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Note by the Secretary-General

The Secretary-General has the honour to transmit to the Security Council the eighteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) (see annex). It is submitted by the Acting Executive Chairman of UNMOVIC in accordance with paragraph 12 of Security Council resolution 1284 (1999) of 17 December 1999.

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Annex

Eighteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999)

I. Introduction

1. The present report, which is the eighteenth[a] submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999), covers the activities of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) during the period from 1 June to 31 August 2004.

II. Developments

2. During the period under review, the Acting Executive Chairman has continued the practice of briefing the respective Presidents of the Security Council, representatives of Member States and officials of the Secretariat on the activities of UNMOVIC.

Investigations into scrap material found outside Iraq

3. The Commission has continued its investigation into the discovery of items relevant to its mandate that have been exported from Iraq as scrap metal. At the beginning of June, Commission experts went to Jordan and with the support and cooperation of Jordanian authorities visited a number of trading companies dealing with the export of scrap metal from Iraq to Jordan. They visited scrapyards associated with the respective trading companies and interviewed relevant personnel, including trading company managers, merchants and truck drivers of Jordanian and Iraqi nationality.

4. A significant number of items relevant to the UNMOVIC mandate were observed at the scrapyards. They included 20 SA-2 missile engines, a solid propellant-mixing vessel tagged by UNMOVIC during its 2002-2003 inspection activities in Iraq, fragmented remains of an SA-2 airframe and booster, as well as four chemical-related vessels made of corrosion-resistant material that had been tagged by the Commission as dual-use items. According to information received from the trading company representatives, the tagged chemical vessels had been dismantled from the chemical industrial complex near Fallujah. The Commission's experts were able to confirm that information by comparing the serial numbers of the United Nations tags still attached to the vessels with information in the UNMOVIC database.

5. During interviews conducted with more than 20 persons involved in the scrap metal trade, it was determined that the first scrap metal started arriving in Jordan

[a] The Commission's 17 previous reports were issued as documents S/2000/516, S/2000/835, S/2000/1134, S/2001/177, S/2001/515, S/2001/833, S/2001/1126, S/2002/195, S/2002/606, S/2002/981, S/2002/1303, S/2003/232, S/2003/580, S/2003/844, S/2003/1135, S/2004/160 and S/2004/435.

from Iraq in June 2003. The flow of stainless steel and other more valuable alloys commenced later in the summer and continued in 2004. A rough estimate made by scrap company managers was that a total of 60,000 tons of Iraqi scrap metal had passed through Jordan's largest free trade zone in 2003 and an additional 70,000 tons up until June 2004. UNMOVIC experts were told that that amount comprised only a small part of all scrap materials exported from Iraq to the other countries that border Iraq and further to Europe, North Africa and Asia. It was also said that a lot of high-quality industrial production equipment from facilities all over Iraq had been purchased by unnamed contractors at low cost, dismantled and moved out of the country. If correct, this could include equipment subject to monitoring in Iraq.

6. According to some of the merchants, the authorities in Iraq had overall control of the scrap export business. Several sites that were monitored previously by UNMOVIC were mentioned as having been razed. Information on the web site of the Iraqi Ministry of Trade (www.motiraq.org) sets out the licensing and other procedures for the export of scrap. There are seven stipulated border crossings to all of Iraq's neighbouring countries, via which scrap metals can be exported. The Iraqi port of Umm Qasr is also authorized to trade directly with the rest of the world.

7. Following the visit to Jordan, information was received from the Government of the Netherlands of the discovery in early July by a Rotterdam scrap company of an additional 22 SA-2 missile engines in a shipment from Turkey. The Commission requested the support of the Government of Turkey to facilitate a visit by UNMOVIC experts to a Turkish company believed to be involved in the trading of scrap originating in Iraq.

8. With the cooperation of the Government of Turkey, a team of UNMOVIC and International Atomic Energy Agency (IAEA) experts visited an Istanbul scrapyard in the second half of July 2004. No items of relevance to UNMOVIC were found at the yard of the company. The team was told that the Turkish company only acted as a transit broker for scrap metal originating in Iraq. Turkish customs officials later explained that scrap from Iraq was transported through Turkey under seal to customs clearing yards, where it was loaded into containers for onward shipment to foreign markets. The experts observed the removal of customs tags from one of the trucks arriving from Iraq. While they were not able to witness the unloading of the truck into the container, a cursory examination of the upper layers of the load did not reveal any items related to Iraq's past weapons programmes or materials subject to monitoring. When questioned, no one recalled seeing any missile engines or other materials relevant to UNMOVIC, but it was stated that it was quite possible that some had passed through Turkey.

9. With the agreement of the relevant Member States, UNMOVIC intends to observe the destruction of the SA-2 missile engines located in Jordan and the Netherlands together with other tagged and dual-use equipment that had been under monitoring in Iraq. All identifying data have been recorded and photographs have been taken.

Sites and equipment subject to monitoring

10. Using commercially available satellite imagery, the Commission continues to assess the status of sites subject to monitoring that were damaged during the war and more recently in some cases completely razed. Those sites contained a range of dual-use equipment and materials that are part of the UNMOVIC inventory of

monitored items. The systematic removal of items subject to monitoring affects the Commission's ability to maintain an accurate and up-to-date assessment of Iraq's capabilities. The fate of the equipment and materials is unknown (except for those which have been identified in scrapyards outside Iraq).

11. The following two examples illustrate the types of site that have been razed or cleaned up and the dual-use equipment and material known to have been there, the fate of which remains unknown (only the most important and tagged equipment is mentioned):

(a) *Al Samoud Factory*. The Al Samoud Factory was one of Iraq's dedicated missile facilities, involved primarily in the manufacture of missile airframes and the production or modification of SA-2 engines for use in the Al Samoud missile. The factory has now been completely razed. Dual-use equipment subject to monitoring remaining at the site included SA-2 missile engines (18), three-axis computer numerical control (CNC) milling machines (7), balancing machines (used in the production of turbopumps) (4), specialized welding equipment (7), vacuum furnaces (3), precision turning equipment (5), a three-dimensional (3D)-measuring machine (1), a hydrostatic test equipment for engine combustion chambers, valves and turbopumps (4), cleaning tanks (5), a flow forming machine (1), a vacuum brazing furnace (1), a vacuum diffusion pump (1) and a spark erosion machine (1);

(b) *Fallujah 2 and 3*. Two sites operated by the Tariq State Company and subject to monitoring in the chemical area, known as Fallujah 2 and Fallujah 3, have been completely emptied and destroyed. The equipment at the site included polyvinyl difluoride-coated tanks (53), graphite or hastalloy heat exchangers (11), glass-lined or rubber-coated tanks and vessels (54), hastalloy or graphite columns (18) and glass-lined reactors (7).

III. Other activities

Compendium

12. Previous quarterly reports have described work on the UNMOVIC compendium of proscribed weapons and programmes. One of the issues under evaluation by UNMOVIC in the framework of the compendium is the examination of information available to it on the past storage, handling and deployment of chemical and biological munitions by Iraq, a summary of which is attached as appendix I. Such an evaluation can assist in the verification and assessment of material balances of such munitions. It may also help in the interpretation of the recent media reports regarding the findings by the coalition forces of a number of chemical munitions in Iraq.

Ongoing monitoring and verification plan

13. Work continues on possible changes to the ongoing monitoring and verification plan approved by Security Council resolution 715 (1991), in the light of experience and changes on the ground in Iraq. One issue currently being examined is the degree of access that would enable UNMOVIC to fulfil the mandate given to it by the Security Council, namely, to operate a system of ongoing monitoring and verification and to verify Iraq's compliance with its unconditional obligations in

paragraph 10 of resolution 687 (1991) not to use, develop, construct or acquire any of the items specified in section C of that resolution.

Assessment of Iraq's remotely piloted and unmanned aerial vehicle programmes

14. In the publicly released testimony of the head of the Iraq Survey Group in March 2004, mention was made of the uncovering of a very robust Iraqi programme for delivery systems that had not been reported to the United Nations. While not much specific detail is provided in the statement by the Survey Group, it is considered important to set out what UNMOVIC knows of Iraq's remotely piloted and unmanned aerial vehicle (RPV/UAV) programmes and their relationship to the delivery of chemical and/or biological warfare agents. A short summary of the Commission's findings on these issues is attached as appendix II, which is a condensed version of a detailed internal UNMOVIC report on its assessment of Iraq's RPV/UAV programmes.

IV. Other issues

Headquarters

15. The UNMOVIC headquarters offices formerly on the 31st floor of the Secretariat building have been relocated to the nearby Alcoa building at 866 United Nations Plaza.

Field offices

16. UNMOVIC continues to retain a core staff of 10 local nationals in Baghdad who maintain the existing offices, laboratories and other equipment there at the Canal Hotel.

17. The Cyprus Field Office continues to store and maintain the UNMOVIC inspection and monitoring equipment recovered from Iraq. A complete inventory of all UNMOVIC property outside Iraq, with photographs and acquisition costs, was completed on 24 June 2004. Loaned equipment, such as four chemical agent monitors, has been returned to the United Kingdom of Great Britain and Northern Ireland and communications equipment was returned to the United States of America. The Field Office staff have disposed of expiring chemicals and medical supplies as well as outdated equipment from the closing of the Bahrain Field Office. Following the inspection and maintenance of the remote monitoring surveillance equipment, an expert has advised the UNMOVIC Field Office staff on how to maintain the chemical detection equipment and the life-support equipment. Additionally, letters have been sent to the manufacturers of the most sensitive inspection equipment for guidance on maintaining equipment during storage. Whenever appropriate, the staff of the Field Office have provided logistics support to flight operations of the United Nations Assistance Mission to Iraq.

Staffing

18. There have been few changes in the staffing levels of UNMOVIC since the last report (S/2004/435). Core UNMOVIC staff in the Professional category at headquarters at present total 50 weapons experts and other personnel drawn from 24 nationalities, 9 of whom are women.

Technical visits, meetings and workshops

19. The Acting Executive Chairman attended the 2004 Carnegie International Non-Proliferation Conference in Washington, D.C., in June and participated in a panel discussing inspections after Iraq.

20. UNMOVIC experts attended the International Chemical Weapons Demilitarization Conference in the Russian Federation in order to gain insight on new developments in technologies for the detection and destruction of chemical weapons. UNMOVIC experts also attended the Eighth International Symposium on Protection against Chemical and Biological Warfare Agents in Sweden. Decontamination procedures for biological agents and the construction of genotyping databases are examples of areas of technologies that were discussed and are of relevance to UNMOVIC.

21. UNMOVIC experts attended a conference in the United States covering missile and UAV guidance, navigation and control technologies. UNMOVIC experts also attended a training exercise involving the SA-2 missile system in Romania, the objective of which was to improve their knowledge in liquid-propellant missile technology and the SA-2 missile in particular. The training exercise consisted of a presentation of the missile and all its different sub-systems, observation of the preparation for a flight test, attendance at several live firings and analysis of the results.

Training

22. During the reporting period, UNMOVIC continued its training activities. An advanced training course for experts on the UNMOVIC roster was conducted in Argentina from 28 June to 9 July 2004. Seventeen experts from 14 Member States and UNMOVIC staff attended the course, which was devoted to enhancing the trainees' practical inspection skills to be used in monitoring inspections of missile sites. The Commission is grateful to the Government of Argentina for the support it provided in the conduct of the course.

V. College of Commissioners

23. During the reporting period the UNMOVIC College of Commissioners was not convened. However, in accordance with paragraph 5 of resolution 1284 (1999), the Commissioners were consulted on the contents of the present report.

Appendix I

Past storage, handling and deployment of chemical and biological munitions by Iraq

Chemical munitions

Filled munitions

1. The Muthanna State Establishment was the major contractor to the Ministry of Defence, solely responsible for the provision of all chemical munitions to Iraq's armed forces. It was subordinate to the Military Industrialization Commission, which was a part of the Ministry of Industry of Iraq. Prior to 1987, the Muthanna State Establishment was known as the State Establishment for Pesticide Production and was subordinate to the State Organization for Technical Industries, which was the predecessor of the Military Industrialization Commission. Its military code was Project 922.

2. According to Iraq's declarations, interviews with Iraqi officials and documents found in Iraq in the period from 1981 to 1991, the Muthanna State Establishment filled and delivered to the armed forces a total of some 130,000 of various types of chemical munition filled with chemical warfare agents. Those numbers did not include tens of thousands of mortar bombs filled with riot-control agents and smoke munitions also supplied by the Establishment.

3. According to Iraq's declarations, of the 130,000 munitions filled with chemical warfare agents, some 105,000 munitions were supplied to the armed forces during the Iran-Iraq war, in the period from 1981 to 1988, the first large-scale production phase. Of these, some 101,000 deployed munitions filled with about 3,000 tons of chemical warfare agents were used in combat by Iraq during the same period. The remaining 25,000 filled chemical munitions were delivered by the Muthanna State Establishment to the armed forces after the Iran-Iraq war, shortly prior to the 1991 Gulf War. The United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) has no evidence that chemical munitions of any type were filled by Iraq with chemical agents after the adoption of Security Council resolution 687 (1991).

4. In the 1980s, the Muthanna State Establishment did not accumulate stocks of chemical munitions beyond the scope of specific orders from the Ministry of Defence. The temporary storage of chemical munitions prior to their shipment by trucks to the armed forces was carried out at reinforced concrete bunkers in the storage area at the Establishment and at dedicated storage areas controlled by it at two conventional ammunition depots, Muhammadiyat and Ukhaider. Chemical munitions were shipped to central and regional conventional ammunition depots and air bases and from there deployed further down to artillery units and air force regiments. After the deployment, the Establishment maintained responsibility for technical inspection and maintenance of chemical munitions in the possession of the armed forces.

5. Iraq did not provide details regarding specific military units involved in the deployment, handling and combat use of chemical munitions. It maintained that such issues were outside the scope of the Commission's verification mandate. However, in its general statements, Iraq acknowledged that regular military units in

theatres of operation involved in the use of conventional munitions were to receive and use chemical weapons if necessary under special directives. This suggested that even if chemical munitions were handled separately from conventional arms at ammunition depots, they could have been inadvertently mixed to a certain extent with conventional weapons at military units.

6. Defective or leaking chemical munitions were routinely recalled and handled by the Muthanna State Establishment. This resulted in the accumulation of hundreds of such filled defective munitions at the Establishment. According to documents found by the Commission in Iraq, some unused chemical munitions were also returned to the Establishment after the end of the Iran-Iraq war in August 1988. However, it remains unknown whether all unused chemical weapons left over after the Iran-Iraq war were collected and returned to the Establishment, since Iraq did not provide sufficient production, deployment, consumption and inventory records for chemical weapons (see S/1999/94).

7. The second large-scale chemical weapon production campaign took place in Iraq from April 1990 to January 1991. During that period, the Muthanna State Establishment produced and supplied the armed forces with some 25,000 chemical munitions referred to above (para. 3). According to Iraq's declarations, the weapons were deployed to 17 ammunition depots, airbases and airfields throughout Iraq. There was no evidence suggesting that they were further distributed to field military units, with the exception of 50 chemical warheads for the Al Hussein missiles deployed to the Technical Battalion of the Surface-to-Surface Missile Corps.

8. Immediately after the 1991 Gulf war, Iraq undertook to collect all chemical munitions delivered to the armed forces at designated areas controlled by the Muthanna State Establishment. Of the 25,000 chemical munitions delivered, over 2,000 were declared by Iraq to have been destroyed by coalition forces during the war. Another 500 munitions were declared to have been destroyed unilaterally by Iraq and some 22,000 munitions destroyed by Iraq under the supervision of United Nations inspectors in accordance with Security Council resolution 687 (1991) in the period from 1991 to 1994. However, during the collection of chemical weapons after the 1991 war, Iraq was not able to locate 500 chemical munitions (see S/1999/356).

9. Later, in 1997, 14 missing munitions filled with the chemical warfare agent mustard were found by UNSCOM having been abandoned at an ammunition depot in Iraq, used in the past as a munitions storage and distribution facility. In 2003, they were destroyed by Iraq under the supervision of United Nations inspectors (see S/2003/580).

10. On another occasion, over 1,000 chemical artillery rockets (of the 2,000 mentioned above) destroyed and damaged by the coalition were buried by Iraq in an open area in 1991. Later, in 1992, around 800 of those munitions were recovered and destroyed by Iraq under the supervision of United Nations inspectors. The recovered rockets were not usable because of poor condition and mechanical damage. However, many of them still contained viable chemical warfare agents. Inspectors continued to unearth additional munitions containing residues of such agents at the burial site up until 1998.

11. In addition to chemical munitions delivered by the Muthanna State Establishment to the armed forces, there were also hundreds of old chemical munitions remaining in its custody, consisting of old weapons left over after the

Iran-Iraq war and defective munitions not suitable for combat use. Most of these munitions were destroyed or damaged by the coalition through the aerial bombardment during the 1991 Gulf war.

12. A bunker at the storage area of the Muthanna State Establishment containing hundreds of artillery rockets filled with nerve agents was destroyed in part through coalition aerial bombardment in 1991. Because of the collapsed roof of the structure it was not possible to determine the exact extent of the destruction of munitions, nor their exact quantity (Iraq claimed that there were 2,500 munitions in the bunker). In order to prevent further contamination of the area with nerve agents from damaged rockets, Iraq, under the supervision of United Nations inspectors, sealed the structure with reinforced concrete and brick walls covered with earth. In 1994, Iraq signed a protocol with the United Nations Special Commission (UNSCOM) by which it undertook to inspect the sealed bunker at least once a month to ensure that the seals were intact and the warning signs were not removed, damaged or defaced. Iraq also agreed to seek the approval of the United Nations inspectors prior to opening or entering the bunker as long as Security Council resolution 715 (1991) remained in force. There were also 16 other sealed structures and areas at the Muthanna State Establishment that contained potentially hazardous items and materials covered by the same protocol. UNMOVIC does not know whether these procedures have been followed up by the coalition forces after the withdrawal of UNMOVIC from Iraq in March 2003 or recently pursued by the Interim Government of Iraq.

Empty munitions

13. According to Iraq's declarations, in addition to munitions filled with chemical agents, there were 98,000 munitions acquired or produced by Iraq for chemical weapons purposes that remained unfilled up until 1991. Those empty munitions were kept at multiple storage areas in the vicinity of the Muthanna State Establishment under its custody and at several other military ammunition depots and some munitions production facilities in Iraq where they had been manufactured. Of the 98,000 munitions, 36,500 were claimed by Iraq to have been destroyed by the coalition through aerial bombardment during the 1991 war, 29,000 were declared to have been destroyed unilaterally by Iraq in the summer of 1991, 15,500 were converted by Iraq to conventional munitions by filling them with high explosives in 1995 and some 17,000 munitions were declared and destroyed by Iraq under the supervision of United Nations inspectors in the period from 1991 to 1994.

14. However, given the lack of physical evidence to support Iraq's declarations on the destruction of unfilled munitions by aerial bombardment and unilateral destruction, it was not possible to finalize their coherent numerical accounting (see S/1999/94). Thus, it was not surprising that, in the course of its inspections in Iraq in 2003, UNMOVIC found 18 unfilled chemical rockets at ammunition depots involved in the handling of similar weapons in the past. These were designated for destruction by UNMOVIC but the destruction did not take place owing to the withdrawal of UNMOVIC from Iraq in March 2003 (see S/2003/580).

Munitions prototypes

15. In addition, in the period from 1981 to 1991, the Muthanna State Establishment used some 1,000 other prototypes of chemical munitions for static and dynamic tests. Those tests were carried out in remote areas in the desert. Munitions for trials were filled with both chemical warfare agents and simulants. One such munition, a 155-mm binary artillery projectile, was referred to in the seventeenth UNMOVIC quarterly report (S/2004/435).

Observations

16. In general, given the large total quantities of chemical munitions produced and filled by Iraq with chemical warfare agents over the period of 10 years, several deployment and recollection campaigns, the dozens of facilities and units involved in the handling of those weapons and the existing gaps in the accounting for the munitions, it is not surprising that some munitions have been found by the coalition forces.

17. UNMOVIC has no specific details to ascertain conditions of the munitions found by the coalition forces. Depending on the munition model, types of chemical warfare agent, dates of their production and filling, storage conditions, some old Iraqi munitions could still retain high-purity chemical warfare agents, while others would contain degraded chemical warfare agents, binary components or only their residues.

Biological munitions

18. According to Iraq's declarations, interviews with Iraqi officials and documents supplied by Iraq, the number of biological munitions produced in a short period of time (1990-1991) were limited, if compared with the tens of thousands of chemical munitions delivered to the armed forces in the period of 10 years. Iraq declared that a total of 182 munitions (157 aerial bombs and 25 missile warheads) were filled with biological warfare agents by the Muthanna State Establishment from December 1990 to January 1991. However, owing to insufficient documentation for the filling of munitions with biological warfare agents, it was not possible to fully verify Iraq's statements regarding the total numbers of munitions filled with such agents.

19. In early 1991, missile warheads filled with biological warfare agents were deployed to the Technical Battalion of the Surface-to-Surface Missile Corps, where a test was performed to check their integration with missile airframes later stored at two locations. Biological bombs were dispatched to two other remote locations but, according to Iraq, remained under the control of the Technical Research Centre, Iraq's main biological warfare production and research organization.

20. In 1995, all filled biological munitions were declared by Iraq to have been destroyed unilaterally in the summer of 1991 at two remote locations. UNSCOM was able to confirm the destruction of some 25 missile warheads at one location through the evaluation of the excavated missile fragments and some biological forensic analysis of the fragments.

21. Iraq declared that the unilateral destruction of filled aerial bombs had taken place at one location, the Al Azzizziyah firing range. In February-March 2003, to minimize the gap in the verification of Iraq's unilateral destruction, Iraq undertook further efforts to recover additional evidence of the destruction of biological bombs.

As at March 2003, different parts accounting for a total of 104 bombs, including 8 intact munitions, were unearthed by Iraq at the location of their unilateral destruction. Together with 24 bombs recovered earlier by UNSCOM, this made a total of 128 bombs out of 157 declared by Iraq (see S/2003/580). Since the ongoing excavation was interrupted after the withdrawal of UNMOVIC from Iraq, it is possible that more munitions and their parts and fragments could remain at the site. Any biological warfare agent found in such munitions would be inactive: sampling and analysis of excavated munitions carried out in 1997 and 2003 found no live agent.

Appendix II

Assessment of Iraq's remotely piloted and unmanned aerial vehicles programmes

Introduction

1. One of the priorities of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) for investigation and inspection has been Iraq's programme for remotely piloted and unmanned aerial vehicles (RPV/UAVs). Under the Security Council resolutions, Iraq is prohibited from developing and producing ballistic missiles capable of exceeding a range of 150 kilometres (km). A revision of the annexes to the plan for ongoing monitoring and verification in 1995 expanded the prohibitions applicable to ballistic missiles to include drones and other RPV/UAV systems. Of concern to United Nations inspection teams in the 1990s was the association between the organizations that managed and supported the RPV/UAV programme and those formerly involved in its proscribed chemical and biological warfare programmes. The production and testing of ballistic missiles and RPV/UAVs were subject to reinforced ongoing monitoring and verification by UNMOVIC under Security Council resolution 1284 (1999).

MiG-21 remotely piloted vehicle and Mirage spray tank

2. In its June 1996 "Full, Final and Complete Disclosure" of biological weapons, Iraq declared a 1990 project to investigate the modification of a MiG-21 fighter aircraft into an RPV for the dissemination of biological warfare agents using a Mirage F-1 drop tank modified to spray liquid agents. The declaration revealed past efforts to link an RPV programme with spray devices to disseminate biological warfare agents. When interviewed, Iraqi personnel indicated that there were in fact two separate projects associated with modified external fuel tanks: a manned Mirage F-1 and a MiG-21 RPV.

3. In a letter to UNMOVIC dated 19 March 2003, Iraq provided more details of the MiG-21 aircraft involved in the project, such as engine number, tail number, squadron and location. This submission of information was provided after UNMOVIC teams had been withdrawn from Iraq and therefore no verification was possible.

Al Bai'aa L-29 RPV project

4. In June 1997, Iraq declared that it had started a project called "Al Bai'aa" in November 1995, involving the conversion of 12 L-29 training aircraft into RPVs for air defence training. Documents obtained during an inspection refer to unmanned aircraft for use as air targets.

5. According to Iraq's declarations, the Al Bai'aa L-29 RPV was designed to fly to a range of about 80 km, which was determined by the effective limits of the remote control station on the ground. United Nations inspection teams found no clear indication to show that Iraq had planned to develop the L-29 RPV to deliver a chemical or biological warfare agent. UNMOVIC inspections in 2003 found that, although documentation indicated that at least one Al Bai'aa L-29 aircraft remained operational as at May 2001, the Al Bai'aa project appeared to have ceased in late 2001.

Smaller RPV/UAV programmes

6. Iraq commenced production of smaller-sized RPVs in the late 1980s, including the Saker, Sharab and Shaheen systems. The Technical Research Centre, which was involved in payload design for some of the smaller RPVs, was also responsible for a number of both proscribed (including research, development and bulk production of biological warfare agents after 1987) and intelligence-related projects. Despite these early connections between the Centre and the RPV programme, there is no evidence available to UNMOVIC to show that the earlier RPVs were actually, or intended to be, configured to disperse chemical or biological warfare agents.

7. Iraq declared to UNMOVIC that it had started a new project called the "RPV-20" in May 1999, aimed at the "design and construction of a programmable drone with a flight range of 100 km and an endurance of one hour". Other projects commenced after 2000, including the "RPV-30" and two experimental RPVs. The RPV-20 was the only new smaller RPV/UAV in series production and was tested several times using its onboard global positioning system (GPS) to fly circuits. In addition, Iraq had declared the continued production of other types of smaller RPV/UAV, which had started in the mid-1990s, including the Yamama series used for air defence training and reconnaissance (see the table below).

Some of Iraq's small remotely piloted and unmanned aerial vehicles

Data	*Full length (m)*	*Wingspan (m)*	*Pay load (kg)*	*Fuel tank (litres)*	*Speed (km/h)*	*Flight range (km)*	*Engine*[a]
RPV-20	3.60[b]	4.80	20	12	165	124	22 or 26 horsepower (hp)
RPV-30 (model 2)	4.70	4.77	30	-	-	-	Rotary 32 hp
RPV-20A(Q8)	3.10	4.80	20	10-12	108	-	9 hp/100 cubic centimetres (cc)
RPV-30A	4.16	7.45	30	20-23	110	55	(front) 8-9 hp/100cc (rear) 12 hp/150 cc
Yamama-4	3.15	4.2	-	-	-	-	18 hp/200 cc
Yamama-11	1.89	2.45[b]	-	1[b]	140	-	35 cc
Yamama-12	2.34	2.46	-	3.75	70-130	-	70 cc
Yamama-13	2.46	3.2	-	6	220	-	272 cc

Note. A dash indicates unknown or data not provided.
[a] Piston engines except where stated.
[b] Approximate.

8. UNMOVIC had concerns that the RPV-20 could have the potential to exceed 150 km. There were also concerns that the RPV-20 could have been considered by Iraq as a delivery platform for biological warfare agents. UNMOVIC has analysed the theoretical possibilities of the flight range of the RPV-20 on the basis of the information collected on RPV/UAVs during inspections and that provided by Iraq in its declarations and explanatory letters. From an aeronautical engineering viewpoint, the RPV-20 could have been capable of a range in excess of 150 km with certain modifications. Iraq declared that one flight test of the RPV-20 had achieved a range

of 124 km. If, for example, the parachute bay were to be replaced by an additional 12-litre fuel tank, this might double the range of the RPV (to more than 250 km). While theoretically and even practically possible, UNMOVIC has no evidence from documentation or interviews that such modifications were actually accomplished or planned. Additionally, none of the RPV-20s seen by UNMOVIC varied from the original diagrammatic models presented by Iraq.

9. While extending the range may have represented a relatively affordable technical task, equipping the smaller UAVs to efficiently deliver a biological agent would have been a much more complicated undertaking. It could have been technically possible to place a limited quantity of a biological warfare agent on a small RPV platform; however, it would be more problematic to develop an efficient device for the effective dissemination of such small amounts of liquid agent (there is no evidence available to UNMOVIC that Iraq ever mastered the technology to produce dry agents). In addition, there was no indication from inspections or Iraqi documentation available to UNMOVIC that Iraq actually undertook to change the original internal configuration of small RPVs.

10. Although inspections confirmed much of what was declared by Iraq, UNMOVIC did find some discrepancies in Iraq's declarations. Following the discovery by inspectors of a 7.45-metre (m) wingspan RPV-30A at Samarra East airfield on 10 February 2003, and confirmed on 17 February, Iraq provided a letter to UNMOVIC on 18 February 2003 stating that a typing error had occurred in the preparation of their relevant declaration and that the declared wingspan was not 4.40 m, but 7.40 m. In addition, inspections discovered an undeclared RPV/UAV similar to the RPV-20. Iraq stated that this was the Yamama-4 and later included it in its letter of 19 March 2003, along with details of other RPV/UAVs (a radar decoy and a cruise missile model). During site inspections, UNMOVIC noticed some RPVs that appeared incomplete or looked still at the test stage.

Summary and conclusions

11. According to Iraq, its RPV programme commenced in the late 1980s. Local production and assembly of a range of small RPVs followed familiarization with basic RPV technology. Those RPVs incorporated foreign designs and imported components and were declared to have been used for air defence training and surveillance. In addition, Iraq also modified obsolete military jet aircraft. The MiG-21 conversion project showed some promise before being halted by the first Gulf war, while the Al Bai'aa L-29 RPV project ceased after several years of development and trials.

12. The small RPV/UAVs were a continuation of earlier programmes and probably reflect Iraqi interest in keeping some production assets employed and keeping abreast with RPV/UAV technology. Iraq had experimented with airframe and design changes for the small RPV/UAVs from 1999 until March 2003 within its limited resources and technical constraints. The information available to UNMOVIC so far suggests that the concept of these RPV/UAVs was for conventional military purposes such as air defence training, data collection and surveillance.

13. UNMOVIC found no technical evidence that Iraq had achieved prohibited ranges or of the development of RPV/UAV systems for the delivery of chemical and biological warfare agents.