1991 Water/glycerine Modified Mirage F1 drop-tank (cap. 2,200 liters)
- Abu Obeydi Airfield – Jan 1991 *Bacillus subtilis*/Glycerine Modified Mirage F1 drop-tank (cap. 2,200 liters)

Source: CIA, October 4, 2002

Effects of Key Iraqi Weapons and Use of Scud Missiles

Effects of Chemical Weapons

Mustard is a liquid agent, which gives off a hazardous vapour, causing burns and blisters to exposed skin. When inhaled, mustard damages the respiratory tract; when ingested, it causes vomiting and diarrhoea. It attacks and damages the eyes, mucous membranes, lungs, skin, and blood-forming organs.

Tabun, sarin and VX are all nerve agents of which VX is the most toxic. They all damage the nervous system, producing muscular spasms and paralysis. As little as 10 milligrammes of VX on the skin can cause rapid death.

Effects of biological agents

Anthrax is a disease caused by the bacterium *Bacillus Anthracis*. Inhalation anthrax is the manifestation of the disease likely to be expected in biological warfare. The symptoms may vary, but can include fever and internal bleeding. The incubation period for anthrax is 1 to 7 days, with most cases occurring within 2 days of exposure.

Botulinum toxin is one of the most toxic substances known to man. The first symptoms of poisoning may appear as early as 1 hour post exposure or as late as 8 days after exposure, with the incubation period between 12 and 22 hours. Paralysis leads to death by suffocation.

Aflatoxins are fungal toxins, which are potent carcinogens. Most symptoms take a long time to show. Food products contaminated by aflatoxins can cause liver inflammation and cancer. They can also affect pregnant women, leading to stillborn babies and children born with mutations. Ricin is derived from the castor bean and can cause multiple organ failure leading to death within one or two days of inhalation.

Effect of a 20-kiloton nuclear detonation

A detonation of a 20-kiloton nuclear warhead over a city might flatten an area of approximately 3 square miles. Within 1.6 miles of detonation, blast damage and radiation would cause 80% casualties, three-quarters of which would be fatal. Between 1.6 and 3.1 miles from the detonation, there would still be 10% casualties.

The use of ballistic missiles

. Iraq fired over 500 SCUD-type missiles at Iran during the Iran-Iraq War at both civilian and military targets, and 93 SCUD-type missiles during the Gulf War. The latter were targeted at Israel and Coalition forces stationed in the Gulf region.

British History of UN Weapons Inspection Effort

During the 1990s, beginning in April 1991 immediately after the end of the Gulf War, the UN Security Council passed a series of resolutions [see box] establishing the authority of UNSCOM and the IAEA to carry out the work of dismantling Iraq's arsenal of chemical, biological and nuclear weapons programmes and long-range ballistic missiles.

These resolutions were passed under Chapter VII of the UN Charter which is the instrument that allows the UN Security Council to authorize the use of military force to enforce its resolutions.

As outlined in UNSCR 687, Iraq's chemical, biological and nuclear weapons programmes were also a breach of Iraq's commitments under the 1925 Geneva Protocol which bans the use of chemical and biological

weapons;

UN Security Council Resolutions relating to Weapons of Mass Destruction

UNSCR 687, April 1991 created the UN Special Commission (UNSCOM) and required Iraq to accept, unconditionally, "the destruction, removal or rendering harmless, under international supervision" of its chemical and biological weapons, ballistic missiles with a range greater than 150km, and their associated programmes, stocks, components, research and facilities. The International Atomic Energy Agency (IAEA) was charged with abolition of Iraq's nuclear weapons programme. UNSCOM and the IAEA must report that their mission has been achieved before the Security Council can end sanctions. They have not yet done so.

UNSCR 707, August 1991, stated that Iraq must provide full, final and complete disclosure of all its programmes for weapons of mass destruction and provide unconditional and unrestricted access to UN inspectors. For over a decade Iraq has been in breach of this resolution. Iraq must also cease all nuclear activities of any kind other than civil use of isotopes. UNSCR 715, October 1991 approved plans prepared by UNSCOM and IAEA for the ongoing monitoring and verification (OMV) arrangements to implement UNSCR 687. Iraq did not accede to this until November 1993. OMV was conducted from April 1995 to 15 December 1998, when the UN left Iraq.

UNSCR 1051, March 1996 stated that Iraq must declare the shipment of dual-use goods which could be used for mass destruction weaponry programmes.

- the Biological and Toxin Weapons Convention which bans the development, production, stockpiling, acquisition or retention of biological weapons;
- the Nuclear Non-Proliferation Treaty which prohibits Iraq from manufacturing or otherwise acquiring nuclear weapons.

UNSCR 687 obliged Iraq to provide declarations on all aspects of its weapons of mass destruction programmes within 15 days and accept the destruction, removal or rendering harmless under international supervision of its chemical, biological and nuclear programmes, and all ballistic missiles with a range beyond 150km. Iraq did not make a satisfactory declaration within the specified time-frame.

Iraq accepted the UNSCRs and agreed to co-operate with UNSCOM. The history of the UN weapons inspections was characterized by persistent Iraqi obstruction.

Iraqi Non-Co-operation with the Inspectors

The former Chairman of UNSCOM, Richard Butler, reported to the UN Security Council in January 1999 that in 1991 a decision was taken by a high level Iraqi Government committee to provide inspectors with only a portion of its proscribed weapons, components, production capabilities and stocks.

UNSCOM concluded that Iraqi policy was based on the following actions:

- to provide only a portion of extant weapons stocks, releasing for destruction only those that were least modern;
- to retain the production capability and documentation necessary to revive programmes when possible;
- to conceal the full extent of its chemical weapons programme, including the VX nerve agent project; to conceal the number and type of chemical and biological warheads for proscribed long-range missiles;
- and to conceal the existence of its biological weapons programme.

In December 1997 Richard Butler reported to the UN Security Council that Iraq had created a new category of sites, “Presidential” and “sovereign”, from which it claimed that UNSCOM inspectors would henceforth be barred. The terms of the ceasefire in 1991 foresaw no such limitation. However, Iraq consistently refused to allow UNSCOM inspectors access to any of these eight Presidential sites. Many of these so-called “palaces” are in fact large compounds which are an integral part of Iraqi counter-measures designed to hide weapons material (see photograph on p35).

UNSCOM and the IAEA were given the remit to designate any locations for inspection at any time, review any document and interview any scientist, technician or other individual and seize any prohibited items for destruction.

Iraq’s policy of deception

Iraq has admitted to UNSCOM to having a large, effective, system for hiding proscribed material including documentation, components, production equipment and possibly biological and chemical agents and weapons from the UN. Shortly after the adoption of UNSCR 687 in April 1991, an Administrative Security Committee (ASC) was formed with responsibility for advising Saddam on the information which could be released to UNSCOM and the IAEA. The Committee consisted of senior Military Industrial Commission (MIC) scientists from all of Iraq’s weapons of mass destruction programmes. The Higher Security Committee (HSC) of the Presidential Office was in overall command of deception operations. The system was directed from the very highest political levels within the Presidential Office and involved, if not Saddam himself, his youngest son, Qusai. The system for hiding proscribed material relies on high mobility and good command and control. It uses lorries to move items at short notice and most hide sites appear to be located close to good road links and telecommunications. The Baghdad area was particularly favored. In addition to active measures to hide material from the UN, Iraq has attempted to monitor, delay and collect intelligence on UN operations to aid its overall deception plan.

Intimidation

Once inspectors had arrived in Iraq, it quickly became apparent that the Iraqis would resort to a range of measures (including physical threats and psychological intimidation of inspectors) to prevent UNSCOM and the IAEA from fulfilling their mandate.

In response to such incidents, the President of the Security Council issued frequent statements calling on Iraq to comply with its disarmament and monitoring obligations.

Obstruction

Iraq denied that it had pursued a biological weapons programme until July 1995. In July 1995, Iraq acknowledged that biological agents had been produced on an industrial scale at al-Hakam. Following the defection in August 1995 of Hussein Kamil, Saddam's son-in-law and former Director of the Military Industrialization Commission Iraq released over 2 million documents relating to its mass destruction weaponry programmes and acknowledged that it had

Iraqi obstruction of UN weapons inspection teams

- firing warning shots in the air to prevent IAEA inspectors from keeping IAEA inspectors in a car park for 4 days and refusing to allow them to leave with incriminating documents on Iraq's nuclear weapons programme (September 1991);
- announcing that UN monitoring and verification plans were "unlawful" (October 1991);
- refusing UNSCOM inspectors access to the Iraqi Ministry of Agriculture. Threats were made to inspectors who remained on watch outside the building. The inspection team had reliable evidence that the site contained archives related to proscribed activities;
- in 1991–2 Iraq objected to UNSCOM using its own helicopters and choosing its own flight plans. In January 1993 it refused to allow UNSCOM the use of its own aircraft to fly into Iraq;
- refusing to allow UNSCOM to install remote-controlled monitoring cameras at two key missile sites (June-July 1993);
- repeatedly denying access to inspection teams (1991- December 1998); interfering with UNSCOM's helicopter operations, threatening the safety of the aircraft and their crews (June 1997);
- demanding the end of U2 overflights and the withdrawal of US UNSCOM staff (October 1997);
- destroying documentary evidence of programmes for weapons of mass destruction (September 1997). pursued a biological programme that led to the deployment of actual weapons. Iraq admitted producing 183 biological weapons with a reserve of agent to fill considerably more.

Iraq tried to obstruct UNSCOM's efforts to investigate the scale of its biological weapons programme. It created forged documents to account for bacterial growth media, imported in the late 1980s, specifically for the production of anthrax, botulinum toxin and probably plague. The documents were created to indicate that the material had been imported by the State Company for Drugs and Medical Appliances Marketing for use in hospitals and distribution to local

authorities. Iraq also censored documents and scientific papers provided to the first UN inspection team, removing all references to key individuals, weapons and industrial production of agents.

Inspection of Iraq's biological weapons programme

In the course of the first biological weapons inspection in August 1991, Iraq claimed that it had merely conducted a military biological research programme. At the site visited, al-Salman, Iraq had removed equipment, documents and even entire buildings. Later in the year, during a visit to the al-Hakam site, Iraq declared to UNSCOM inspectors that the facility was used as a factory to produce proteins derived from yeast to feed animals. Inspectors subsequently discovered that the plant was a central site for the production of anthrax spores and botulinum toxin for weapons. The factory had also been sanitized by Iraqi officials to deceive inspectors. Iraq continued to develop the al-Hakam site into the 1990s, misleading UNSCOM about its true purpose.

Another key site, the Foot and Mouth Disease Vaccine Institute at al-Dawrah which produced botulinum toxin and probably anthrax was not divulged as part of the programme. Five years later, after intense pressure, Iraq acknowledged that tens of tonnes of bacteriological warfare agent had been produced there and at al-Hakam.

As documents recovered in August 1995 were assessed, it became apparent that the full disclosure required by the UN was far from complete. Successive inspection teams went to Iraq to try to gain greater understanding of the programme and to obtain credible supporting evidence. In July 1996 Iraq refused to discuss its past programme and doctrine forcing the team to withdraw in protest. Monitoring teams were at the same time finding undisclosed equipment and materials associated with the past programme. In response, Iraq grudgingly provided successive disclosures of its programme which were judged by UNSCOM and specially convened international panels to be technically inadequate.

In late 1995 Iraq acknowledged weapons testing the biological agent ricin, but did not provide production information. Two years later, in early 1997, UNSCOM discovered evidence that Iraq had produced ricin.

Iraq has yet to provide any documents concerning production of agent and subsequent weaponisation. Iraq destroyed, unilaterally and illegally, some biological weapons in 1991 and 1992 making accounting for these weapons impossible. In addition, Iraq cleansed a key site at al-Muthanna, its main research and development, production and weaponisation facility for chemical warfare agents, of all evidence of a biological programme in the toxicology department, the animal-house and weapons filling station.

Iraq refused to elaborate further on the programme during inspections in 1997 and 1998, confining discussion to previous topics. In July 1998 Tariq Aziz personally intervened in the inspection process stating that the biological programme was more secret and more closed than other mass destruction weaponry programmes. He also played down the significance of the programme. Iraq has presented the biological weapons programme as the personal undertaking of a few misguided scientists.

At the same time, Iraq tried to maintain its nuclear weapons programme via a concerted campaign to deceive IAEA inspectors. In 1997 the IAEA Director General stated that the IAEA

was “severely hampered by Iraq’s persistence in a policy of concealment and understatement of the programme’s scope”.

Inspection achievements

Despite the conduct of the Iraqi authorities towards them, both UNSCOM and the IAEA Action Team have valuable records of achievement in discovering and exposing Iraq’s biological weapons programme and destroying very large quantities of chemical weapons stocks and missiles as well as the infrastructure for Iraq’s nuclear weapons programme.

Despite UNSCOM’s efforts, following the effective ejection of UN inspectors in December 1998 there remained a series of significant unresolved disarmament issues. In summarizing the situation in a report to the UN Security Council, the UNSCOM Chairman, Richard Butler, indicated that:

- contrary to the requirement that destruction be conducted under international supervision “Iraq undertook extensive, unilateral and secret destruction of large quantities of proscribed weapons and items”;
- Iraq “also pursued a practice of concealment of proscribed items, including weapons, and a cover up of its activities in contravention of Council resolutions”.

Overall, Richard Butler declared that obstructive Iraqi activity had had “a significant impact upon the Commission’s disarmament work”.

Withdrawal of the inspectors

By the end of 1998 UNSCOM was in direct confrontation with the Iraqi

Government which was refusing to co-operate. The US and the UK had made clear that anything short of full co-operation would make military action unavoidable. Richard Butler was requested to report to the UN Security Council in December 1998 and stated that, following a series of direct confrontations, coupled with the systematic refusal by Iraq to co-operate, UNSCOM was no longer able to perform its disarmament mandate. As a direct result on 16 December the weapons inspectors were withdrawn. Operation Desert Fox was launched by the US and the UK a few hours afterwards.

Material unaccounted for

Based on the UNSCOM report to the UN Security Council in January 1999 and earlier UNSCOM reports, we assess that when the UN inspectors left Iraq they were unable to account for:

- up to 360 tonnes of bulk chemical warfare agent, including 1.5 tonnes of VX
- nerve agent;
- up to 3,000 tonnes of precursor chemicals, including approximately 300
- tonnes which, in the Iraqi chemical warfare programme, were unique to the production of VX;
- growth media procured for biological agent production (enough to produce
- over three times the 8,500 liters of anthrax spores Iraq admits to having manufactured);

- over 30,000 special munitions for delivery of chemical and biological agents.

The departure of UNSCOM meant that the international community was unable to establish the truth behind these large discrepancies and greatly diminished its ability to monitor and assess Iraq's continuing attempts to reconstitute its programmes.

Operation Desert Fox (16–19 December 1998)

Operation Desert Fox targeted industrial facilities related to Iraq's ballistic missile programme and a suspect biological warfare facility as well as military airfields and sites used by Iraq's security organizations which are involved in its weapons of mass destruction programmes. Key facilities associated with Saddam Hussein's ballistic missile programme were significantly degraded.

UNSCOM and IAEA achievements

UNSCOM surveyed 1015 sites in Iraq, carrying out 272 separate inspections. Despite Iraqi obstruction and intimidation, UN inspectors uncovered details of chemical, biological, nuclear and ballistic missile programmes. Major UNSCOM/IAEA achievements included:

- the destruction of 40,000 munitions for chemical weapons, 2,610 tonnes of chemical precursors and 411 tonnes of chemical warfare agent;
- the dismantling of Iraq's prime chemical weapons development and production complex at al-Muthanna and a range of key production equipment;
- the destruction of 48 SCUD-type missiles, 11 mobile launchers and 56 sites, 30 warheads filled with chemical agents, and 20 conventional warheads;
- the destruction of the al-Hakam biological weapons facility and a range of production equipment, seed stocks and growth media for biological weapons;
- the discovery in 1991 of samples of indigenously-produced highly enriched uranium, forcing Iraq's acknowledgement of uranium enrichment programmes and attempts to preserve key components of its prohibited nuclear weapons programme;
- the removal and destruction of the infrastructure for the nuclear weapons programme, including the al-Athir weaponisation/testing facility.

The Situation since 1998

There have been no UN-mandated weapons inspections in Iraq since 1998. In an effort to enforce Iraqi compliance with its disarmament and monitoring obligations, the UN Security Council passed Resolution 1284 in December 1999. This established the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) as a successor organization to UNSCOM and called on Iraq to give UNMOVIC inspectors "immediate, unconditional and unrestricted access to any and all areas, facilities, equipment, records and means of transport". It also set out the steps Iraq needed to take in return for the eventual suspension and lifting of sanctions. A key measure of Iraqi compliance would be full co-operation with UN inspectors, including unconditional, immediate and unrestricted access to any and all sites, personnel and documents.

For the past three years, Iraq has allowed the IAEA to carry out an annual inspection of a stockpile of nuclear material (depleted natural and low-enriched uranium). This has led some

countries and western commentators to conclude erroneously that Iraq is meeting its nuclear disarmament and monitoring obligations. As the IAEA has pointed out in recent weeks, this annual inspection does “not serve as a substitute for the verification activities required by the relevant resolutions of the UN Security Council”.

Dr Hans Blix, the Executive Chairman of UNMOVIC, and Dr Mohammed El- Baradei, the Director General of the IAEA, have declared that in the absence of inspections it is impossible to verify Iraqi compliance with its UN disarmament and monitoring obligations. In April 1999 an independent UN panel of experts noted that “the longer inspection and monitoring activities remain suspended, the more difficult the comprehensive implementation of Security Council resolutions becomes, increasing the risk that Iraq might reconstitute its proscribed weapons programmes”.

The departure of the inspectors greatly diminished the ability of the international community to monitor and assess Iraq’s continuing attempts to reconstitute its chemical, biological, nuclear and ballistic missile programmes.

UN Security Council Resolutions and Provisions for Inspections and Monitoring: Theory and Practice: CIA Analysis October 4, 2002

Res. 687 (3 April 1991)

Requires Iraq to declare, destroy, remove, or render harmless under UN or IAEA supervision and not to use, develop, construct, or acquire all chemical and biological weapons, all ballistic missiles with ranges greater than 150 km, and all nuclear weapons-usable material, including related material, equipment, and facilities. The resolution also formed the Special Commission and authorized the IAEA to carry out immediate on-site inspections of WMD-related facilities based on Iraq's declarations and UNSCOM's designation of any additional locations.

Baghdad refused to declare all parts of each WMD program, submitted several declarations as part of its aggressive efforts to deny and deceive inspectors, and ensured that certain elements of the program would remain concealed. The prohibition against developing delivery platforms with ranges greater than 150 km allowed Baghdad to research and develop shorter-range systems with applications for longer-range systems and did not affect Iraqi efforts to convert full-size aircraft into unmanned aerial vehicles as potential WMD delivery systems with ranges far beyond 150 km.

Res. 707 (15 August 1991)

Requires Iraq to allow UN and IAEA inspectors immediate and unrestricted access to any site they wish to inspect. Demands Iraq provide full, final, and complete disclosure of all aspects of its WMD programs; cease immediately any attempt to conceal, move, or destroy WMD-related material or equipment; allow UNSCOM and IAEA teams to use fixed-wing and helicopter flights throughout Iraq; and respond fully, completely, and promptly to any Special Commission questions or requests.

Baghdad in 1996 negotiated with UNSCOM Executive Chairman Ekeus modalities that it used to delay inspections, to restrict to four the number of inspectors allowed into any site Baghdad declared as "sensitive," and to prohibit them altogether from sites regarded as sovereign. These modalities gave Iraq leverage over individual inspections. Iraq eventually allowed larger numbers of inspectors into such sites but only after lengthy negotiations at each site.

Res. 715 (11 October 1991)

Requires Iraq to submit to UNSCOM and IAEA long-term monitoring of Iraqi WMD programs; approved detailed plans called for in UNSCRs 687 and 707 for long-term monitoring. Iraq generally accommodated UN monitors at declared sites but occasionally obstructed access and manipulated monitoring cameras. UNSCOM and IAEA monitoring of Iraq's WMD programs does not have a specified end date under current UN resolutions.

Res. 1051 (27 March 1996) Established the Iraqi export/import monitoring system, requiring UN members to provide IAEA and UNSCOM with information on materials exported to Iraq that may be applicable to WMD production, and requiring Iraq to report imports of all dual-use items.

Iraq is negotiating contracts for procuring—outside of UN controls—dual-use items with WMD applications. The UN lacks the staff needed to conduct thorough inspections of goods at Iraq's borders and to monitor imports inside Iraq.

Res. 1060 (12 June 1996) and Resolutions 1115, 1134, 1137, 1154, 1194, and 1205.

Demands that Iraq cooperate with UNSCOM and allow inspection teams immediate, unconditional, and unrestricted access to facilities for inspection and access to Iraqi officials for interviews. UNSCR 1137 condemns Baghdad's refusal to allow entry to Iraq to UNSCOM officials on the grounds of their nationality and its threats to the safety of UN reconnaissance aircraft.

Baghdad consistently sought to impede and limit UNSCOM's mission in Iraq by blocking access to numerous facilities throughout the inspection process, often sanitizing sites before the arrival of inspectors and routinely attempting to deny inspectors access to requested sites and individuals. At times, Baghdad would promise compliance to avoid consequences, only to renege later.

Res. 1154 (2 March 1998)

Demands that Iraq comply with UNSCOM and IAEA inspections and endorses the Secretary General's memorandum of understanding with Iraq, providing for "severest consequences" if Iraq fails to comply.

Res. 1194 (9 September 1998)

Condemns Iraq's decision to suspend cooperation with UNSCOM and the IAEA.

Res. 1205 (5 November 1998)

Condemns Iraq's decision to cease cooperation with UNSCOM.

UNSCOM could not exercise its mandate without Iraqi compliance. Baghdad refused to work with UNSCOM and instead negotiated with the Secretary General, whom it believed would be more sympathetic to Iraq's needs.

Res. 1284 (17 December 1999)

Established the United Nations Monitoring, Verification, and Inspection Commission (UNMOVIC), replacing UNSCOM; and demanded that Iraq allow UNMOVIC teams immediate, unconditional, and unrestricted access to any and all aspects of Iraq's WMD program.

Iraq repeatedly has rejected the return of UN arms inspectors and claims that it has satisfied all UN resolutions relevant to disarmament. Compared with UNSCOM, 1284 gives the UNMOVIC chairman less authority, gives the Security Council a greater role in defining key disarmament tasks, and requires that inspectors be full-time UN employees.