

CHAPTER 7

ALTERNATIVE PROLIFERATION FUTURES FOR NORTH AFRICA

Bruno Tertrais

OF “CASCADING” EFFECTS IN THE MIDDLE EAST

The Iranian nuclear program has led to renewed fears of a “cascade” of proliferation in the Middle East: a rapid and almost mechanical process through which a country crossing the threshold would lead others to follow suit. Some claim these fears are overblown. They note that they are a recurring feature of Western strategic analysis, which have not been proven by subsequent developments.¹ So why would a nuclear Iran trigger a cascade of proliferation in the Middle East, the argument goes, whereas a nuclear Israel has not produced that effect for more than 40 years? The answer is fourfold:

- Iran’s in-your-face nuclear policy poses a real political challenge to Arab states in terms of prestige and legitimacy. Israel never publicly acknowledged its nuclear capability, and it is much more an adversary than a competitor vying for influence in the region.
- Iran is seen as a potential security threat by the Gulf States, but also by many in Egypt, given its increasing influence in the Gaza strip. By contrast, a stable “cold peace” continues to prevail with Israel.
- In the context of an ongoing worldwide nuclear “renaissance” – which is likely to continue, al-

beit at a slower pace, after the Fukushima catastrophe – ambitious, ostensibly civilian nuclear programs justified by the need to preserve hydrocarbon resources could provide an excellent cover for dual-use or military-related activities.

- Some of the actors in the region are losing confidence in the United States as a security guarantor. Washington’s longstanding motto is that a nuclear Iran is “unacceptable.” Thus, if Iran became nuclear, it will be seen throughout the Middle East as a failure of U.S. policy. This logic may be applicable in particular to Saudi Arabia, whose relations with the United States degraded significantly in 2011.

This chapter will assess the probability of “tertiary” proliferation; that is, the scenario whereby an Arab country – in this case, Algeria – would be reacting to an Egyptian nuclear option, which itself would be largely a reaction to Iran’s program.² Cairo and Algiers, whose political regimes are dominated by the armed forces, are rivals on the Arab scene, and have always had difficult relations. Their respective nuclear programs resemble each other, and Algeria – which enjoys good relations with Iran – seems to be watching very closely what Egypt is doing to make sure that it does not appear to fall behind the coming Middle Eastern nuclear “race.”

Of all the Middle East countries, Egypt may be the most likely to go nuclear if the Iranian program continues unabated. Egypt has significant nuclear expertise and is likely to be attracted by both the political and strategic advantages of a nuclear option. The fact that other Middle East countries – Saudi Arabia and Turkey – are also reported to be tempted to go in that

direction will be an added incentive. Egypt may not seek at all costs to be the first Arab nuclear state. But it is almost certain to do what it must to avoid being the *second* one.

THE EGYPTIAN OPTION

As the most populated Arab state, with a long tradition of intellectual supremacy in the region, Egypt considers itself to have a particular status in the Middle East and in the Muslim world. At the domestic level, Egypt has entered a phase of transition whose outcome is uncertain. Two things were apparent in the Fall of 2011: first, the military does not intend to completely relinquish its grip on power; second, the Muslim Brotherhood increasingly appears to be the best-organized political force in the country.

The Egyptian announcement of the revival of its nuclear program in 2006 raised concerns in the non-proliferation community. Egypt—the “usual suspect”—has regularly aroused suspicions concerning its nuclear intentions.³ While Libya has demonstrably renounced the nuclear option, Egypt has never really come to terms with Israel’s possession of nuclear weapons. But most important, the emergence of Iran as a potential nuclear power leads one to wonder if the nuclear military option could be reconsidered by Mubarak’s successors.

Egypt’s longstanding ambitions in the field of nuclear energy have been stymied for decades due to lack of funds and political will, poor management, and little enthusiasm by potential Western nuclear providers. However, under Hosni Mubarak, the country’s nuclear research activities had significantly increased. As a result, Egypt today has probably the most mature

nuclear research program in the Arab world (along with Algeria, as will be seen below).

The Egyptian Atomic Energy Authority (EAEA) has two major research centers located at Inshas, near Cairo. The first is the Nuclear Research Centre (NRC), Egypt's main nuclear facility. It includes a 10 MeV (million electron volts) cyclotron provided by Russia through a 1991 agreement, a Nuclear Fuel Research Laboratory, and a Fuel Manufacturing Pilot Plant, as well as two research reactors:

- ETRR-1 (EG-001), a small Warm Water Reactor (WWR) tank reactor (2 megawatt thermal [MWth]), which was built in 1958 by the Soviet Union and became critical in 1961. The fuel (10-percent enriched uranium) was also provided by Moscow. It is used for solid state, nuclear, and reactor physics; chemical research; isotope production; and biological irradiation. After an in-service inspection by the International Atomic Energy Agency (IAEA) in 1992, the EAEA started to modernize instrumentation and safety systems, fission chamber assemblies, and other equipment. ETRR-1 has been used less after the commissioning of ETRR-2.
- ETRR-2 (EG-002), an open pool-type light-water reactor (22.5 MWth) built by the Argentine firm INVAP (*Investigaciones Aplicadas*), was inaugurated in 1998. Its fuel elements were made by Argentina, using 19.75-percent enriched uranium from Russia. The last shipment of fuel was delivered in 1997. It is primarily used for radioisotope production, medical and nuclear solid-state research, nuclear engineering experiments, material fuel tests, and various other fields to train scientists and technical person-

nel. This fuel is of the same type as the one previously provided by INVAP to Algeria (see below). The ETRR-2 could produce more than 6 kilos of plutonium a year.⁴

The other key node in the Egyptian nuclear program is the Hot Laboratories and Waste Management Centre (HLWMC), also located at Inshas. It includes a Radioisotope Production Facility, a Low- and Intermediate-Level Liquid Waste Station, and a Radioactive Waste Disposal Site. The HLWMC aims, *inter alia*, at developing Egyptian expertise in the back end of the fuel cycle: the site also hosts a Nuclear Chemistry Building and a Hydrometallurgy Pilot Plant.

Egypt does not report any conventional uranium resources. There is, however, speculation about possible resources amounting to up to 15,000 tons. Unconventional resources of uranium are found in phosphate and monazite deposits. The Nuclear Material Agency has established a pilot-scale extraction plant to exploit the Egyptian black sands at Rosetta Beach on the Mediterranean coast.

Anwar el-Sadat's decision to ratify the Nonproliferation Treaty (NPT) in February 1981 symbolized the abandonment of the military nuclear option. A Comprehensive Safeguards Agreement with the IAEA came into force in June 1982. Today, all known Egyptian nuclear facilities are safeguarded.

At the turn of the century, Egyptian attempts to acquire nuclear weapons seemed to belong to the past. Writing in 2002, a well-known Israeli expert said:

As far as entering the nuclear arms race itself, the consensus in Israel today is that Egypt continues to uphold its strategic decision of 1981 (when it ratified the NPT) not to pursue this option.⁵

It was also widely believed that Egyptian dependence on U.S. assistance would be a serious de facto deterrent to any violation of the NPT by Cairo.

But the Egyptian nuclear picture has significantly changed in the past 5 years. On March 28, 2006, during the 18th annual Arab Summit, Amr Musa, the Secretary General of the 22-nation Arab League and former Egyptian Foreign Minister, called on all Arab countries "to respond to societal energy needs by aggressively pursuing peaceful nuclear energy programs and, in the words of one report, thereby joining the 'nuclear club'."⁶ A few months later, Gamal Mubarak, the then-President's son and Assistant Secretary of the National Democratic Party (NDP), announced during a conference of the party in September 2006 that Egypt planned to restart its nuclear energy program.⁷ This was confirmed 2 days later by the President, who emphasized that nuclear energy would allow Egypt to meet its energy needs in the face of a shortage in national oil and gas reserves.⁸ The higher ministerial council for energy reconvened for the first time in 20 years: it created an ad hoc committee comprised of five ministries (including electricity and energy, oil, and defense) to explore the nuclear option.⁹ Electricity Minister Hassan Yunis announced a global plan that consisted of the building of three plants, generating a total of 1,800 megawatts (MW) until 2020. He said that Egypt would build its first power plant (a 1,100 MW station) at El-Dabaa.

In 2007, Yunis confirmed the government's aim of more than doubling the country's power generation capacity by 2027 from 23,000 MW to 52,000 MW. This plan was also intended to reduce dependence on natural gas and petroleum for electricity generation

by using alternative energy sources, including renewable ones.¹⁰ Egyptian experts say the plan's rationale is "purely economic."¹¹ Egyptian power generation relies on oil and natural gas. It is argued that indigenous reserves are expected to be depleted in 30-40 years, and that generating electricity through nuclear energy would allow Egypt to export more of its own natural resources. Former Minister of Electricity and Energy (1968-70) and current head of the Energy Committee at the National Specialized Councils, Mustafa Kamal Sabry, affirmed that: "The fact that our other energy sources are either too expensive or not everlasting means that the nuclear energy option is inevitable for Egypt."¹² There are also clearly status and domestic legitimacy dimensions in Cairo's nuclear bid. As claimed by Minister Yunis:

The people are searching for a dream, a national project that proves to us that we are strong and capable of doing something fitting of the grandeur of a country that some have begun to doubt.¹³

Egypt has a high number of nuclear cooperation agreements in force, and signed a new one with Russia in 2008.

The political turmoil in Egypt and the Fukushima catastrophe have not diminished Cairo's nuclear ambitions. The tender for the future Egyptian power plant to be issued in early 2011 was delayed for obvious political reasons. But in July, it was reported that the process would be launched after the presidential elections.¹⁴ Amr Moussa, then a main presidential hopeful, insisted that the program should and will go ahead.¹⁵ A conjunction of several elements has come to cast serious doubts upon the strictly peaceful nature of Egypt's nuclear intentions.

Egypt persistently refuses to bolster its nonproliferation credentials. It does not want to subscribe to an Additional Protocol. It does not want to exclude the option of building enrichment or reprocessing facilities, arguing “against any attempt to limit the right of state-parties to the NPT to the full fuel cycle” and refusing new commitments as long as Israel’s facilities are not put under safeguards.¹⁶ Egypt has not ratified the Pelindaba Treaty (signed in April 1996) establishing a Nuclear-Weapon-Free Zone (NWFZ) in Africa. It has failed to ratify the Comprehensive Test Ban Treaty (CTBT, signed in October 1996). While Cairo claims that matters of status and principle explain its position, the fact is that Egypt seems to behave like a typical “hedging” state.

It is now known that Egypt has conducted significant undeclared activities in the past. A February 2005 report by the IAEA Director General identified multiple failures to report to the IAEA a number of activities related to conversion, irradiation, and reprocessing. Regarding uranium conversion, Cairo had failed in 1982 to report the possession of approximately 67 kilos of imported UF₄, 3 kilos of uranium metal (some of which had been imported, the rest had been produced from imported UF₄), 9.5 kilos of imported thorium compounds, and small amounts of domestically produced UO₂, UO₃, and UF₄. Between 1990 and 2003, Cairo had conducted uranium and thorium irradiation experiments, as well as preparatory activities related to reprocessing (including undeclared imported non-irradiated fuel rods containing 10-percent enriched uranium). Egypt had also avoided providing initial design information for the Hydrometallurgy Pilot Plant and the Radioisotope Production Facility, and modified design information for the two reactors.¹⁷ As some experts have emphasized:

The work itself was not illegal, but the failure to declare it to the IAEA raises questions about Egypt's intentions, the true extent of their nuclear infrastructure and capabilities, and whether it carried out other, undeclared activities related to nuclear weapon development.¹⁸

During IAEA investigations, Egypt claimed its innocence and reaffirmed its continued commitment to its obligations. Cairo denied allegations of a secret program and declared that the failures were not intentional. Subsequent to the IAEA Director General report, IAEA board members qualified the violations as minor. The United States even praised Egypt's cooperation, saying that its example clearly demonstrated the "appropriate means for resolving outstanding safeguards issues, specifically, full cooperation with the IAEA on steps to address all concerns."¹⁹ This led experts to conclude that "Egypt's infractions do not show a methodical build-up of a latent weapons capability."²⁰

However, the subsequent discovery of traces of highly enriched uranium in the country has led to new questions about Egypt's activities and imports. As stated in the IAEA Safeguards Statement for 2008:

In 2007 and 2008, some high enriched uranium (HEU) and low enriched uranium (LEU) particles were found in environmental samples taken at Inshas. Egypt stated that, as a result of an investigation carried out to identify the source of the particles, it believed the particles could have been brought into the country through contaminated radioisotope transport containers.²¹

According to AEA officials, such containers had been imported for research in the areas of medicine and agriculture.²² This record and the absence of an Additional Protocol naturally raise questions about whether the full range of Cairo's nuclear activities is publicly known. For instance, given the longstanding involvement of Egyptian scientists and technicians in the small Libyan nuclear research program, one would like to be certain that none had been involved in Kaddafi's secret effort to acquire a uranium enrichment capability.²³

As in the case of some Gulf States, the timeline of Egypt's rejuvenation of its nuclear energy program suspiciously coincided with Iran's acceleration of its nuclear effort (in particular, the start of uranium enrichment at Natanz in early 2006). The two countries have had difficult relations since the assassination of President Sadat. A Tehran street has been named in honor of his murderer. Iran's growing prestige and influence in Iraq, Lebanon, and, most importantly, in the Gaza Strip, are seen with increasing discomfort in Cairo. In February 2006, Egypt voted in favor of the IAEA Board of Governors' resolution that transferred the Iranian file to the United Nations (UN) Security Council. As noted by some observers:

Egypt's announcement [in September 2006] that it will revive its dormant nuclear program—coupled with similar statements from Morocco, Saudi Arabia, and other Arab governments—is a direct consequence of Iran's budding nuclear program and the international community's inability to stop it.²⁴

Dr. Mohamed Kadry Said, an advisor at Cairo's Al Ahram Center for Political and Strategic Studies, stated that "for our people here to feel some sort of

inferiority with regard to the Iranians or Israelis this affects their morale very much.”²⁵ This simultaneous reference to Israel and Iran has become a standard in Egyptian debates—implicitly giving ground to suspicions, considering that Israel’s nuclear civilian activities are quite modest. While President Mubarak alluded several times in the 1990s to the possibility of a nuclear weapons program and/or to a withdrawal from the NPT, such statements by Egyptian officials now seem to be increasingly frequent and explicit. In January 2007, Mubarak affirmed: “We don’t want nuclear arms in the area but we are obligated to defend ourselves. We will have to have the appropriate weapons.”²⁶ In April 2010, Foreign Minister Ahmad Abu Al-Gheit alluded to the possibility that Iran would be “forcing the Arabs to engage in a [nuclear arms] race.”²⁷ In another interview, he, too, referred simultaneously to Iran and Israel, and refused, when asked to say that Egypt would not build nuclear weapons.²⁸ In June 2010, Ambassador Maged Abdul Aziz, the Egyptian head of delegation to the NPT Review Conference, said:

If others will acquire nuclear weapons—and if others are going to use these nuclear weapons to acquire status in the region of the Middle East—let me tell you, we are not going to accept to be second-class citizens in the region of the Middle East. . . . If the Iranian program proves to be a military program and [if] Israeli nuclear capabilities [are maintained], both are going to be a threat to . . . Egypt and to all the countries in the Arab world. That will make a lot of countries of the Arab world change their mind.²⁹

In September 2011, a retired Egyptian general openly called for Cairo to follow Tehran’s example.³⁰

Despite such insistence on external drivers, an Egyptian nuclear military option would doubtlessly also have an important domestic political component. As a commentator put it shamelessly 15 years ago, nuclear weapons could be:

... the most cost-effective means available to Egypt for improving her intrinsic strength and relative power . . . [and would] revitalize Cairo's political and cultural leadership role in the region. It will also help disseminate a moderating and democratizing Arab vision. This can only serve the interests of peace and stability in the region.³¹

The Muslim Brotherhood – who is now the dominant political force in the country, having won both parliamentary and presidential elections – praise a nuclear weapons option to counter Israel's nuclear capabilities.³² Several members of the Shura Council (the consultative Upper House) have also called for a nuclear weapons program.³³ It is a sign of the times that even Mohamed El-Baradei, the former Director General of the IAEA and a former presidential hopeful, refused to discard a nuclear weapons option for Egypt – perhaps seeking support from the Muslim Brotherhood.³⁴ Finally, a nuclear weapons program could bolster the domestic and regional status of Mubarak's successors.

Since it became a member of the NPT in 1981, Egypt has actively promoted, through national means as well as through the League of Arab States and the Non-Aligned Movement (NAM), the idea of a Nuclear-Weapon-Free Zone in the Middle East. Egypt rightly assesses that consensus at the 1995 NPT Review and Extension Conference was made possible only by the adoption of a specific resolution on the Middle East. In

recent years, the idea of a Weapons of Mass Destruction (WMD)-free zone in the Middle East has become a useful vehicle for Egyptian diplomacy to challenge the Iranian nuclear program under the disguise of a project historically aimed primarily at the denuclearization of Israel.³⁵

At the May 2010 NPT Review Conference, Cairo was a key participant as the chair of the NAM and of the New Agenda Coalition. Egypt's diplomacy was instrumental in ensuring that the idea of a conference on the establishment of a WMD-free zone in the Middle East obtained consensus. The conference is to be held in or after 2012. Presumably, a perceived failure to make progress in this regard could be used as a pretext by those Egyptians who are pushing for a nuclear weapons option.

Finally, an official acknowledgment by Israel of its nuclear weapon capability would be an extraordinarily strong incentive for Egypt to push for its own nuclear weapons option. While nothing suggests that today Israel is ready to change its longstanding declaratory policy on the subject, an openly nuclear-armed Iran might lead Israel to reconsider its position if it was judged necessary to ensure deterrence vis-à-vis Tehran and the reassurance of its own population.

If Egypt was to visibly take steps in that direction, it is not certain that the threat of cutting off Western assistance to the country would be enough of a deterrent. An Egyptian government that decides to build nuclear weapons might also be one that has decided to distance itself from the West. This could happen, for instance, if the Muslim Brotherhood grew in power and influence within the new regime. Moreover, as it happened in the past for Pakistan, Gulf countries could step in and assist Egypt – and perhaps even be-

come stakeholders in a de facto multinational Arab nuclear program.

AN ALGERIAN OPTION?

When it comes to assessing prospects for nuclear proliferation, Algeria is usually not on the radar screen of most Western analysts. This is a mistake. Algeria has the technical means and potentially the political will to be at least a “nuclear hedging” country.

Since the late 1980s, Algeria has had a very significant nuclear program, which includes in particular now-safeguarded nuclear facilities on two different sites.

- The Nur research reactor (DZ-0001) is located at the Draria nuclear complex, about 20 kilometers (km) east of Algiers. It is owned and licensed by the Research and Higher Education Ministry, and operated by the *Unité de Recherche en Génie Nucléaire* (URGN).³⁶ The reactor’s construction by the Argentinian firm INVAP began in 1987, under a contract signed in May 1985. This was not a “turnkey” operation: the construction involved a significant number of Algerian firms and technicians.³⁷ The small pool-type, light-water reactor of 1 MWth went critical in 1989. Its fuel (20-percent LEU) was provided by Argentina. Its stated goal is research and the production of isotopes.
- Algeria also has a pilot fuel fabrication plant, UDEC, located at the Drania nuclear complex. It was built by INVAP under a 1985 agreement. Even though the plant was 90 percent completed in mid-1991, domestic security conditions hampered further work on the project. It was fully completed only in mid-2000.³⁸

- The Es Salam research reactor (DZ-0002) is located in Ain Oussera, in the Saharasert, 140 kilometers south of Algiers. It is owned by the Research and Higher Education Ministry, licensed by the Algerian Nuclear Safety Commission, and operated by the *Centre de Développement des Systèmes Energétiques* (Centre for the Development of Energy Systems, CDSE).³⁹ The construction began in 1988, and went critical in 1992, before being inaugurated in 1993 – after a controversy arose about the nature of Algeria’s program (see below). The reactor was a heavy water-type, reported to the IAEA to be designed to produce 15 MWth. The reactor was built following the signing of a nuclear cooperation agreement with China in February 1983. The builder was Zhongyuan Engineering Corporation (a subsidiary of China National Nuclear Corporation), the same company that built the Pakistani Chashma nuclear power plants. Beijing stated in 1991 that under this agreement, it had also delivered to Algeria 11 metric tons of heavy water and 216 fuel modules, totalling 909 kilos of 3 percent LEU.⁴⁰ (It seems that the Algerian government had envisioned cooperating with France, but ended up turning to Beijing at the end of 1982.)⁴¹ The reactor’s fuel was also provided by China.
- The Ain Oussera site also hosts various facilities, including an isotope production plant, hot cell laboratories, and waste storage tanks. These are collectively mentioned in the IAEA list of safeguarded installations as AURES-1.

Algeria today has one of the best and most developed nuclear complexes of the whole Arab world; it also has vast deposits of uranium in the southeast part of the country, near Tamanrasset. In addition, the country has considerable amounts of phosphate ore from which uranium could be recovered.⁴² Concerns about Algeria's nuclear intentions surfaced in 1991, as U.S. satellite observation revealed the existence and nature of the Ain Oussera project. The U.S. State Department reportedly did not believe that Algiers was seriously considering a program of a military nature. In fact, it turned out that a senior State Department official had been informed as early as 1988 of the nature of the contract by the Chinese government.⁴³ The story became public through an article in *The Washington Times*.⁴⁴ (The day before, Algiers had expelled the United Kingdom [UK] military attaché for having been found with a camera on the site.)

That the Algerian nuclear complex resembled Egypt's program fueled suspicions. Not unlike Egypt's, Algeria's nuclear infrastructure is significantly developed and includes a fairly large research reactor. Proliferation concerns stemmed from the combination of several factors. First, Algeria had not signed the NPT, and its facilities were not safeguarded. (In 1991, many nonaligned states had yet to sign the NPT, since they viewed it as an instrument of domination by industrialized nations.) Algeria had signed an INFCIRC/66-type agreement in 1989, which covered only the Argentine-supplied reactor.

Second, the El Salam complex, which is fairly large and well protected for a research facility, is of a type that would potentially allow for the production of weapon-grade plutonium, and satellite observation of the site raised many questions. Several foreign experts

believed that a heavy-walled building near the reactor was intended to be a full-scale reprocessing plant. The size of the cooling towers was said to exceed the requirements of a 15 MW reactor and to be consistent with a 40- or even 60-MWth reactor.⁴⁵ Finally, the site was well protected, including through Soviet-made SA-5 surface-to-air missiles.⁴⁶

Estimates regarding the quantity of plutonium that could be generated by the reactor at 15 MW vary between three and five kilograms (kg) a year.⁴⁷ However, in June 1995, it was reported – consistently, as is now known, with U.S. intelligence estimates at the time – that the reactor was in fact fueled with 3-percent LEU instead of natural uranium. This lessened the quantity of plutonium possible to produce annually with the reactor, which was evaluated at one kilogram, assuming a power of 15 MW.⁴⁸ There are, however, several options for producing weapon-grade plutonium from such a reactor. One would be to increase significantly the number of reloads of LEU; another would be to switch to natural uranium fuel. A third option would be to irradiate natural uranium targets – a process through which it would be possible to obtain about 1.5 kg of plutonium a year.⁴⁹ A European expert estimated in 2009 that the Ain Oussera reactor had produced 50 kilos of plutonium since its inauguration – a very high estimate, but, nevertheless, a not implausible one.⁵⁰

A prominent member of the then-Algerian government has stated in a 2009 conversation with this author that the project had entirely been run by the military, and that the civilian leadership had been kept in the dark.⁵¹ Algeria faced no direct military threat at the time. A nuclear option could have been motivated by one of several of the following factors: recurring tensions with its two main neighbors, Morocco and Libya

(which entertained a nuclear weapons option, as Algiers probably knew); a “prestige” dimension, which certainly would have mattered to a country that is one of the biggest in Africa, has been a leading member of NAM and sees both Libya and Egypt as competitors in both North Africa and in the Arab world; or domestic balance-of-power considerations, if the armed forces were looking to bolster their grip on power. There is also the possibility that Algiers’s past military-oriented nuclear activities were conducted on behalf of, or in cooperation with, another country.

At a press conference on April 29, 1991, a spokesman for the Algerian Ministry of Scientific Research said that the El Salam reactor’s purpose was the production of isotopes and electricity.⁵² In May, the government claimed that it was preparing for the “*post-oil*” era.⁵³ The government gave technical details about the reactor and announced that it would be put under safeguards once completed.⁵⁴ An official TV report included government comments to the effect that the reactor’s power could not be increased beyond 20 MW, and that the Ain Oussera site was chosen only because of its geological stability.⁵⁵

The role of international pressure was probably important in leading Algiers to accept NPT ratification and IAEA safeguards. At that time, the Algerian government was isolated and needed to consolidate its relations with the West. Following the aborted December 1991 elections that had given victory to the Islamic Salvation Front, a coup had taken place on January 11, 1992, and a state of emergency had been declared on February 9, 1992.⁵⁶

The first IAEA inspections to El Salam took place in January 1992, thus in the midst of the political crisis.⁵⁷ A few days later, a temporary facility-specific

safeguards agreement was signed with the IAEA, allowing for inspection of the Ain Oussera complex; it came into force in June 1992.

Algeria officially announced its decision to join the NPT on December 21, 1993, on the occasion of the inauguration of the El Salam reactor.⁵⁸ Algiers deposited its instruments of ratification of the NPT in January 1995. A full-scope safeguards agreement with the IAEA came into force in January 1997. (Inspections reported minor discrepancies with Algeria's initial declarations, namely small quantities of undeclared materials – three kg of enriched uranium, several litres of heavy water, and several pellets of natural uranium provided by China.⁵⁹) Algiers also signed the CTBT in October 1996 and ratified the Pelindaba Treaty in February 1998.

At the same time, Algiers sought to reinforce its cooperation with China through a series of next-steps agreements in 1996 and 1997, which covered the completion of a hot-cells facility (phase two), the building of facilities for the production of isotopes (phase three), as well as the construction of underground waste-storage tanks. There have been reports of Algeria's unwillingness to open the Ain Oussera hot cells facility to inspections, as well as of an undeclared removal of two fuel rods from the reactor.⁶⁰ Algerian claims that the isotope facility is to be used for the production of Cobalt-60 have been met with suspicion.⁶¹ However, in 2002, the United States was said to have been satisfied with IAEA surveillance of the Ain Oussera complex.⁶²

Concerns resurfaced in the late 1990s, as a report from the Spanish intelligence service, Centro Superior de Información de la Defensa (CESID), allegedly claimed that even though there was currently no evi-

dence of a political will by Algiers to undertake nuclear military applications:

. . . The knowledge acquired by a notable team of technicians and scientists, with the availability of the facilities that it will have at the end of the century, puts this country in a privileged position to restart the programme's military character if the political decision is made.⁶³

In this regard, it is noteworthy that there was a significant transfer of "nuclear know-how" by INVAP during the construction of the Nur reactor and the UDEC pilot fuel fabrication plant (which was then being built).⁶⁴ It is noteworthy that experts from the Institute for Science and International Security (ISIS), after extensive research, have found that there was a discrepancy between the 300 highly qualified engineers claimed to be working in the Algerian nuclear program—and the low number of Algerian publications in the field, furthering suspicions that some of the scientists may have been involved in classified work.⁶⁵

As in many other states in the region, the idea of developing nuclear power has attracted interest. Algeria's scarcity of water resources and the benefits of reserving an increasing share of the country's oil and gas for exports, given the rising prices of such commodities, have frequently been cited as economic incentives. There is also clearly a prestige factor at play, as in many other countries. In November 2006, the Minister of Energy and Mining announced that a significant nuclear power program would be launched, taking advantage of the country's abundant resources in uranium.⁶⁶ In December, a security and safety institution was established. Algiers would like to have

its first nuclear power plant running in 2020. Algeria seems to consider that it is a natural leader in Africa's development of indigenous energy programs. It hosts the African Union Energy Commission (AFREC)⁶⁷ and, in January 2007, hosted the first Africa-wide conference devoted to nuclear energy.⁶⁸

During the French presidential election campaign, then-candidate Nicolas Sarkozy launched the idea of an energy partnership with Algeria, which would include investment in gas exploitation in return for nuclear cooperation.⁶⁹ However, as of the Fall of 2011, this proposal had not been translated into concrete action by the two countries except for a generic nuclear cooperation agreement signed in 2008. The French firm AREVA is said to be uninterested in selling a reactor to Algeria.⁷⁰

So Algiers seems keen to multiply and diversify its options. In May 2006, an 11-strong delegation visited South Korea to explore bilateral nuclear cooperation, with reportedly a strong interest in facilities such as hot cells.⁷¹ In November 2006, Algiers expressed interest in Iran's offer of sharing its expertise.⁷² In 2007-2008, Algeria also signed various new nuclear cooperation agreements with a number of countries, including Argentina, China, France, and the United States.

Algiers ratified the CTBT in July 2003. Under pressure from the United States and Europe, it negotiated with the IAEA an Additional Protocol (AP) to its Safeguards Agreement. The IAEA Board of Governors approved the Algerian AP in September 2004. However, as of August 2010, Algeria had yet to sign it. Whether Algeria is using the coming into force of the AP as a political tool to advance the cause of a NWFZ in the Middle East, to appear as the champion of nonaligned countries' right to peaceful use of nuclear energy, or

it is seriously hesitating before giving up a potential military option remains unclear. Algeria has been a long-standing proponent of the idea of a NWFZ in the Middle East. More recently, it has consistently supported the Iranian position as to its “right” and intention to pursue a full nuclear fuel cycle, abstaining in several votes on the Iranian issue at meetings of the IAEA Board of Governors.⁷³ (Algerian-Iranian relations had been restored in 2002, after a decade-long freeze – due to Tehran’s alleged support for Algerian extremists.) Bouteflika’s support for the Iranian position was reiterated at the occasion of Ahmadinejad’s visit to Algiers in August 2007, saying it was:

unacceptable that countries which are members of the Nuclear Non-Proliferation Treaty are constrained, because of selective and unilateral interpretations, to renounce their normal and legitimate right to acquire these technologies for purely peaceful purposes.⁷⁴

In some respects, Algeria’s contemporary situation could be compared with Pakistan’s: a military-dominated Muslim-majority state with a serious terrorism problem, which enjoys good relations with the United States, but has received important nuclear assistance from China. After the aborted elections of December 1991, Washington benefited from a cold in French-Algerian relations, and the U.S.-Algeria relationship has been made stronger in the post-September 11, 2001, environment. At the same time, cooperation with China has continued and expanded in the economic field.⁷⁵ Meanwhile, the terrorist *Groupe Salafiste de Prédication et de Combat* (GCSP) continues to be very active in the country, threatening both national and international interests – French ones, in particular. Since 2006, the group has been officially designated

as al Qaeda's affiliate in the region ("Al Qaeda in the Islamic Maghreb" [AQMI]). A radicalization of the country remains a very hypothetical scenario. The current system – partly democratic with a strong military influence – looks strong. However, the aborted 1991 elections showed that the population was ready to give a majority to political forces perceived as being less corrupt than the old guard that had run the country since the 1962 independence, and more in tune with its day-to-day needs.

An Algerian nuclear military option remains a real possibility.⁷⁶ The probability of such an option being realized would dramatically increase if three conditions were met: a rebirth of nuclear weapons options or "hedging" strategies in the Arab world; a further weakening of the nuclear nonproliferation regime, particularly if Iran were to continue to proceed on the nuclear path; and a growing tension between Algeria and the West, be it under the current regime or after a "regime change" – leading the country to be governed, for instance, by an Adalet ve Kalkınma Partisi (AKP)-type Islamist-oriented political force. Given Algeria's membership in the NPT and the Pelindaba Treaty, any nuclear option would have to be developed either in secrecy – for instance, through a uranium enrichment program, possibly with Iranian or North Korean assistance – or after a withdrawal from such treaties.

The main obstacle to a possible Algerian nuclear option is that the country does not have ballistic missiles or even a missile industry. This would not be an issue for a "hedging" option with primarily political goals. A more ambitious nuclear program would have to be accompanied by foreign procurement of missiles, probably in Iran or North Korea.

Algeria, whose institutions have been dominated by the National Liberation Front since its 1962 independence, has enjoyed a growing relationship with Iran since the resumption of diplomatic relations in 2000.⁷⁷ Tehran could be a conduit for the acquisition not only of ballistic missiles, but of nuclear-related technology. In fact, Algiers would be almost an ideal candidate if Tehran was looking for partners in its own nuclear weapons drive.⁷⁸ Algeria could be, for instance, an alternative source of weapons-usable plutonium for Iran.

REGIONAL DYNAMICS AND THE RISK OF ACTION-REACTION

From a technical standpoint, Egypt and Algeria have largely similar nuclear programs, and doubts linger in both countries regarding the existence of undeclared nuclear activities (notably in the field of uranium enrichment or plutonium separation), especially given that neither of the two has brought an Additional Protocol into force. According to a European expert, Algerian expertise and know-how are actually superior to Egypt's.⁷⁹ For Algeria, an Egyptian drive for nuclear weapons would undoubtedly be a trigger to restart (or accelerate) its dual-use or military-related nuclear activities.

It is not widely appreciated that the two countries have an extraordinarily bitter relationship, made up of resentment and jealousy with deep historical roots. In particular, despite the fact that Nasser openly supported the Algerian independence movement, there is the feeling in Algiers that the self-appointed leader of the Arab world did not do its best to support the insurgency (or alternatively, that Egypt exaggerates its

contribution to the independence of Algeria).⁸⁰ After Algeria's independence, Egypt touted itself as a model and a tutor for the young Republic, an attitude that many Algerians saw as condescending and involving undue meddling into internal affairs. Among the grudges that Algeria holds over Egypt are its alleged lack of recognition for the military and financial support given to Cairo in its wars against Israel between 1967 and 1973, and its subsequent separate peace with Israel. In the debate over the reform of the UN Security Council, Algeria has made it clear that it will not accept Egypt being conferred a permanent seat at the UN Security Council. Also in 2004, Algeria challenged Cairo's leadership over the League of Arab States.⁸¹

At the risk of oversimplification, there is an Egyptian "superiority complex" over Algeria, and a corresponding Algerian "inferiority complex" over Egypt. This rivalry was exposed to the limelight in recent years at the occasion of the 1990 and 2010 Soccer World Cup Playoffs. In 1989, Egypt qualified by winning over Algeria.⁸² In 2009, the reverse happened: Algeria qualified by winning over Egypt. At both occasions, passions ran high, and violence erupted after the games, with significant diplomatic and economic consequences.⁸³

The contract with INVAP to build the ETRR-2 reactor was signed in September 1992, 18 months after the revelation of the existence of the Algerian reactor.⁸⁴ Algeria's attitude regarding Egypt was made clear in 2006, when it announced its nuclear energy program just a few weeks after Egypt's own announcement. Just like Cairo, Algiers would like to have its first nuclear power plant operating around 2020. These plans have not been altered by the Fukushima accident.

In the Spring of 2010, the Algerian press published a declassified U.S. document reporting a May 1991 State Department request for Egyptian assistance in gathering information about the Ain Oussera reactor.⁸⁵ Unsurprisingly, this created a furor in Algeria.

In sum, there is enough evidence to suggest that Algeria's conduct in the nuclear field should be monitored as carefully as Egypt's. "Tertiary proliferation" might not be the end of the proliferation game in the Middle East. If both Egypt and Algeria were showing signs of going nuclear, should one expect the new Libyan regime, for instance, to stand idle?

ENDNOTES - CHAPTER 7

1. See, for instance Moeed Yusuf, "Predicting Proliferation: The History of the Future of Nuclear Weapons," *Policy Paper No. 11*, Washington, DC: The Brookings Institution, January 2009.

2. It could be argued that Pakistan's nuclear program was also a case of "tertiary" proliferation, since it was a reaction to India's program, which itself was largely a response to China's own program. However, in the case of Asia, the trauma of military defeats (1962 for India, 1971 for Pakistan) was arguably as important as the existence of neighboring nuclear programs. By contrast, in the Middle East, the 1967 defeat against Israel did not lead to a rush to go nuclear in Arab countries.

3. The expression "the usual suspect" comes from Mark Fitzpatrick, ed., *Nuclear Programmes in the Middle East: In the Shadow of Iran*, London, UK: International Institute for Strategic Studies, 2008, p. 17.

4. Wyn Bowen and Joanna Kid, "The Nuclear Capabilities and Ambitions of Iran's Neighbors," in Henry Sokolski and Patrick Clawson, eds., *Getting Ready for a Nuclear-Armed Iran*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2005, p. 64.

5. Emily B. Landau, "Egypt's Nuclear Dilemma," *Strategic Assessment*, Vol. 5, No. 3, November 2002.

6. Sammy Salama and Gina Cabrera-Farraj, "Secretary General of Arab League Urges Arab Countries to Exploit Nuclear Power, Enter 'Nuclear Club'," *WMD Insights*, May 2006.

7. "Mubarak's Son Proposes Developing Nuclear Energy," *The Associated Press*, September 19, 2006.

8. "Egyptian President Discusses Reform Plans, Nuclear Energy at Party Conference," *BBC*, September 22, 2006.

9. "Time for the N word," *Al-Ahram Weekly*, No. 814, 2006.

10. "Egypt Aims to Double Power Generation Capacity within 20 Years," *Global Insight*, August 3, 2007.

11. Dr. Abdel Hakim Kandil, Professor of Nuclear and Inorganic Chemistry at Cairo's Helwan University, quoted in "Inside Egypt's Nuclear Debate," *International Security Network*, March 26, 2007.

12. Quoted in "Dumping the Nuclear Option?" *Al-Ahram Weekly*, No. 713, 2004.

13. Quoted in Sammy Salama and Gina Cabrera-Farraj, "Renewed Egyptian Ambitions for a Peaceful Nuclear Program," *WMD Insights*, November 2006.

14. "N-power Tender after Presidential Polls," *The Egyptian Gazette*, July 3, 2011.

15. See, for instance, Amr Moussa, "Egypt Must Turn Over New Leaf with All Countries, Including Iran," Interview with *Khabar Online*, MEMRI Special Dispatch, No. 3994, July 12, 2011.

16. Miles Pomper and Peter Crail, "Interview with Nabil Fahmy, Egyptian Ambassador to the United States," *Arms Control Today*, July 21, 2008. A more precise, official description of the Egyptian position by Egyptian Deputy Foreign Minister Ramzy Ezzedine Ramzy is: "Egypt rejects any attempts to impose ad-

ditional obligations on non-nuclear weapon states, which are already in compliance with their commitments pursuant to the Treaty, if they are not reciprocated by equal and commensurate measures by states that still lie outside the treaty and are not bound by Comprehensive Safeguards Agreements." Statement at the NPT PrepCom 2008 General Debate, New York, April 29, 2008.

17. *Implementation of the NPT Safeguards Agreement in the Arab Republic of Egypt*, GOV/2005/9, Vienna, Austria, International Atomic Energy Agency, February 14, 2005.

18. Jack Boureston, Yana Feldman, and Mary Beth Nikitin, "Egypt—New Revelations about Past Activities?" *First Watch International*, March 4, 2005.

19. Ambassador Jackie Sanders, "US Praises Egypt's Nuclear Openness," *Reuters*, March 2, 2005.

20. Boureston *et al.*, "Egypt—New Revelations about Past Activities?"

21. *The Safeguards Implementation Report for 2008*, p. 11.

22. Gamal Essam El-Din, "An Old Story Made New," *Al-Ahram Weekly*, No. 947, 2009.

23. Some Israeli experts claim that there are a high number of Egyptian publications related to uranium enrichment (interviews in Tel-Aviv, Israel, January 2007). It is widely suspected that Egyptian officials met with representatives of the A. Q. Khan network in the past.

24. Sammy Salama and Heidi Weber, "Arab Nuclear Envy," *Bulletin of the Atomic Scientists*, September-October 2007.

25. Quoted in "Inside Egypt's Nuclear Debate."

26. "Egypt May Develop Nuclear Weapons," *United Press International*, January 20, 2007.

27. "Egyptian Foreign Minister Ahmad Abu Al-Gheit Warns that a Nuclear Iran Would Force the Arabs to Join the Nuclear Race," Special Dispatch No. 2929, *The Middle East Media Research Institute*, April 30, 2010.

28. Quoted in "Obama Pushes For Cuts to Nuclear Arsenal During Global Summit," *PBS NewsHour*, April 12, 2010.

29. Quoted in Elaine M. Grossman, "Egypt Plays Key Non-proliferation Role, But Keeps Nuclear Options Open," *NTI Global Security Newswire*, June 10, 2010.

30. "Retired Egyptian General Abd Al-Hamid Umran Calls for an Egyptian Nuclear Program: We Should Follow the Iranian Model and Deceive the International Community," MEMRI Special Dispatch No. 4142, September 16, 2011.

31. Adel Safty, "Proliferation, Balance of Power, and Nuclear Deterrence: Should Egypt Pursue a Nuclear Option?" *International Studies*, Vol. 33, No. 1, 1996, pp. 32-34.

32. Sammy Salama and Khalid Hilal, "Egyptian Muslim Brotherhood Presses Government for Nuclear Weapons," *WMD Insights*, November 2006. The Brotherhood is not overtly opposing Iran's nuclear drive.

33. Gamal Essam El-Din, "'No Need for Nukes,'" *Al-Ahram Weekly*, No. 977, 2009.

34. In an April 2010 interview, when asked, "Can you say that your country, Egypt, will never acquire nuclear weapons even if its neighbor Israel possesses them?" El-Baradei replied: "The solution would be that Israel gives up its arsenal. But if instability continues, if we continue to see Palestinians being killed, if the wars in Afghanistan, in Iraq or in Somalia continue, then all scenarios are possible." Antoine Malo, "Nous ne pouvons pas attendre une explosion au milieu de Manhattan" ("We Cannot Expect an Explosion in the Middle of Manhattan"), *Le Journal du Dimanche*, April 11, 2010.

35. Nevertheless, the Egyptian-dominated League of Arab States has opposed the Gulf Cooperation Council's idea of push-

ing first for a “Gulf WMD-free zone”; that is, to give priority to Iran over Israel.

36. “Nur” means “light” in Arabic. The URGN is the Draria Nuclear Centre.

37. “Reactor Nur (Algeria)—Introduction,” available from www.invoap.net.

38. Roberto Mario Ornstein, “Argentina as an Exporter of Nuclear Technology—Past, Present and Future,” Buenos Aires, Argentina: Consejo Argentino Para Las Relaciones Internacionales, 2001, pp. 25-26.

39. “El Salam” means “peace” in Arabic. The Center for the Development of Energy Systems (CDSE) is now commonly referred to as the Birine, or El Salam Nuclear Research Center.

40. “China-Nuclear Cooperation Agreements,” Washington and Lee University, Lexington, VA: NTI Research Library. See also a collection of declassified documents in William Burr, ed., “The Algerian Nuclear Problem, 1991: Controversy over the Es Salam Reactor,” Electronic Briefing Book No. 228, Washington, DC: George Washington University, National Security Archive, September 10, 2007 (Hereafter: Burr, “The Algerian Nuclear Problem”).

41. Ann MacLachlan, “Algerian Leader Asserts Good Faith in Nuclear Research Reactor Plans,” *Nucleonics Week*, May 23, 1991, pp. 11-12.

42. Jeffrey Fields and Jack Boureston, “Algeria Country Profile,” Stockholm, Sweden: Stockholm International Peace Research Institute (SIPRI), July 2004. Regarding the country’s uranium resources, official Algerian estimates vary between 29,000 and 56,000 tons.

43. David Albright and Corey Hinderstein, “Algeria: Big Deal in the Desert?” *Bulletin of the Atomic Scientists*, May-June 2001, p. 47.

44. Bill Gertz, “China Helps Algeria Develop Nuclear Weapons,” *The Washington Times*, April 11, 1991.

45. Mark Hibbs, "Cooling Towers are Key to Claim Algeria Is Building Bomb Reactor," *Nucleonics Week*, April 18, 1991, pp. 7-8; MacLachlan, "Algerian Leader Asserts Good Faith," pp. 11-12. In 1991, U.S. Intelligence assessed that the reactor's power could be increased to 50 megawatts (MW), see Burr, "The Algerian Nuclear Problem." Some analysts pointed out that China had a history of building research reactors with "disproportionate cooling." See Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 47.

46. The U.S. Government noted in 1991 that the site had been defended by anti-aircraft batteries and early warning radar from mid-January to mid-March of that year, that is, during Operation DESERT STORM. See Burr, "The Algerian Nuclear Problem."

47. "Algeria," in Joseph Cirincione, Jon B. Wolfstahl, and Miriam Rajkumar, *Deadly Arsenal: Tracking Weapons of Mass Destruction*, Washington, DC: Carnegie Endowment for International Peace, 2002, p. 299; and "Algeria: Nuclear Reactor Update," *Wisconsin Project on Arms Control*, The Risk Report, Vol. 1, No. 5, June 1995, p. 12. U.S. intelligence estimated in 1991 that if the reactor's power was increased to 50 MW, its plutonium production capability would be approximately 10 to 13 kilograms (kg), See Burr, "The Algerian Nuclear Problem."

48. "Algeria: Nuclear Reactor Update," p. 12. U.S. Intelligence noted in 1991 that a power increase to 50 MW would imply a capability to produce three kg of plutonium (Pu) a year. See Burr, "The Algerian Nuclear Problem."

49. "Algeria: Nuclear Reactor Update," p. 12; Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 50.

50. Friedrich Steinhäusler, "Infrastructure Security and Nuclear Power," paper prepared for the seminar on Extended Deterrence, Security Guarantees, and Nuclear Proliferation: Strategic Stability in the Persian Gulf, Dubai, United Arab Emirates, Gulf Research Center, October 4-5, 2009.

51. Interview in Paris, January 2009.

52. "El Salam Reactor—Ain Oussera," available from www.globalsecurity.org.

53. See Burr, "The Algerian Nuclear Problem."

54. MacLachlan, "Algerian Leader Asserts Good Faith," pp. 11-12; Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 48.

55. See Burr, "The Algerian Nuclear Problem."

56. Reports in early 1992 that Iraq had transferred nuclear material and scientists to Algeria were found unsubstantiated. Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 49.

57. *Ibid.*

58. See "Address by the Minister for Foreign Affairs of Algeria on the Occasion of the Inauguration of the 'Es Salam' Reactor on December 21, 1993," INFCIRC/429, February 18, 1994.

59. Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 49.

60. *Ibid.*

61. *Ibid.*, p. 50.

62. See Cirincione, *et al.*, *Deadly Arsenals*, p. 301.

63. Quoted in M. Gonzales and J. M. Larraya, "El Cesid Warns that Algeria Can Have the Capacity to Produce Military Plutonium in Two Years," *El Pais*, August 23, 1998 (English translation by ISIS).

64. "Reactor Nur (Algeria)—Introduction"; Ornstein, "Argentina as an Exporter of Nuclear Technology—Past, Present and Future."

65. Albright and Hinderstein, "Algeria: Big Deal in the Desert?" p. 50.

66. Khalid Hilal, "Algeria Announces Plans for Expanded Nuclear Energy Programme; Iran Offers to Help," *WMD Insights*, February 2007.

67. An “African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology” (AFRA) was signed in 1990. See INFCIRC/377, April 2, 1990.

68. The Conference adopted on January 14, 2007 a “Final Declaration of Algiers” and a “Plan of Action.”

69. Discours de Nicolas Sarkozy – Conférence de presse sur la politique internationale, Paris, France, Méridien Montparnasse (Speech by Nicolas Sarkozy at a Press Conference on International Policy in Paris, France, Le Meridien Montparnasse), February 28, 2007.

70. Interviews in Paris, France, August 2007.

71. See Daniel A. Pinkston, “Algeria Seeks Nuclear Cooperation with South Korea as Seoul Prepares New Nuclear Plans,” *WMD Insights*, June 2006.

72. Hilal, “Algeria Announces Plans.”

73. *Ibid.*

74. Reuters, “L’Algérie marque son appui à l’Iran sur le nucléaire civil” (“Algeria Marks its Endorsement Iran on Civil Nuclear”), *Le Monde*, August 7, 2007.

75. In addition, Russia has become a significant strategic partner of Algeria, through important conventional weapons sales, including a 2006 \$8-billion deal.

76. This author wrote about Algeria’s possible nuclear intentions in a 2009 book entitled *Le Marché Noir de la Bombe (The Black Market of the Bomb)*, Paris, France: Buchet-Chastel, 2009. A flurry of headlines ensued in Algeria (as well as in Morocco). Many officials and journalists suggested that the author had a political agenda and was possibly acting on France or Israel’s behalf. More interestingly, Energy and Mining Minister Chakib Khelil was led to claim that Algeria “is currently setting up measures that will allow it to sign the Additional Protocol.” See “Les précisions de Khelil” (“The Details of Khelil”), *Le Temps d’Algérie (The Times of*

Algeria), September 25, 2009. Nearly 1 year later, the AP had still not been signed by Algiers.

77. The two countries had severed diplomatic relations in 1993, following accusations of Iranian support for the Islamic Salvation Front.

78. In 2000, two commentators noted that "The Sahara desert sites . . . might be ideal for testing an Iranian-built atom bomb." Al J. Venter and Pat Lancaster, "A Nuclear Newcomer," *The Middle East*, June 1, 2000. This remains an improbable scenario, given the constant Algerian complaints about the alleged consequences of French nuclear testing on Algerian territory from 1960 to 1966.

79. Steinhäusler.

80. Nasser's support for the Algerian insurgency was a key reason behind France's decision to go to war, along with the United Kingdom, against Egypt in 1956.

81. The Arab League has been located in Cairo since its creation in 1945, and its Secretary General has always been an Egyptian (except between 1979 and 1990, when the League was moved to Tunis with a Tunisian Secretary General, because of Arab challenges to the Egyptian peace with Israel).

82. Egypt refused to send a team to the 1990 Africa Cup held in Algeria.

83. Egypt is the largest foreign investor in Algeria.

84. Available from www.invap.net.

85. See Ian Allen, "U.S. Asked for Egypt's Spy Help on Algerian Nuclear Reactor," available from intelNews.org, May 5, 2010; and "Amr Moussa dément: L'Egypte accuse d'espionnage en Algérie" ("Insane Amr Moussa: Egypt Accused of Spying in Algeria"), May 8, 2010. Given that the Egyptian foreign minister at the time was the current Secretary of the League of Arab States, this episode was widely seen in Cairo as an attempt to weaken Egyptian influence in the League.