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NOTE BY THE SECRETARY-GENERAL

The Secretary-General has the honour to transmit to the members of the Security Council the attached communication, dated 10 January 1996, which he has received from the Director General of the International Atomic Energy Agency (IAEA).

Annex

Letter dated 10 January 1996 from the Director General of the International Atomic Energy Agency addressed to the Secretary-General

Please find attached the report of the twenty-ninth International Atomic Energy Agency inspection in Iraq under Security Council resolution 687 (1991). You may deem it appropriate to transmit the report to the members of the Security Council.

I remain, of course, available, as do my staff, for any consultations you or the Council may wish to have.

(Signed) Hans BLIX

Appendix

REPORT ON THE TWENTY-NINTH IAEA ON-SITE INSPECTION IN IRAQ UNDER SECURITY COUNCIL RESOLUTION 687 (1991)

17-24 October 1995

I. INTRODUCTION

1. The present report summarizes the results of the twenty-ninth inspection carried out in Iraq by the International Atomic Energy Agency (IAEA) under Security Council resolution 687 (1991), with the assistance and cooperation of the United Nations Special Commission (UNSCOM). The inspection took place from 17 to 24 October 1995. The team was led by Paul Stokes, and consisted of 13 inspectors of 8 nationalities.

2. This inspection was carried out to pursue further the information revealed by the Iraqi authorities after the departure of Lieutenant General Hussein Kamel from Iraq. It was a continuation of the inquiries begun during the twenty-eighth inspection by IAEA in Iraq, conducted from 9 to 20 September 1995.

3. The primary objectives of the inspections were:

(a) To obtain further detailed descriptions of Iraq's centrifuge enrichment and weaponization technologies to refine our assessment of Iraq's state of knowledge of these technologies;

(b) To obtain programme management information, especially schedules and milestones, in order to assess the progress of the centrifuge enrichment and weaponization programmes, at the time they were interrupted by the Gulf War;

(c) To obtain documents that would enable IAEA to confirm or confute the information provided during the inspections;

(d) On the basis of the above, to ensure that ongoing monitoring and verification activities are properly focused.

II. CENTRIFUGE ENRICHMENT PROGRAMME

A. Organization, management and facilities

4. Investigations of the centrifuge enrichment programme prior to August 1995 were conducted without the benefit of documents produced in the course of the programme. After the departure of Lieutenant General Hussein Kamel, Iraq turned over to UNSCOM and IAEA a large number of documents (the so-called Haider House Farm documents) concerning their programmes to develop weapons of mass destruction. Included in these documents were, for the first time, documents describing technical details of centrifuges and cascades. New information provided during meetings with the Iraqi counterpart in August, and also reflected in the Haider House Farm documents, revealed a previously unknown plan

to construct a 50-centrifuge cascade in 1991 to enrich further, for weapons use, the enriched uranium contained in safeguarded research reactor fuel. During this inspection, inquiries that had begun during the IAEA-28 inspection were continued in order to obtain further details regarding the 50-centrifuge cascade, as well as to obtain additional information about the overall centrifuge enrichment programme.

5. Meetings were held with the Iraqi counterpart at the headquarters of the Military Industrial Corporation to discuss technical and programmatic details and the organizational structure of the centrifuge enrichment programme. In addition to these meetings, inspections were conducted at the Al Shakyli store, the Engineering Design Centre (Rashdiya) and the Al Furat site.

6. The organization of the Engineering Design Centre - i.e. the centre where centrifuge development work was located - was discussed in detail, on the basis of the chart provided by the Iraqi counterpart during IAEA-28. According to this chart, the Engineering Design Centre was organized in one administrative and five technical groups. Most of the group leaders were educated abroad and many of them are still employed within the Engineering Design Centre or elsewhere within the Military Industrial Corporation. A document provided at the end of the mission indicates that a security and possibly an intelligence function were also included in the Engineering Design Centre organization. These functions, however, do not appear in the organization chart provided by the Iraqi counterpart.

7. The director of the Engineering Design Centre stated that, even though the Engineering Design Centre belonged to the Military Industrial Corporation, they reported directly to Lieutenant General Hussein Kamel, then Minister of Industry and Military Industrialization, rather than to Lieutenant General Amer Hamoodi Al-Saadi, then head of the Military Industrial Corporation. The reporting status of the Engineering Design Centre director, however, is unclear since a high ranking PC-3 official affirmed that the centrifuge programme reported to the head of the Military Industrial Corporation.

8. The Engineering Design Centre director stated that his organization had spent the equivalent of some $70 million on the centrifuge programme between 1987 and early 1991. Those funds, he asserts, were deposited in Engineering Design Centre accounts based on his verbal request to the Minister (Lieutenant General Hussein Kamel) and no records were kept. The Iraqi counterpart insists that, although project managers were appointed, management was informal and no detailed project schedules or budgets were developed. Despite this statement, it is difficult to accept that financial records were not kept.

9. Programme documents released to IAEA reflect a formal and tightly controlled organization with well-defined and communicated project schedules and progress reports. Project planning was described by the Iraqi counterpart to involve the preparation and presentation of a basic design to a design review panel; the distribution of the approved basic design to the appropriate departments within the Engineering Design Centre for materials selection and preparation of a detailed design; and release for procurement following approval of the detailed design by the project originators. The Engineering Design Centre had a complex document coding and control system, and every group was

responsible for its own drawings and documents. It was stated that, once a project had been finished, the original documents were handed over to the Engineering Design Centre central file. 1/ Although some originals of Engineering Design Centre project drawings and documents have been found in the Haider House Farm cache, IAEA inspectors are convinced that many more documents relating to the centrifuge programme have been produced than have been provided to IAEA. Despite the Iraqi counterpart's assurances to the contrary, it remains difficult to accept that these and other documents do not remain in storage somewhere in Iraq.

10. The Iraqi counterpart stated that Engineering Design Centre (Rashdiya) was the main centrifuge development site and that Al Furat was intended to be the manufacturing site under Engineering Design Centre management. Both sites had been visited by foreigners, who assisted the Iraqi centrifuge programme. The Iraqi counterpart indicated the areas within the Engineering Design Centre that had been used for centrifuge development and testing and the IAEA inspectors observed that the ceiling height and overall area of the cascade hall under construction at the Engineering Design Centre was considerably greater than the corresponding hall in building B01 at Al Furat. As discussed below, Iraqi officials admitted to IAEA-29 that the Engineering Design Centre hall had been adapted for longer supercritical machines. Taji was also mentioned several times as having been a possible future site for centrifuge enrichment activities. Documents revealed the existence of plans for a project 1200, which was described as a 4,000-machine cascade to be built in the Taji area. The Iraqi counterpart stated that it was an early plan considered for the oil bearing beams-type centrifuge. After the decision was made to develop and build a new more efficient centrifuge of the Zippe type, based on magnetic bearings, the number of machines planned for this site was said to have been reduced to 1,000. It was further stated that, while an appropriate area in Taji had been identified, no construction work for the facilities of project 1200 was ever undertaken. The absence of indications of site-works at the planned location of project 1200 was physically verified during IAEA-28.

B. Centrifuge machines

11. Previous investigations conducted by IAEA with the assistance of centrifuge enrichment experts had led to the conclusion that several models of magnetic type centrifuges had been designed by Iraq involving variations in the design of the magnet bearings, in the feed/extraction system and in rotor material. IAEA-29 inspectors had been tasked to identify the code number for each model and to obtain detailed information on work possibly conducted at the Engineering Design Centre on machines having two or more rotor tubes joined by bellows. 2/ Engineering Design Centre staff provided "out of memory" a list of the code numbers used to designate the different centrifuge models, with some indications of the design variations. This list and the description of the variation, however, appear inconsistent with the information contained in the new documents given to IAEA. When asked to recall details of their work with machines having two or more rotor tubes joined by bellows, the Iraqi counterpart admitted having acquired bellows hardware and having sought bellows production technology. Early in the IAEA-29 inspection, the Engineering Design Centre staff claimed that they had only "seen a drawing" of a 3-metre-long supercritical machine made

of seven tubes connected with bellows and that, while they had found it interesting, they had done no work on it. They eventually admitted that they had had almost a complete set of drawings of the long machine and that they had made additional drawings themselves for separation calculations. The Engineering Design Centre staff also admitted that they had designed the cascade hall at the Engineering Design Centre to accommodate the long machine if it became available and had modified the doorway to the test area at Al Furat "just in case" the long machine became available. Contrary to the information provided by Iraq, the Iraqi interest in the long centrifuge clearly went beyond the stage of efficiency calculations; drawings made by Iraq (and now in IAEA possession) contain far more detail than is warranted for calculations alone. From the above, it is considered that additional information about Iraq's activities and progress with these machines is still being withheld by Iraq.

C. Centrifuge cascades

12. Based on the documentation provided by Iraq, the Engineering Design Centre designed several centrifuge cascades. Their design included such aspects as equipment layouts, piping and instrumentation diagrams, process flow diagrams and floor plans. The Iraqi counterpart claims that none of the cascades were built. Cascade designs discovered among the new documents thus far are consistent with their subcritical machines and include:

(a) Project 521, the detailed design of which was finished in October 1989, consisting of 36 machines (9 product/feed stages, 6 tails stages);

(b) Project 521 A/B, the detailed design of which was completed in July 1990, consisting of 120 machines (41 product/feed stages, 5 tails stages);

(c) Project 521 C, the detailed design of which was completed in December 1990, consisting of 49 machines (12 product/feed stages, 13 tails stages). Project 521 C was the contribution of the Engineering Design Centre to the crash programme. 3/

13. Iraqi officials also stated that the 120-machine cascade was designed to enrich natural uranium to 93 per cent. This cascade could have been built at Al Furat (project 521 A) or at the Engineering Design Centre (project 521 B). They volunteered that, in all, they had prepared 13 cascade designs, including a 1989 concept report (not a complete design) for a 1,000-machine cascade. This latter cascade, they said, may have been intended for the project at Taji outlined in paragraph 10 above and provided the basis for their procurement. The Engineering Design Centre staff insisted they had no direct foreign assistance in their cascade design, attributing similarities to Western cascade design to scientific and technical literature that they studied carefully and to the training received in the context of the contract with the overseas company which was building the centrifuge manufacturing plant at Al Furat. This training exposed them to several elements of enrichment plant cascade piping. The claim cannot be verified and should not necessarily be accepted at face value.

14. Because of its significance to the "crash programme", revealed following the departure of Lieutenant General Hussein Kamel, the 50-machine cascade (project 521 C) merits additional discussion. The Engineering Design Centre was asked what would be required to enrich 70 per cent ^{235}U to 93 per cent. 4/ They estimated that, discarding tails at 40 per cent enrichment, a 49-machine cascade would be adequate and could process the amount of material involved in three months and, on this basis, were instructed to proceed with the preparation of the cascade. The Iraqi counterpart stated that the time originally estimated for completion of the cascade consisting of 49 centrifuges was March 1991. The inspection team expressed doubts that this schedule would have been met, particularly as there appear to have been very few centrifuge parts available in January 1991. The Iraqi response was that, if the centrifuge components had been available in time, final assembly would have been achieved on schedule. It was stated that the Engineering Design Centre had kept for itself the task of producing carbon fibre rotor cylinders and that the procurement of a suitable filament-winding machine to produce these cylinders was in progress. 5/ However, responsibility for the production of the end caps and baffles had been given to the Al Nida (Al Rabiya) Establishment and it was not at all evident that Al Nida would have been able to deliver. Other more conventional components of the cascade such as piping, valves and frequency converters posed no problem since they were already in Iraq and used in the research programme. In conclusion, the Iraqi side stressed that their tight schedule for the 49-machine cascade project could have been met if components had been supplied. They admitted, however, that the repeated failures of Al Nida to produce key components would have provided them with a convenient justification for failure to complete the cascade for the crash programme.

D. Procurement and foreign assistance

15. The procurement of equipment and materials was revisited. The discussion generally confirmed what was already known, although a few minor revisions were made to our existing understanding. The Iraqi counterpart was asked to identify the source of the 17 tonnes of maraging steel that had been found in August at the same site where the documents were stored, and which appeared to be additional to the 100 tonnes declared and destroyed earlier. The counterpart stated that the 17 tonnes were part of the 100 tonnes. It is possible that, as a result of the statistical approach used by the IAEA inspectors, the estimated weight of the steel that had been destroyed was incorrect. 6/ The most significant new developments in foreign assistance had to do with the 3-metre supercritical machine and the individual who supplied the drawings. In this machine, use is made of bellows to connect the various segments of the rotor. Although the Engineering Design Centre staff told IAEA-28 that they never carried out procurement activity for the supercritical machine, they admitted to IAEA-29 that they had sought bellows production technology. They also revealed that their consultant, whose identity is known to IAEA, had provided them with three samples of bellows, six baffles and a pin, and that the same consultant had personally assembled the upper bearing of their single cylinder (lid), subcritical test machine. The access to materials, designs, and assembly techniques attributed to this single individual by the Iraqi counterpart is truly remarkable. Although the IAEA team insisted there must have been additional consultants for some aspects of the technology, the Iraqi counterpart

flatly denied that any individuals other than those previously identified provided any technical assistance.

III. WEAPONIZATION

16. Meetings were held with the Iraqi counterpart to continue discussions begun in IAEA-28 and the facilities at the Al Qaqaa State Establishment and at Balat Ash Shuada were inspected. The purpose of these meetings and the inspections was to further the understanding of the status and objectives of the PC-3 Fourth Group weaponization programme and the associated technologies at the end of 1990. The Iraqi counterpart was requested to provide the team with information about the management and schedule of the programme, before and after August 1990.

17. On the last day of its stay in Iraq, the team was provided with an optical disk, on which reports from PC-3 Fourth Group (the weaponization group), dated from 1988 to 1991, were stored. These reports, in Arabic, seem to cover the most significant areas of the weaponization activities and will require several months to be properly assessed. Except where noted, the following text does not include information coming from these documents, but rather relies on information obtained during the discussions.

18. In August 1995, the Iraqi counterpart asserted that the progress towards the production of "qualified components" was such that it would not have been possible to have assembled a nuclear explosive device until 1994. This assertion was amended during IAEA-28, when the Iraqi counterpart estimated that, in crash programme mode, the assembly of a nuclear explosive device might have been possible before the end of 1992. However, during the course of IAEA-29 discussions, the Iraqi counterpart indicated that the estimate made during the IAEA-28 discussions was rather conservative, and that they might have been able to assemble a nuclear explosive device before that date. In particular, if tests of single full-size lenses would have been successful, the first full-scale non-nuclear implosion with a natural uranium pit and an internal neutron initiator could have taken place sometime in 1991.

19. As in the IAEA-28 discussions, the Iraqi counterpart reiterated the statement, made at the August talks that all weaponization activities had permanently ceased at all facilities at the onset of the Gulf War (17 January 1991).

20. Although several design options of an implosion device were being considered during the studies begun in 1988, it was stated that the "most probable design" mentioned in the design report dated 14 July 1990, handed over during IAEA-28, was close to the final design being considered at the beginning of 1991. The only open issue was the final optimization to reduce the outside diameter and weight in order to be compatible with the missile to be used as the delivery vehicle. The gun-type device was, again, said to have never been seriously considered other than as a back-up option in case the development of the implosion device failed. Documents from the optical disk show that some studies at an early stage of the programme in 1988 defined a basic design for a gun-type device. The implosion device was chosen as the primary option because

it required considerably less heavy enriched uranium than the gun-type device and its lesser weight made it more readily adaptable to missile delivery systems.

21. In the field of uranium metallurgy, the Iraqi counterpart stated that the main activity during the second half of 1990 was to install, adapt and commission the available equipment in the dedicated building at Al Atheer. As the embargo prevented Iraq from getting all the equipment that had been ordered abroad, some facilities of the Iraqi industrial complex were requested to provide Al Atheer with suitable replacements. It was stated that the metallurgy team would have been ready to cast and machine full-size uranium pieces by mid-1991, inasmuch as final commissioning of most of the equipment would have been possible by February 1991.

22. Many shock wave and high explosive experiments were carried out, mainly at the Site 100 bunker at Al Atheer, with fast response instrumentation and also at Al Qaqaa with simpler equipment. Spherical-wave lenses fabricated at Al Qaqaa were tested by the experimental unit of the Fourth Group at the end of 1990. The experimentalists concluded that the lenses were satisfactory, while the theorists conceded only that the lens designers were "on the right track". All of the explosive lenses tested were stated to have been formed by mechanical pressing, without additional machining. The Fourth Group also tested cylindrical charges manufactured at Balat Ash Shuada. After the IAEA-29 team's departure, Iraq provided IAEA with additional details of some of the "spherical wave lens experiments".

23. As reported by IAEA-28, a unit at the Al Qaqaa State Establishment was specially created to undertake the research, design, development, and manufacturing of the high explosive lenses and detonators needed for the implosion device. Personnel from this unit, which eventually became a support unit to the Fourth Group, declared that it had started to manufacture lenses related to a full-size nuclear device at the beginning of January 1991. The process used for that purpose was vacuum casting, because the previously used process of mechanical pressing was limited with regard to the size of lenses it could produce. Specific equipment had to be developed after August 1990 in order to counteract the effects of the embargo, which had precluded the delivery of equipment ordered from foreign sources. It was stated that, in parallel, the development of lenses using cast composite explosives had led to the need to use equipment, used for composite propellants in missile engines, at the adjacent missile facility, Balat Ash Shuada (now Al Rasheed/Mamoun factory). It was restated that the research on plastic-bonded explosives was still at a preliminary stage, such that these explosives could not be used to produce lenses at the desired time and that Iraq did not possess an isostatic press suitable for use in fabricating plastic bonded explosives.

24. Areas involved in weaponization activities at Al Qaqaa and Balat Ash Shuada were inspected. The vacuum casting area within Al Qaqaa has been dismantled and is now abandoned. A vacuum chamber and a mixer in the Balat Ash Shuada facility are still operational and are being used for the production of short-range missile propellant.

25. During IAEA-28, it was acknowledged that key equipment and designs of the facilities at Al Qaqaa were obtained from foreign sources. The principal contracts between Al Qaqaa and the foreign companies were provided to the IAEA-29 inspection team.

26. In the area of neutron initiators, several different concepts had been explored for neutron sources located internally or externally to the nuclear device. Experimental work on one of the concepts for an external initiator was considered to be a failure, while another such concept was considered to require considerable time to develop. It was said that the nominal option would have been an internal initiator.

27. It was confirmed that the most probable delivery system would have been a missile. In a meeting at Ibn Al Haytham with the former head of the missile project, it became clear that design and development of the delivery system had progressed further than previously disclosed. According to the Iraqi counterpart, several meetings and detailed technical exchanges had taken place, during the second half of 1990, between the nuclear weapon and the missile groups. A modification of the Al Hussein missile was being designed with a separable warhead to deliver a payload of 1 tonne over a distance of 600 kilometres. It was estimated that six months would have been needed to complete its development. Other missiles with larger diameters were not sufficiently advanced in development to be considered.

28. The missile organization provided a conventional warhead from the Al Hussein missile to the Fourth Group for their analysis in developing a compatible nuclear device. The Fourth Group designers developed detailed drawings of the nuclear device, taking into account the environmental conditions expected during missile delivery. Several options of the structure for mounting the device into the missile warhead were designed and analysed, and one was selected for development.

29. The concepts for arming, fusing and firing of the nuclear weapon had been defined. The firing system had been developed and some of the components for arming and fusing had been selected. Simulation of the operation of the warhead and the arming, fusing and firing system during re-entry was being planned. A simulated warhead was to be dropped at high altitude from an aircraft, and diagnostics were to be telemetered to ground stations. It was stated that no specific aircraft had been selected for the test.

30. A study, documented in two Iraqi reports, of the requirements for an underground nuclear test site had established that the test site would have been located in the south-west of Iraq, and a specific area was selected. A map of the most probable locations was provided to the team. However, the Iraqi counterpart stated that an underground nuclear test would not have been conducted before Iraq had available a small stockpile of devices. Thus, the time of the first test would have depended on the success of the indigenous enrichment programme.

31. During the discussions, the descriptions of the intended or actual activities carried out in the principal buildings at Al Atheer were confirmed.

A summary of the uses of these buildings, taking into account recent declarations, is included in the attached table.

IV. CONCLUSIONS

32. As observed in the report of IAEA-28, the Iraqi counterparts displayed a remarkable level of openness in the discussions, although there was some variation from subject to subject and from individual to individual. Degrees of reticence however appear to remain and the impression persists that the process to approach the full truth on some parts of their programme - centrifuge enrichment is a typical example - has still some way to go. In this context, it is relevant to note that, although a number of new documents were provided in the weapon design and development area, no documents were obtained on centrifuge enrichment. Contradictions have been noted between statements made to IAEA-28 and IAEA-29 and the content of some original PC-3 documents. It is not possible at the present time to determine if this is due to the individual fears of mid-level officials or is part of a plan aimed at protecting information, equipment and materials. A detailed analysis of the new documents will anyway provide a powerful tool to confirm or confute Iraqi assertions.

33. It is now clear that the original planning of the nuclear weapons programme had the objective of producing a small arsenal of weapons with the first device being produced in 1991. The three main components of the programme, namely the production of heavy enriched uranium from domestic sources of uranium, the design of a viable device and the development of the delivery system had not progressed equally to meet the original deadline. The weapon design component assigned to the Fourth Group was, in the opinion of the Iraqi counterpart, the closest and, with some luck and the solution of a few remaining problems still pending in January 1991, the Fourth Group was confident that compliance with the original plan was not an impossible task. The production of heavy enriched uranium by enrichment of domestic uranium, assigned to the First Group (centrifuge enrichment) and the Second Group (electromagnetic isotope separation (EMIS)) was lagging far behind. EMIS was years away from completion of the plant and the centrifuge enrichment was still at the stage of single machine testing. Less is known on the delivery system/testing station. A preliminary analysis of the data available tends to indicate that this component could have been readied within a few months of the original schedule.

34. The decision to embark upon a crash programme to provide in a short time sufficient heavy enriched uranium for a single device modified substantially the objective of the initial programme based on the achievement of a small arsenal of weapons and probably suppressed the need to establish a testing facility by restricting the short-term option to missile delivery.

35. Iraq has developed or otherwise acquired many of the technologies required to produce deliverable nuclear weapons. The attempt made by Iraq to assemble a nuclear device by extracting the required amount of heavy enriched uranium from the safeguarded research reactor fuel is a clear indication that their secret enrichment programme was still far from production at the beginning of 1991. The Gulf War destroyed the EMIS facilities and halted efforts to master centrifuge technology. IAEA has removed from Iraq all existing research reactor

fuel, and hence any in-country source of quickly available heavy enriched uranium.

36. Adequate provisions are now in place in Iraq to detect the resurgence of a capability to produce significant quantities of nuclear weapons-usable material. Vigilance is necessary to prevent the direct acquisition of nuclear weapons-usable material by Iraq in view of the low signature associated with the assembly of a nuclear device.

Notes

1/ The Iraqi counterpart stated that orders were received in summer 1991 to remove all documentation from the Engineering Design Centre. All documents were allegedly removed from the various groups and from the central file, put in labelled boxes and sacks and handed over to the security forces. Engineering Design Centre staff claimed that the removal was expected to be only for a short period.

2/ The Iraqi centrifuge programme had developed a machine that reflected the status of Western technology in the early 1960s (subcritical machines). Modern Western technology utilizes supercritical machines, in which the rotor consists of a number of tubes joined by bellows.

3/ For a detailed description of the crash programme, see the report of the twenty-eighth inspection mission in Iraq (S/1995/1003, annex).

4/ The original enrichment of Russian reactor fuel was 80 per cent. During operation in the reactor, the ^{235}U content of the fuel decreases in proportion to burn-up.

5/ IAEA was aware of this attempt by Iraq to procure a filament-winding machine and, with the cooperation of concerned Governments, had started an investigation in May 1994. Although it is not yet concluded, the investigation indicates that Iraq had ordered the machine from a Swiss company in summer 1990 and that it had been delivered to Jordan in early July 1991, by air freight via Singapore. According to Iraqi statements (August 1995), this machine was never brought into Iraq. The present whereabouts of this machine are not known, but efforts to locate it continue.

6/ Subsequent investigation of this discrepancy supports the explanation that the 17 tonnes of maraging steel included in the Haider House Farm cache was indeed part of the single consignment of 100 tonnes.

Table

Al Atheer buildings

IAEA No.	Present status	Formerly declared function	Newly declared function
A33	Destroyed	Ammunition testing bunker (Hatteen)	Hydrotests bunker
A18	Destroyed	Internal explosion chamber for testing hand grenades and mortar shells (Hatteen)	Internal explosion chamber for tests with radioactive material with up to 1 kg explosive
A19	Destroyed	Control room (Hatteen)	Control room for A18
A21	Destroyed	Physics laboratories (Hatteen)	Gas guns laboratory
A29-32	Unused	Magazines for ammunition store (Hatteen)	Magazines for explosive lens storage
A101	Used as a warehouse	Ammunition store (Hatteen)	Non-explosive material storage, including uranium
A50	Destroyed	Casting building, two lines for ferrous and non-ferrous materials	Uranium casting building, two lines for heavy enriched uranium and natural uranium One area for final assembly of the first device
A55	Destroyed	Tungsten carbide building	Uranium machining and beryllium handling
A82	Destroyed	Powder building	Powder building, including a beryllium area
A84	Destroyed	Polymer research laboratory	Originally planned for uranium metal production, but later planned as polymer laboratory. The metal group remained at Tuwaitha
A14	Used as offices	Quality control building	Non-nuclear experiments offices and small laboratory
A85	One bay used for tungsten carbide recovery	Material characterization building, including X-ray and metallography	Characterization building Temporarily housing uranium casting in 1990
