

Iraq Nuclear Chronology

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Last update: February 2009

As of February 2009, this chronology is no longer being updated.

For current developments, please see the Iraq Nuclear Overview.

2009-2006

12 February 2009

Mohammed Naji Mohammed of the United Iraqi Alliance coalition is pursuing a parliamentary resolution to seek at least one billion dollars from Israel for its 1981 air strike on the Osirak reactor [Note: See NTI Israel and Iraq Nuclear Chronologies 7 June 1981]. Mohammed is using UN Security Council Resolution 487 as justification for the claim, which "considers that Iraq is entitled to redress for the destruction it has suffered, responsibility for which has been acknowledged by Israel."

—"Iraq MPs seek reparation for 1981 Israeli attack on nuclear reactor," Haaretz, 12 February 2009.

1 December 2008

President George W. Bush admits his biggest regret during his eight-year presidency is the intelligence failure that Saddam Hussein possessed weapons of mass destruction. Such accusations were central to his administration's case to invade Iraq, but later proved inaccurate. President Bush declined to comment on whether he would have gone to war if intelligence had stated that Iraq possessed no weapons of mass destruction. [Note: See NTI Nuclear Chronologies, January and February 2003].

—Suzanne Goldenberg, "Iraq my biggest regret, Bush admits," *Guardian*, 2 December 2008; "Bush calls flawed Iraq intelligence biggest flaw," Reuters, 1 December 2008.

19 August 2008

Iraq signs the Comprehensive Nuclear-Test-Ban Treaty (CTBT). Iraq is the 179th state to sign the treaty, and the 21st signatory of the 26 states in the treaty-defined critical region of the Middle East and South Asia. Iraq will be able to participate in CTBTO decision-making bodies and access data from its International Monitoring System for use in civil and scientific applications. Iraqis are now also eligible to work at the CTBTO.

—"Iraq Signs Comprehensive Nuclear Test Ban Treaty," *Defense Daily International*, 22 August 2008, in Lexis-Nexis Academic Universe; CTBTO Preparatory Commission, "Iraq Signs the Comprehensive Nuclear-Test-Ban Treaty," 20 August 2008.

5 July 2008

The last major stockpile of material from Iraq's nuclear program, consisting of approximately 600 tons of

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yellowcake (milled uranium oxide), is delivered to Montreal after being removed from the Tuwaitha site. U.S. military personnel helped to remove the yellowcake from Tuwaitha, and the Iraqi government sold it to the Canadian uranium producer Cameco Corporation. It will be processed and used to fuel power reactors. Although uranium in yellowcake form is not weapons useable, safety and security concerns prompted the Iraqi government to request its removal and sale.

—Alissa J. Rubin and Campbell Robertson, "U.S. helps remove uranium from Iraq; Nuclear dismantling is nearly complete," *The International Herald Tribune*, 8 July 2008 in Lexis-Nexis Academic Universe; "Uranium shipment arrives in Montreal," *The Gazette (Montreal)*, 6 July 2008, in Lexis-Nexis Academic Universe.

1 July 2008

The U.S. Department of State begins the Iraqi Nuclear Facility Dismantlement and Disposal Program, which will assist Iraq in dismantling and disposing radioactively contaminated materials leftover from Saddam's nuclear program (emphasizing the Al-Tuwaitha nuclear complex southeast of Baghdad). The program is a culmination of past efforts by the IAEA and Texas Tech's "Train and Engage" Program, who began training Iraqi scientists in 2005. It is funded by the U.S. Department of State, the U.K., and Iraq. Implementing organizations include Sandia National Laboratories, the Department of Energy, Texas Tech University, the Environmental Protection Agency, the Nuclear Regulatory Commission, and Iraqi government officials in the Ministries of Science and Technology, Industry, and Environment.

—John Cochran, "Iraq Nuclear Facility Dismantlement and Disposal Project," Sandia National Laboratories, www-ns.iaea.org; John Davis, "Texas Tech Professors Assist with Nuclear Dismantlement in Iraq," Texas Tech University News, 8 July 2008; "Sandia aids cleanup of Iraqi nuclear facilities, rad waste," Sandia National Laboratories Press Release, 13 October 2008.

5 June 2008

The Senate Intelligence Committee releases a report on Iraq's WMD program, stating that President Bush and top-level officials misled the public by presenting "intelligence as fact when it was unsubstantiated, contradicted or even nonexistent," according to Sen. John D. Rockefeller IV, the Senate Intelligence Committee's chairman. The report found that some claims made by the Bush administration to justify action against Iraq were not based on intelligence reports of the time, "such as suggestions that Saddam's Iraq and Osama bin Laden's Al Qaeda were operating in a kind of partnership." The report also asserts that the "claim by then-Defense Secretary Donald H. Rumsfeld that Iraq had concealed its stockpiles of weapons of mass destruction in underground bunkers too deep to be destroyed by air power alone" was contradicted by intelligence from that time.

—Joby Warrick and Walter Pincus, "Bush Inflated Threat From Iraq's Banned Weapons, Report Says," *The Washington Post*, 6 June 2008, in Lexis-Nexis Academic Universe; Mark Mazzetti and Scott Shane, "Bush Overstated Evidence on Iraq, Senators Claim," *The New York Times*, 6 June 2008 in Proquest; Scott Shane, "Exaggeration cited in lead up to war; Senate report accuses White House of using 9/11 to justify Iraq," *The International Herald Tribune*, 6 June 2008, in Lexis-Nexis Academic Universe.

18 February 2008

Foreign Secretary David Miliband releases a draft of the 2002 British Joint Intelligence Committee dossier to the public in response to the filing of a freedom of information request. Miliband claims that this document "was not

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used as the basis for later documents, drafted by the Joint Intelligence Committee." The document states that "Saddam had or was close to deploying weapons including long-range missiles and 'has acquired uranium' needed for a nuclear bomb."

—Paul Waugh, "New Questions as Draft Iraq Dossier Finally Published," *The Evening Standard (London)*, 18 February 2008, in Lexis-Nexis Academic Universe; "British Iraq Dossier Surfaces, Without Crucial Weapons Claim," Associated Press, 19 February 2008, in Proquest.

29 June 2007

The Security Council passes Resolution 1762 terminating the mandates of the UN Monitoring, Verification, and Inspection Commission (UNMOVIC) and the IAEA in Iraq. Resolution 1762 also requests the UN Secretary General to dispose safely of archives containing sensitive information and to transfer any remaining UNMOVIC funds to the Development Fund for Iraq. The IAEA's responsibilities are reduced to ensuring Iraqi compliance with standard safeguards agreements under the auspices of the NPT. A letter to the Security Council from the Iraqi government indicates it is committed to respecting its obligations to the nonproliferation regime.

—Colum Lynch, "UN Security Council Dissolves Unit Looking for Iraqi Arms," *The Washington Post*, 30 June 2007, in Lexis-Nexis Academic Universe; UN Security Council, "Iraq (UNMOVIC)," Security Council Report, Update Report No. 10, 26 June 2008.

28 September 2006

Abu Hamza al-Muhajir (also known as Abu Ayyub al-Masri), believed to be the new leader of Al-Qaeda in Iraq, releases an audiotape on the web calling for experts in "chemistry, physics, electronics, media, and all other sciences - especially nuclear scientists, and explosive experts" to join the group's holy war.

—David Rising, "Call for Nuclear Holywar," *The Courier Mail (Australia)*, 30 September 2006, in Lexis-Nexis Academic Universe; Bassem Mroue, "Join Us and Kill Them with Nuclear Bombs; New Iraqi Al-Qaeda Leader's Appeal," *Daily Record*, 29 September 2006, in Lexis-Nexis Academic Universe.

22 July 2006

The Iraqi Military Manufacturing Commission is to have 13 of its former companies reestablished, including the Nuclear Energy Organization. Previously, staff from the Nuclear Energy Organization had transferred to the Higher Education and Scientific Research Ministry.

—"Iraq Plans to Reinstate Staff of Former Nuclear Energy Organization," BBC, 22 July 2006.

25 April 2006

IAEA safety expert Dennis Reisenweaver announces a project to begin cleaning Tuwaitha, one of Iraq's former primary nuclear facilities, of radioactive contamination. Tuwaitha was largely disassembled during the early 1990s by Iraqis and international inspectors. The site was then bombed in 2003 during Operation Iraqi Freedom and subsequently looted by Iraqis. The current project is expected to last for many years, and involve combing the location for unknown burial sites of contaminated equipment and materials, as well as recovering lost records which determine the extent of radioactive materials in waste containers.

—Ian Traynor, "IAEA Launches Iraq Nuclear Site Cleanup," *Guardian*, 25 April 2006.

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23 April 2006

Tyler Drumheller, a former high-ranking CIA official in Europe, accuses the Bush administration of "choosing to ignore" intelligence stating Iraq possessed no WMD or an active nuclear program prior to Operation Iraqi Freedom. Drumheller claims Naji Sabri, Iraq's Foreign Minister in the Ba'ath regime, provided the CIA with information that there were no active WMD in Iraq. Drumheller relates the reaction of the White House, saying they were not interested in the intelligence from Sabri, and instead replied, "This isn't about intel anymore. This is about regime change." Secretary of State Condoleeza Rice is quoted as saying the reason Sabri was not believed was that he was a single source, whose story could not be corroborated.

—"Ex-CIA Official: WMD Evidence Ignored," *CNN*, 23 April 2006.

27 March 2006

The federal government makes public a large portion of the documents seized during Operation Iraqi Freedom by posting them on the Internet. Intelligence officials say they will remove any sensitive information prior to their release. The release is believed to be a bid to attract nation-wide 'volunteers' for research purposes who have already begun posting comments, blogs, and translations of the material. Included in the posted documents are Iraqi memos, reports, training guides, transcripts, and audio/videotapes.

—Robert Tanner, "U.S. Agency Sets 'Power of the Internet' Upon Seized Iraqi Documents," Associated Press, 27 March 2006.

22 March 2006

Documents are released to the press that were confiscated during the invasion of Iraq indicating Saddam tried to prove to international inspectors he had no WMD in order to get the sanctions against Iraq lifted. Transcripts show statements by Saddam and other high-ranking Iraqi officials claiming they had nothing, and wondering if UN inspectors would "roam for 50 years" in pursuit of nonexistent WMD in Iraq.

—"Documents Show Hussein Tried to Convince U.N. That Iraq Had No Weapons of Mass Destruction," Global Security Newswire, 22 March 2006.

13 February 2006

The United Nations approves Secretary General Kofi Annan's recommendation that over \$400,000, approximately 0.8 percent of annual Iraqi oil revenue, earmarked for the United Nations Monitoring, Verification and Inspection Commission for Iraq be credited instead toward Iraqi UN dues. The Security Council suggests that the sum be allocated for renovation of the New York UN complex, peacekeeping projects, tribunal activities, and other regular budget expenses.

—"Security Council Okays Use of Iraqi Funds for UN Dues," *Xinhua*, 13 February 2006.

13 February 2006

Russia recommends that all material and findings collected by UNMOVIC and related inspection bodies such as the IAEA and the ISG be presented to the Security Council. Russia cites reasons for this recommendation as a way to bring full and final clarity to the much debated issue of Iraq's WMD programs.

—"Russia Wants All Iraq Inspections Files Referred to UN Security Council," *Xinhua General News*, 13 February 2006.

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8 January 2006

Former UN weapons inspector Scott Ritter publishes "Iraq Confidential: The Untold Story of the Intelligence Conspiracy to Undermine the U.N. and Overthrow Saddam Hussein." In the book, Ritter elucidates his account of Iraq's WMD holdings prior to 2003. He alleges that the CIA and the U.S. government's desire to undermine UNSCOM's success in Iraq kept economic sanctions in place longer than necessary. Ritter blames both the U.S. government and the Iraqi government for hindering inspection bodies that could have discovered that Iraq destroyed its nuclear program in 1991. Ritter is known for his opposition to the invasion due to his belief that Iraq had no weapons of mass destruction.

—Walter Putnam, "Insider Recalls Hunt for WMD," Associated Press, 8 January 2006.

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2005

5 November 2005

The U.S. Federal Bureau of Investigation concludes that financial gain, not desire to influence foreign policy, was the motivation underlying the forgery of documents regarding Nigerian uranium ore sought by Iraq.

—"FBI: Financial Gain Drove Uranium Forgery," Associated Press, 5 November 2005.

3 November 2005

A hearing is held in Rome concerning forged documents given to the United States and Britain by Italy detailing a deal between Iraq and Niger in which Iraq attempted to purchase 500 tons of uranium concentrate. The parliamentary commission overseeing secret services questions Nicolo Pollari, director of Italy's SISMI intelligence agency, and Gianni Letta, cabinet undersecretary and one of Premier Silvio Berlusconi's top aides, in regards to the documents. General Pollari identifies a spy named Rocco Martino as the origin of the forgery. The false documents stating a relationship between Iraq and Niger and the acquisition of yellowcake were one of the justifications given by the Bush administration for the war in Iraq.

—Ariel David, "Italian Officials Questioned on Disputed Claim of Iraq Uranium Deal," Associated Press, 3 November 2005; Elaine Sciolino, "Source of Forged Niger-Iraq Uranium Documents Identified," *The New York Times*, 4 November 2005.

25 October 2005

IAEA inspectors verify nuclear material in Iraq held near the al-Tuwaythah complex. The United Nations Resolution 1051 had requested that the Director-General of the IAEA submit progress reports on Iraq nuclear verification semi-annually to the Security Council. For the first time since March 17, 2003, the IAEA inspectors are able to verify all nuclear material subject to safeguards.

—"IAEA Inspectors Verify Iraqi Nuclear Material Remains Subject to Safeguards," 25 October 2005, in FBIS document EUP20051026001011.

20 October 2005

Former State Department official, Army Colonel Lawrence Wilkerson states that while U.S. and foreign officials

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were justified prior to the 2003 invasion in believing Iraq had possession of chemical and biological weapons, there was no agreement on whether or not Saddam had attempted to reconstruct a nuclear weapons program.

Wilkerson served as chief of staff to Colin Powell while Powell was Secretary of State. He goes on to say that while there was no consensus in the Bush administration on determining if Iraq posed an imminent threat to the United States, a small faction of senior officials dominated by Vice President Dick Cheney and Defense Secretary Donald Rumsfeld made the decision to pursue invasion.

—David Ruppe, "Saddam 'Spoofed' US on Chemical, Biological Weapons, Former State Department Official Says," *Global Security Newswire*, 20 October 2005.

3 October 2005

A resolution passes unanimously at the general conference of the International Atomic Energy Agency which calls for a nuclear weapon-free zone in the Middle East.

—"IAEA Calls for Nuclear Weapon-Free Middle East," *Global Security Newswire*, 3 October 2005.

October 2005

A report released by the U.S. Government Accountability Office (GAO) states that for six months after the March 2003 invasion of Iraq, radiological sources were left unsecured by the coalition forces. Because of this vulnerability, the report further implies that some of the materials could possibly have gone missing during that time period. The purpose of the GAO report is to advise the Pentagon of mistakes and suggest improvements for future policy toward securing radiological sources post-invasion. While none of these sources found in Iraq had been in the form of a weapon, it is possible that they can be used in conjunction with conventional explosives which would result in a "dirty bomb." The GAO's report details the amount of materials located and transported by the U.S. Defense Threat Reduction Agency and the Department of Energy. Of the radioactive sources that were collected, 1,100 of them were transferred to the United States, and another 700 were left in Iraq after being secured. The report clarifies that the U.S. or Iraqi ownership status of the sources kept in the United States are still being determined. The total number of sources remains unknown, though the GAO believes it is likely sources remain yet to be secured in Iraq.

—Paul Kerr, "US Failed to Secure Iraq Materials," *Arms Control Today*, October 2005.

30 September 2005

An article is published in a science magazine citing examples of the current prosecution of Iraqi scientists. At least 58 professors, 150 medical doctors, and dozens of various scientists, including nuclear scientists, working in institutes and ministries have been murdered. Due to the pattern of kidnapping and methods of killing, the assassins are believed to be members of the insurgency. Many scientists are leaving the country due to the present danger, as well as the inability to work because of looting of scientific institutes and universities. The State Department's Iraqi International Center for Science and Industry is creating a job-placement initiative in order to reinstate scientists who worked on Saddam's weapons programs in new jobs within Iraqi ministries. The article states that scientists are being targeted by the insurgency due to the perception that they are helping the American army.

—Richard Stone, "In the Line of Fire," *Science*, Vol. 309, 30 September 2005.

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23 September 2005

The IAEA issues a statement claiming their inspections in Iraq have found no evidence of nuclear matter being used, smuggled, or diverted into undeclared activity. The agency reports that the natural or low-enriched uranium is securely stored near the Tuwaitha complex, a facility south of Baghdad. The inspection is part of an NPT policy of annual Physical Inventory Verification of declared nuclear material.

—"No Diversion of Nuclear Material Found in Iraq: IAEA," Agency France Presse, 23 September 2005.

16 September 2005

John Wolfe, former Assistant Secretary of State for Nonproliferation, speaks out against a potential DOD policy of pre-emptive nuclear strikes against states possessing WMD. He uses the case of mistaken WMD in Iraq as a reason why adopting such a policy would be a mistake.

—Joe Fiorill, "Former US State Department Nonproliferation Chief Opposes Nuclear Pre-Emption Policy," Global Security Newswire, 16 September 2005.

9 September 2005

Former Secretary of State Colin Powell describes in a television interview his 2003 speech to the United Nations about Iraq's weapons programs as a "blot" on his record.

—"Powell Tells of Blot on Record," *New York Times*, 9 September 2005.

7 September 2005

The US Government Accountability Office releases a report to Congressional Committees regarding the removal of radiological materials from Iraq by the Department of Defense. The study suggests improvements of DOD methods after a review of its performance in Iraq while attempting to secure and remove nuclear materials such as processed uranium and radiological sources. The report concludes that the DOD and US Department of Energy should ensure that more advanced planning occur prior to any similar circumstances in the future. Looting of radiological areas is cited as one of the most complicating factors behind securing and collecting facilities and items that could potentially be used in a "dirty bomb." The report asserts that the DOD was not adequately prepared for securing the facilities by March of 2003, and military personnel had insufficient guidance and equipment in the ensuing six months following the initial invasion.

—US Government Accountability Office, "Radiological Sources in Iraq; DOD Should Evaluate Its Source Recovery Effort and Apply Lessons Learned to Future Recovery Missions," Report to Congressional Committees, September 2005.

24 August 2005

A draft of the Iraqi constitution contains language addressing the issues of terrorism and weapons of mass destruction. The draft asserts the Iraqi government's commitment to preventing the spread and production of nuclear, chemical and biological weapons.

—"Iraq draft Constitution Addresses WMD Proliferation," Reuters, 24 August 2005.

22 August 2005

Due to the recent and impending releases of several nuclear scientists known to work under Saddam Hussein, the

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United Nations and the White House are pushing for special inspections in order to monitor potential WMD programs being restarted in Iraq. Iraqi politicians refuse to accept extra constraints and demand to be given fair treatment.

—John Barry, "U.N. Considers Monitoring Iraqi Weapons Efforts," *Newsweek*, 22 August 2005.

19 August 2005

American Colonel Lawrence Wilkerson, chief of staff to former U.S. Secretary of State Colin Powell from 2002 to 2005, alleges that the speech made by Secretary of State Powell to the United Nations on February 14, 2003 was based on intelligence from the White House that resembled a "sort of Chinese menu" and appeared to be "anything but an intelligence document." Colonel Wilkerson asserts that allegations in the speech, which were intended to prove the presence of weapons of mass destruction programs in Iraq, were later proven to be incorrect by David Kay, former C.I.A. chief weapons inspector, after he completed several months of extensive searches of Iraqi facilities for the suspected WMD stockpiles after the fall of Saddam Hussein.

— "Former aide: Powell WMD speech 'lowest point in my life,'" CNN, 19 August 2005.

31 July 2005

A former Central Intelligence Agency officer claims that he received information from a significant source in 2001 proving that the Iraqi government had already ceased its uranium enrichment program for nuclear weapons. The officer claims that although he filed a report in the C.I.A. Counter Proliferation Division, standard procedure was abandoned when the report failed to be addressed in important government analyses pertaining to Iraqi pre-war intelligence and reach other American intelligence agencies and policy makers.

— "Spy's Notes on Iraqi Arms Aims Were Shelved, Suit Says," *New York Times*, 31 July 2005.

28 July 2005

In a testimony before a House Intelligence subcommittee the Principal Deputy Director of National Intelligence, General Michael Hayden, announces that future National Intelligence Estimates will be subjected to a new set of strict safeguards in order to ensure a high level of accuracy for assessing national intelligence. The procedural changes, which General Hayden called "a major breakthrough," are a direct response to the National Intelligence Estimate of October 2002 which asserted that Iraq was harboring weapons of mass destruction programs, but later proven to be incorrect.

— "Top Spy's No. 2 Tells of Changes to Avoid Error," *The New York Times*, 28 July 2005.

27 July 2005

The investigation led by the U.S. Senate Select Committee to determine whether or not the Bush administration misconstrued intelligence in order to justify the war in Iraq has come to a halt. Senator John Kerry says that as a result of the stalled proceedings "a year and a half later, there's still no report, no conclusions, no accountability for the mistakes, and no way to be sure they won't be repeated."

— "Prewar Iraq Intelligence Inquiry in Senate," Global Security Newswire, 27 July 2005.

June 2005

The Central Intelligence Agency (CIA) released the final report of its investigation concerning Iraq's suspected

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weapons of mass destruction programs. The report provides supplementary information to the September 2004 report written by Charles Duelfer, special advisor of the Iraq Survey Group. The CIA supplementary report asserts that although there is a risk that Iraqi officials with knowledge of weapons of mass destruction programs could be recruited to work for other governments, terrorist groups, or insurgents thus far there is "only very limited reporting" that other governments have made attempts to recruit Iraqis and there are "no reports" that any successful attempts have occurred.

— "Final Iraq Report Downplays Brain Drain," *Arms Control Today*, June 2005.

14 July 2005

U.S. Undersecretary of Defense for Policy Douglas Feith says that U.S. policy makers relied too heavily on information regarding the suspected WMD stockpiles believed to exist in Iraq prior to the 2003 invasion. Feith argues that the U.S. led war in Iraq is necessary, but claims that "we as an administration, instead of giving proper emphasis to all major elements of the rationale for war, overemphasized the WMD aspect."

— "AP Interview: Departing Pentagon policy chief says administration overemphasized WMD as war rationale," Associated Press, 14 July 2005.

4 July 2005

Mogens Lykketoft, former foreign minister of Denmark, writes an open letter to President George Bush that claims the United States falsely accused Saddam Hussein of harboring "dangerous weapons of mass destruction" as an "original and official justification for the Iraq war."

— "Danish SDP's Lykketoft Writes Open Letter to Bush Criticizing US Foreign Policy," *Copenhagen Politiken*, 4 July 2005, in FBIS document EUP20050704364006.

30 June 2004

British Prime Minister Tony Blair asserts that the previously classified Downing Street memos released to the public in May 2005 have been misinterpreted. In response to accusations, resulting from the release of the memos, that there was a U.S. initiative coupled with U.K. support to invade Iraq shortly after September 11th 2001, Prime Minister Blair says that "people say the decision was already taken. The decision was not already taken."

— "Downing Street Memos Misinterpreted, Blair Says," *Global Security Newswire*, 30 June 2005.

24 June 2005

The United Nations Security Council approves a transfer of \$200 million dollars from the Iraqi Oil for Food program to the Development Fund for Iraq. Money generated from the Oil for Food program has most recently been used to finance UNMOVIC activities in Iraq in order to dismantle weapons of mass destruction programs. A transfer of funds from Oil for Food Accounts to the Development Fund for Iraq results in a reduction of the UNMOVIC budget from \$345.9 million to \$125 million. Samir Sumaidaie, Iraq's acting ambassador to the United Nations argues that spending more than \$10 million per year for UNMOVIC in Iraq is no longer a useful allocation of government funds because Iraq does not possess any weapons of mass destruction and therefore is no longer a threat.

— "U.N. approves transfer of \$200 million in oil-for-food revenue to Iraq Development Fund," Associated Press, 24 June 2005.

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8 June 2005

Reports indicate that there is growing support among countries in the United Nations Security Council to dismantle UNMOVIC programs in Iraq. The Security Council is under pressure from the new Iraqi leadership to shut down UNMOVIC because its \$12 million operating budget is provided by oil revenue which could alternatively be used towards reconstruction expenses.

— "UN eyes shutting down Iraq arms inspection agency," Reuters, 8 June 2005.

8 June 2005

The U.S. abandons its campaign to keep Mohamed ElBaradei from winning re-election to a third term as director general of the IAEA. The U.S. is suspected of trying to force ElBaradei out of office after he challenged U.S. allegations of nuclear weapons programs in Iraq before the invasion.

— Dafna Linzer, "U.S. Drops Opposition to IAEA Chief," *Washington Post*, 8 June 2005.

8 June 2005

U.S. President George Bush and U.K. Prime Minister Tony Blair deny claims in the previously released Downing Street Memo that pre-war WMD intelligence was "fixed" around a policy of military invasion and regime change. President Bush claims that the memo was made public in an effort to hinder Prime Minister Blair's re-election process.

— "Blair, Bush Deny Manipulating WMD Intelligence," Global Security Newswire, 8 June 2005.

31 May 2005

A recent report claims that U.S. government analysts responsible for faulty intelligence on Iraq's pre-war nuclear capabilities have been awarded job performance awards. False intelligence findings that linked aluminum tubes with uranium enrichment in Iraq has been attributed to the same analysts that received job performance awards. Some officials argue that this demonstrates that the current administration is not holding officials accountable for false intelligence.

— "Analysts Behind Faulty Iraq Intelligence Rewarded," Global Security Newswire, 31 May, 2005.

31 May 2005

Condoleezza Rice, U.S. Secretary of State, announces that Iraq has joined the Proliferation Security Initiative program in an effort to halt global black market trafficking of nuclear related materials and technologies.

— "U.S. to Detail Interception of Weapons Materials," Global Security Newswire, 31 May 2005; Stefan Nicola, "WMD trafficking hard to stop without China," *Washington Times*, 10 June, 2005.

24 May 2005

Charles Duelfer, U.S. Chief Weapons Inspector, claims that personal narcissism and fear of an Iranian invasion caused Saddam Hussein to intentionally mislead international authorities about Iraq's nuclear capabilities.

— "Inspector says Saddam wanted to bluff Iran on arms," Reuters, 25 May 2005.

5 May 2005

Mohammed ElBaradei, director general of the IAEA, reports that it is not surprising that no substantial evidence of an Iraqi nuclear weapons program has been found. He says the absence of evidence supports previous conclusions

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reached by the IAEA before the war began. ElBaradei advises that the case of Iraq offers a "basic lesson" that countries must bare caution when they "say that a nuclear program in a country is for military purposes."

— "IAEA Chief ElBaradei Explains Position on Nuclear Proliferation," *Al-Sharq al-Awsat*, 5 May 2005, in FBIS Document GMP2005050702001.

1 May 2005

The "Downing Street Memo," a classified document dated July 23, 2002, is recently leaked to the public and reveals top British officials warning Prime Minister Tony Blair that there is sparse evidence of weapons of mass destruction programs in Iraq eight months before the invasion occurs. The memo indicates that Blair supported the U.S. policy of Iraqi regime change by means of a military invasion, but was advised by other British government officials that there was no legal evidence for such actions. Blair says "regime change and WMD were linked in the sense that it was the regime producing WMD...If the political context were right, people would support regime change." Subsequently, it is alleged by U.K. newspapers that in the following months Blair intentionally produced faulty information that supported the presence of Iraqi nuclear weapons in an effort to gain British support for a military invasion.

— "Leaked No 10 Memo Shows Blair Committed to Iraq Eight Months Before Invasion," *Sunday Times*, 1 May 2005.

28 April 2005

In a speech at Kutztown University in Pennsylvania, former CIA Director George Tenet says he regrets telling President Bush in 2002 that finding WMDs in Iraq was a "slam dunk." Tenet reports general apathy in the government toward terrorism in the decade prior to 11 September accounted for the lapse in accurate intelligence produced by the CIA.

— "Tenet Says he Regrets 'Slam Dunk' Comment," Associated Press, 28 April 2005.

27 April 2005

Charles Duelfer, U.S. chief weapons inspector, declares the inquiries into Iraq's weapons of mass destruction are exhausted and have gone as far as feasibly possible. He issued an addendum to the Iraq Survey Group's paper published in October, which officially closes the investigation.

— "US Closes Book on Iraq WMD Hunt," *BBC News*, 27 April 2005, <http://news.bbc.co.uk>.

26 April 2005

The Iraq Survey Group that was in charge of the search for WMDs in Iraq since the fall of Saddam Hussein releases a report declaring it has found no evidence supporting the claim that Iraqi arms are hidden in Syria. The findings of the report contradict the previous sentiment of U.S. officials that had believed some WMD from Iraq had been moved to Syria prior to 2003.

— "Inspectors Find No Proof Iraq Hid Weapons in Syria," Reuters, 26 April 2005.

8 April 2005

Britain's Joint Intelligence Committee releases its annual report, in which it admits that some of the main claims in the Iraq weapons dossier, Prime Minister Tony Blair's main justification for joining the coalition forces, were false. The statement made in the dossier that Iraq was believed to be pursuing a nuclear weapons program the report

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now concludes to be unsubstantiated. The JIC also retracted false statements made on Iraq's biological and chemical weapons arsenal as well.

—Kim Sengupta, "Intelligence Chiefs Admit Iraq Weapons Claims Were Untrue," *Independent*, 8 April 2005.

3 April 2005

UN inspectors who had been in pre-war Iraq accuse the United States of dismissing and ignoring the findings of these international bodies in the events leading up to Operation Iraqi Freedom. The inspectors say that the evidence the Bush administration presented to justify the operation had been tested and disproved by the IAEA. The accusation includes reports of IAEA inspectors discovering that the documents presented to them showing an attempted purchase of uranium from Niger were actually forged; however the CIA maintained their position on the documents' authenticity.

—Dafna Lizner, "Panel: U.S. Ignored Work of U.N. Arms Inspectors," *Washington Post*, 3 April 2005.

3 April 2005

Former top Iraqi nuclear chemist Dr. Hussein Shahrstani is elected deputy speaker of the new Iraqi parliament. Hussein Shahrstani, formerly worked under Saddam Hussein, but was imprisoned in 1979 for refusing to build a nuclear bomb.

—"Iraqi Parliament Elects Speaker," AFX News, 3 April 2005.

3 April 2005

Former top Iraqi nuclear chemist Dr. Hussein Shahrstani is elected deputy speaker of the new Iraqi parliament. Hussein Shahrstani, formerly worked under Saddam Hussein, but was imprisoned in 1979 for refusing to build a nuclear bomb.

—"Iraqi Parliament Elects Speaker," AFX News, 3 April 2005.

1 April 2005

The Presidential Commission on WMD intelligence reports the CIA resisted acknowledgment of other government agencies such as the Energy Department that maintained evidence found in Iraq was not meant for nuclear activity. The aluminum tubes cited numerous times in the 2002 National Intelligence Estimate were considered to be proof that Saddam Hussein was working toward building a nuclear program. The Energy Department expressed doubt on the usage of such tubes, and instead determined they were meant for rocket use, copied from the designs of Italian rocket manufacturers. The Federal Joint Atomic Energy Intelligence Committee reportedly requested to have access to the aluminum tubes in order to review their possible purpose; however the CIA denied their request on two separate occasions.

—Dafna Linzer, "CIA Resisted Doubts on Aluminum Tubes Thought to Be for Iraqi Nuke Program," *Washington Post*, 1 April 2005.

29 March 2005

The Senate select committee on U.S. Intelligence releases an unclassified version of a report on the U.S. Intelligence Community's Prewar Intelligence Assessments on Iraq, in which it summarizes the prewar assumptions of the U.S. government on Saddam Hussein's holdings of WMD and further asserts that many of the assumptions

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should not have been concluded from the available intelligence. The report blames spies in the Central Intelligence Agency and Defense Intelligence Agency, as well as information gatherers in the National Security Agency and imagery experts in the Geospatial-Intelligence Agency. Intelligence analysts were also pointed to for the shortcomings of the Intelligence agencies and accused of being too wedded to their assumptions about Saddam's WMD capacity and intentions. The National Intelligence Estimate produced in October 2002 by the National Intelligence Council is cited for false conclusions that Iraq was at the time reconstituting its nuclear weapons program and was actively in pursuit of obtaining nuclear weapons.

The findings of the Iraq Survey Group are also noted, which were published on 30 September 2004 after exhaustive inspections of Iraq's weapons facilities post-invasion and found no proof of the Intelligence Community's pre-war assumptions. These mistakes are attributed to the Intelligence Community's reaction to its underestimation of Iraq's nuclear program and chemical weapons holdings prior to the 1991 Gulf War. The report further claims that in the wake of the terrorist attacks of 11 September 2001, intelligence analysts and gatherers were more wary of underestimating capabilities of the United States' adversaries than they were of hastening to conclusions. Saddam Hussein's actions were also said to be consistent with that of someone who possessed the alleged WMD. In other case studies within the report, intelligence gathered on Libya is commended for its accuracy, in which the state of Libya's nuclear arsenal was assessed correctly and led to a positive outcome.

In general, the Intelligence Assessment report pointed toward a lack of human intelligence as the main reason for the false pre-war assumptions. While too few human sources were utilized for evaluation of Iraq's nuclear capabilities and leadership intentions, the ones that were sought out turned out to be misleading and deceitful, such as the source dubbed "Curveball," whom the CIA relied upon heavily for inside intelligence and later proved to be fabricating his testimony. The concluding consensus of the report expresses the senate committee's dissatisfaction with the competence of the Intelligence Community.

—"Overview of the Report," Report on the U.S. Intelligence Community's Prewar Intelligence Assessments on Iraq, 29 March 2005, www.wmd.gov.

27 March 2005

Iraqi former nuclear scientist Hussein al-Shahristani is named by the United Iraqi Alliance as its candidate for deputy to the parliament speaker.

—"Developments in Iraq," Associated Press, 27 March 2005.

25 March 2005

A presidential commission is preparing a review of 15 U.S. agencies that were involved in the collection and/or assessment of intelligence relating to weapons of mass destruction in Iraq, and is not likely to be complimentary to any of the agencies. The report will assess the reasons why intelligence believed Saddam Hussein was reconstructing Iraq's nuclear program.

—Katherine Shrader, "WMD Commission Prepares to Release Report," Associated Press, 25 March 2005.

20 March 2005

Iraqi newspaper *Al-Furat* publishes a claim that an Israeli delegation has met with Kurdish political leader Jalal

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Talabani. The negotiations are said to have involved the Kurdish desire to establish a nuclear reactor in the north of Iraq for peaceful energy purposes. The members of the delegation from Israel are identified as technical consultants with European passports. The Kurds allegedly plan to begin work on the reactor in the middle of this year.

—"Iraq Kurdish Party Leader, 'Israeli' Nuclear Experts Said in Kurdistan Talks," BBC, 20 March 2005.

18 March 2005

Despite the findings of the Iraq Survey Group, David Kay, the former head of the organization, believes that there was intent in Iraq to continue production of WMD. Due to the continued presence of hundreds of Iraqi scientists known to be 'luminaries' within their fields of nuclear, biological, and chemical weapons, and the return of expatriate Iraqi scientists, the possibility exists of renewed nuclear research. Most nuclear research facilities are not functioning currently, but are instead being maintained for use in the future following reconstruction. However, because such rejuvenated projects will require many resources and much funding, restarting these programs currently remains a remote possibility.

—"Weapons Expertise in Iraq and Iran," *Jane's Intelligence Digest*, 18 March 2005.

9 March 2005

The interim Iraqi government appeals to the United Nations to end the presence of the UN Monitoring, Verification and Inspection Commission and the International Atomic Energy Agency personnel responsible for disposing of the country's alleged nuclear program. Iraq's ambassador to the UN, Samir Sumaidai says UNMOVIC costs Iraq \$12 million annually, and also claims the IAEA will cost them \$12.3 million over the next two years. This money comes out of Iraq's oil revenue, which the country wants to use for reconstruction purposes, rather than funding "irrelevant" UN bodies. UN Security Council members agree that they must begin to examine the future of these bodies in Iraq, but also are hesitant to do so until the permanent Iraqi government is in place.

—"UN Takes No Action on Iraq Inspections," Al-Jazeera, 9 March 2005.

4 March 2005

Hans Blix, the former United Nations chief weapons inspector speaks of Iraq's continued possession of nuclear weapons technical expertise in an epilogue to the new version of his book *Disarming Iraq*, which was originally published in 2004. The additional epilogue expresses Blix's proposal for a less "nuclearized" world. He encourages the idea of a Weapons of Mass Destruction-Free Zone in the Middle East, and cites Iraq's retention of nuclear know-how and possible nuclear future as reasons to push for such a zone.

—Charles J. Hanley, "Iraq Arms Controller Urges Nuke-Free Mideast, Raps 'Misleading' U.S. Leadership," Associated Press, 4 March 2005.

3 March 2005

The United States opposes Mohammed ElBaradei's confirmation to a third term as director-general of the IAEA, citing such reasons as a two-term limitation, as well as not being strong enough on issues with Iran, and his failure to confirm U.S. claims of weapons of mass destruction in Iraq under the Saddam Hussein administration.

—"UN Nuclear Boss Talks Deadlocked," BBC, 3 March 2005.

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18 February 2005

Porter Goss, the new Director of the CIA, warns the Senate Select Committee on Intelligence that the repercussions of the war in Iraq could possibly lead to increased risk in the U.S. due to terrorist acquisition of technology and weapons of mass destruction. He says "those jihadists who survive will leave Iraq experienced and focused on acts of urban terrorism. They represent a potential pool of contacts to build trans-national terrorist cells and networks."

—Sridhar Krishnaswami, "Iraq War Fuelling Terrorism: CIA," *Global News Wire*, 18 February 2005.

17 February 2005

Former head of Iraq's nuclear program under the Saddam Hussein regime, Jafar Dhia Jafar, admonishes the International Atomic Energy Agency for failing to provide adequate resistance in the debate over Iraq's alleged weapons of mass destruction prior to the U.S.-led invasion. Jafar accuses the IAEA of bowing to U.S. pressure when the agency should have made stronger assurances to the U.N. Security Council on nuclear disarmament in Iraq.

—"IAEA Should Have Stood Up to U.S., Says Former Iraqi Official," *Deutsche Press-Agentur*, 17 February 2005.

13 February 2005

Recent findings by Pakistan's Inter-Services Intelligence agency reveal that Dr. A. Q. Khan, the country's lead nuclear scientist currently under house arrest in Islamabad, at one time had approached Saddam Hussein's regime with an offer to sell Baghdad nuclear technology. One ISI official claims Baghdad seemed interested and agreed initially, only to back out later citing suspicion of possible US involvement in the solicitation, which would implicate the Iraqis of having the desire to develop nuclear weapons technology.

—Massoud Ansari, "Our Man Sold Secrets to Iran, Admits Pakistan," *The Telegraph*, 13 February 2005.

1 February 2005

The CIA releases an unusual report officially disavowing those assessments that it made prior to the invasion of Iraq due to subsequent findings that disprove such notions. The report, dated 18 January 2005, is titled "Iraq: No Large-Scale Chemical Warfare Efforts since Early 1990s" and claims Iraq gave up its chemical and nuclear weapons programs in 1991. The report is considered unusual by the intelligence community due to the fact that the CIA generally does not contradict prior intelligence estimates. The Iraq Survey Group provided the information for the report, and David Kay, former head of the team, asserts "we were almost all wrong."

—Greg Miller, "CIA Corrects Itself on Arms," *Los Angeles Times*, 1 February 2005.

27 January 2005

Former United Nations senior weapons inspector in Iraq from 1991 to 1998, Scott Ritter, criticizes the invasion of Iraq and blames politicians, as well as media and the public for embarking upon an illegal war. He accuses the Bush administration of dismissing Iraqi declarations of WMD holdings as lies, as well as advertising fabricated information about such holdings, and "spinning" data found by the Iraq Survey Group in order to further the purposes of the White House.

—Scott Ritter, "Criminals the Lot of Us. The Invasion of Iraq Was a Crime of Gigantic Proportions, for Which Politicians, the Media and the Public Share Responsibility," *The Guardian*, 27 January 2005.

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27 January 2005

Jafar Dhia Jafar, commonly known as the father of Iraq's nuclear program, says his country's pursuit of nuclear weapons ended with the invasion of Kuwait in 1991. Jafar asserts he was three years away from achieving nuclear capabilities at the time, with a team of about 8,000 people involved in the nuclear program, but Operation Desert Storm prevented further developments.

—Doug Mellgren, "1991 Gulf War Stopped Baghdad's Atomic and Biological Weapons, Top Iraqi Scientist Says," Associated Press, 27 January 2005.

12 January 2005

With the hunt for weapons of mass destruction in Iraq discontinued, the Iraq Survey Group's 30 September 2004 report, which maintains there are no stockpiles of chemical, biological, or nuclear weapons in Iraq, is considered the definitive account of the CIA's findings. The search lasted until this date due to the administration's suspicion that weapons had been taken out of Iraq or hidden well within the country; however intelligence officials have come to the conclusion that such speculation is highly unlikely.

—Dafna Linzer, "Search for Banned Arms in Iraq Ended Last Month; Critical September Report to be Final Word," *Washington Post*, 12 January 2005.

12 January 2005

United States intelligence officials confirm the search for weapons of mass destruction has been brought to a halt. US chief investigator for the Iraq Survey Group, Charles Duelfer reported in 2004 that his team had found no stockpiles of chemical, biological, or nuclear weapons at the time of the US-led invasion, and now asserts they have not found any since. The belief in the existence of such a stockpile had been the main reason cited for the war in Iraq.

—"US Gives up Search for Iraq WMDs," *BBC*, 12 January 2005.

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2004-2003

21 December 2004

Iraqi nuclear scientist and Municipal Council member Dr. Talib Ibrahim Zahir is assassinated by an unidentified gunman in Kharnabat, Iraq. Before his death, Dr. Zahir had been an employee of Diyala University.

—"US Troops Injured in Blast; Iraqi Nuclear Scientist 'Assassinated,'" *Al-Jazeera*, 21 December 2004.

4 November 2004

IAEA Director-General Mohammed ElBaradei criticizes both the Bush administration for its handling of Iraq and the UN Security Council for practicing double standards in its approach to proliferation issues. ElBaradei says that pre-war inspections were working in Iraq and that the IAEA has been proven correct in assessing Iraq did not possess a nuclear weapons program. He also calls for new efforts to bolster the Nuclear Non-Proliferation Treaty, including by introducing a mechanism to keep non-nuclear weapon states from developing the means to enrich uranium. They are allowed to do so under the current NPT agreement, with the caveat that such enrichment occur only for

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peaceful purposes. He argues this has created facilities which quickly can be transformed into weapons-grade enrichment programs.

—Robert Collier and James Sterngold, "Top U.N. arms inspector slams Bush," *San Francisco Chronicle*, 5 November 2004.

3 November 2004

A group of US Army reservists and National Guardsmen claim they witnessed looting at the Al-Qaqaa military installation in the weeks following the fall of Baghdad. The soldiers say they were among approximately one dozen troops guarding the facility. According to the soldiers, their requests to commanders for additional troops to secure the facility went unheeded. They also say that due to the small size of their contingency, they were unable to prevent looters from pilfering material under their watch. They describe Iraqis in Toyota trucks plundering explosives from the unsecured bunkers.

—Mark Mazzetti, "Soldiers Describe Looting of Explosives," *Los Angeles Times*, 4 November 2004.

29 October 2004

The Pentagon releases an aerial photo showing two semi-trailers situated outside a weapons bunker at the Al-Qaqaa facility two days prior to the start of the March 2003 war. It is unclear which bunker the trucks are parked in front of, or what if anything was being loaded into them. The Pentagon also reports that US Army soldiers removed approximately 250 tons of material from the Al-Qaqaa facility in April 2003, although officials are unable to confirm exactly what material was taken from the storage bunkers.

—Jonathan Landay, "Trucks linked to missing explosives," *Daily Telegraph*, 30 October 2004; Bradley Graham and Colum Lynch, "Pentagon: Army Took Munitions," *Washington Post*, 30 October 2004.

27 October 2004

An affiliate station in the ABC television network in the United States broadcasts a videotape of a television crew with American troops at the Al-Qaqaa military installation on April 18, nine days after the fall of Baghdad. The videotape shows a massive supply of explosives still on hand at the facility at that time. It is unclear if the explosives captured on camera were in fact those now missing from the facility. However, images of what appears to be an IAEA seal across the doors of one bunker suggests that the bunker may have contained HMX, as this was the only material under such seal when the IAEA left Iraq prior to the onset of the war, according to the IAEA.

—William J. Broad and David E. Sanger, "Video Shows G.I.'s at Weapon Cache," *New York Times*, 29 October 2004.

26 October 2004

White House officials reassert that the missing conventional explosives from Al-Qaqaa military installation were not on hand when soldiers from the Army's 101st Airborne Division visited the complex on 10 April 2003, which was the day after coalition forces took over Baghdad. In an interview, however, the unit's commander says his troops did not search the site during that visit and are thus unable to comment as to whether the explosives were there at that time.

—Jim Dwyer and David E. Sanger, "No Check of Bunker, Unit Commander Says," *New York Times*, 27 October 2004.

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25 October 2004

The Pentagon says the 380 tons of explosives missing from the Al-Qaqaa military installation in Iraq were removed sometime over a 2-1/2 month period during the spring of 2003. This period of time includes several weeks before and after Baghdad fell to US-led forces.

—Bradley Graham, "U.S. Thinks Explosives Vanished in Spring '03," *Washington Post*, 27 October 2004.

25 October 2004

Former chief inspector of the Iraq Survey Group David Kay says that he believes the missing explosives were removed from the Al-Qaqaa facility sometime in April or May 2003 immediately following the war.

—Mark Mazzetti and Maggie Farley, "The Conflict in Iraq: White House Downplays Missing Iraq Explosives," *Los Angeles Times*, 26 October 2004.

25 October 2004

The IAEA and the White House confirm that large quantities of conventional explosives including RDX, PETN, and HMX are missing from the Al-Qaqaa military installation. Some of this material was under UN seal prior to the US-led invasion. An IAEA spokeswoman says that the Iraqi government has said the material was removed due to a lack of security. According to reports, the IAEA was notified about the missing material by the Iraqi government around October 10.

—Colum Lynch and Bradley Graham, "Iraqi Explosives Missing, U.N. Is Told," *Washington Post*, 26 October 2004; Mark Mazzetti and Maggie Farley, "The Conflict in Iraq: White House Downplays Missing Iraq Explosives," *Los Angeles Times*, 26 October 2004; Charles Clover and Guy Dinmore, "Tonnes of explosives missing in Iraq," *Financial Times* (London), 26 October 2004.

Mid-October 2004

Reports emerge that the Iraqi interim government has warned the United States and other international parties about approximately 380 tons of high-powered conventional explosives--mainly HMX and RDX--that are missing from the Al-Qaqaa military installation. These explosives are used by countries around the world to destroy buildings, fabricate missile warheads and detonate nuclear weapons. The Al-Qaqaa facility is a large site where the former regime stored massive amounts of military equipment and materials. The facility and its contents were under the supervision of the IAEA prior to the US-led invasion, and the US military was responsible for its control following the 2003 war.

—James Glanz, William J. Broad and David E. Sanger, "Huge Cache of Explosives Vanished From Site in Iraq," *New York Times*, 25 October 2004.

13 October 2004

Iraqi staff at the Tuwaitha nuclear complex provides tours of the facility to journalists in an effort to counter reports that large quantities of equipment are missing from nuclear facilities in Iraq. This tour includes a visit to "Location C", where 550 tons of yellowcake uranium and other nuclear materials have been logged and stored by the IAEA. Journalists are also shown a hole in the barbed wire near to the Location C building. In addition, workers at the facility interviewed by journalists say that since the war, Americans have removed far more equipment and materials from the facility than did Iraqi looters. They also say that employees of the US firm Raytheon have been

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spotted at the facility trying to account for looted items.

—Charles Clover, "Inside Iraq's 'looted' nuclear reactor site," *Financial Times*, 14 October 2004.

13 October 2004

Rashad Omar, technology minister in Iraq's interim government, says that although US troops secured sensitive nuclear facilities soon after the war began, missing equipment from nuclear plants was removed by looters in the time immediately after the US-led invasion began. He adds that while he has no information to confirm reports about buildings being torn down in the past at the Tuwaitha site, eight buildings are currently being renovated there in an effort to transform the site into a science and technology park where peaceful research will take place.

—"No WMD but has nuclear equipment gone to terrorists?" *Herald* (Glasgow), 13 October 2004.

13 October 2004

The BBC reports that former chief UN weapons inspector Hans Blix and former chief Iraq Survey Group (ISG) inspector David Kay both believe the coalition's loss of control over Iraq's nuclear facilities following the 2003 invasion is scandalous. Kay reportedly added, however, that the loss of nuclear-related equipment and material is not by itself dangerous, because such items are often legally available outside of Iraq.

—"Iraq nuclear losses 'a scandal'," BBC News, 13 October 2003, www.news.bbc.co.uk.

11 October 2004

The IAEA expresses concern that missing Iraqi nuclear-related equipment and materials may be sold to groups or countries interested in producing nuclear weapons. The IAEA says US-led coalition forces failed to notice that equipment and materials have been disappearing from Iraq since the start of the 2003 war. An IAEA spokesman says that dual-use items were "systematically removed" from facilities the IAEA monitored prior to the war.

—Louis Charbonneau, "U.N. fears bombmakers may get Iraq nuke items - diplomats," Reuters, 12 October 2004.

30 September 2004

The Iraq Survey Group (ISG) releases a comprehensive report detailing its findings related to Iraq's weapons of mass destruction programs. In it, the ISG reports that Saddam Hussein wanted to recreate Iraq's weapons of mass destruction capabilities after sanctions were removed. Inspectors also believe that while Hussein aspired to develop a nuclear weapons capability, his post-sanction planning was more geared toward the development of ballistic missiles and tactical chemical warfare capabilities. Among its other findings, the ISG says Saddam Hussein ended Iraq's nuclear program following the first Gulf War in 1991. No evidence suggests a coordinated effort to restart that program thereafter. Hussein did, however, express his intent to maintain the intellectual capital that had developed within the nuclear program prior to 1991, but the ISG found that this was in a process of decay in successive years. Iraq also sought to conceal elements of its program from inspectors following the 1991 war. The regime's secretive efforts included concealing and preserving documents related to the nuclear program, hiding technology, and transferring many nuclear scientists to jobs in Iraq's Military Industrial Commission (MIC) where they would maintain their weapons knowledge and gain ongoing hands-on experience. In addition, the ISG report states that specific projects, including efforts to build a rail gun and copper vapor laser, might have been useful in future activities aimed at restarting a nuclear weapons program, but they did not uncover evidence of such a purpose. The report also concludes that Saddam Hussein purposefully sought to spread ambiguity about his

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weapons of mass destruction capabilities. According to interviews conducted by the ISG, he privately told his aides that he sought to deceive the world about his weapons capabilities in order to avoid appearing weak as well as to deter aggression from Iraq's neighbors, especially Iran. However, the inspectors' analysis concludes that the regime never reconciled the inherent contradiction between international demands for disarmament and this desire to maintain a strategic deterrent.

—"Comprehensive Report of the Special Advisor to the DCI on Iraq's WMD," Central Intelligence Agency, 30 September 2004, www.cia.gov.

6 July 2004

The US Department of Energy announces that US authorities have seized approximately 1,000 sources of radioactivity and two tons of low-enriched uranium from the Tuwaita nuclear research center in Iraq. These items are being shipped to an unidentified location in the United States. Officials also say that some of the "less sensitive" materials at the center were left there.

—Matthew L. Wald, "Radioactive Material Seized From a Nuclear Plant in Iraq," *New York Times*, 7 July 2004.

14 April 2004

IAEA Director General Mohammed El-Baradei circulates a letter to the UN Security Council that says equipment, contaminated scrap, and even buildings where radioactive materials were monitored prior to the war in Iraq, have disappeared. He also states in the letter that it remains unclear whether the disappearance of these items was the result of a systematic effort or looting. Meanwhile, visits to other countries and satellite imagery have together shown that scrap, some of it contaminated from sites previously monitored by the IAEA, was transported out of Iraq.

—"Contaminated Scrap Missing From Iraq," *Los Angeles Times*, 15 April 2004; Mark Turner, "IAEA raises fears on Iraq nuclear sites," *Financial Times*, 15 April 2004.

30 March 2004

Iraq Survey Group (ISG) chief inspector Charles Duelfer testifies before the US Congress. He says that the ISG has developed information which suggests Iraq maintained an interest in both preserving and expanding its knowledge base related to the development of nuclear weapons. According to Duelfer, one indicator of this interest is a high-speed rail gun program conducted under the direction of two senior scientists who were associated with Iraq's nuclear weapons program before the first Gulf War. Documents obtained from the scientists' office demonstrate an important incongruity between the ostensible purpose of this research and the actual speeds of the rail gun being developed. Other documents discovered in the office also describe diagnostic techniques which are important for nuclear weapons experiments. These include x-ray radiography, high-speed photography, and laser velocimetry. In addition, Duelfer notes that the ISG has expanded its areas of focus to include an investigation of the regime's intent.

—"Testimony to the US Congress by Mr. Charles Duelfer," Central Intelligence Agency, 30 March 2004, www.cia.gov.

2 October 2003

In his testimony on the interim progress of the Iraq Survey Group (ISG) given to members of the US House of

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Representatives, chief inspector David Kay says the ISG has determined from the testimony of Iraqi scientists and senior government officials that Saddam Hussein remained firmly committed to acquiring nuclear weapons. In addition, Kay reports that Iraq took action to preserve some technological capability from its pre-1991 nuclear weapons program. Kay also says that inspectors have not yet uncovered evidence demonstrating Iraq took significant post-1998 steps towards building nuclear weapons or producing fissile material.

—"Statement by David Kay on the Interim Progress Report on the Activities of the Iraq Survey Group (ISG) Before the House Permanent Select Committee on Intelligence, the House Committee on Appropriations, Subcommittee on Defense, and the Senate Select Committee on Intelligence," Central Intelligence Agency, 2 October 2003, www.cia.gov.

6 July 2003

Former American ambassador Joseph C. Wilson publishes an editorial in the *New York Times* in which he states that some of the information used by the Bush administration to build support for the invasion of Iraq was exaggerated. Specifically, Wilson refers to the administration's claims about Iraq's purported attempt to buy uranium yellowcake in Africa. Wilson identifies himself as the individual that the Central Intelligence Agency (CIA) sent to Niger in early 2002 to investigate an intelligence report related to this allegation. The CIA informed him that the intelligence report referred to a memorandum of agreement from the late 1990s, although Wilson never saw the report itself. He also writes that the CIA told him Vice President Dick Cheney's office had questioned the intelligence report and were awaiting further details about it. Wilson's investigation ultimately found it unlikely that any such agreement existed or transfer took place. He, in turn, filed a report detailing these findings upon his return from Niger. He says he was dismayed in subsequent months, however, when the Bush administration joined a British report in citing Iraq's attempts to procure uranium yellowcake from Niger as evidence of Saddam Hussein's ongoing nuclear ambitions.

—Joseph Wilson, "What I Didn't Find in Africa," *New York Times*, 6 July 2003.

25 June 2003

An American official says that the former head of Iraq's centrifuge uranium-enrichment program, Mahdi Shukur Ubaydi, has given the Central Intelligence Agency (CIA) documents and parts related to Iraq's nuclear program, which Ubaydi had concealed for 12 years. The documents were reportedly hidden beneath a rose bush in a garden next to Ubaydi's home. According to Ubaydi, Iraq's senior leadership ordered that the documents be concealed so as to preserve the regime's ability to restart efforts to build a centrifuge enrichment capability sometime in the future.

—"After the War; Old Nuclear Parts Are Turned Over in Iraq," *New York Times*, 26 June 2003.

7 June 2003

UN nuclear inspectors arrive in Iraq for the first time in three months to evaluate the damage caused by looting at the Tuwaitha nuclear research center.

— "Nuclear Agency Returns to Iraq; U.N. Team's Task Is at Looted Plant," *Washington Post*, 7 June 2003.

29 May 2003

US military officials in Iraq notify the IAEA that its inspectors will be barred from entering the Tuwaitha nuclear

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research center when they arrive in the country next week. Moreover, according to the IAEA, the inspectors will eventually be permitted to perform only the minimum extent of checks required by international law, which amounts to conducting an inventory of one small area at the center where radioactive material was stored before the war. The inspectors will not be permitted to conduct an investigation of public health claims linked to the looting of nuclear materials from the center, nor will they be involved in the hunt for weapons of mass destruction.
—Julian Borger, "Iraq: after the war: Looting inquiry ban on nuclear inspectors," *Guardian*, 30 May 2003.

20 May 2003

According to a US State Department official, the United States has commenced discussions with the IAEA to facilitate the return of IAEA inspection teams to Iraq. The IAEA inspectors will be charged with ascertaining what may have been pilfered from nuclear-related sites. The discussions are taking place one day after IAEA Deputy General Mohammad El-Baradei issued a statement expressing concern about vulnerable nuclear and radioactive materials in Iraq, especially at the Tuwaitha nuclear research center. US Defense Secretary Donald Rumsfeld states that the Pentagon has "no problem with" the return of UN inspectors to Iraq.

—Walter Pincus, "U.S., IAEA Negotiate Sending Teams to Iraq; Agency Concerned About Nuclear Sites," *Washington Post*, 21 May 2003; Julian Borger, "Iraq: after the war: US dirty bomb fears after nuclear looting," *Guardian*, 21 May 2003.

14 April 2003

A US official speaking on the condition of anonymity says top Iraqi nuclear scientist J'affar Dhia J'affar is in US custody. He reportedly turned himself in to coalition forces.

—"Nuclear scientist surrenders to US," *Australian*, 15 April 2003.

11 April 2003

The IAEA says it has asked the United States to secure the Tuwaitha nuclear research center in Iraq after US forces detected high levels of radioactivity at the site on 10 April. IAEA Director General Mohammad El-Baradei says that Washington responded by agreeing to guard the complex and restrict access to it. El-Baradei also notes that some high radiation levels are normal at Tuwaitha since Iraq was permitted to retain uranium there under UN resolutions.

—"Nuclear facilities closely watched," *Gazette*, 12 April 2003; Christopher Adams and Mark Huband, "US engineers draw another blank over suspected weapons site," *Financial Times*, 12 April 2003.

10 April 2003

A US Army unit arrives at Iraq's main nuclear research center, the Tuwaitha facility 30km south of Baghdad, to measure radiation levels after a Marine engineering company discovered the site had been abandoned and infiltrated by looters following the recent fall of Saddam Hussein's regime. The Army determines that the radiation levels exceed safety limits. Responding to this discovery, IAEA Director General sends the US government a letter noting the immediate need to secure the Tuwaitha site.

—Walter Pincus, "U.S., IAEA Negotiate Sending Teams to Iraq; Agency Concerned About Nuclear Sites," *Washington Post*, 21 May 2003.

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19 March 2003

The onset of Operation Iraqi Freedom and subsequent invasion and occupation of Iraq by US-led coalition forces. One of the main rationales for this military operation is rooted in the belief that Saddam Hussein's regime had been deceiving the international community and hiding its WMD arsenals and capabilities.

7 March 2003

In a report to the UN Security Council, the IAEA states that in recent weeks Iraq has provided it with considerable documentation related to issues of particular concern. The report also says IAEA inspectors have concluded that it is unlikely Iraq sought high-strength aluminum tubes for a centrifuge program, as the Bush administration claims. With regard to Iraq's efforts to import high-strength permanent magnets or develop the capability to produce them indigenously, the IAEA concludes none of the magnets or magnet production plans that Iraq has declared could be used specifically in a centrifuge magnetic bearing. The report notes, however, that Iraq does possess the technical know-how and capability to manufacture magnets suitable for enrichment centrifuges, and therefore the IAEA plans to continue monitoring developments in this area. In terms of uranium acquisition, the IAEA has concluded that controversial documents purportedly proving Iraq tried to acquire enriched uranium from Niger are inauthentic. The IAEA report also states that there is no indication of resumed nuclear activities at Iraqi facilities identified in satellite imagery as having been reconstructed or newly built, and there is no sign of other proscribed nuclear-related activities at IAEA inspected sites.

—"The Status of Nuclear Inspections in Iraq: An Update," International Atomic Energy Agency at the Meeting of the United Nations Security Council, 7 March 2003.

14 February 2003

IAEA Director General Mohammed El-Baradei issues an interim report to the UN Security Council on inspectors' activities related to Iraq's nuclear program. Among the developments since the IAEA's last report three weeks ago, the IAEA has determined that Iraq's procurement of the dual-use carbon-fiber material was not for use in a nuclear program. However, efforts to identify the intended purpose for high-strength aluminum tubes continue. The report also states that the IAEA has reviewed 2,000 pages found at the home of a nuclear scientist on 16 January and assessed these papers do not contain information that changes the IAEA's past assessments of Iraq's nuclear programs.

—"The Status of Nuclear Inspections in Iraq: 14 February 2003 Update," IAEA Director General Dr. Mohammed El-Baradei, 14 February 2003, www.un.org.

5 February 2003

Speaking at a meeting of the UN Security Council, Secretary of State Colin Powell charges that Saddam Hussein remains determined to acquire nuclear weapons. Powell says Hussein has made secretive attempts to procure highly specialized aluminum tubes that can be used in centrifuges for enriching uranium. He also points to Iraq's efforts to acquire magnets and high-speed balancing machines, both of which can be used in a uranium enrichment gas centrifuge program. Powell says that he believes these procurement efforts reflect Iraq's desire to reconstitute its nuclear weapons program, namely by creating an indigenous capability to produce fissile material. Powell also notes that Saddam Hussein has focused increased attention on Iraq's scientific community during the past 18 months, a group that includes Iraq's nuclear community.

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—"Remarks to the United Nations Security Council," Secretary of State Colin Powell, 5 February 2003, www.state.gov.

3 February 2003

A former high-ranking Iraqi nuclear scientist says the United States is purposely exaggerating the potential risk from Iraq's alleged nuclear program. Downplaying the threat, scientist Imad Khadduri claims that the 1991 Gulf War effectively destroyed Iraq's nuclear program and that the country has since lacked the qualified management team necessary to resurrect the dormant program. Khadduri is now living in Canada where he teaches computer science at a Toronto college.

—Jeffrey Hodgson, "Iraq has no nuclear weapons, former top scientist says," *Ottawa Citizen*, 4 February 2003.

30 January 2003

The United States discloses some of the evidence it intends to present to the UN Security Council as proof that Iraq continues its nuclear weapons program. The evidence includes declassified intelligence relating to the controversial purchase of aluminum tubes, which the United States claims were to be used to build centrifuges to enrich uranium. Specifically, the materials offer details about the unusual strength and design specificity of the tubes that the Iraqis ordered, as well as the surprisingly high price the Iraqis paid for the shipment and the great lengths they went to avoid international detection of the shipment.

—Roland Watson and Elaine Monaghan, "US says aluminum tubes are evidence of Iraq's nuclear goal," *Times* (London), 31 January 2003.

29 January 2003

US President George W. Bush delivers his annual State of the Union address. In the speech, Bush promises to lead a coalition to disarm Iraq if Saddam Hussein does not do so by his own accord. Bush also says the British government has learned that Saddam Hussein attempted recently to acquire substantial quantities of uranium from Africa. In addition, according to Bush, US intelligence sources have reported that Hussein has sought to purchase high-strength aluminum tubes that are suitable for nuclear weapons production.

—"President's State of the Union Address to Congress and the Nation," *New York Times*, 29 January 2003.

16 January 2003

UN inspectors discover documents related to Iraq's nuclear program at the home of Iraqi physicist Faleh Hassan. The documents are discovered as the inspectors begin making unannounced visits to private homes of interest in Iraq. The documents at Dr. Hassan's house appear to be related to laser enrichment, which could be used to enrich uranium for nuclear weapons. Experts disagree about the significance of the find, however, as it is unclear whether the documents are decades-old or part of an official research program conducted by the Iraqi nuclear regime. Dr. Hassan, who is the director of the Al-Razi military industrial facility, claims the documents reflect his private research work and the graduate work of students he supervised.

—George Jahn, "Countdown to War: Iraq: Nuclear Data Found in Scientist's Home," *Independent*, 19 January 2003.

9 January 2003

IAEA Director General Mohammad El-Baradei says he finds credible Iraq's claim that it sought high-strength

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aluminum tubes for use in building 81mm rockets, not for a centrifuge system to enrich uranium as the Bush administration has accused.

—Michael R. Gordon, "Threats and Responses: Nuclear Technology; Agency Challenges Evidence Against Iraq Cited by Bush," *New York Times*, 10 January 2003.

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2002-1992

25 November 2002

UN inspectors arrive in Baghdad to begin inspections.

—Richard C. Hottelet, "Inspectors Due Monday, Hussein Inspects Remaining Trump Cards," *Christian Science Monitor*, 18 November 2002, www.lexis-nexis.com; James Dao, "U.N. Inspectors Arrive in Iraq," *New York Times*, 25 November 2002, www.nytimes.com.

14 November 2002

The UN Security Council enacts Resolution 1441 demanding that Iraq comply with its obligations to disarm as required by this resolution and other UN Security Council resolutions.

—David Albright and Corey Hinderstein, "Now for the Hard Part: Implementing Strengthened Inspections in Iraq," Institute for Science and International Security, 14 November 2002, www.isis-online.org.

9 September 2002

Institute for Science and International Security (IISS) Director Dr. John Chipman notes the following regarding the Iraq's current nuclear capacity: (1) Iraq does not possess facilities to produce fissile material in sufficient amounts for nuclear weapons; (2) Iraq would require several years and extensive foreign assistance to build such fissile material production facilities; (3) It could, however, assemble nuclear weapons within months if fissile material from foreign sources were obtained; and (4) It could divert domestic civil-use radioisotopes or seek to obtain foreign material for a crude radiological device.

—Dr. John Chipman, "Iraq's Weapons of Mass Destruction: A Net Assessment," *IISS Strategic Dossier*, 9 September 2002.

Mid-June 2002

Procurement agents from Iraq's covert nuclear-arms program are detected as they attempt to purchase stainless-steel tubing, that could used in gas centrifuges and a key component in making nuclear bombs. [Stainless-steel tubing is considered "dual-use" with non-nuclear uses for developing artillery, anti-tank rockets, and multiple rocket launch systems. Thus, the dispute is whether enough evidence exists to state that the tubes were definitely ordered for the gas centrifuge program.]

—Bill Gertz, "Iraq Seeks Steel Used to Make Nukes," *Washington Times*, 26 July 2002; "Aluminum Tubing Is an Indicator of an Iraqi Gas Centrifuge Program: But Is the Tubing Specifically for Centrifuges," Institute for Science and International Security, 9 October 2002, www.isis-online.org.

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6 February 2002

Director of Central Intelligence George J. Tenet testifies before the Senate Select Committee on Intelligence. He says, "We believe Saddam never abandoned his nuclear weapons program. Iraq retains a significant number of nuclear scientists, program documentation, and probably some dual-use manufacturing infrastructure that could support a reinvigorated nuclear weapons program. Baghdad's access to foreign expertise could support a rejuvenated program, but our major near-term concern is the possibility that Saddam might gain access to fissile material."

—Anthony H. Cordesman, "The Military Balance in the Gulf," Center for Strategic and International Studies, 38 June 2002.

15 April 2001

Iraqi scientist Hussein al-Shahrastani, who escaped from an Iraqi prison in 1991, affirms that Saddam Hussein would have been able to produce a nuclear bomb, had he delayed the invasion of Kuwait by six months. Al-Shahrastani also asserts that Iraq still maintains a nuclear weapons program saying, "I know very well that the Iraqi regime had built and laid the foundation for nuclear installations. It had also developed a nuclear program under Jabal Himrin in northern Iraq. This project was extremely secretive, and the inspection committees did not visit it. No information is available about it or about the equipment and installations that exist there. The information I have is that Iraq is currently developing its atomic program at the nuclear installations under Jabal Himrin and not at the nuclear research center in the Al-Tuwaythah district where such facilities no longer exist." [Khidhir Hamza also concurs with the assertion that Saddam's invasion of Kuwait thwarted an Iraqi nuclear bomb, writing in his book, "[N]ow we had all the pieces in place to make it [a bomb] work, I assured [Hussein] Kamel. The bomb was in sight. The only problem was Saddam. On August 2, he invaded Kuwait. And everything came to a halt."]

—Mu'add Fayyad, "Iraqi Nuclear Scientist Reveals Iraq's Nuclear Installations, Capabilities," *Al-Sharq al-Awsat* (London), 15 April 2001; cited in FBIS 20010415000047; "Interview with Husayn Shahrastani," *al-Majalla* (London), 28 January-3 February 1996.

September 2000

Saddam Hussein publicly exhorts his "Nuclear Mujahidin" to "defeat the enemy," contributing to the growing concern about a reconstituted Iraqi nuclear weapons program.

—Bill Gertz, "Iraq Seeks Steel Use to Make Nukes," *Washington Times*, 26 July 2002.

25 January 2000

IAEA inspectors resume nuclear inspections in Iraq.

—Barbara Crossette, "Iraq to Allow Nuclear Inspections Again," *New York Times*, 13 January 2000.

12 January 2000

Iraq reports that it will allow inspectors from the IAEA visit Iraq to inspect its stockpiles of uranium.

—Barbara Crossette, "Iraq to Allow Nuclear Inspections Again," *New York Times*, 13 January 2000.

December 1999-October 2002

UNMOVIC screens Iraqi contracts pursuant to UN Security Council Resolution 1284 and finds more than 100

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contracts containing dual-use items that could be diverted into WMD programs.

—U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 25.

17 December 1999

In an attempt to enforce Iraqi compliance with UN disarmament and monitoring obligations, the UN Security Council passes Resolution 1284, reaffirming all previous UN Security Council resolutions, disbanding UNSCOM, and establishing the UN Monitoring Verification and Inspection Commission (UNMOVIC). Iraq denounces the resolution on the grounds that it does not set a clear timetable or criteria for lifting sanctions.

—Dr. John Chipman, "Iraq's Weapons of Mass Destruction: A Net Assessment," *IISS Strategic Dossier*, 9 September 2002; U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 4; "Iraq's Weapons of Mass Destruction—The Assessment of the British Government," www.ukonline.gov.uk, p. 41.

25 August 1999

A classified US White House Report concerning Iraq's weapons of mass destruction (WMD) programs is sent to Congress. The reports states that US intelligence is monitoring activities at Iraqi facilities "capable of producing WMD and long-range ballistic missiles." It is also examining possible Iraqi efforts to covertly purchase dual-use materials, substances and technologies that have both civilian and weapons applications.

—Matthew Campbell, "West Fears Saddam is on Brink of Building Nuclear Missile," *Sunday Times* (London), 5 September 1999, www.sunday-times.co.uk; Jonathan S. Landay, "Is Iraq Building Weapons Again," *Christian Science Monitor*, 30 August 1999, p. 1.

17 August 1999

IAEA Director-General Hans Blix says that there is evidence that Iraq is close to producing an operational nuclear weapon.

—Touraj Shiralilou, "Defuse Saddam," *Iran Daily* (Tehran), 17 August 1999, www.iran-daily.com.

15 June 1999

German engineer Karl-Heinz Schaab confesses to illegally selling blueprints for a gas ultra-centrifuge to Iraqi buyers in September 1989. [Later, he pays a \$32,000 fine and receives a five year suspended sentence in Germany.]

—Robert Jaquet, "Construction Plans Sold to Iraq," *Süddeutsche Zeitung* (Munich), 16 June 1999, www.sueddeutsche.de; "Six Years Jail Time Demanded for Nuclear Spy," *Taz* (Munich), 22 June 1999, www.taz.de; Jonathan Rhodes, "Saddam's Nuclear Quest: 1980-1991," *efreedomnews*, 22 September 2002, www.efreedomnews.com.

16-19 December 1998

A few hours after the withdrawal of UN weapons inspectors, the United States and the United Kingdom launch Operation Desert Fox that targets industrial facilities related to Iraq's ballistic missile program and a suspected biological warfare facility as well as military airfields and sites used by Iraq's security organizations that are involved in its WMD programs.

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—Anthony H. Cordesman, "The Military Balance in the Gulf," Center for Strategic and International Studies, 28 June 2002; "Iraq's Weapons of Mass Destruction-The Assessment of the British Government," www.ukonline.gov.uk, p. 40.

16 December 1998

Iraq ousts UN inspectors and prohibits Security Council-mandated monitoring overflights of Iraq facilities by UN aircrafts. Consequently, IAEA inspectors leave Iraq while stating that they are confident that Iraq's indigenous nuclear weapons program has not produced more than a few grams of weapons grade material.

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; Dr. John Chipman, "Iraq's Weapons of Mass Destruction: A Net Assessment," *IJSS Strategic Dossier*, 9 September 2002; US Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 5.

9 September 1998

The UN Security Council enacts Resolution 1194 condemning Iraq's decision to suspend cooperation with UNSCOM, deeming Iraq's actions as a totally unacceptable contravention of its obligations. It also demands that Iraq rescind its decision and decides not to conduct the 60-day sanctions reviews until Iraq does so.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

Spring 1998

Iraq produces a document containing a summary of the technical achievements of its crash program which the IAEA regards to be consistent with its own assessment of the Iraqi crash program.

—"IAEA and Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org.

2 March 1998

The UN Security Council enacts Resolution 1154 demanding 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.

—U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 4.

1998

Iraq recalls its experienced nuclear scientists from Iraqi universities and civilian scientific centers to its nuclear program.

—"Iraq's Weapons of Mass Destruction-The Assessment of the British Government," www.ukonline.gov.uk, p. 24.

12 November 1997

The UN Security Council enacts Resolution 1137 condemning the continued violation by Iraq of its obligations, including its unacceptable decision to seek to impose conditions on cooperation with UNSCOM. It also imposes a travel restriction on Iraqi officials who are responsible for, or participated in the instances of non-compliance.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

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November 1997

Iraq's Deputy Prime Minister Tariq Aziz pays Russian Prime Minister Yevgeny Primakov \$800,000 for strategic materials from Moscow to build up its nuclear weapons stockpile.

—Seymour Hersh, "Saddam's Best Friend," *New Yorker*, 5 April 1999, www.shmoo.com.

23 October 1997

The UN Security Council enacts Resolution 1134, which demands that Iraq cooperate fully with the Special Commission, continues the suspension of the periodic sanctions reviews and foreshadows additional sanctions pending a further report on Iraq's cooperation with UNSCOM.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

21 June 1997

The UN Security Council enacts Resolution 1115 condemning Iraq's actions, and demands that Iraq allow UNSCOM immediate, unconditional and unrestricted access to any sites for inspection and officials for interviews by UNSCOM. The Council also calls for an additional report on Iraq's cooperation with the Commission and suspends the periodic sanctions review.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

12 June 1996

The UN Security Council enacts Resolution 1060 demanding that Iraq cooperate with UNSCOM and allow inspection teams immediate, unconditional, and unrestricted access to facilities for inspection and access to Iraq officials for interviews. [In reality, however, Iraq 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.]

—U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 4.

27 March 1996

The UN Security Council enacts Resolution 1051 requiring UN members to provide the 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. [Later, Iraq continues to negotiate contracts for procuring dual-use items with WMD application outside of UN controls.]

—U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 4.

8 February 1996

In an interview with *Al-Majallah*, Iraqi nuclear scientist Hussein al-Shahristani reveals that Saddam Hussein changed the peaceful nature of Iraq's nuclear program soon after taking power in July 1979 and instructed all scientific facilities to develop nuclear weapons. Al-Shahristani describes how Iraq has come close to enriching uranium to 93 percent with assistance from Western companies. He describes how during the 1980s, Iraq established 15 "major nuclear installations" capable of enriching uranium through centrifuge, electromagnetic

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separation (EMIS), and laser techniques. Western companies helped the Iraqi military develop complex detonation devices crucial to the successful explosion of a nuclear weapon. Al-Shahristani asserts that scientists who worked on the Iraqi nuclear weapons program are, for the most part, still in Iraq. [Al-Shahristani escaped detention in Iraq during the Gulf war. The date and location of this interview is not given.]

—"Scientist Views Iraq's, Iran's Nuclear Programs," FBIS-TAC-96-002, 12 February 1996, Original Source: Ghalib Darwis, *Al-Majallah* (London), 28 January 1996, pp. 22, 24.

January 1996

Hussein Kamel returns to Baghdad and is subsequently assassinated.

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 330.

1996

Iraq provides a summary of enriched uranium output at Al Tarmiya which shows that less enriched material was produced than it declared in 1991.

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org.

December 1995

Moayad Hassan Naji al-Janabi, an engineer in the Iraqi nuclear program, is shot dead in Amman, Jordan while seeking asylum from the United States or the United Kingdom.

—Jon Swain, "Mystery of Iraqi Nuclear Expert," *Sunday Times*, 2 April 1995, cited in www.nti.org.

September 1995

Saddam's second son, Qusay Hussein, assumes the responsibility of concealing Iraq's nuclear program.

—U.S. Department of State, "Iraq Weapons of Mass Destruction," *U.S. Government White Paper*, 31 February 1998, www.state.gov.

20 August 1995

Following the defection of Hussein Kamel, Iraq divulges information about its crash program during high-level technical talks. The Iraqi government denies that it had made a decision to manufacture nuclear weapons by stating that Kamel had tricked the Iraqi government and had developed a nuclear weapons program without the consent of the Iraqi government as evidenced by documents on Iraq's program found in Kamel's chicken farm. Nonetheless, Iraq's failure to declare its crash program and to give the IAEA all nuclear-related documents and materials constitute violations of Iraq's obligations under pertinent UN Security Council resolutions.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, pp. 65, 92; UN Security Council, "Eighth Report of the Director General of the IAEA on the Implementation of the Agency's Plan for the Future Ongoing Monitoring and Verification of Iraq's Compliance with Paragraph 12 of Resolution 687 (1991)," S/1995/844, 6 October 1995, www.iaea.org, p. 4; David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute

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for Science and International Security, October 2002, www.isis-online.org; Khidhir Hamza, "Inside Saddam's Secret Nuclear Program," *Bulletin of the Atomic Scientists*, September/October 1998, (54) 5, www.bullatomsci.org; Ann Scott Tyson, "How Arms Sleuths Battle Iraqi Deceit," *Christian Science Monitor*, 20 November 1997, cited in www.lexis-nexis.com.

August 1995

Hussein Kamel, Saddam Hussein's son-in-law and head of the Ministry of Industry and Military Industrialization, defects to Jordan, revealing to Western intelligence sources more than was previously known about Iraq's WMD programs.

—Shyam Bhatia and Daniel McGrory, "Brighter than the Baghdad Sun: Saddam's Race to Build the Bomb," (London: Little Brown and Company, 1999), pp. 235-240.

8 August 1995

Iraq informs UNSCOM that it is withdrawing its deadline to halt its cooperation with UNSCOM and the IAEA.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

August 1995

Iraq acknowledges that Karl-Heinz Schaab, a former German expert in the Urenco gas centrifuge enrichment program, provided Iraq with top-secret design know-how. It also admits that he had manufactured and exported a carbon fiber filament winding machine to Jordan, where it was awaiting re-export to Iraq at the advent of the Persian Gulf War.

—Mark Hibbs, "Future of IAEA in Iraq at Stake after Middle East Tension Rises," *Nuclear Fuel*, 23 September 1996, cited in www.lexis-nexis.com.

July 1995

Iraq threatens to end all cooperation with UNSCOM and the IAEA if there is no progress towards the lifting of sanctions and the oil embargo by 31 August 1995.

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

2 April 1995

The *Sunday Times* of London publishes an erroneous story reporting that Hamza had been killed by the Iraqi intelligence service after sneaking out secret documents exposing Iraq's reconstituted nuclear weapons program.

—Khidhir Hamza, "Inside Saddam's Secret Nuclear Program," *Bulletin of the Atomic Scientists*, September/October 1998, (54) 5, www.bullatomsci.org; Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 295.

15 October 1994

The UN Security Council enacts Resolution 949 demanding that Iraq "cooperate fully" with UNSCOM and that it withdraw all military units deployed to southern Iraq to their original positions. [Iraq thereafter withdraws its forces and resumes its work with the Commission.]

—UN Special Commission, "UNSCOM: Chronology of Main Events," December 1999, www.un.org.

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August 1994

As a result of Hamza's defection, Iraq admits that it had enriched uranium using the diffusion method.

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 336.

August 1994

Khidhir Abdul Abas Hamza, former director of Iraq's nuclear weapons programs, defects to the West. In response to his defection, Iraq provides an official explanation that Hamza retired from the nuclear program in 1990, entered in the food business, and became a millionaire.

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 13; Mark Hibbs, "Suspected Informer Was Physicist in Iraq's Uranium Enrichment Program," *Nuclear Fuel*, 24 April 1995, www.lexis-nexis.com.

February 1994

The IAEA completes the removal of all weapon-usable nuclear material (primarily research reactor fuel) under IAEA safeguards.

—"IAEA and Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org.

6 December 1993

The first consignment of Iraq's irradiated fuel is flown to Russia for disposal.

—"First Consignment of Irradiated Fuel Flown to Russia," *BBC Summary of World Broadcasts*, 8 December 1993, www.lexis-nexis.com.

8 October 1993

Iraq gives chief UN Weapons Inspector Rolf Ekeus a list of foreign suppliers that assisted its nuclear weapons program.

—"Iraq Owns up to Weapons Suppliers," *Press Association*, 8 October 1993, www.lexis-nexis.com.

February 1993

The IAEA and the AEC sign a memorandum of understanding on the removal of the spent fuel inventory from Iraq's research reactors at the Al Tuwaitha Nuclear Research Center.

—"Iraq," *Nuclear Fuel*, 10 May 1993, www.lexis-nexis.com.

14-21 July 1992

The destruction of the Al Tarmiya and Al Sharqat facilities is completed.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," *S/1997/779*, 8 October 1997, www.iaea.or.at, p. 63.

April 1992

Iraq reluctantly allows the destruction of Al Atheer and the adjacent Al Hatteen high-explosive test establishment after the IAEA reveals two Iraqi documents that disclose plans to develop a nuclear explosive device at Al Atheer.

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The decision to destroy Al Atheer's main buildings means that even if Iraq later acquires or purchases fissile materials, it would lack a site where they could be fabricated into weapons.

—David Albright and Mark Hibbs, "Iraq: It's All Over at Al Atheer," *Bulletin of the Atomic Scientists*, June 1992, www.bullatomsci.org; David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org.

April 1992

A group of nuclear weapons designers from the United States, United Kingdom, France, and Russia meet to assess the progress of Iraq's nuclear program before the Persian Gulf War, based on documents obtained through subsequent IAEA inspections. These designers conclude that bottlenecks in the program could have delayed completion of a working bomb for at least three years, assuming Iraq had continued its multifaceted strategy and design approach.

—"Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org.

Week of 24 February 1992

Eight managers from three German firms (H & H Metalform GmbH, Rhein-Bayern Fahrzeugbau GmbH & Co KG, and Neue Magdeburger Werkzeugmaschinenfabrik GmbH) are arrested and suspected of aiding Iraq's clandestine nuclear and non-conventional weapons program. IAEA inspectors find equipment from all three companies at various clandestine sites in Iraq. [Rhein-Bayern Fahrzeugbau supplied the State Electrical Industries Establishment in Baghdad with 240,000 dual-use ferritic spacer magnets for the motor stators of gas centrifuges. Neue Magdeburger Werkzeugmaschinenfabrik is named as the manufacturer of computer-numerically-controlled (CNC) machines which are equipped with fixtures and program to manufacture centrifuge parts. H & H supplied the Iraqis with numerous flow-forming machines for cold-pressing thick metal cylinders into thin-walled tubes.]

—Mark Hibbs, "Eight German Executives Arrested on Dual-Use Exports to Iraq," *Nuclear Fuel*, 2 March 1992, cited in www.lexis-nexis.com.

13 January 1992

Iraq acknowledges that it had imported German materials and components and had acquired 100 tons of maraging steel and other raw materials needed to manufacture centrifuge components.

—David Albright and Mark Hibbs, "Iraq's Shop-till-you-drop Nuclear Program," *Bulletin of the Atomic Scientists*, April 1992, www.bullatomsci.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 80.

12 January 1992

IAEA officials accuse Iraqi Foreign Ministry officials of failing to declare large quantities of materials and components Iraq had obtained for its gas centrifuge program.

—David Albright and Mark Hibbs, "Iraq's Shop-till-you-drop Nuclear Program," *Bulletin of the Atomic Scientists*, April 1992, www.bullatomsci.org.

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1991-1990

15, 17 November 1991

In compliance with UN Security Council Resolution 687, fresh HEU of Soviet origin including 68 fuel assemblies of 80 percent enrichment and 10 of 36 percent enrichment is removed from Iraq. As a result of the removal of the reactor fuel, the Iraqis decide to abandon the "crash program."

—UN Security Council, "Report on the Eighth IAEA On-Site Inspection in Iraq under Security Council Resolution 687 (1991)," S/23283, 12 December 1991, www.iaea.org, p. 9; "Nuclear Capabilities of Iraq - the IAEA Plan of Action," IAEA, April 1992, www.iaea.or.at; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 52.

11-18 November 1991

IAEA inspectors conduct an eighth on-site inspection (IAEA 8) with a focus on removing unirradiated fuel and investigating Iraq's centrifuge program.

—International Atomic Energy Agency, Iraq Nuclear Verification Office, *Chronology of Main Events*, 27 December 2002, www.iaea.org.

21 October 1991

The AEC admits that Al Atheer was built for materials production as well as to service the weaponization program.

—"IAEA and Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org.

14 October 1991

The Iraqi Atomic Energy Commission (AEC) discloses that Al Tuwaitha conducted research studies in weaponization.

—"IAEA and Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org.

8 August 1991

IAEA inspectors find that the Iraqi-made centrifuge rotors do not have any traces of uranium and have not test-processed UF₆ feedstock.

—Mark Hibbs, "Indigenous Iraqi Centrifuge Plant Was in Primitive State, IAEA Says," *Nucleonics Week*, 15 August 1991, www.lexis-nexis.com.

27 July-10 August 1991

Iraq confirms the existence of a clandestine program to manufacture several kilograms of UO₂, irradiate it in the IRT-5000 reactor, and reprocess the irradiated fuel in order to chemically separate gram amounts of plutonium.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 76.

July 1991

IAEA inspectors discover the Al Furat facility on its fourth inspection tour.

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—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 41, www.iaea.or.at.

May/June 1991

The IAEA successfully accounts for the entire inventory of Iraqi HEU reactor fuel demonstrating that the extraction of the HEU from the reactor fuel had not yet begun and subsequently preventing Iraqi attempts to redesign Projects 601 and 602.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 48; David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; UN Security Council, "Consolidated Report on the First Two IAEA Inspections under Security Council Resolution 687 (1991) of Iraqi Nuclear Capabilities," S/22788, 11 July 1991, www.iaea.org.

15-21 May 1991

The IAEA conducts its first on-site inspection (IAEA 1) under UNSCR 687. The team inspects declared sites and Tarmiya.

—IAEA, Iraq Nuclear Verification Office, "Chronology of Events," www.iaea.org.

Late April 1991

In light of the enactment of UN Security Council Resolution 687, Iraq creates an Administrative Security Committee (ASC) responsible for advising Saddam on information that could be released to UNSCOM and the IAEA. The Committee consists of senior Military Industrial Commission (MIC) scientists from all of Iraq's WMD programs and the Higher Security Committee (HSC) of the Presidential Office with the overall command of deception operations. —"Iraq's Weapons of Mass Destruction-The Assessment of the British Government," www.ukonline.gov.uk, p. 36.

18 April 1991

Iraq submits the first declaration to the IAEA in which it denies having nuclear weapons or weapons-grade nuclear material.

—Understanding the Lessons of Nuclear Inspections and Monitoring Iraq: A Ten-Year Review," ISIS Transcript, Institute for Science and International Security, 28 August 2001, www.isis-online.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 61.

15 April 1991

The IAEA establishes the Action Team composed of a small core group of four people that would be able to coordinate and draw upon the assistance and expertise from other areas of the IAEA, from UNSCOM, and from member states to form inspection teams.

—"Understanding the Lessons of Nuclear Inspections and Monitoring Iraq: A Ten-Year Review," ISIS Transcript, Institute for Science and International Security, 28 August 2001, www.isis-online.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of

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Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 61; David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org.

6 April 1991

Iraq formally accepts UN Security Council Resolution 687.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 61.

3 April 1991

The UN Security Council enacts Resolution 687 requiring Iraq to destroy, declare, or render harmless its weapons of mass destruction (WMD) arsenal and production infrastructure under UN or IAEA supervision. The Security Council decides that "Iraq shall unconditionally agree not to acquire or develop nuclear weapons or nuclear-weapon-usable material or any subsystems or components or any research, development, support or manufacturing facilities related to the above." The resolution also demands that Iraq forgo the future development or acquisition of WMD. The IAEA receives two mandates: (1) to uncover and dismantle Iraq's clandestine nuclear program; and (2) to develop and implement an Ongoing Monitoring and Verification (OMV) Plan. [Later, Iraq develops a ballistic missile capability that exceeds the 150 km range limitation established under UN Security Council Resolution 687.]

—U.S. Central Intelligence Agency, "Iraq's Weapons of Mass Destruction Programs," October 2002, www.cia.gov, p. 3; International Atomic Energy Agency, Iraq Nuclear Verification Office, *Chronology of Main Events*, 27 December 2002, www.iaea.org; UN Security Council, "The Situation Between Iraq and Kuwait," S/RES/687 (1991), 3 August 1991, www.un.org.

April 1991

Iraq is unable to achieve its April 1991 deadline of diverting the safeguarded uranium, further enriching a portion of it, and converting it to metal "buttons." [Several research and development steps remained before Iraq could successfully process the material and it was not accomplishing these steps at a fast enough pace to meet its self-imposed deadline.]

—David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org.

March 1991

The Iraqis bring evacuated equipment and materials back to the Engineering Design Center/Rashidiya. [Later, Iraq claims that it did not resume any centrifuge work at Rashidiya or elsewhere after the war.]

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org.

After the Persian Gulf War

Iraq establishes a program at its universities to train a new generation of nuclear scientists who are deemed more

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loyal to the regime and are instructed to apply their expertise only in Iraq.

—David Albright and Khidhir Hamza, "Iraq's Reconstitution of its Nuclear Weapons Program" *Arms Control Today*, October 1998, www.isis-online.org.

Post-Persian Gulf War

Saddam Hussein declares that Atomic Energy Commission would be split into several groups to rebuild the country's infrastructure. In reality, AE's Group Number Four is transferred to the Technical Training Institute where it continues to work on the design and components for a bomb.

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 259.

28 February 1991

A cease fire takes effect in the Persian Gulf War.

17 January-27 February 1991

Allied bombings destroy three of Iraq's seven major nuclear sites (including Al Sharqat, Al Tarmiya, and Al Tuwaitha). The LAMA facility at Al Tuwaitha is destroyed, but the plant components are salvaged and placed in temporary storage at the Al Shakili storage complex adjacent to Al Tuwaitha. Building 64 of Project 602 is severely damaged and the project is no longer able to proceed in the building. [Later, the project is redesigned and documented as Project 602B.] The weapons-development site at Al Atheer survives with only the explosives bunker damaged after a coalition pilot drops a bomb while returning from another target. Fearing greater destruction, the Iraqis pack equipment from Al Atheer valued at \$14 million into 400 boxes and transport it to another site for safe storage. Action is also taken to redesign the HEU uranium recovery and the HEU uranium metal preparation plant for re-installation at alternative locations.

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 238; David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org; Shyam Bhatia and Daniel McGrory, *Brighter than the Baghdad Sun* (London: Little, Brown and Company, 1999), 193; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 75.

17 January 1991

The Allies bomb the Atomic Energy headquarters building, which holds the plasma focus equipment obtained from Poland, the library, and the Russian reactor. [Later, Saddam Hussein claims to IAEA inspectors that the Russian reactor had been destroyed even though the core fuel remained in the reactor.]

—Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 245-246.

17 January 1991

Iraq completes installation of "cold testing" the equipment used to dissolve fuel rods in "hot cells" at the French-

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supplied LAMA facility at Al Tuwaitha for Project 601. [This facility was not intended for reprocessing but rather for handling radioactive material, and Iraq had to remove the old equipment before preparing its concrete "hot cells" for their new use. The throughput of the plant was designed to accommodate the processing of one, and possibly two, fuel elements per day such that the recovery of the HEU from the 69 fresh and 38 lightly irradiated fuel elements could have been accomplished within 2 or 3 months, thus making available some 26kg of HEU, in the form of UNH containing 22.4kg of the isotope U-235, less process losses.]

—David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org; David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 48.

17 January 1991

Design and construction activities of Project 521C are completed. In order to conceal the preparations for 521C, the concrete foundations cast on the floor of Hall 9 are removed and the concrete floor tiles are stripped from the entire floor area. The hall is also filled with sacks of cement which inhibit access for inspection.

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 50.

17 January 1991

Project 602 scientists charged with designing and constructing a facility to receive the uranyl nitrate solution from Project 601 and convert it into metallic form complete the major part of its construction and cold testing activities. The project is housed in Al Tuwaitha Building 64 and involves the conversion of the input uranyl nitrate hexahydrate (UNH) through UO₄ to UO₂, the conversion of UO₂ to UF₄, the reduction of UF₄ to uranium metal and systems for waste recovery. Although the waste recovery plans are not yet installed, the capability to start the conversion to HEU from UNH to metal is available.

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 50.

17 January 1991

The allied campaign to liberate Kuwait, Operation Desert Storm, begins.

12 January 1991

At an internal meeting, Iraq specifies the precise design dimensions of the explosive lenses to build a nuclear bomb. [Later, Iraq admits that it had specified the dimensions of the lenses, but denies that it had been making similar decisions regarding the design of the weapons components. Iraq admitted only to have RDX/TNT explosives

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when in fact, Iraq had imported three hundred tons of HMX, a more powerful kind of explosive, which is used to make lighter and more powerful lenses than those it had declared.]

—Mark Hibbs, "Renewed Conflict with Baghdad Defers Russian Bid to End IAEA Inspections," *Nuclear Fuel*, 9 February, 1998, cited in www.lexis-nexis.com.

3 January 1991

An Iraqi internal report (PC-3 report 1556) reveals calculations estimating the HEU content of 62 irradiated fuel elements (80 percent enriched) based on tabulated data of the burn-up and cooling-time of each elements. These 62 elements, together with the 34 elements remaining in the core of the IRT-5000 reactor, represent the total inventory of 96 irradiated fuel elements of 80 percent enrichment.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 49.

End of 1990

Project 602 is installed and commissioned and produces a 10kg test batch of natural UF₄.

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 50.

Late 1990

Iraq produces an exact model of a nuclear weapon made of machined metal parts. [The IAEA learns of the mockup in 1995, but by 1998, IAEA inspectors are still unable to find the mockup or its parts.]

—Mark Hibbs, "IAEA and UNSCOM Puzzled Over Iraqi Mockup of Nuclear Bomb," *Nucleonics Week*, 12 February 1998, cited in www.lexis-nexis.com.

Mid-December 1990

Project 521C (the centrifuge program at the Engineering Design Center/Rashidiya facility) in charge of taking the Russian-supplied HEU and further enriching it in a short cascade up to 93 percent plans to commission the cascade in April 1991 and introduce uranium hexafluoride by July 1991. [The actual enrichment level of this material, half of which was irradiated varied from 56 to 80 percent, with an average of 70 percent. The cascade was designed to have 49 centrifuges, each with a separative output of 2 SWU per year. The tails assay was 40 percent and the nominal feed rate was 6.9kg per month. Overall, the centrifuge program is unlikely to have succeeded in making a cascade on the schedule mentioned.]

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org.

December 1990

The US Central Intelligence Agency (CIA) receives its first clue about the progress of Iraq's nuclear weapons program when Iraq releases Western hostages held near the Al Tuwaitha Nuclear Research Center. Uranium carbide particles removed from the hostages' clothing show that the uranium specks had been enriched beyond

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the 20 percent needed for routine experiments.

—Shyam Bhatia and Daniel McGrory, *Brighter than the Baghdad Sun* (Washington, DC: Regenery Publishing Inc., 2000), p. 18.

December 1990

The LAMA laboratory of Project 601 is installed in Al Tuwaittha's building 22. [Iraq hopes that the laboratory would be able to produce up to 25kg of HEU in two to three months.]

—"Iraq's Nuclear Weapon Program," *Iraq Watch*, accessed on 27 November 2002, www.iraqwatch.org.

15 December 1990

Iraq suspends operations at Tarmiya. [Subsequent damage during the Gulf War prevents operations from resuming.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," *S/1997/779*, 8 October 1997, p. 36, www.iaea.or.at.

Late November 1990

Assistant US Secretary of State Lawrence Eagleburger alleges that "Iraq has clandestinely obtained a cache of unsafeguarded highly enriched uranium from an outside source."

—David Albright and Mark Hibbs, "Hyping the Iraqi Bomb," *Bulletin of the Atomic Scientists* (47) 2, March 1991, www.bullatomsci.org.

22 November 1990

US President George Bush warns US troops in Saudi Arabia of Iraqi President Saddam Hussein's nuclear program. He says, "Those who would measure the timetable for Saddam's atomic program in years may be seriously underestimating the reality of that situation and the gravity of the threat."

—David Albright and Mark Hibbs, "Hyping the Iraqi Bomb," *Bulletin of the Atomic Scientists* (47) 2, March 1991, www.bullatomsci.org.

19-20 November 1990

The IAEA records Iraq's research reactor fuel inventory and finds that the safeguarded material is intact implying that Iraq did not make any practical progress in the recovery of the HEU material. [Had Iraq been able to proceed, it is possible that the HEU material from the fresh and lightly irradiated reactor fuel could have been recovered and made available in metal form toward mid-1991.]

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," *S/1997/779*, 8 October 1997, www.iaea.or.at, p. 52; David Albright and Robert Kelley, "Has Iraq Come Clean at Last?," *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org.

September 1990

Eight 1200mm electromagnetic isotope separators begin operating at Taramiya. The separators eventually produce 640 grams of enriched uranium with an average enrichment of 7.2 percent and 685 grams with an average enrichment of 3 percent.

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—"Tarmiya, Iraq Special Weapons Facilities," Federation of American Scientists, www.fas.org; "Iraq's Nuclear Weapon Program," Iraq Watch, Wisconsin Project on Nuclear Arms Control, www.iraqwatch.org.

September 1990

Iraq decides to transfer several engineers and technicians from Al Tarmiya to Al Tuwaitha to work on designing and installing equipment for projects 601 and 602.

—David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org.

Mid-August 1990

Hussein Kamel initiates a crash program to extract HEU from Iraq's stock of safeguarded HEU fuel to build a nuclear weapon by the end of February 1991. Project 601 is established Al Tuwaitha to extract HEU from the French and Russian research reactor fuel to use as the core material of a nuclear weapon. [After the Persian Gulf War when it became clear that Project 601 could no longer be housed in the Active Metallurgy Testing Laboratory (LAMA) building, the uranium recovery plant was redesigned-as Project 603-so that it could be reinstalled at Al Tarmiya which had sustained lesser bomb damage. table 1 lists the quantities of safeguarded enriched uranium the Iraqis have declared they planned to divert. The total amount of HEU (in terms of initial uranium mass) was 39.5kg with an average enrichment of about 84 percent contained in 175 fuel elements.] The program is composed of the chemical processing of both unirradiated and irradiated research reactor fuel, the re-enrichment of part of the HEU through the use of a 50-machine centrifuge cascade, and the conversion of the HEU chemical compounds to metal. Iraq also considers the direct use of HEU without further enrichment because the centrifuges are not ready at this time.

Iraq's Safeguarded Fuel

			Uranium	
Reactor	Irradiation level	Initial enrichment (%)	Mass* (gm)	No. of elements
Tammuz-2	Fresh	93	417	1
Tammuz-2	Light	93	11,874	38
IRT-5000	Fresh	80	13,689	68

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IRT-5000	High	80	13,490	68
IRT-5000	High	10	87,760	69
*The mass given is the initial mass of the uranium before irradiation, the actual mass of irradiated uranium is less.				

Sources: David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org.

Iraq aims to produce a missile warhead with a 20-kiloton yield. Design details indicate that Iraq is trying to develop a solid-core HEU weapon, which would use a simple peryllium-polonium source as a neutron initiator built into the center of the bomb core and activated by the crushing action of the implosion package. The reflector/tamper for the bomb is manufactured from natural uranium metal, not beryllium. [Later, because the weight and size of the device was too big to be mounted on a missile, Iraqi scientists pursued the development of beryllium and graphite reflectors that would be many pounds lighter than the uranium metal reflectors originally planned.] Iraq decides to adopt a levitation design, which leaves a gap around the bomb core and surrounding components to create a bigger bang per kilogram than other designs the Iraqis could have managed. [The Allied bombing campaign in mid-January 1991 stops Iraq's effort to build a nuclear weapon before its completion. Hamza asserts that the idea was to construct a warhead that could be mounted on a missile and fired at Israel if Allied forces invaded. Bhatia and McGrory say the plan was to place a nuclear device near Kuwait City.]

—David Albright and Khidhir Hamza, "Iraq's Reconstitution of its Nuclear Weapons Program," *Arms Control Today*, October 1998, www.isis-online.org; "Iraqi Nuclear Weapons," *Federation of Atomic Scientists*, www.fas.org; "Iraq's Weapons of Mass Destruction-The Assessment of the British Government," www.ukonline.gov.uk, p. 13; David Albright, "Iraq's Programs to Make Highly Enriched Uranium and Plutonium for Nuclear Weapons Prior to the Gulf War," Institute for Science and International Security, October 2002, www.isis-online.org; Mark Hibbs, "Iraqi Execution of Bomb Design 'Two Years Away' Data Suggests," *Nuclear Fuel*, 14 October, 1991, cited in www.lexis-nexis.com; Shyam Bhatia and Daniel McGrory, *Brighter than the Baghdad Sun* (London: Little, Brown and Company, 1999), p. 12; "Iraq's Nuclear Weapon Program," *Iraq Watch*, www.iraqwatch.org; David Albright and Robert Kelley, "Has Iraq Come Clean at Last?," *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 237; Shyam Bhatia and Daniel McGrory, "Brighter than the Baghdad Sun: Saddam's Race to Build the Bomb," (London: Little Brown and Company, 1999), pp. 235-240.

6 August 1990

UN Security Council Resolution 661 banning the sale of Iraqi oil is imposed, precluding Iraq from purchasing special

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equipment and materials from abroad before it could finish its facilities or produce significant quantities of fissile material. The Security Council acting under Chapter VII of the United Nations decides that "All States should prevent the import into their territories of all commodities and products originating in Iraq or Kuwait exported therefrom after the date of the present resolution."

—David Albright and Robert Kelley, "Has Iraq Come Clean at Last?" *Bulletin of the Atomic Scientists*, November/December 1995, www.bullatomsci.org; UN Security Council, "The Situation Between Iraq and Kuwait," S/RES/661 (1990), 6 August 1990, www.un.org.

2 August 1990

—Iraq invades Kuwait.

August 1990

Project 601 at Al Tuwaitha is established to extract HEU from the French and Russian research reactor fuel to use as the core material of a nuclear weapon. [After the Persian Gulf War when it became clear that Project 601 could no longer be housed in the Active Metallurgy Testing Laboratory (LAMA) building, the uranium recovery plant was redesigned-as Project 603-so that it could be reinstalled at Al Tarmiya which had sustained lesser bomb damage.]

—UN Security Council, "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under Paragraph 16 of Security Council Resolution 1051 (1996)," S/1997/779, 8 October 1997, www.iaea.or.at, p. 48; Khidhir Hamza and Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 237.

June 1990

Iraq completes construction of the soft iron foundry located at the Nasser General Establishment and begins producing the soft iron necessary for the EMIS magnets.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past," Institute for Science and International Security, 2003, www.exportcontrols.org.

7 May 1990

The Minister of Industry and Military Industrialization (MIMI) Hussein Kamel opens the Al Atheer facility for Saddam's bomb designers, who are known as Group 4.

—David Albright and Mark Hibbs, "Iraq's Bomb: Blueprints and Artifacts," *Bulletin of the Atomic Scientists*, January/February 1992, www.bullatomsci.org; Shyam Bhatia and Daniel McGrory, *Brighter than the Baghdad Sun* (London: Little, Brown and Company, 1999), p. 21.

Early 1990

Personnel, sophisticated equipment, and testing systems pertaining to Iraq's weapons efforts are transferred from Al Tuwaitha and other sites to Al Atheer. [Al Atheer remains undiscovered for months after the end of the Persian Gulf War. Its true significance was not understood until Hussein Kamel's defection in 1995.]

—David Albright and Mark Hibbs, "Iraq's Bomb: Blueprints and Artifacts," *Bulletin of the Atomic Scientists*, January/February 1992, www.bullatomsci.org; Shyam Bhatia and Daniel McGrory, *Brighter than the Baghdad Sun* (London: Little, Brown and Company, 1999), p. 19.

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Spring 1990

The first magnetic centrifuge using a carbon fiber composite rotor is successfully assembled and tested at an operating speed of 60,000 rpm over a period of several months in a mechanical test stand.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at.

January-February 1990

Former MAN Technologie employee Kark-Heinz Schaap supplies Iraq with 20 carbon fiber centrifuge rotors.

—Mark Hibbs, "German Expert Wanted By Authorities for Giving Iraq Carbon Centrifuge Rotors," *Nuclear Fuel*, 9 November 1992.

1990

Iraq attempts to purchase vacuum diffusion pumps from CVC, a machinery firm in Rochester, N.Y. The US Department of Commerce blocks the export just prior to shipment after customs inspectors determine it was to be used for uranium enrichment. A US official says, it had been "assumed" that the pumps were destined for Iraq's gas centrifuge program. [US officials later believe the CVC pumps might have been intended for use in Iraq's calutron project.]

—Mark Hibbs, "U.S. Believes Iraq Has Built Magnetic Isotope Enrichment Plant," 20 June 1991.

1990

Installation and commissioning of R120 separators at Al Tarmiya commence. [By the time of the Gulf War, a total of eight R120 separators are in limited operation.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at.

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1989-1980

Late 1980s

A US firm exports to Iraq around \$1.2 million worth of 5-ampere, 40- to 45,000-kilovolt electrical generators, ostensibly destined for induction welding. [US officials later surmise that the generators were to provide power supplies for Iraq's calutrons. At the time, the generating equipment is not listed as nuclear dual-use equipment and does not require a US interagency review prior to export to Baghdad.]

—Mark Hibbs, "U.S. Believes Iraq Has Built Magnetic Isotope Enrichment Plant," 20 June 1991.

Late 1989

Sometime around December 1989 or January 1990, Iraq approaches Brazil seeking unsafeguarded LEU. Brazil declines to provide the material. It is suspected that the LEU will be used as feedstock for the Tarmiya EMIS facility.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past," Institute for Science and International Security, 2003, www.exportcontrols.org.

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Late 1989

Hamza makes a trip to Hungary to recruit Gy Csikai, an expert on neutron generators, into Iraq's nuclear weapons program. Csikai agrees to work on a neutron generator, believing it will be used to trigger neutron bursts for oil exploration. [Csikai had in the past helped Iraq with an old French neutron generator it possessed.]

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 234.

Mid-1989

Iraq accepts an offer from a former MAN Technologie employee, Karl-Heinz Schaab, to provide design details for a sub-critical centrifuge based on a carbon fiber composite rotor and also to supply some trial rotors. Iraq also obtains 25 pieces of maraging steel from an unidentified source, 19 of which it machines into centrifuge preforms at Nasser Engineering Establishment. Six more are machined by an unidentified foreign company.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 39, www.iaea.or.at.

Mid-1989

Confident of success in gas centrifuge enrichment technology, Iraq contracts with local and international organizations for the construction of the Al Furat facility, for the mass production of centrifuges and a pilot-scale cascade hall.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 39, www.iaea.or.at.

May 1989

Hamza travels to Poland to inquire about purchasing a plasma focus device.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 225.

1989

Iraq cancels its gaseous diffusion project.

—"Iraqi Nuclear Weapons," Federation of American Scientists, www.fas.org; "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 38, www.iaea.or.at.

1989

The German firm H&H METALFORM introduces the centrifuge team to a former MAN Technologie employee who in parallel with another ex-MAN employee, provides the Iraqis with detailed design drawings along with 170 technical reports related to the production and operation of centrifuges under development by URENCO in the 1970s. [The two former MAN employees are likely Bruno Stemmler and Karl-Heinz Schaab.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 39, www.iaea.or.at; Mark Hibbs, "Stemmler, Too, Sold Baghdad Urenco Centrifuge Blueprints," *Nuclear Fuel*, 12 March 1996.

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Late 1988-mid-1990

The Engineering Design Center (EDC), the team responsible for gas centrifuge enrichment, concludes that Iraq's existing manufacturing capabilities are insufficient to produce the rotating components of centrifuge machines to the required accuracy and quality. The decision is made to strengthen Iraq's industrial infrastructure through the import of high quality, dedicated machine tools. Iraq subsequently approaches machine tool suppliers in Germany, Yugoslavia, and Switzerland.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 40, www.iaea.or.at.

December 1988

Iraq's General Directorate for Industrial Supply (GDIS) agrees to purchase six high-voltage power supplies from US company Universal Voltronics Corporation. The Voltronics design is reverse engineered by Iraq and later becomes the basis for power supplies used to power the R120 and R60 separators at the Tarmiya facility. The total contract is worth \$1 million. GDIS provides an official end-use letter to Voltronics stating that the power supplies are to be used in the development of RF generators and RF heating equipment. Voltronics accepts the end-use statement although the voltage stability specifications for the power supplies are strict enough to meet EMIS requirements.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past" Institute for Science and International Security, 2003, www.exportcontrols.org.

July 1988

A UN-mandated cease-fire ends the Iran-Iraq War.

1988

Iraq's attempts to produce graphite domestically result in failure. However acquiring graphite from foreign sources proves to be easy and Iraq halts further efforts to produce graphite for use in EMIS collectors.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past" Institute for Science and International Security, 2003, www.exportcontrols.org.

1988

Iraq begins construction of a foundry designed for production of soft iron, necessary for the fabrication of magnets used in the EMIS process. The foundry is built at the Nasser General Establishment.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past" Institute for Science and International Security, 2003, www.exportcontrols.org.

1988

Iraq begins research into uranium enrichment through solvent extraction and ion exchange processes. The objective is to provide an alternative supply of LEU as feed for the EMIS facilities. Most research is conducted at Tuwaitha, except for the production of tri-butyl phosphate which, together with some theoretical work on crown ethers, is done at Muthanna.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph

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16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 43, www.iaea.or.at; "Iraqi Nuclear Weapons," Federation of American Scientists, www.fas.org.

1988

Iraq is successful in manufacturing a barrier tube suitable for operation in UF₆.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at; "Iraqi Nuclear Weapons," Federation of American Scientists, www.fas.org.

Late 1987

Facing difficulties achieving rotational speeds greater than 30,000 rpm in its first oil centrifuge, Iraq seeks assistance from the German firm H&H METALFORM, which puts the Iraqis in contact with two ex-MAN Technologie employees. [By mid-1989 rotational speeds of 50,000 rpm are achieved in a vacuum.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 39, www.iaea.or.at.

August 1987

Faced with limited capability to manufacture several items needed for the gaseous diffusion effort, Iraq revises the mission of the team assigned to the task and gives priority to gas centrifuge technology for uranium enrichment (although some work on research and development of the barrier material and tests of compressors continues). The goal of the centrifuge project is a production capacity of 10kg of 93 percent HEU per year by 1994. Work begins with an attempt to develop an oil-bearing gas centrifuge (for which extensive design information was available in open literature).

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 39, www.iaea.or.at.

August 1987

Khidhir Hamza travels to Germany to purchase a foundry capable of manufacturing high-precision bomb components. Hamza and his assistants attempt to pass off the purchase as a commercial project to purify tungsten. Representatives of Degussa and Leybold see through the ruse immediately but are still eager to make the sale. A deal is eventually signed for \$120 million. Also on Hamza's procurement list are cameras for photographing explosive sequences including a flash X-ray camera powerful enough to penetrate the explosive plume of compression charges, and desktop computers. [Hamza also attempts to buy uranium of any degree of enrichment, but finds the task almost impossible because of export controls. He also contends that the notion of a black market awash in bomb-grade uranium and plutonium is grossly exaggerated.]

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), pp. 205, 209-210.

1987-1989

Priority on the gaseous diffusion effort is reduced after efforts do not progress beyond the qualification of a single type of barrier.

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—"Iraqi Nuclear Weapons," Federation of American Scientists, www.fas.org; "Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 38, www.iaea.or.at.

1987

Iraq signs a \$600 million deal with Yugoslavian Serbs to build a magnetic uranium enrichment factory.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 194.

1987

Control of the bomb program is transferred to the Ministry of Industry and Military Industrialization (MIMI) by Hussein Kamel, Saddam Hussein's son-in-law.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 130.

1987

The design work for the third phase of the EMIS program, the production phase, is finalized. The design calls for two identically equipped industrial scale plants, Tarmiya and Al Sharqat, each with 70 R120 separators for the production of uranium enriched to around 20 percent and with 20 R60 separators for the production of 93 percent HEU.

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at.

1987

When the achievements of the Laser Section are evaluated, it is decided that the project should be downgraded to a "watching brief" and that a number of key personnel should be transferred to other projects, notably the EMIS effort.

—"Iraqi Nuclear Weapons," Federation of American Scientists, www.fas.org.

1986

The Iraqi Auqba bin Nafi General Establishment (ABN) contracts the Yugoslavian state company Federal Directorate of Supply and Procurement (FDSP) to build the Tarmiya electromagnetic isotope separation (EMIS) facility. The effort is designated project 946. The contract is valued at over \$100 million.

—David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past" Institute for Science and International Security, 2003, www.exportcontrols.org.

1985

By this time, some progress is made in producing barrier material for the gaseous diffusion process and an emphasis is placed on compressor, diffuser, and heat exchange design. [However, it soon becomes apparent that the infrastructure to continue is beyond the indigenous capabilities of Iraq.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at.

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1984

The Al Qaim facility begins producing yellowcake. [All of the yellowcake used by Iraq's nuclear program allegedly is produced at this site. Ore is supplied to the facility by both Iraqi and foreign sources.]

—"Major Sites Associated with Iraq's Past WMD Programs," UNSCOM, 3 December 1997, www.fas.org.

Late 1984

Realizing that France will not rebuild the destroyed Osirak reactor, Project 182 is established with the objective of designing and constructing a natural uranium fueled, heavy water moderated and cooled reactor with a 40Mwt capacity modeled on the Canadian NRX research reactor. [This development is confirmed by Iraqi documentation, although it contradicts Tariq Aziz's assertions in December to the *Washington Post* that France and Iraq are very near a deal to rebuild the Osirak reactor. There are however, no indications that the design of the natural uranium reactor progressed beyond theoretical studies.]

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 53, www.iaea.or.at.

Late 1984

By this time, Iraq is self-sufficient in uranium ore.

—"Iraq's Weapons of Mass Destruction: The Assessment of the British Government," 24 September 2002, www.pm.gov.uk.

Late November-Early December 1984

According to a *Washington Post* article, the war between Iran and Iraq enabled France to delay the reconstruction of the Osirak reactor bombed by Israel in June 1981. In order to expedite an agreement to rebuild the reactor, Iraq agrees to accept a French precondition of using a "low-grade uranium" fuel. The "caramel" fuel functions at 10 percent enrichment compared to 80 percent for the fuel in the original reactor. Deputy Prime Minister Tariq Aziz tells the *Post* that France and Iraq are "almost finalizing" replacement of the reactor.

—Michael Dobbs, "France Delays on Iraqi Reactor; Gulf War Holds Up Reconstruction of Facility Bombed By Israel," *Washington Post*, 3 December 1984.

Mid-1984

Iraq's uranium recovery plant is in full operation. The al-Qaim fertilizer facility produces 1,200 metric tons of phosphoric acid per day.

—Gulf link, Construction of Uranium Plant, www.fas.org.

1984

Iraq contracts with Serbian entities for a chemical processing plant to leech uranium from ore, and another plant for fabricating rocket fuel.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 194.

March 1984

A March 1984 report submitted by the FRG's Federal Intelligence Service (BND) to the Chancellor's Office, the

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Foreign Ministry, and other ministries documents secret nuclear transactions between Brazil and Iraq, including the supply by Brazil of enriched uranium.

—"Involvement in Brazil-Iraq Nuclear Deal Reported," *Nuclear Developments*, 14 September 1990, pp. 17-18.
Original Source: Helmut Loelhoeffe. *Frankfurter Rundschau* (Frankfurt/Main). 5 September 1990, p. 1.

1984

Buildings 60 and 85 at the Tuwaitha Site are completed. Building 85 is originally designed for the development of the gaseous diffusion separating stages and EMIS chemistry. Building 60 houses engineering offices and labs for the electronics department, particularly control and high voltage engineering for the EMIS program.

—David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?," Institute for Science and International Security, 26 April 1999, www.isis-online.org.

Early 1984

Khidhir Hamza travels to the United States to purchase additional equipment for the weapons program. On his shopping list are an electron microscope, advanced computers for "nuclear calculations and controls," and specialized air filters to protect electronic equipment in laboratories. Additionally, under the cover of attending a space conference at the University of Michigan, he and an assistant photocopy hundreds of technical documents related to uranium enrichment.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 153.

1983

The second phase of the EMIS program commences. Phase two focuses on development of R50 and R100 pre-production-scale units (Project 104), as well as 1:5 scale model units (Project 105), which are used to research multi-magnet series operation as an analytical tool for the production phase configuration.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, p. 35, www.iaea.or.at.

Early 1982-Mid-1984

Iraq constructs a uranium recovery plant at the Al Qaim (aka Al Kaim) fertilizer complex in western Iraq.

—Gulf link, Construction of Uranium Plant, www.fas.org.

1982-1988

Iraq separates 2.26 grams of plutonium at a laboratory at the Tuwaitha Nuclear Research Center.

—David Albright and Mark Hibbs, "News the Front Page Missed," *Bulletin of the Atomic Scientists*, October 1991, www.bullatomsci.org.

1982

Iraq begins the design and construction of electromagnets and different magnet separators systems at Tuwaitha.

—Fact Sheet: Iraq's Nuclear Weapon Programme, IAEA Action Team, www.iaea.org.

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1982-1989

Initial UCl₄ production and purification experiments commence in Buildings 9 and 15 at Tuwaitha. The experiments are later transferred to Building 85, the Chemical Engineering Research Laboratories where activities continue until January 1991. Fifteen laboratory-scale research projects and pilot-scale production and purification projects are implemented during the nine-year period. Many different feed materials, including, UO₂, UO₃, U₃O₈, and UO₄:2H₂O are tried as are different reaction techniques such as fluid bed, static bed (boat type) and rotary reactors with liquid, vapor and gas phase chlorination. The extensive experimentation culminates in the design and construction of a pilot scale production unit, Project 242, in Building 85, which uses UO₂ as the feed material and gas phase chlorination.

—The components of Iraq's clandestine nuclear programme, Attachment 1 to the 4th Consolidated Report under UNSCR1051(S/1997/779), www.iraqwatch.org.

17 May 1982-20 June 1982

Iraq receives yellowcake from Portugal in two batches. The second batch is received as three shipments from 17 May through 20 June. It consists of 487 drums containing 148,348kg yellow cake.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 25-26, www.iaea.or.at.

18 March 1982

Iraq receives its second shipment of yellowcake from Niger. It consists of 426 drums containing 139,409kg yellowcake.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 25-26, www.iaea.or.at.

1982

Iraq imports from Italy 1,767kg of uranium enriched to 2.6 percent in U-235 in the form of UO₂ powder.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, p. 25, www.iaea.or.at.

1982

Iraq obtains 426 drums containing 139,409kg of yellowcake from Niger and 487 drums containing 148,348kg yellowcake from Portugal.

—Fact Sheet: Iraq's Nuclear Weapon Programme, IAEA Action Team, www.iaea.org.

1982

Iraq imports 1,767kg of low enriched uranium (LEU) from Italy.

—Fact Sheet: Iraq's Nuclear Weapon Programme, IAEA Action Team, www.iaea.org.

1982

Smugglers in Italy offer to sell plutonium and highly-enriched uranium to Iraq. Italian smugglers receive a \$60 million down payment from Iraq. [It is unknown whether the delivery of the plutonium or highly-enriched uranium occurs. Khadhir Hamza later writes in his book that every offer of black market plutonium or uranium that he was

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aware of was bogus.]

—R. Nordland, T. M. Defrank, And P. Hinckle, "How Soon Will Saddam Have The Bomb?" *Newsweek*, 3 December 1990, pp. 22-23.

1982

New buildings are added in the northwest section of the Tuwaitha Site. Building 80 is finished and houses the EMIS program.

—David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?" Institute for Science and International Security, 26 April 1999, www.isis-online.org.

1982

Building 63 at the Tuwaitha Site is completed. The materials science section is moved from building 73 to this building.

—David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?" Institute for Science and International Security, 26 April 1999, www.isis-online.org.

1982

Research and development begins on UCl₄ production at Tuwaitha. [Laboratory-scale projects continue through January 1991.] Fifteen laboratory-scale research projects and pilot-scale production and purification projects are implemented during a nine year period. Many different feed materials, including, UO₂, UO₃, U₃O₈, and UO₄:2H₂O are tried as are different reaction techniques such as fluid bed, static bed (boat type) and rotary reactors with liquid, vapor and gas phase chlorination.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, p.31, www.iaea.or.at.

1982

Iraq begins exploratory work on gaseous diffusion technology.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 36-37, www.iaea.or.at.

1982

Iraq begins efforts to produce U-235 through EMIS at the Tuwaitha facility. Iraq builds the first separator unit (with a 400mm radius of beam curvature) to test its concept for the unit's insulator and liner. [Iraq would subsequently use larger units to test larger ion sources, multiple ion sources and a hexagonal liner design, as well as concepts for the control system and collectors. According to Iraq's declarations to UN inspectors, it managed to produce 640 grams of enriched uranium with an average enrichment of 7.2 percent at Tuwaitha and some 685 grams at an average enrichment of 3 percent at Al Tarmiya.]

—"WMD Profiles: Nuclear," Wisconsin Project on Nuclear Arms Control, *Iraq Watch*, www.iraqwatch.org.

1982

Iraq begins exploratory work on gaseous diffusion technology.

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—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 36, www.iaea.or.at.

1982

Phase one of the EMIS development program begins at Tuwaitha. It involves the construction and operation of an electromagnet (Project 101) and two different magnet/separator systems (Projects 102 and 103).

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 35, www.iaea.or.at.

1982

Iraq creates the new Office of Studies and Development (OSD, later renamed PC-3) to pursue secret uranium enrichment and weapons activities, appointing Jaffar Dhia Jaffar as its head. Jaffar, motivated by his extensive experience working on accelerators in Europe, recommends that Iraq pursue an EMIS program as its primary means of enriching uranium. This decision leads to a major expansion of Tuwaitha.

—David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?" Institute for Science and International Security, 26 April 1999, www.isis-online.org; David Albright, Kate Buehler, and Corey Hinderstien, "Roadmap to Responsible Export Controls: Learning from the Past" Institute for Science and International Security, 2003, www.exportcontrols.org.

3 December 1981

A Congressional Research Service report for the Senate Foreign Relations Subcommittee on Arms Control indicates that Iraq is dependent upon outside help for its nuclear program, including: Brazil, for nuclear technology and training; Italy, for hot cell insulation units of the nuclear reactor; and Portugal for the supply of uranium (120 tons in 1980).

—David K. Willis, "How South Africa and Israel are Maneuvering for the Bomb," *Christian Science Monitor*, 3 December 1981, p. 14; cited in www.lexis-nexis.com.

15-17 November 1981

IAEA safeguards inspectors G. Rabot and V. Seleznev tour the bombed facilities of the Tuwaitha complex. They establish an inventory of 39 fuel assemblies of French origin containing about 12.5kg of highly enriched uranium, and inspect the presence of fuel assemblies of the small research reactor (IRT-200).

—"An IAEA Inspection of the Iraqi Nuclear Complex 'Revealed No Compliance,'" *Nucleonics Week*, 26 November 1981, p. 3.

9 November 1981

The IAEA issues a statement saying that it has been "informed by the Iraqi Atomic Energy Commission that after the removal of bombs and of partially damaged radioactive resources from the Tamuz reactor building, it is now more safe to approach the building and that they are prepared to receive IAEA inspectors at any time."

—"An IAEA Inspection of the Iraqi Nuclear Complex 'Revealed No Compliance,'" *Nucleonics Week*, 26 November 1981, p. 3; cited in www.lexis-nexis.com.

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Late 1981

Iraq finalizes its strategy for acquiring weapons-grade nuclear material. Using EMIS as the primary technology, Iraq would develop industrial-scale plants with a production capacity of 15kg per year of 93 percent HEU, based initially on natural uranium feed. Gaseous diffusion would be the subsidiary technology with the objective of building a plant to produce 5 metric tons per year of LEU to be used as feed material for the EMIS plant. The EMIS development program is organized into three phases with the first phase concentrating on research and development activities using "R40" magnet/separation chambers. Phase one is established in Tuwaitha. It involves the construction and operation of an electromagnet (Project 101) and two different magnet/separator systems (Projects 102 and 103).

—"Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996)," S/1997/779, 8 October 1997, p. 35, www.iaea.or.at.

September 1981

Jaffar is released from prison after two years of detention and quickly returns to work on Iraq's nuclear weapon program. He subsequently decides on two routes for uranium enrichment for the Iraqi nuclear weapon program. He would work on electromagnetic isotope separation (EMIS) and with some help from Hamza, a gaseous diffusion route as well. Hamza would be responsible for the overall bomb design. [Hamza surmises that Jaffar has decided on this strategy to cull favor with Saddam Hussein by demonstrating that he was "pulling out all the stops" in pursuit of a workable bomb. The team assesses that EMIS is the preferable route and gaseous diffusion will be the secondary option to produce LEU as feedstock for EMIS. If EMIS was unsuccessful, the gaseous diffusion facility would be expanded to produce HEU directly. Jaffar's preference for EMIS also owed to his training in high energy physics.]

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), pp. 138-139; "EMIS Procurement," ISIS, www.exportcontrols.org.

Fall 1981

With the Osiraq reactor destroyed, Iraqi physicist Humama al-Ghafour suggests enriching uranium using centrifuge technology as an alternative to the plutonium route. [Note: Hamza is initially against this idea because it would require sophisticated foreign technology, the acquisition of which risked exposure of the program.]

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York: Scribner Press, 2000), p. 130.

17 August 1981

French President Francois Mitterand and Iraqi Vice Prime Minister Tariq Aziz meet in Paris in the first direct contact since the Israeli bomb raid to discuss conditions under which France would rebuild the destroyed Osiraq reactor.

—"France Has Told Iraq it is Fully Willing to Rebuild," *Nucleonics Week*, 27 August 1981, p. 2.

August 1981

Iraq receives 7,914kg of UO₂ (in 120 drums) from Brazil.

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—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 25-26, www.iaea.or.at.

19 July 1981

Saddam Hussein says that Iraq would build its next nuclear reactor underground and it could consist of "five, indeed 10, nuclear reactors if our possibilities permit it."

—"Iraq Will Soon Ask France Officially to Rebuild Its Destroyed Nuclear," *Nucleonics Week*, 23 July 1981, p. 5; cited in www.lexis-nexis.com.

Early July 1981

IAEA inspectors attempt to inspect the Iraqi Osirak complex, but are unable to reach critical areas of the complex because of unexploded bombs and damaged radioactive resources.

—"An IAEA Inspection of the Iraqi Nuclear Complex 'Revealed No Compliance,'" *Nucleonics Week*, 26 November 1981, p. 3; cited in www.lexis-nexis.com.

Week of 29 June 1981

In an interview with *Nucleonics Week*, Comitato Nazionale per L'Energia Nucleare (CNEN) President Umberto Colombo responds to Iraqi President Saddam Hussein's statement mobilizing support for an Arab nuclear weapon saying, "If this statement is confirmed, I would recommend that Italy disassociate itself entirely from any further nuclear cooperation with Iraq."

—"Reacting to a Statement Attributed to Iraqi President Saddam Hussein," *Nucleonics Week*, 9 July 1981, p. 3; cited in www.lexis-nexis.com.

26 June 1981

French External Relations Minister Claude Cheysson says that nuclear cooperation with Iraq would resume contingent upon tougher safeguards.

—"Nuclear Supplies to Iraq Dependent on Tougher Sanctions, France Asserts," *Nucleonics Week*, 2 July 1981, p. 1; cited in www.lexis-nexis.com.

24 June 1981

In a recorded speech broadcast on Iraqi radio on 24 June 1981, President Saddam Hussein declares, "Regardless of Iraq's intentions and capabilities at present and in the future, any country in the world that seeks peace and security, respects people, and does not wish those people to fall under the hegemony or the oppression of external foreign forces should assist the Arabs in one way or another to obtain the nuclear bomb in order to confront Israel's existing bombs. This will realize and achieve peace regardless of Arab aims and capabilities. No power can stop Iraq from acquiring technological and scientific know-how to serve its national objectives."

—"Iraq Asserts Arabs Must Acquire Atoms Arms as a Balance to Israel," *New York Times*, 24 June 1981.

Week of 24 June 1981

Sources in the French nuclear industry insist that Iraq would not have been able to produce weapons-grade uranium or plutonium because of the nature of the reactor and the possibility of detection by on-site French technicians and IAEA inspectors. They disregard the Israeli government's concern that the "Tammuz tunnel" could

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breed plutonium through the use of a uranium blanket, and claim instead that plutonium production would be slow in the underground facility and would be detectable by IAEA inspectors.

—"France Sees Obligation to Supply Iraq with New Reactor," *Nucleonics Week*, 25 June 1981, p. 1; cited in www.lexis-nexis.com.

19 June 1981

Former IAEA safeguards inspector Roger Richter testifies before the US Senate Foreign Relations Committee stating that Iraq's intent to develop nuclear weapons is "obvious" and IAEA safeguards, as currently constituted, are "totally incapable of detecting the production of plutonium."

—Marsha McGraw, "No More Safeguards," *Christian Science Monitor*, 14 July 1981; cited in www.lexis-nexis.com.

18 June 1981

Senator Alan Cranston (D-California) speaks to the Senate Foreign Relations Committee about the Israeli attack on the Iraqi research reactor. While citing documents from the IAEA, he claims that Iraq could have produced enough plutonium each year in the Osirak reactor to build a maximum of three nuclear weapons, and that IAEA inspectors would not have been able to detect the plutonium production. He asserts that plutonium production could go undetected because Iraq's IAEA agreement calls for three inspections per year. Thus, he says, "Iraq could load its reactor between inspections, but unload it before each pre-announced inspection."

—Sandy Cannon, "U.S. at Odds over Need for Osirak Strike," *Nuclear Fuel*, 22 June 1981; cited in www.lexis-nexis.com.

18 June 1981

The Israeli government states that it based its 7 June attack in part on information supplied by US intelligence and that a "highly reliable resources," led them to conclude that the "Tammuz tunnel" located 13 feet under the surface housed a "secret chamber" containing equipment capable of processing plutonium and U-235 suitable for the fabrication of nuclear warheads.

—"Damage to Iraqi Reactor Still Unknown as Controversy Continues," *Nucleonics Week*, 18 June 1981, p. 2; cited in www.lexis-nexis.com.

11 June 1981

French Prime Minister Pierre Mauroy calls the 7 June Israeli attack "a grave act that the French government judges unacceptable." The French government does not react immediately to the attack because it wants to discuss the issue in a high-level meeting with French President Francois Mitterand and his ministers.

—"France Mulls Next Move in Wake of Israel Attack on Iraqi Reactor," *Nucleonics Week*, 11 June 1981, p. 1; cited in www.lexis-nexis.com.

Week of 8 June 1981

The IAEA board of governors vote 29-2 to "strongly condemn" Israel for its "premeditated and unjustified attack on the Iraqi Nuclear Research Center, which is covered by agency safeguards," and suggests that IAEA members consider suspending Israel's membership in the organization.

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—"Damage to Iraqi Reactor Still Unknown as Controversy Continues," *Nucleonics Week*, 18 June 1981, p. 2; cited in www.lexis-nexis.com.

7 June 1981

Fourteen Israeli jets destroy the 70MWth Tammuz-1 (Osirak) research reactor located near Baghdad in a bombing mission known as Operation Babylon. The attack lasts 80 seconds and a total of 13 bombs are dropped. The smaller Tammuz-2 (Isis) reactor, the 600kwth critical assembly unit, and associated reprocessing laboratories escape damage. It also appears that the Israeli jets specifically target a 100 foot-long tunnel that runs between the Osirak reactor and a large laboratory believing the tunnel houses sensitive experiments crucial to the Iraqi nuclear effort. Approximately 8 or 9 men are killed in the attack, including a French technician. [Note: Although the Osirak reactor was loaded with fuel in September 1980, it was removed during the Iraq-Iran War and no nuclear fuel was found to be in the reactor when it was bombed. Israel bombed the reactor at this time in order to "avoid radiological contamination to residents in the area" believing that the core of the reactor would be supplied with nuclear fuel as early as 1 July.]

—"France Mulls Next Move in Wake of Israel Attack on Iraqi Reactor," *Nucleonics Week*, 11 June 1981, p. 1; cited in www.lexis-nexis.com; William E. Burrows and Robert Windrem, *Critical Mass: The Dangerous Race for Superpowers in a Fragmented World* (New York: Simon & Schuster, 1994), p. 275; Trudy Rubin, "That Israeli Raid on the Iraqi Reactor: The Facts - and Deeper Issues," *Christian Science Monitor*, 24 June 1981; cited in www.lexis-nexis.com.

8 February 1981

Niger ships yellowcake to Iraq in two batches. Batch one, which consists of 432 drums and 137,435kg of yellowcake, is received.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 25-26, www.iaea.or.at; Fact Sheet: Iraq's Nuclear Weapon Programme, IAEA Action Team, www.iaea.org.

September 1980

Iran attempts an air raid on the Osirak reactor using F4 Phantom jets. The poorly trained Iranian pilots miss their target and no damage is inflicted on the reactor or its surrounding facilities.

—Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 22, 128; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

20 June 1980

Iraq procures its first batch of yellowcake from Portugal-429 drums containing 138,098kg.

—Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, pp. 25-26, www.iaea.or.at; Fact Sheet: Iraq's Nuclear Weapon Programme, IAEA Action Team, www.iaea.org.

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13 June 1980

Yehia al-Meshad, an Egyptian nuclear scientist working on Iraq's nuclear program, is murdered in a French hotel room. Al-Meshad is sent to Paris in order to resist French attempts at amending the Osirak contract to provide LEU proliferation-resistant-type reactors. It is widely presumed that the Israeli intelligence service, the Mossad, is responsible for the murder.

—"Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (Scribner: New York: Scribner, 2000), pp. 133-134.

1980

The French, nervous about the significant quantities of HEU that will be provided to Iraq under the Osirak deal, attempt to amend the contract by providing a reactor which utilizes a lower enriched uranium fuel known as "caramel" fuel (enriched to 8 percent). Iraq refuses the proliferation-resistant reactor but is willing to settle for any kind of reactor which utilizes HEU. [Note: Many analysts point to this as a clear indication of Iraq's intent to use the fuel for a nuclear weapons effort. Other analysts conclude that the fact the reactor is being built above ground proves that it is intended for peaceful purposes-although Israel's Dimona reactor is also built above ground.]

—"Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (Scribner: New York: Scribner, 2000), p. 133.

1980

Brazil begins clandestinely providing Iraq with nuclear assistance. The effort begins with photogrammetry and prospecting work to locate uranium ore, and culminates in a five-year industrial project to supply a facility for converting yellowcake into uranium dioxide (UO₂).

—Mark Hibbs, "Collor Moving To End Influence of Military in Nuclear Program," *Nucleonics Week*, 4 October 1990, pp. 6-7; Steve Weissman and Herbert Krosney, *The Islamic Bomb; the Nuclear Threat to Israel and the Middle East* (New York, NY: Times Books, 1981), p. 272.

1980

Iraq places an order for 11,364kg of depleted-uranium metal fuel pins from the West German company NUKEM. The pins are already fabricated into irradiation pins sized for the Osirak reactor and could be irradiated to yield plutonium. The 11 metric tons of target material are enough to produce 11kg of plutonium after 150 days of irradiation in the Osirak reactor. The deal is aborted when NUKEM subcontractors in the United States and Canada are told that export licenses would not be issued for the material.

—"Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Frank Barnaby, *How Nuclear Weapons Spread* (Routledge, 1993), p. 91; Leonard S. Spector, *Nuclear Ambitions* (Boulder, CO: Westview Press, 1990), p. 187.

Early 1980

The Swedish company Brown Boveri, a major magnet supplier to the European Organization for Nuclear Research (CERN), is contracted to assist in the design of a calutron magnet under the guise of a peaceful research project.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



—"Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (Scribner: New York: Scribner, 2000), pp. 133-134.

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1979-1956

December 1979

Saddam, alarmed by the storming of the US embassy in Iran and the growing power of the Shiite extremists, demands further updates on the status of the nuclear weapons program. Saddam's principal nuclear advisor, Dr. Husayn al-Shahristani, is arrested after he challenges the bomb program and for what are perceived as indiscreet political views against the regime. He is repeatedly beaten and tortured and remains in prison for 11 years until his escape during the Gulf War. Saddam's other science advisor, Jaffar Dhia Jaffar, attempts to intervene on al-Shahristani's behalf and is also jailed and beaten until he recants and is allowed back to work.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 22, 70; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz."

18 September 1979

Saddam Hussein holds a surprise meeting at al-Tuwaitha with the heads of the nuclear program, Jafar Dhia Jafar and Husayn al-Shahristani, and demands a report on the plutonium program and when delivery for a bomb is expected. Later it is learned that Saddam's demands for quick progress are linked to his plan for attacking Iran.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 22.

16 July 1979

Iraqi President Al-Bakr is forced to resign. Saddam Hussein takes over as president, secretary general of the Baath party, and chairman of the Revolutionary Command Council.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 22; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

6 April 1979

The reactor cores for Tammuz I (Osirak) and Tammuz II (Isis) are damaged by saboteurs in an explosion while they are awaiting shipment to Iraq in a warehouse in the French Mediterranean town of Seyne-sur-Mer. Initially, French environmentalists claim responsibility. Authorities, however, concluding that the bombing was done by professionals, suspect the Mossad is most likely responsible for the sabotage. The French inform the Iraqis that manufacturing new reactors would take at least two years. The Iraqis in turn are forced to accept the damaged reactors, which have hairline fractures.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



— Steve Weissman and Herbert Krosney, *The Islamic Bomb; the Nuclear Threat to Israel and the Middle East* (New York, NY: Times Books, 1981), pp. 227-233; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 110.

1 February 1979

The Iranian cleric, Ayatollah Ruholla Khomeini, returns to Iran following a 15-year exile. The collapse of the shah and the ayatollah's return mark the beginning of the Iranian Revolution, which eventually results in a Shiite fundamentalist Iran. This has significant implications for Iraq's security environment as Shiite demonstrations spill over the border into southern Iraq.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 106-107.

1979

Jaffar Dhia Jaffar becomes Vice Chairman of the Iraq Atomic Energy Commission. The principal scientists on the program are now Jaffar, Khidhir Hamza—who is responsible for the reactor program—and Husayn al-Shahristani who heads the plutonium separation program.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; William E. Burrows and Robert Windrem, *Critical Mass: The Dangerous Race for Superpowers in a Fragmented World* (New York: Simon & Schuster, 1994), p. 37.

1979

Iraq signs a contract with the Italian firm SNIA-Techint for a pilot plutonium separation and handling facility, and a uranium refining and fuel-manufacturing plant. Neither facility is subject to IAEA safeguards.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1979

Iraq imports from Italy 4,006kg of UO₂ powder and 508kg of uranium as UO₂ in the form of pressed fuel pellets. The UO₂ powder and the pellets are used in the Experimental Research Laboratory for Fuel Fabrication (ERLFF) for research and development activities. Iraq also imports from Italy, 6,005kg of depleted uranium as UO₂ powder.

— Fourth Consolidated Report of the Director General of the International Atomic Energy Agency under paragraph 16 of Security Council resolution 1051 (1996), S/1997/779, 8 October 1997, p. 25, www.iaea.or.at.

1978

The IRT-5000 research reactor originally purchased from the Soviets in 1962 is upgraded from 2MW to 5MW output.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1977

At the direction of Humam al-Ghafour, Iraq continues to invest millions of dollars on laser enrichment techniques although no tangible results are produced. Department 6240, the Laser Section of the Physics Department at the Tuwaitha Nuclear Research Center, is established.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.



— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 103-104.

Mark Hibbs, "Baghdad Steered Dedicated Effort To Enrich Using MLIS, AVLIS," *NuclearFuel*, 21 November 1994.

1976

Iraq and France conclude the contract for the Iraqi purchase of the nuclear research reactors. The French agree to supply a 40MWth MTR reactor called Tammuz-1 or Osirak, a zero-power reactor called Tammuz-2, a materials testing hot laboratory (called LAMA), workshops, and a radioactive waste treatment station (RWTS).

— David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaita Site: What if the Public or the IAEA Had Overhead Imagery?," Institute for Science and International Security, www.isis-online.org; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

10 September 1975

Saddam Hussein travels to Paris to meet with French Prime Minister Jacques Chirac to negotiate the export of the two Tammuz research reactors to Iraq in a deal sweetened by cheap Iraqi oil. Prior to his trip to Paris, Hussein tells the Lebanese news magazine *Al Usbu Al-Arabi* that the agreement is "the first concrete step toward the production of the Arabic atomic weapon" and that Iraq should be helped to obtain nuclear weapons in order to balance the Israeli nuclear arsenal.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 105.

1975

Dr. Khidhir Hamza and Dr. Hadi al-Obeidi, an Iraqi scientist specializing in laser optics, attend a conference on nuclear developments in Sante Fe, New Mexico. During this conference, they inquire about rumors of Israeli success in utilizing the AVLIS process for uranium enrichment. Most experts at the conference concur that the rumor is false since it is improbable that the Israelis have overcome key technical barriers. During the same trip, the two scientists pay a visit to National Electrostatic Corporation (NEC) headquarters in Madison, Wisconsin. The scientists explore the possibility of purchasing a Pelletron accelerator for an estimated \$1.5 million; however, no deal is made at the time.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 97-100.

1975

Under a very secretive operation at the Al-Hazen Ibn Al Hayatham Center for Research, work is conducted on the laser and optics technology necessary for the AVLIS enrichment process. Under the direction of Humam al-Ghafour, the research is conducted by Serwan al-Satidah, a Palestinian considered to be a protégé of PLO chairman Yasser Arafat. Utilizing extensive contacts with British and American universities, al-Satidah is able to procure significant funding from Saddam Hussein to further research at Al-Hazen.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and*

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Biological Weapons Agenda (New York, NY: Scribner Press, 2000), p. 95; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1975

Saddam Hussein appoints Humam al-Ghafour as one of his primary advisors regarding Iraq's nuclear weapons effort. In his early thirties, Al-Ghafour, has only a master's degree in physics but quickly becomes prominent at IAEC due to his party connections and loyalty to Hussein. One of al-Ghafour's primary goals is to implement a uranium enrichment program which utilizes atomic vapor laser isotope separation (AVLIS) technology.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 93-94.

June 1974

A delegation from the IAEC, including Hamza, Jaffar, and Hussein al-Shahristani, travel to Paris to negotiate the purchase of a reactor based on the French-designed Osiris reactor. Dr. al-Shahristani is a high-ranking nuclear physicist at the NRC, educated at the University of Toronto, he is an expert in neutron activation. The Osiris design is a pool-type reactor fueled by 93% enriched uranium. The French eventually dub the reactor Osirak, a play on the words Osiris and Iraq. [Iraq is spelled with a "k" in French and thus both spellings—Osiraq and Osirak are prevalent.] The Iraqis, however, call the reactor "Tammuz-1," after the month of the Islamic calendar when the Baath party came to power in 1968. At 40 megawatts (thermal), Tammuz-1 is a large materials test reactor (MTR), totally inappropriate for beginning a peaceful nuclear energy program but ideal for irradiation of target materials which is how Iraq plans to produce Pu-239. Iraq also contracts for a second lower power reactor called Tammuz-2 (designated Isis by the French). The total cost for the entire reactor package is estimated at \$300 million. This is nearly double the initial estimate given by the French. The Iraqis are aware they have no other choice than to pay the exorbitant sum.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 22, 80-83.

April 1974

Dr. Jaffar Dhia Jaffar, an experimental physicist who had previously headed the IAEC reactor and physics departments and later moved to Europe to work at the Geneva based European nuclear physics laboratory, (CERN), is enticed by Dr. Saeed to return to Iraq. Jaffar eventually becomes the principal and one of the most well known scientists working on Saddam Hussein's nuclear weapons program.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 79-80.

Late 1973

In a move to tighten his control over Iraq's nuclear weapons program, Saddam Hussein transfers oversight of the Iraqi Atomic Energy Commission (IAEC) to the Revolutionary Council. IAEC Secretary-General Dr. Moyesser Al-Mallah and NRC Director Husham Sharif are removed and Saddam Hussein appoints himself chairman of the IAEC (this appointment is never disclosed to the IAEA). Hussein installs 33-year-old Dr. Khalid Ibrahim Saeed as deputy

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chief for overseeing the IAEC and the nuclear weapons effort.

— David Albright, Corey Gay and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What if the Public or the IAEA Had Overhead Imagery?," Institute for Science and International Security, www.isis-online.org.

September 1973

Ordered by Saddam Hussein to "get inside and turn it to our purposes," an Iraqi delegation visits the International Atomic Energy Agency (IAEA). Dr. Moyesser al-Mallah, Dr. Khidhir Hamza, and minister of higher education Dr. Hisham al-Shawi, travel to Vienna to lobby for an Iraqi to have a seat on the IAEA board of governors. They are successful, and al-Shawi takes the seat. To further penetrate the IAEA's operations, a special intelligence office is created at the Iraqi embassy in Vienna. The position of "scientific attaché" is created and filled by Suoor Mahmoud Mirza, a brother of Saddam Hussein's senior bodyguard. Al-Shawi eventually succeeds in getting Iraqi nuclear physicist, Abdul-Wahid al-Saji, appointed as an IAEA inspector. Insider knowledge of IAEA operations proves invaluable in circumventing IAEA's detection of Iraqi cheating.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 74-77.

1973

French Prime Minister Jacques Chirac and Saddam Hussein reach an agreement in which France will provide Iraq with a nuclear reactor in exchange for petroleum concessions, imports of French automobiles, and options on future military aircraft purchases.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 81.

29 February 1972

In accordance with Article III of the Nuclear Non-Proliferation Treaty (NPT), Iraq agrees to accept International Atomic Energy Agency (IAEA) safeguards. The agreement is designed to monitor and prevent Iraqi fissionable material from being diverted towards a nuclear weapons program.

— IAEA INFCIRC 172, 22 February 1973, www.iaea.org.

1972

Khidhir Hamza submits his comprehensive plan for developing nuclear weapons in the form of a 40-page report. The plan calls for acquiring a medium-sized research reactor from the French under the guise of a civilian nuclear program. The plan also calls for a clandestine reprocessing unit necessary to separate the plutonium. The report is reviewed by a group affiliated with the Revolutionary Council and is ultimately approved by Saddam Hussein.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 70; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1972

The Iraqi nuclear weapons program begins in earnest. At the heart of Khidhir Hamza's plan is the acquisition of a

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foreign reactor for producing plutonium. The goal is to acquire a complete, safeguarded fuel cycle able to produce separated plutonium and duplicate the facilities clandestinely in order to produce unsafeguarded plutonium which in turn can be diverted towards a nuclear bomb.

— David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?," Institute for Science and International Security, 26 April 1999, www.isis-online.org.

1971

Dr. Khidhir Hamza is responsible for purchasing Iraq's first mainframe computer. The IBM 360/135 mainframe will eventually become the centerpiece of the clandestine nuclear weapons program.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), pp. 21, 72.

1971

A secret nuclear weapons program is initiated by the Iraqi Atomic Energy Commission (IAEC). The newly appointed chairman of the physics department of the Nuclear Research Center (NRC) is Dr. Khidhir Hamza. Hamza is approached by the two men in charge of the IAEC, the secretary-general, Dr. Moyesser al-Mallah, and the newly appointed director of the NRC, Husham Sharif, both Baath party members. Al-Mallah and Sharif request that Hamza develop a plan for acquiring nuclear weapons, one that uses an ambitious and carefully designed civilian nuclear program as a guise to obtain the technology, skills, and infrastructure required to successfully create a nuclear arsenal. [Note: Whether at the direction of Saddam Hussein or simply as a ruse to generate revenue for the poorly funded nuclear program, it is unclear who or what prompted the two scientists to approach Hamza with the idea of building a nuclear weapon.]

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 64; "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1970

The Tuwaitha Site grows to include several buildings including an isotope production laboratory, power substation, workshop, physics and chemistry laboratories, and expanded office space for the Nuclear Research Center. The number of personnel has also expanded from a few dozen to a few hundred.

— David Albright, Corey Gay and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What if the Public or the IAEA Had Overhead Imagery?," Institute for Science and International Security, www.isis-online.org.

Early 1970s

A newly published book, *The Israeli Bomb*, is widely read by the Arab intelligentsia. The author, Fouad Jabir, an American of Palestinian descent, asserts that the Arab world will face a bleak future of Israeli dominance unless it matches Israel's nuclear capabilities. The book proves influential among Iraq's top nuclear scientists.

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 62.

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29 October 1969

Iraq ratifies the Nuclear Non-Proliferation Treaty (NPT) thereby pledging not to develop nuclear weapons.

— Situation on 31 December 1996 with respect to the conclusion of safeguards agreements between the Agency and non-nuclear-weapon States in connection with NPT, *1996 Annual Report*, www.iaea.org.

17 July 1968

A Baath-led coup ousts General Abd-al-Rahman Muhamad Arif and Gen Ahmad Hasan al-Bakr becomes president. Saddam Hussein, a relative of Bakr, emerges as Vice President and deputy head of the Revolution Command Council (RCC).

— Khidhir Hamza with Jeff Stein, *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 48.

1 July 1968

Iraq signs the Nuclear Non-Proliferation Treaty (NPT).

— UN Disarmament Resources website, Status of Treaties, <http://disarmament.un.org>.

1967

The 2 megawatt IRT-5000 supplied by the Soviet Union goes critical and marks the beginning of nuclear research in Iraq.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>.

1962

Construction begins on Iraq's first research reactor, the 2 megawatt IRT-5000 supplied by the Soviet Union. The Tuwaitha Site, located about 30 kilometers south of Baghdad, becomes the Nuclear Research Center after it is chosen as the location of the Soviet-supplied reactor and its associated facilities.

— "Iraq's Nuclear Weapons Program: From Aflaq to Tammuz," <http://nuketesting.enviroweb.org>; David Albright, Corey Gay and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What if the Public or the IAEA Had Overhead Imagery?," Institute for Science and International Security.

1959

Iraq sends 375 students to the Soviet Union to study nuclear technology.

— "The Development of Iraq's Nuclear and Biochemical Weapons," *Shijie Zhishi*, 16 January 1999, No. 2, pp. 17-18.

1956

Under the auspices of the Atoms for Peace Program, the Iraqi Atomic Energy Commission (IAEC) is established with US help and encouragement to foster and conduct research, development and training in nuclear science and technology. The IAEC is under the Ministry of Higher Education and is structured in two units, the Nuclear Research Center (NRC) and the Secretariat (primarily the administrative body of the IAEC). The United States donates most of the US Atomic Energy Commission (AEC) unclassified reports from the Manhattan Project. The United States also provides training for the first generation of Iraqi nuclear scientist.

— David Albright, Corey Gay, and Khidhir Hamza, "Development of the Al-Tuwaitha Site: What If the Public or the IAEA had Overhead Imagery?," Institute for Science and International Security, 26 April 1999; Khidhir Hamza with

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Jeff Stein, www.isis-online.org. *Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda* (New York, NY: Scribner Press, 2000), p. 69.

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