

Iran's Nuclear Programme

Sverre Lodgaard*

Original paper
UDC 623.45(55)
Received in October 2006

Although Iran's nuclear programme can be traced back to the 1950s, and a US-supplied research reactor went online at the Teheran Nuclear Research Center (TNRC) at the end of the 1960s, it was only after the oil crisis in 1973 that the Shah began to invest heavily in nuclear energy. In the following years, Iran concluded contracts with the United States (1974), Germany (1976) and France (1977) for the construction of power reactors and supply of fuel for them. It bought itself into the Eurodif gaseous diffusion enrichment plant in France and the Rossing uranium mine in Namibia, acquired yellowcake from South Africa and sent technicians abroad for training in nuclear sciences. The scientists at TNRC were given wide discretion regarding the nature and orientation of the nuclear research to be conducted. Spurred by the influx of oil revenues, the stated goal was to generate 23 000 MWe from nuclear power stations.

Key words: Nuclear programme, Iran

1. Introduction

Under a contract with Siemens (FR Germany), two light water reactors (LWRs) were built at the Persian Gulf city of Bushehr, each with a capacity of 1200 MWe. They were due to be operational in 1980, but the construction works came to an abrupt halt with the revolution in 1979. Ayatollah Khomeini took no personal interest in nuclear matters,¹ and many Iranian nuclear scientists left the country. Also, declining oil revenues and insufficient electrical infrastructure made the suppliers reluctant to proceed.

Did the Shah have in mind to develop a nuclear weapon capability under the umbrella of the NPT, wrapped in a civilian power programme? Iran signed the NPT in 1968 and ratified it in 1970, the year it entered into force.

The founder and head of the Atomic Energy Organization of Iran (AEOI) up to 1979, Akbar Etemad, says the Shah took no interest in military applications.² Western intelligence agencies have not

been convinced about that, however. Even if Etemad's claim was correct for the Shah and his closest collaborators, this might not be the whole story. Iranian research teams may have pursued scientifically interesting avenues of relevance for weapons acquisition on their own initiative, especially since they were so generously funded and broadly mandated. This is well known from the nuclear programmes of other countries: with or without the knowledge of their political superiors, scientists have conducted activities of direct relevance for weapons production.

With the passage of time, and in relation to a regime that has been relegated to history, evidence about nuclear weapon ambitions could be expected to pop up. This has not happened. The secrecy surrounding such intentions makes it hard to prove them, especially since there is no need to make formal decisions about weapons objectives a long time in advance: preparations for the production of nuclear weapons can be made in reference to a variety of other purposes. As long as there is no need to pass any reference to weapons at any level of government, there may simply be no documents to leak.

* Director of Norwegian Institute of International Affairs

Whatever the intent, what was done in the 1970s came to use later when Iran resumed a more vigorous nuclear programme in the mid-1980s. At Bushehr, one of the light water reactors is rebuilt by Russia and scheduled to be operational in 2007. Enrichment contracts with foreign companies, first entered into in 1975, were followed up upon in the 80s and 90s. In response to an IAEA inquiry, Iran explained that a recent attempt to purchase hot cell manipulators and lead glass windows for reprocessing of spent fuel was based on design information provided by a foreign supplier in the 1970s.³ Generally, it can be assumed that the supplier network of the 1970s was helpful in starting the clandestine programme ten years later.

Ever since the NPT came into being, it has been acknowledged that states may come close to nuclear weapon status while observing the provisions of the Treaty and the associated safeguards agreements with the IAEA. Naturally, the revelation of 18 years of concealed fuel cycle activity, and of an underground supplier network nurtured from within a nuclear weapon state (NWS), took the Iranian case to the top of the non-proliferation agenda.

2. Concealment

In the summer of 2002, the National Council of Resistance of Iran (NCRI) identified two previously unknown facilities: a uranium enrichment plant at Natanz and a heavy water production plant at Arak. Shortly thereafter, Iran announced that it was developing a nuclear power programme that relied solely on indigenous resources.⁴ This information triggered intensified IAEA inspections and hectic diplomatic activities to clarify the full scope of Iran's nuclear programme.

In 1985, Iran made a decision to pursue enrichment technologies. In 1987, it acquired drawings of a P-1 centrifuge and samples of centrifuge components from the Qadeer Khan network.⁵ Centrifuge RBcD testing began at TNRC in 1988 and continued at Kalaye Electric from 1995 on.⁶ Between 1994 and 1996, Iran received another set of drawings for the P-1 design along with components for 500 centrifuges. At about the same time, it also received design drawings for a P-2 centrifuge through the same network. The P-2 rotors are based on maraging steel and can work at twice the speed of P-1 rotors, which are made of aluminium. Hexafluoride was fed into a centrifuge at Kalaye Electric for the first time in 1999, and then into a cascade of 19 centrifuges in 2002.⁷

It is the enrichment programme that raises the greatest proliferation concerns. Iran's ability to produce weapons-grade plutonium is more distant. Up to 2003, work on both tracks was kept secret, in vio-

lation of the safeguards agreement. As listed in the Director General's report to the Board of Governors of November 2004 and summarized in his report of September 2005, Iran has failed over an extended period of time to report on important transactions and activities; to declare the existence of important facilities; to provide design information; and, on many occasions, to cooperate to facilitate the implementation of safeguards.⁸ Between February and October 2003, as the IAEA began to track clandestine activities down, Iran took a number of steps to conceal the origin, source and extent of its enrichment programme and other nuclear activities.⁹

Subsequent to a request by the Board of Governors of September 2003 for a "...full declaration of all imported material and components relevant to the enrichment programme..."¹⁰, Iran informed the Director General that a decision had been taken to provide the Agency with a full disclosure of Iran's past and present nuclear activities. On 21 October, 2003, it provided what it described as a full picture of its nuclear activities. In a number of respects, the new story was much different from the story that had been conveyed to the IAEA the previous month. The reorientation was part of a deal brokered by Britain, France and Germany (EU3), in which Iran also agreed to a time-limited suspension of its uranium enrichment programme. The IAEA was asked to monitor the suspension.

It rarely happens that a government declares itself guilty - from one month to the other; in one wholesale admission - of having conducted a comprehensive disinformation campaign. In the rationality and ethics of the Western world, this is deplorable. In Muslim societies it is not necessarily so. Resort to misleading information may be appropriate in order to get out of difficult and dangerous situations. Especially in Shia culture, efforts to extricate oneself from pressing problems by creating confusion among the infidels may be legitimate.¹¹

Was the October decision a radical turn away from concealment and disinformation to full and accurate information about the nuclear programme? Admitting the need for confidence building in view of the concealment practices of the past, the Iranian government signed an additional safeguards protocol based on the model protocol outlined in INFCIRC 540, and undertook to act as if it was in force.¹² Accordingly, it declared a number of nuclear-related activities that had not been under the Agency's purview and gave the Agency expanded inspection rights. One and a half years later, all declared nuclear material had been accounted for. To date, nothing has been diverted to prohibited activities. However, the Agency is not in a position to conclude that there are no undeclared nuclear materials and activities in Iran. Since

February 2006, when the IAEA reported Iran to the UN Security Council and Iran withdrew from the Additional Protocol in protest, the Agency has been unable to make further progress in this regard.¹³

The Additional Protocol was developed in response to the Agency's failure to detect the clandestine programme in Iraq in the 1980s. By casting the net beyond nuclear materials to also include activities related to such materials, and by providing stronger inspection rights, the Protocol gives the Agency a better chance to detect undeclared projects. It has scored some successes already, *inter alia* by making the nuclear history of South Korea more transparent.¹⁴ Iran is a more demanding case, however. Even under normal circumstances, determining whether everything has been declared is a time-consuming process; it took 5 years in Japan and 31/2 years in Canada. In view of Iran's past pattern of concealment, making a full and accurate account of its nuclear history is particularly demanding.

What is the proper approach to the Iranian challenge? Governments answer this question differently because there is no uniform understanding of what is going on in Iran, and because they pursue different objectives there.

3. Interpreting the Iranian Challenge: Four Scenarios

Reliable information about the programme is first and foremost the data collected by the IAEA. The accuracy of information provided by national intelligence agencies, and of political statements made in reference to national intelligence, is hard to assess because of the secrecy of the collection process.¹⁵ So far, however, national intelligence has hardly added much to the information collected by the IAEA. No "smoking gun" has been found.

The IAEA secretariat is restrained by its own evidence and must stick to its neutral monitoring and verification function. It examines Iran's technological procurement efforts and does not engage in public speculations about Iranian motives. Governmental experts, on the other hand, have to calibrate Iran's intentions as best they can when formulating their policies.

To get a better understanding of what the data mean, they should be interpreted in the light of various assumptions about the nature and objectives of the Iranian programme. Four scenarios may be of particular interest:

(1) Iran is building a comprehensive indigenous programme for peaceful utilization of nuclear energy. Very much of what we know - about the uranium cycle in particular - is internally consistent and in conformity with such a reading. Some critical questions remain unresolved, however. One of them

concerns the need for a natural uranium/heavy water reactor of the size now being built at Arak (40 MWt). This is the same kind of reactor that India used to make plutonium for its first nuclear explosion in 1974,¹⁶ and that Israel acquired in the early 1960s.¹⁷ To produce isotopes for medical and agricultural uses, a smaller reactor would arguably do.

Another question concerns the economics of the programme. For a country so richly endowed with oil and gas to go for nuclear energy was not seen as a commercially viable proposition. Not until recently: on the basis of today's petroleum prices, and the likelihood that prices will stay high or become even higher in the future, the calculations look much different. Also, nuclear power has become more economical because the safety improvements after Chernobyl produced spin-offs in terms of lower operating costs.¹⁸ Sceptics emphasize, however, that the recent sharp increases in petroleum prices could not have been foreseen at the time major decisions about the Iranian nuclear programme were made.

Third, while Iran underlines the importance of self sufficiency and therefore insists on building complete indigenous fuel cycles, its uranium deposits appear too small to sustain a power programme of the projected size (7000 MWe). However, the uranium market has been a buyer's market for long, so self sufficiency in most if not all other respects would go a long way towards real energy independence. Today, all major powers are competing for oil and gas worldwide. At the beginning of this century and for a long time ahead; geopolitics is first of all about energy supplies and energy security. For Iran, the combination of oil, gas and nuclear power can secure high export incomes as well as a high degree of energy independence.

Finally, why such an effort to conceal the programme in violation of international commitments? Iran says concealment was necessary because an open programme would have run into US sanctions. In view of the adversarial relationship between these countries since the days of the hostage crisis, this would very likely have been the case. When Iran decided to pursue the uranium enrichment route, the war with Iraq was still going on, and the US and other Western powers supported Iraq. However, this does not necessarily explain Iranian motives at the time. The US, European states and others assert that Iran's extensive concealment left a confidence deficit that can only be removed by elimination of all fuel cycle elements.

(2) Iran went for nuclear weapons under the umbrella of the NPT and tries to keep the programme on course as best it can. As indicated above, this approach may not have been alien to some of the Shah's men either. NPT membership and IAEA safeguards shed legitimacy on Iran as a non-nuclear weapon state

(NNWS), in lieu of which a secret programme could materialize - much the way Iraq pursued nuclear weapons in the 1980s following the Israeli bombing of Osiraq in 1981.¹⁹ Iraq was a member of the NPT, and a safeguards agreement was in force.

The clandestine programme went uninterrupted until 2002, when the NRCI triggered a crack in the secrecy. When the IAEA followed up, Iran took evasive action for most of 2003, but turned around to cooperate much better with the Agency from October that year. Much better, but not fully: in this scenario, Iran does not disclose more than strictly speaking necessary, just enough not to be caught in another act of cheating. True to its nuclear weapon ambition it tries to rescue as much as possible and therefore balks at full disclosure. After nearly three years of intensive investigations, the IAEA remains unable to paint the full picture.

If "smoking guns" exist - which is an underlying assumption here - what is the likelihood that the Agency can find them? A "smoking gun" is something which can only be explained as preparations for weapons; such as work on warhead designs, trigger mechanisms for nuclear bombs or missile electronics to deliver nuclear warheads. Here, the Agency is in a bind; for it has no clear mandate to reach out for them. For instance, it has no right to demand access to military sites unless there is some indication that nuclear-related activities are or have been going on there. Naturally, a sovereign government will not accept international inspections at any military site for fear that important national defence information may end up with its adversaries and undermine its security.²⁰ The Iranian government has strong reasons to be concerned about that since the United States openly refers to the possibility of using force. Bombing raids to destroy the nuclear programme in Iran may extend, say, to the infrastructure of the revolutionary guard (the Pasdaran), so information about military sites may help shape the target lists.

Among the outstanding issues are the use or non-use of P-2 centrifuge technology, the documentation being too thin for comfort; the existence in Iran of a 15-pages document describing the procedures for the reduction of UF₆ to uranium metal and the casting and machining of it into hemispheres, i.e. into a form suitable for weapons; and allegations concerning the so-called Green Salt project²¹, high explosives testing and design of missile re-entry vehicles. The findings about the origin of enriched uranium contamination tend to support Iran's statements, yet some questions remain.²²

Given all the concealment efforts over so many years, the Agency may never be able to reconstruct Iran's nuclear history and verify the correctness and completeness of Iran's statements unless Teheran

offers transparency beyond the formal requirements of the safeguards agreement and the Additional Protocol. For a while, it did so, a little by little. However, when in mid-2005 the IAEA asked for better access to individuals, documentation relating to procurement, dual-use equipment, certain military-owned workshops and research and development locations, Iran found that request peculiar "now that matters have neared total resolution", and expressed doubts about the integrity of the IAEA.²³ Half a year later, it ceased to implement the Additional Protocol, leaving the Agency hamstrung.

(3) When the programme was exposed, and subsequent attempts at evasive action were unsuccessful, Iran decided to become fully transparent about everything involving fissile materials, but without revealing any work on non-nuclear components of nuclear weapons. This was the decision communicated to the IAEA on 21 October 2003.

By that time, Iranian deceit and deception, and the intense international condemnation and scrutiny of it through the IAEA, had surprised many Iranian decision-makers and embarrassed educated members of Iranian society. Many of them had not known about the now-documented illicit activities and were concerned that international reactions could hurt the economy severely. Therefore, continuation of undeclared, illicit activities was considered too risky. If detected, it would damage Iran's reputation severely. Worse, it might isolate the country and bolster its enemies.

For years, the leadership had coped very well with US sanctions, to the point of faring better with than without them. Tightening of economic relations with the European Union and others was quite another matter, however. The compromise was therefore to leave aside whatever weapon ambition that leading figures might have harboured; press ahead with the fuel cycle programmes, the uranium enrichment programme in particular; and become fully transparent.²⁴

Transparency, with one important modification: specific indications of past interest in nuclear weapons would not be revealed. The regime would be stupid to willingly hand over any "smoking gun", that is, information about whatever research and development of non-nuclear components of nuclear weapon systems it may have undertaken, and which the IAEA has no right to investigate anyhow. Since it is bent on building a complete indigenous fuel cycle and, thus, establish a technical option to produce fissile material for weapons, the combination of past pursuit of weapons and continued realization of a weapons option - by the same regime - would trigger stiff international reactions.

After more than two years of work based on the Additional Protocol, voluntary transparency

measures offered by Iran and leads submitted by member states, no new undeclared facility or activity has been identified. Consistent with this scenario, Iran may well have declared all its nuclear and nuclear-related activities. Given the relative ease with which "smoking guns" can be hidden and the limited scope of the voluntary measures, whether or to what extent work on non-nuclear components have been going on remains an open question.

(4) Iran has pursued two programmes more or less in parallel: a civilian programme and a separate production line for weapons. Assuming that at some point, the civilian programme would have to be declared, Iran has built a separate production line for nuclear weapons run by the military. Preferably, the civilian line should have been declared on Iran's own initiative, at the latest when indigenously produced fuel would enter the first power reactor. Or, it would have to be declared if exposed by others, as became the case. The trick, then, would be to work with the IAEA to establish that nothing had been diverted from the civilian line to prohibited military uses, and convince the Agency that it could and should rest its case. The first part of this has happened, but the second not.

In many ways, this is the most intriguing scenario. Technological achievements in the civilian programme have been at the disposal also of the military production line, but as long as the existence of that line has not been documented, no technology transfers have been documented either. Without known points of destination, such transfers are hard to prove. No material was ever diverted: that was part of the plan in order to have a real chance of becoming "clean". More than once, Iran has urged the IAEA to draw that conclusion.

If this is the way the Iranians have organized themselves, they may be only a few unresolved questions away from success. One of them - about the P-2 technology that it obtained in 1995 - is sticky, however. Iran says it has been fully occupied applying the P-1 technology and so did no work on the P-2 until 2002, when the design information was given to a small firm in Teheran. This firm developed a modified version so expeditiously that the IAEA finds the story unrealistic unless it was assisted by somebody else. The Agency therefore concludes that "The reasons given by Iran for the apparent gap between 1995 and 2002...do not provide sufficient assurance that there were no related activities carried out in that period..."²⁵

Israel appears convinced that there is a separate, undetected military production line in Iran. The United States also asserts that there are more undetected facilities and activities there. Others are more cautious, recalling the unfounded claims that West-

ern national intelligence agencies made about weapons of mass destruction in Iraq prior to the war in 2003. US and British services, in particular, have been discredited, casting doubts on their assessments of other cases. Claims that go significantly beyond IAEA reports are therefore met with caution and suspicion. All the more so since all the hints of undeclared activities that the US has communicated, and the Agency has been able to check, have been proven wrong.

Some of these scenarios are more likely to capture Iranian realities than others. There is much to suggest that Iran carries its nuclear programme as far as it sees fit, the reactions of the outside world taken into consideration. That is, had it not been for external pressures it would have gone all the way to nuclear weapons: Under the circumstances, a national consensus has developed in support of the fuel cycle programme as a technological prestige project, with an in-built weapon capability. Seen this way, scenarios 2 and 3 stand out as the more realistic ones. The United States holds that it has been a weapons programme all the time, while others regard it as a civilian programme with a military spin-off.

How realistic is scenario (4)? If Iran has a separate military programme, why did it gamble to accept the Additional Protocol? They did not have to. Only a minority of IAEA member states have acceded to the Protocol and the opposition to it in the non-aligned movement, where Iran belongs, is strong.²⁶

If it nevertheless made that gamble, and a separate programme does exist, the problems it faces at Esfahan and Natanz in making the UF₆ pure enough for effective enrichment, and in producing high numbers of well working centrifuges, make it unlikely that there is a much more advanced programme elsewhere. Therefore, in the worst of cases, there seems to be ample time to continue the search for a political solution to the problem.

4. Major Power Objectives in Iran

Major power approaches to the Iranian challenge also depend on what these powers are trying to achieve. The great majority of states want to prevent Iran from becoming a NWS. All major powers share that objective. However, they mix the non-proliferation objective with other national interests in ways that differ from case to case. The United States is working for regime change in Iran. China is careful not to rub its petroleum cooperation with the Iranians. Russia has significant arms sales to Iran, is building the first Iranian power reactor, and may get contracts for many more. For China and Russia, Iran is

important also in their efforts to thwart US global ambitions. The European states are the ones giving the highest priority to the non-proliferation objective.

Israel is less specific about regime change than the US, but is keen to limit Iran's military strength and reduce its capacity to hit at Israel. Decimating Iran is an obvious Israeli national interest.

4.1. The United States

The updated version of the US National Security Strategy of March 2006 enhances the focus on Iran as the next possible target of regime change. The document has a preface signed by the President, the first words of which are "America is at war". It names seven tyrannical regimes: North Korea, Iran, Syria, Cuba, Belarus, Burma and Zimbabwe. Two of them are singled because they continue to harbour terrorists at home and sponsor terrorist activity abroad: Syria and Iran. One of them also tries to acquire nuclear weapons: Iran. The concerns about Iran are much broader than that: "it threatens Israel, seeks to thwart Middle East peace, disrupts democracy in Iraq, and denies the aspirations of its people for freedom". The conclusion is that Iran presents the single greatest threat to the United States.²⁷

Bombing is not a recipe for regime change, however. On the contrary: when nations are under threat, people usually mobilize in support of their leaders. Domestic conflicts are set aside in defence of a higher cause. So why does the US deem it vitally important to take military action, if necessary, to stop Iran from acquiring nuclear weapons?

History is one part of it. The relationship between the United States and Iran is highly politicized and deeply adversarial. The animosity towards the ayatollahs is bipartisan. No country is more difficult for the United States to engage diplomatically than Iran. Insert Iran's nuclear programme into this adversarial relationship and it has turned even more confrontational - especially so since the programme happened to surface in a fundamentally new international context driven by 9/11 and a much more assertive US policy. Nobody in Iran - and nobody else - could have envisaged that. It was a historical coincidence of sorts.

Another part of the explanation is physical control of oil supplies. One third of the world's oil supplies flows through the Strait of Hormuz, and to keep it flowing has been bedrock US foreign policy for more than 50 years. Mossadeq was overthrown partly because of an unseemly affinity to the Iranian communist party (the Tudeh party), partly because of his plans to nationalize the Iranian oil industry. The Shah's unswerving commitment to the free flow of Iranian oil became a central pillar of the Nixon

doctrine. In his final State of the Union address, President Carter declared that "Any attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and such an assault will be repelled by any means necessary, including military force".²⁸ The Reagan administration said the same, and began establishing military bases in Saudi Arabia. In 1990, when Saddam had occupied Kuwait, Secretary of Defence Cheney stated "We're there because the fact of the matter is that part of the world controls the world supply of oil, and whoever controls the supply of oil...will have a stranglehold on the American economy."²⁹ If those considerations were not part of the reason for occupying Iraq, it would have been the first time in more than half a century that the uninterrupted flow of Gulf oil was not a central element of US foreign policy.

Today, geopolitics is first of all about energy supplies and energy security. The US has occupied Iraq and keeps a military presence in Afghanistan; has a number of bases in the Gulf region, including new ones in Iraq to replace those that were lost in Saudi Arabia; and deploys carrier groups in the vicinity of the Gulf. It holds the region in a tight military grip. A nuclear-armed Iran could question the credibility of that military dominance, however. Even if regime change is out of reach at this point in time, it still makes sense to strike at Iran's nuclear programme and limit Iran's ability to strike back.

A third part of it involves Israeli interests. Far from recognizing Israel, the Iranian President says he wants to wipe Israel off the map. To Israel, no threat is greater than nuclear weapons in Iranian hands. It is no surprise, therefore, that Israel goes by worst-case readings of the Iranian nuclear programme, claiming that Iran has a separate, secret military programme not yet uncovered. It prepares itself to take military action if nobody else (i.e. the US) does. Israeli interests weigh heavily on US decision-making. While the Democrats are not programmatically committed to regime change the way the Republicans are, any US administration will do its utmost to prevent Iran from becoming nuclear weapon state. Non-proliferation and regime change are difficult to reconcile. Policies of regime change make serious negotiations impossible. If one party makes it clear that his primary objective is to cut the throat of the other, the other has little incentive to negotiate. Furthermore, if one reads the Iranian programme along the lines of scenarios 2-4, assuming a weapons ambition, there is a dynamic escalatory element in US-Iranian relations similar to the relationship between the US and North Korea: the US threatens Iran; Iran pushes its nuclear programme with a long-term view to keeping outside powers from dic-

tating and attacking it; and the US in turn uses this to put additional pressure on the regime.

4.2. EU3

The E3/EU - France, Germany, the United Kingdom and the High Representative of the European Union - have sought a political solution within the framework of the non-proliferation regime. Their first attempt to keep Iran unambiguously non-nuclear was part and parcel of Iran's reorientation of 21 October 2003: not only did Iran promise to cooperate with the IAEA to become fully transparent, but on that date it also signed the Teheran Agreed Statement with the E3/EU in which it undertook to suspend sensitive fuel cycle works and negotiate a long-term solution to the controversy. The scope of the agreement turned out to be contentious, however, particularly with regard to Iran's uranium conversion facility at Esfahan. Iran continued work on this facility, and eventually began to convert uranium oxide into hexafluoride.

While these negotiations unravelled, the parties signed another agreement in Paris on 15 November 2004, building on the Teheran agreement. In the Paris agreement, suspension of all enrichment-related and reprocessing activities was agreed and specified in unambiguous language.³⁰ The IAEA was invited to verify and monitor the suspension. The E3/EU recognized that the suspension was a voluntary confidence-building measure and not a legal obligation.

The long-term arrangement to be negotiated on the basis of the Paris agreement should provide "objective guarantees that Iran's nuclear programme is exclusively for peaceful purposes". In return, Iran would get "firm guarantees on nuclear, technological and economic cooperation and firm commitments on security issues".³¹

The parties never agreed on the operative meaning of "objective guarantees". Iran emphasized that compliance with the provisions of the NPT, full transparency and application of the additional protocol is all that an NPT member can legitimately be asked to accept.³² The E3/EU held that in view of Iran's long record of concealment and non-compliance with international obligations, the only way the international community could be confident that Iran is not determined to produce nuclear weapons was for Iran to forego all enrichment and reprocessing activities, for a period of time to be defined.³³ However, on 1 August, 2005, Iran announced that it would restart its uranium conversion facility, and when the E3/EU forwarded their offer to Iran a few days later, outlining the contributions they would make if Iran would abstain from fuel cycle activities, the offer was summarily dismissed.

The Paris agreement reaffirmed the parties' commitment to the NPT. However, the E3/EU emphasized that exercise of the "inalienable right" to develop nuclear energy for peaceful purposes must be "in conformity with" art. I and II, and that there could be no confidence that fuel cycle facilities on top of deceit and deception would meet that requirement.

4.3. Russia

In the early days of his presidency, Vladimir Putin worked to improve ties with China, India and Iran while at the same time reaching out to Europe and the United States. Moves in one direction were offset by moves in another. After 9/11, Putin seized the opportunity to forge a stronger partnership with the Western world. In so doing, he changed the international political agenda in such a way that in the future, it became less likely that Russia would be involved in humiliating disputes with the United States and other Western powers. Throughout the 1990s, Russia had been the loser in several important conflicts of interest.³⁴ In effect, Putin recognized the global political primacy of the United States and realigned Russia with the new realities of power.

The United States has been leaning on Russia to minimize its nuclear cooperation with Iran as a part of a broader policy of sanctions, and of stopping arms transfers to the ayatollahs in particular.³⁵ For this reason or for reasons of its own or both, Russia declined Iranian demands in 1990 for a heavy water reactor, and later turned down a request for gas centrifuges which had been part of a deal made in 1995.³⁶ The Yeltsin government also rejected an invitation to assist Iran in the mining of uranium. Similarly, the plans to sell Russian laser enrichment technology were scuttled under US pressure in 2000.³⁷

In the case of Bushehr, however, Russia made it clear that it will finish the light water reactor under construction there, and that it stands ready to build five more power reactors over the next decade at an estimated cost of \$ 10 billion.³⁸ The LIS, which had been opposed to the entire Iranian nuclear programme, was reluctant about the Bushehr reactor. Its concern was not primarily about the handling of the spent fuel: Russia would provide the fresh fuel and take the spent fuel back.³⁹ It had more to do with the associated transfer of know-how and expertise: By augmenting Iran's nuclear infrastructure and involving thousands of Russian nuclear scientists, the project would contribute indirectly to the weapon programme. On its part, Russia stressed that Iran must abide by its non-proliferation obligations and ratify the additional safeguards protocol.

The US has also criticized Moscow for transferring missile technologies to Iran in violation of

the MTCR agreement. At the Moscow/St. Petersburg summit in 2002, this became a matter of dispute. Putin refuted the claim and pledged that Russia's cooperation with Iran was strictly in accordance with its obligations under the international non-proliferation regime. He countered that Western companies, not Russian entities, had furnished Iran with missile and nuclear technologies.⁴⁰

While cooperating with the United States on a variety of issues, especially after 9/11, nuclear cooperation with Iran became a litmus test of the independence of Russian foreign policy in the face of US pressure. Hence, Russian-Iranian affairs got a symbolic value in addition to their economic and political importance. In recent years, the scope of the cooperation has been clarified and restricted in a way that makes it legitimate in the view of the E3/EU. Also in the future, Russia can be expected to chart its own course on the Iranian nuclear issue, be it in relation to the US or the EU or in multilateral fora such as the IAEA Board of Governors and the UN Security Council.

4.4. China

In 2004, China signed two agreements with Iran for the import of altogether 360 million tons of liquefied natural gas (LNG) over a period of 25 years. In addition to LNG, China will import 150 barrels per day of crude oil over the same period. At the end of 2004, China became Iran's top oil export market. Also, China has agreed to invest \$100 billion in Iran's energy sector over the coming 25 years. Next to Russia, Iran has become its most important foreign source of petroleum. To secure continued high economic growth, nothing is more important for China than adequate energy supplies.⁴¹

In some important respects, China, Russia and Iran are political partners. China and Russia emphasize that Sino-Russian relations have reached "unparalleled heights"⁴², and Iran is an important partner for both of them. Along with energy supplies, arms transfers and investments, the triangle cultivates compatible foreign policies. On important issues like Taiwan and Chechnya they are holding identical positions. China and Iran support Putin's war against the Chechen separatists, and the recent promulgation of China's anti-secession law, stating Beijing's intolerance of Taiwanese independence in no uncertain terms, was heartily commended in both Moscow and Teheran. Another common denominator is their opposition to US unilateralism.

The joint statement from the Russia-China summit of October 2004 issued a strong rejection of the Bush administration's unilateral foreign policy. It noted that "...it is urgently needed to (resolve) in-

ternational disputes under the chairing of the UN and resolve crises on the basis of universally recognized principles of international law. Any coercive action should only be taken with the approval of the UN Security Council and enforced under its supervision...". The China-Iran-Russia triangle is Beijing's and Moscow's way of countering US global ambitions. Seen in this perspective, Iran is integral to the broader effort to thwart the Bush administration's foreign policy goals. For this and other reasons, China and Russia oppose punitive action against Iran over its nuclear programme.

China also has a history of nuclear assistance to Iran that goes back to the mid-80s, when Iran restarted its programme. It reportedly trained Iranian nuclear technicians and engineers in China under a ten-year agreement for cooperation signed in 1990. It supplied Iran with two small research reactors installed at Esfahan, and provided an amount of UF4 and UF6 (hexafluoride).⁴³ Like Russia, it brought some important nuclear transfers to a halt: the sales of a plutonium-production research reactor and of two 300 MWe power reactors were cancelled. The cancellations may have been caused by a variety of factors, however, not just US pressure.⁴⁴ At the US-China summit of October 1997, China undertook to stop almost all its existing nuclear assistance to Iran and not to enter any new agreements in this field. The commitment included a pledge to terminate the sale of a uranium conversion plant to Iran. In 2001, the US concluded that China had lived up to the commitment, but that Chinese missile assistance continued to pose a proliferation risk.⁴⁵ However, neither in the case of China nor Russia is there any hard evidence to prove that they have been acting in violation of their MTCR commitments.⁴⁶

5. Conflicting Approaches to the Problem

The major powers read the Iranian challenge differently; they pursue different objectives in Iran; and they therefore differ in their practical approaches to the challenge.

The differences can be analysed along a number of lines. In the most rudimentary of terms, there is a dividing line between the E3/EU and the US on the one hand, and Russia and China supported by non-aligned states on the other. There are important differences also between the E3/EU and the US.

5.1. E3/EU & US/Russia & China

The Western states assume that Iran has weapons ambitions. The Europeans read the challenge along the lines of scenarios 2 and 3 - scenario 2 mean-

ing that Iran actively conducts a weapons programme while scenario 3 leaves a weapon option that could be realized on short notice at some later stage, somewhat similar to the situation in Japan. The US perceives the problem along the lines of scenarios 2 and 4, assuming in both cases that there remain undeclared activities in Iran. Germany may have been more cautious than other Western powers about imputing a weapons motive into Iranian behaviour.

Russia and China have been less explicit about their understanding of the Iranian programme. They appear more relaxed about its weapons potential - certainly more so than the United States - although Russia has been leaning on Iran to go by the additional safeguards protocol and send spent reactor fuel of Russian origin back to Russia. They have been acting as if scenario 1 might be proven correct, and have pleaded for the IAEA to be given sufficient time and all necessary means to carry its investigations to an end.

Russia and China joined the other big powers in calling on Iran to suspend all enrichment and reprocessing works and let the IAEA back in, full scale, in order to facilitate a political solution. China may be ready to normalize relations if and when the IAEA concludes - however guardedly - that there are no undeclared facilities or activities in Iran, and the strongest safeguards provisions apply there. The Chinese may agree with the Iranians that this would amount to an objective guarantee of peaceful intent. Russia may be leaning in the same direction. It is unwavering in its commitment to Bushehr and future power reactor deals, and the Russia-China-Iran triangle strengthens its determination to go ahead. However, as long as the IAEA is unable to conclude on the Iranian file, this is a hypothetical question.

Many non-aligned states explicitly support the Iranian claim that it has an "inalienable right" under art. IV of the NPT to acquire fuel cycle facilities. They object to US and other NWS attempts to redress the fundamental trade-offs on which the NPT is built, emphasizing non-proliferation at the expense of disarmament and peaceful uses of nuclear energy.

5.2. E3/EU/USA

Iran's response to the Framework for a Long-Term Agreement offered by the E3/EU on 5 August, 2005 was stiff "...the proposal is extremely long on demands... (and) absurdly short on offers to Iran... (and) amounts to an insult on the Iranian nation..."⁴⁷

At the core of the offer were assurances of fuel supply for Iranian power reactors in return for a halt to all fuel cycle activities in Iran. The proposal elaborates on how the fuel supply can be assured in practice, expressing support for the cooperation between Russia and Iran and committing the E3/EU to

assist in the establishment of a buffer store of fuel; sufficient to maintain supplies at the contracted rate for a period of 5 years. While international supply arrangements can never be as reliable as domestic sources of supply, and the buffer store would be located outside Iran, the credibility of these assurances is high. They are made by a group of states and communicated to all interested parties through an international organization (the IAEA), and so can not be withdrawn all of a sudden by any single government. It is suggested that the IAEA "might be invited to monitor the operation of the mechanism and certify its operation on objective principles"⁴⁸

The Framework recognized Iran's right to develop a nuclear power programme to reduce its dependence on oil and gas and to choose the most appropriate mix of energy sources. However, it stopped short of offering Iran light water reactors. While art. IV of the NPT commits supplier states to facilitate access to technology for NNWS parties, the Framework only promised "not to impede participation in open competitive tendering".⁴⁹

In addition to stopping all fuel cycle activities, reconfirming its NPT obligations and ratifying the Additional Protocol, Iran should undertake to cooperate proactively with the IAEA to solve all outstanding issues "including by allowing IAEA inspectors to visit any site or interview any person they deem relevant to their monitoring of nuclear activity in Iran". In response, Iran noted that such inspections would go beyond the Additional Protocol, and considered this demand an intimidating infringement on its sovereignty.⁵⁰

The Paris guidelines said the long-term agreement "...will...provide...firm commitments on security issues". The offer did not do that. It merely referred to the UN Charter and reaffirmed the security assurances that France and the United Kingdom have given together with the other veto powers, summarized in SC Res. 984 of 1995. The E3 reaffirmed their commitment to work for a zone free of weapons of mass destruction in the Middle East, but without introducing any new element that could take that proposition forward. As part of an overall agreement, the E3/EU would welcome an expanded dialogue on regional security issues. However, all of this is far from addressing Iran's security concerns in a firm manner.

Neither is it easy for the E3/EU to do so, for the main threat to Iranian security comes from the US. When working on the Paris agreement, the Europeans deemed it important that the US should be comfortable with its provisions and in the negotiations that followed, they kept the US well informed. However, far from considering any security assurances for Iran, the US did military contingency planning and kept the pressure on the ayatollahs up.

In the early stages of the negotiations, the US made two gestures: it would no longer object to Iranian negotiations for WTO membership, and it was willing to provide spare parts for Iranian civilian aircraft. WTO negotiations had been on the Iranian demand list to the Europeans. There is a long way, however, from the start of WTO negotiations to their successful conclusion. There are a great many ways in which the talks might derail. Far from meeting main Iranian concerns, Teheran scoffed at Washington's gestures.

However, the US offer was addressed to the Europeans as much as to the Iranians. It conveyed a semblance of support for the European diplomatic endeavour while staying at a distance. Since the Iranian fuel cycle activities would be suspended for as long as the negotiations lasted, and the suspension was defined in accurate and comprehensive terms, diplomacy bought valuable time for the Americans. Not knowing what to do - there was no clarity in Washington about the proper approach to the Iranian problem - buying time was a sensible strategy. As long as the Europeans stayed committed to halting all fuel cycle works in Iran - which they did - the talks could do no harm. They could only be helpful. However, the US never gave them much of a chance beyond being a holding manoeuvre.

The Framework for a Long-Term Agreement was too little too late. At an earlier stage of the negotiations, it could have made sense as an input for further consideration, but five days passed the 1 August deadline it had no chance of winning Iranian acceptance. The European negotiators hardly failed to foresee that, although they may have been surprised by the strong-worded, categorical rejection.

6. The Path of Escalation

In short: August 2005 was a turning point. Iran briskly turned the E3/EU offer down; in a comment, President Bush ended in reference to the use of force; to which Chancellor Schroeder said that under no circumstance would Germany participate in an armed attack.⁵¹ In Iran, Mahmoud Ahmadinejad was elected President: with him, new leaders took office, many of them with a background in the Revolutionary Guard. The conflict was set on a path of escalation.

The Americans used every occasion to escalate the conflict. More than anybody else, they framed the discussions at the IAEA, constraining the action space of other-governments, big and small. At the September meeting of the IAEA Board of Governors, for the first time since the vote to refer North Korea to the Security Council in 1993 the Board did not move by consensus, but adopted a resolution by majority vote referring to Iranian non-compliance

and to a resulting absence of confidence that "give rise to questions that are within the competence of the Security Council".⁵²

At the same time, the experience from Iraq and Afghanistan proved that even the US could benefit from cooperating with others and building international legitimacy for its policies. Thus, it was mindful of the importance of building a broad coalition against Iran. The conflict therefore escalated slowly but steadily to the point where in January 2006, Condoleeza Rice said that the time for talk had come to an end (except for Security Council considerations of punitive measures). Two months later, the updated National Security Strategy named Iran the single greatest threat to the United States.

In 2003, the inspection process in Iraq was overtaken by the urge to go to war. Two years later, the inspection process in Iran was overwhelmed by the politics of the matter. On 4 February 2006, the Board of Governors reported Iran to the Security: the next day, Iran withdrew from the Additional Protocol - as it had said it would do. From then on, the Agency's ability to look for facilities and activities that may not have been declared has been severely restricted. Over time, this is going to enhance uncertainties about what is going on in Iran, and strengthen the case of those who believe in punitive measures, the use of force included.

In all of this, the provocative statements of the new Iranian president were seen to play into the hands of Western hawks. In the eyes of many observers, Ahmadinejad became their useful idiot.

However, those statements may also be understood in quite a different way. There were a great many of them. Israel should be wiped off the map. Doubts were expressed about Holocaust: did it really take place? Few questions can create such anger in the Western world. Nuclear technology could be transferred to Sudan, which has an Islamist regime (but no industrial basis for a nuclear programme). In mid-April, the President even alluded to Iranian application of the second generation technology for enrichment (P-2), which they got from the Khan network in the mid-90s, but which they said they had left aside because they had their hands full mastering first generation centrifuges (P-1). For a long while, the whereabouts of the P-2 technology had been a critical point in the IAEA's efforts to map the nuclear programme, and it still is. The reactions were predictable: aha, didn't we expect that? Don't they have a secret, military production line based on P-2 centrifuges? The conclusion seems obvious: far from being useful idiots, the Iranians *deliberately* escalated the conflict to the highest political levels.

Why? Ahmadinejad's predecessor, the liberal Mohammed Khatami, tried to be forthcoming to the

West, but to little or no avail. The new leaders were all the more convinced that a soft line would lead nowhere. They did not disregard the risk of war: being part of the axis of evil the threat was obvious. Defensive measures, including tunnels and cavities in hard rock to keep valuable assets from being destroyed, were taken. At the same time, getting on talking terms with the US was of the essence. Only by striking a deal with the US could their security be much improved if not ensured and their relations with the Western world normalized. They made no secret of this. The question was one of timing.

7. Course Correction: Playing for Time

In late winter/spring of 2006, President Bush faced mounting problems. Iraq developed from bad to worse; the repercussions of hurricanes Katrina and Rita haunted him; other domestic problems also weighed in and brought his popularity down to a historical low. While in January, public opinion seemed supportive of bombing of Iran, confidence in the President's hard-line Middle East policy dropped throughout the year. As the Congressional elections came up on the radar screen of US politics, an attack on Iran appeared too risky for comfort. The Government therefore settled for multilateral diplomacy in a play for time. The Iranian issue went back and forth between Vienna and New York and in early June, the US even joined the E3, Russia and China in presenting another incentives package to Iran, improving on the offer that the E3/EU had made in August 2005. The Iranians therefore had their strategy right: this was the time to bring the conflict to the highest political levels in a bid for direct talks with the US for at this stage, the US was not ready for military action, but in a diplomatic mode playing for time. More than anything else, the course correction was due to Bush's problems at home. For Americans, the home ground is more than half the world.

In the Framework for a Long-Term Agreement, the E3/EU was more cautious about light water reactor supplies than the wording of art. IV of the NPT would suggest.⁵³ In the new offer, the P5+1 did better, committing "to support actively the building of light water reactors in Iran, in accordance with the IAEA statute and the NPT."⁵⁴ On the other hand, the security assurances remained vague, limited to support for a new conference to promote dialogue and cooperation on regional security issues. Moreover, while the commitment on light water reactors is a commitment "up front" to create the right conditions for negotiations, a conference on regional security issues is an agenda item for the negotiations on a long-term comprehensive agreement.

In response, Iran sought clarification on a number of issues. It wanted firm guarantees on the sale of light water reactors, noting that US sanctions presently prohibit such transfers to Iran. Is the United States ready to lift some if not all of the sanctions? Furthermore, it sought clarification of the proposal for a regional security conference and, also, on the timeline of the promised economic and trade incentives.⁵⁵

Regarding suspension of the fuel cycle elements as a precondition for negotiations, Iran stated that everything would be negotiable - the future of enrichment and reprocessing works included - but that suspension of them could not be a precondition for resumption of talks. This matter is at the core of the conflict: Iran's failure to meet the requirements of Security Council resolution 1696 of July 30, confirmed by the IAEA report on safeguards implementation of 31 August 2006, activates Council discussions of appropriate measures under art. 41 of Ch. VII of the UN Charter, i.e. sanctions.⁵⁶

Rather than moving straight into discussions of sanctions, however, the EU engaged Iran in follow-on talks about the P5+1 offer and the Iranian response to it. China and Russia clearly preferred continued diplomacy over punitive measures. The UN Secretary General also pleaded for more time for talks.⁵⁷ The United States recommended a gradual approach to sanctions starting with travel bans and freeze of bank accounts and extending into more severe measures like trade sanctions. While keeping up a certain pressure to escalate, not to appear inconsistent, this was not a matter of urgency for the US either. The administration seemed intent on going low and slow ahead of the Congressional elections.

8. A Peaceful Solution?

A peaceful solution rests on US willingness to engage Iran diplomatically, and on Iranian readiness to go back on its fuel cycle works, become fully transparent, and substitute cooperation for confrontation.

Some time ago, there were bilateral talks between the US and Iran on the situation in Afghanistan. Later, green light was given for talks between the US ambassador in Baghdad, Khalilzad; and Iranian counterparts. The US underlined that the talks would be about Iraqi matters and nothing else. To be of interest to Iran, however, their scope would have to be enlarged. It seems that different views on framing and modalities brought the initiative to nothing. With rare exceptions, talking with the priesthood in Teheran has been anathema for all US governments.

However, in connection with the P5+1 offer, the US said it would come to the table together with the other five - i.e. in a format similar to the 6-power

talks on North Korea - if Iran met the conditions spelt out by the IAEA/the Security Council. To Iran, this meant defeat first and talks afterwards. Instead, it took the view that everything was negotiable, but that there could be no preconditions. In short, the Iranian effort to engage the US came to something, but not to any practical results.

All things considered, the Bush administration is unlikely to sit down with the Iranians. The tactical adjustments of 2006 meant no change of strategy and objectives. The administration remains adamantly opposed to appeasement of its enemies, warning against any repeat of the mistakes of the 1930s. Still, a turnaround cannot be ruled out. Should the problems in the Middle East become ever more intractable, and the President stay weak and beleaguered and with little domestic support for military action, a political deal with Iran may seem better than no effective policy at all. The President has emphasized, repeatedly, that the worst weapons must be kept out of the worst hands, and the neo-cons like to be seen as men of action. Therefore, while bilateral talks take a major change of mindset and therefore appear improbable, it cannot be excluded.

9. Conclusion

What could a political solution be about? Which are the parameters?

Having hidden the programme for 18 years and having tried to mislead the IAEA through most of 2003, it takes a lot to re-establish confidence in Iran as a non-nuclear weapon state. This has to be the starting point. Only when the IAEA has ascertained that there are no undeclared facilities or activities and trust has been recreated can Iran claim the full benefits of art. IV of the NPT.⁵⁸

Ideally, a solution should be sought within the framework of the international non-proliferation regime, and in such a way that it would strengthen the regime. Iran's acceptance of the Additional Protocol would help establish the Protocol as the new verification norm. Acceptance of voluntary transparency measures could set a valuable precedent for clarification of the nuclear history of other states which have failed to live up to their obligations, or been suspected of irregularities. If Iranian participation in a multinational fuel cycle centre becomes part of the long-term solution, this would be the first time such a venture is set up in a proliferation-prone region.⁵⁹ Multinational centres may be the best way to bridge art. IV and articles I/II of the NPT, making peaceful utilization of nuclear energy more compat-

ible with the non-proliferation objective.⁶⁰ Last not least, if the US would extend credible security assurances to Iran, an important proliferation driver would be removed and the regime would stand to gain. On the other hand, if the preparations for military attack continue and escalation picks up again, Iran may leave the NPT. Unfortunately, for the time being none of this is seriously entertained: In essence, the matter is subject to big power politics outside rather than inside the non-proliferation regime.

At the turn of 2005/2006, Russia invited Iran to cooperate on uranium enrichment on Russian soil. Iran, however, wanted to combine industrial-scale enrichment in Russia with pilot-scale enrichment in Iran, often referred to as research and development activities. At the core of these efforts were the *place* and *time* of enrichment. Industrial-scale enrichment would take place in Russia, but to what extent would Iran be involved? What would be the role of Iranian scientists? Would pilot-scale enrichment in Iran, involving only a small number of centrifuges so that the activity would be harmless from a weapons point of view, be agreeable? For how long or under what circumstances would enrichment have to be done in Russia, and when or under what conditions could industrial-scale enrichment take place in Iran?

In terms of weapons relevance, separate work units (SWUs) are a continuum: at the low end of it, the amounts are militarily insignificant. For instance, if Iran were allowed to run UF₆ through one or two cascades of 164 centrifuges and no more, the amount would be militarily insignificant. The *degree* of enrichment could be limited to no more than 5 per cent - i.e. what is needed for reactor fuel - and the production would be under IAEA surveillance. For the Western powers, however, *no* enrichment on Iranian soil was acceptable. Russia took the same view.

Prior to the meeting of the IAEA Governing Board on March 6, Russia indicated that Iran might nevertheless be allowed to do some small-scale enrichment works, small enough to be militarily insignificant. The Director General of the IAEA had similar thoughts, realizing that in order to strike an agreement with Iran, some face-saving measure would be necessary. Germany may not have been alien to the idea, but France and the UK were negative, and the US rejected it out of hand. After a while, Russia said it would not introduce such a proposal, and the E3 maintained its position not to accept any degree of enrichment in Iran. However, the idea may be revived, depending on how the conflict evolves.

In textbook logic, the Iranian crisis presents an opportunity to follow up on the idea of the zone free of weapons of mass destruction in the Middle East. A

first step could build on former President Bush's arms control proposal of 1991, in which he called for a freeze on reprocessing activities in Israel. Today, a freeze on the production of fissile materials in the Middle East would have two main addressees: Iran and Israel. Agreement to do this would amount to a regional cut-off in the production of fissile materials. If Israel could be convinced to institute a freeze in Dimona, it would be harder for Iran to resist doing the same. More than that, it could be turned into a diplomatic victory for Iran. However, Iran does not recognize Israel; Israel is not ready for it; the US supports Israel; and multilateral arms control has no important place in the Bush administration approach to proliferation problems. In the long term, textbook logic may prove to be good political logic, but hardly in time to help solve the Iranian problem.

There remains the possibility that in the last instance, in the face of stiff international reactions and the threat of use of force, Iran will back down and accept the demands made by the IAEA and the Security Council. To date, there are no signs that this will happen, however.

As time goes on, the uncertainties about the Iranian programme are growing. Iran had indicated that by the end of 2006, there would be 3000 centri-

fuges installed at Natanz: by the end of August, it had only come to a second cascade of 164 centrifuges, testing of which was due to start in September. This may be interpreted in many directions: technical problems; slower speed in order not to provoke Western interlocutors and endanger the diplomatic process; slow-down at Natanz, but intensified activity at some undeclared site(s); and lesser emphasis on fissile material production while more resources are devoted to non-nuclear components of nuclear weapon systems.⁶¹ A recent finding of HEU particles in a waste dump fuelled suspicions. In the absence INFCIRC 540 type safeguards; worst case assumptions may take hold.

The gains of bringing escalation to a halt and of achieving a political solution can be fully assessed only when compared with the costs of war. The costs cannot be predicted with any precision, but they are potentially huge, not only for the warring parties, but for the entire region of the Middle East and for energy prices and economic development worldwide. Different from the case of Iraq, where realistic assessments of the long-term consequences of war were absent, much attention has been drawn to the political implications of the use of force against Iran. The lessons from Iraq are sobering.

NOTES

1 Pakistani foreign minister Aga Shahi visited Khomeini shortly after the revolution, and warned him that if he let the nuclear programme slip it would take him a long time to build it up again. In response, the ayatollah talked about the ouster of Mossadeq and the LIS interference in Iran through the Shah. It was clear that in his cosmology, there was no place for nuclear matters. Personal communication from Aga Shahi to the author.

2 Akbar Etemad, "Iran", in Aarald Muller, ed., *A European Non-Proliferation Policy*. Oxford: Clarendon Press, 1987.

3 Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, GOV/2004/83 of I S November 2004; p. 16. In August 2004, Iran presented to the Agency drawings that it had received from a foreign company in 1977 for hot cells that were to be constructed at Esfahan.

4 The NCRI announcement was made on 14 August 2002. In September, Iran informed the IAEA that the facilities were built as part of a program to develop a nuclear fuel cycle. "The Iran Nuclear Crisis: A Chronology", Arms Control Association, <http://www.armscontrol.org/country/iran/#2002>

5 In the mid-1970s, Qadeer Khan stole the P-1 technology from URENCO, a tripartite enrichment plant at Almelo, the Netherlands.

6 Kalaye Electric is based in Teheran and belongs to the AECL.

7 GOV/2004/83, op.cit., p. 6. All of this according to Iran's own reporting to the IAEA.

8 GOV/2005/67. Six instances of failure to report certain activities, mostly concerning enrichment and laser experimentation and including the import of uranium gas from China in 1991; two instances of failure to declare enrichment facilities; six instances of failure to provide design information or updated design infor-

mation for certain facilities; and a general charge of failure on many occasions to cooperate to facilitate the implementation of safeguards, as evidenced by extensive concealment activities. 9 GOV/2004/83, op.cit., p. 7.

10 Resolution GOV/2003/69.

11 Islam has a special legal term for the permitted lie - taqiya - which may also be interpreted as cautiousness, meaning that in time of trouble a Muslim may be right in hiding his intentions. Taqiya is a strategic means of disorienting one's opponents.

12 Signature and commitment of December, 2003. The Parliament did not ratify the agreement.

13 In a letter of 27 April 2006, Iran said it would "provide a timetable within the next three weeks" for clarification of the remaining outstanding issues within the framework of the Comprehensive Safeguards Agreement (INFCIRC 153). No such timetable has as yet been received by the Agency. Report on "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran", IAEA, GOV/2006/53 of 31 August 2006.

14 In the past two years, the IAEA has found discrepancies in the reports of as many as 15 countries.

15 It has been indicated that Israel is conducting human intelligence within Iran from Kurdish controlled territories in northern Iraq, where it has established a presence, and that the United States is doing the same out of Pakistan in cooperation with Pakistanis who have been involved in nuclear cooperation with Iran. Seymour H. Hersh, "The coming wars", *The New Yorker*, 24 January 2005.

16 CIRUS, obtained from Canada ten years earlier. Sometimes, natural uranium/heavy water reactors of about this size have been referred to - ominously - as the CIRUS line.

- 17 Built with French assistance, it became operational in 1963. Initially, the capacity of the reactor was in the neighbourhood of 30 MWt. Later, it has been upgraded.
- 18 To improve the safety of complex operations, they are often made simpler and more automatic *inter alia* to reduce the risk of human error. A spin-off of such improvements is therefore lower operating costs.
- 19 David Albright and Khidhir Hamza, "Iraq's Reconstitution of its nuclear program", *Arms Control Today*, October 1998: <http://www.isis-online.org/publications/iraq/act1298.html>
- 20 IAEA inspectors visited military sites at Kolehduz, Lavisan and Parchin. Nothing was found. At Parchin, the Agency divided the area into four sectors and asked for permission to inspect two of them. Iran allowed it to pick one sector. The Agency has asked for a follow-up inspection, but this has been denied.
- 21 Information made available to the Agency about "alleged studies, known as the Green Salt Project, concerning conversion of uranium dioxide into UF₄ (often referred to as "green salt"), as well as tests related to high explosives and the design of a missile re-entry vehicle, all of which could involve nuclear material and which appear to have administrative interconnections".
- 22 See the safeguards implementation reports of 27 February, 28 April, 8 June and 31 August 2006.
- 23 Statement by Vice-President Aghazadeh at IAEA General Conference, 26 September 2005.
- 24 The scenario has been discussed in George Perkovich, "Changing Iran's Nuclear Interests", *Carnegie Endowment for International Peace*, May 2005.
- 25 GOV/2004183. *op.cit.*, p. 11.
- 26 Former IAEA Deputy Director for safeguards, Bruno Pellaud, says he does not believe Iran has a military programme. "My view is based on the fact that Iran took a major gamble in December 2003 by allowing a much more intrusive capability to the IAEA. If Iran had had a military programme they would not have allowed the IAEA to come under this Additional Protocol. They did not have to." "Bullying won't work with Iran", *Swissinfo*, 27 June, 2005.
- 27 The National Security Strategy of the United States of America, March 2006, <http://www.whitehouse.gov/nsc/nss/2006/nss.pdf>
- 28 As quoted in Ted Koppel, "Will fight for oil", *New York Times*, 24 February 2006
- 29 Ted Koppel, *op.cit.*
- 30 Iran undertook to "continue and extend its suspension to include all enrichment related and reprocessing activities, and specifically: the manufacture and import of gas centrifuges and their components; the assembly, installation, testing or operation of gas centrifuges; work to undertake any plutonium separation, or to construct or operate any plutonium separation installation; and all tests or production of any uranium conversion installation."
- 31 INFCIRC/637 of 26 November 2004.
- 32 By the end of 2005, the additional protocol was in force in 84 states only, "Additional Protocols to the Safeguard Agreement", IAEA, 22 September 2005, http://www.iaea.org/OurWork/SV/Safeguards/sg_protocol.html
- 33 Western powers probably conceived of a moratorium on enrichment and reprocessing in Iran of the order of 20 years or so.
- 34 Enlargement of NATO, US withdrawal from the ABM Treaty, NATO's intervention in Kosovo, and another round of NATO enlargement. Putin managed to extricate Russia from a pattern of clash and defeat.
- 35 In a secret deal of June 1995, Prime Minister Chernomyrdin and Vice President Gore agreed that Russia should stop military cooperation with Iran in 2000 upon completion of existing contracts. The deal was disclosed by the *New York Times*. In Russia, Chernomyrdin was overruled: the cooperation continued. John Broder, "Despite Secret 95 Pact by Gore, Russian Arms Sales to Iran Go on", *New York Times*, 13 October, 2000.
- 36 Other elements of that deal were an agreement, in principle, for Russia to supply a 30-50 MWt light water research reactor, 2000 metric tons of natural uranium, and the training of Iranian graduates in the nuclear field in Russia.
- 37 Judith Miller, "U.S. Asks Putin Not to Sell Iran a Laser System", *New York Times*, 19 September, 2000.
- 38 Peter Baker, "Russia Unyielding on Iran Nuclear Project", *Washington Post* 16 August, 2002.
- 39 It has been Soviet and Russian practice to bring spent fuel of Russian origin back to the Soviet Union/Russia. This will be the case also in Iran. In the beginning of 2005, Russia and Iran signed a confidential protocol that sets out the timetable for delivery of fuel for Bushehr, and that obliges Iran to send the spent fuel rods to Russia. *BBC News*, 27 February, 2005.
- 40 Putin made this claim on 20 September 2003. *Nuclear Threat Initiative, Country Profiles*, http://www.nti.org/e_research/profiles/Iran/1825_2612.html
- 41 Drew Thompson, "China's global strategy for energy, security, and diplomacy", *The Jamestown Foundation*, 29 March 2005, http://www.jamestown.org/publications_details.php?volume_id=408&issue_id=3280&article_id=2369493
- 42 This expression was used in connection with the summit meeting in October 2004, when long-standing border issues were settled and Moscow and Beijing agreed to hold joint military exercises in 2005, for the first time since 1958.
- 43 IAEA, GOV/2003/75, 10 November, 2003.
- 44 Cirincione, Wolfsthal, Rajkumar, *Deadly Arsenal. Tracking Weapons of Mass Destruction*, CEIP, 2002.
- 45 *Proliferation: Threat and Response*, U.S. DOD 2001.
- 46 State Department briefing, 10 September, 2005 (Deputy State Department Spokesman James Foley).
- 47 Response of the Islamic Republic of Iran to the Framework Agreement proposed by the E3/EU
- 48 Framework for a Long-Term Agreement, para. 24, printed in INFCIRC/651, 8 August, 2005.
- 49 Framework for a Long-Term Agreement, *op.cit.*, para. 19b.
- 50 Response of the Islamic Republic of Iran, *op.cit.*
- 51 "Germany attacks US on Iran threat", *BBC News*, 13 August 2005. http://news.bbc.co.uk/2/hi/middle_east/4149090.stm
- 52 Adopted by a vote of 22 in favour, 1 against and 12 abstentions, IAEA, 19 September 2005 http://www.iaea.org/NewsCenter/Focus/laeliran/iran_timeline2.shtml#september05
- 53 "Parties to the Treaty in a position to do so shall also cooperate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world." From art IV of the NPT.
- 54 The offer is printed in S/2006/521.
- 55 Abbas Maleki and Kaveh L. A&asiabi, "Saving face with Iran", *International Herald Tribune*, 26/27 August 2006. The 21 pages document which Iran submitted on August 22 in response to the P5+1 offer is not yet public.
- 56 S/res/1696 (2006), para. 8.
- 57 "There are times when a little patience is more effective", interview with *Le Monde*, here as quoted in the *International Herald Tribune*, September 6, 2006.
- 58 The "inalienable right" to peaceful utilization of nuclear energy inscribed in art. IV of the NPT does not apply irrespective of compliance or non-compliance with safeguards obligations.
- 59 Today, the need for such arrangements is stronger than ever before because nuclear power is on the rise, and the international consensus that fostered the NPT is about to break up.
- 60 In 2005, an IAEA expert group reported on the problems and possibilities of multinational fuel cycle arrangements. Two of the options identified by the group are based on the notion of shared ownership or control, promoting multinational arrangements with the participation of other states, nuclear and non-nuclear, as confidence-building measures. Upon taking office, President Ahmadinejad entertained the same idea, proposing that public and private companies might be involved in the sensitive parts of Iran's nuclear programme. A number of technical fixes could significantly enhance the proliferation resistance of multinational arrangements. See "Multinational facilities may solve Iranian nuclear stalemate", *Jane's Intelligence Review*, Number 04, April 2006.
- 61 "Conflicting data on Iran makes showdown dicey", *International Herald Tribune*, 7 September 2006.