Michele Gerli

BEYOND NUCLEAR AMBIGUITY

The Iranian Nuclear Crisis and the Joint Comprehensive Plan of Action

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Beyond Nuclear Ambiguity

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SOMMARIO

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PRESENTAZIONE

Giusto Puccini

Nel 2010, la allora Facoltà di Scienze Politiche "Cesare Alfieri" dell'Università degli studi di Firenze – oggi omonima Scuola – decise di istituire un Premio per Tesi di Laurea Magistrale intitolato a Guido Galli, funzionario dell'ONU rimasto vittima del terremoto di Haiti del 12 gennaio 2010, mentre era impegnato in una riunione di lavoro all'Hotel Christopher, quartier generale dell'ONU, insieme ad altri suoi colleghi.

Con l'istituzione di questo premio di laurea, la Facoltà intendeva onorare la memoria di questo suo ex studente nel modo più consono ai propri fini istituzionali e, al tempo stesso, allo spirito del tutto particolare che ha caratterizzato la vita e l'attività professionale di Guido Galli.

A tale ultimo proposito, merita innanzitutto ricordare che Guido Galli, nato a Firenze il 5 settembre 1967, si è iscritto alla "Cesare Alfieri" nel 1985, dopo aver conseguito il diploma di maturità classica, sempre a Firenze, presso il Liceo Dante.

Fin dall'inizio degli studi superiori, egli ha manifestato sia una notevole propensione all'impegno personale nella vita universitaria e nella politica studentesca, sia uno spiccato interesse per le tematiche inerenti alle relazioni internazionali ed alle vicende umane e sociali dei popoli.

Così, da un lato egli figura fra gli animatori della mobilitazione studentesca del 1990 (il movimento c.d. della 'Pantera'), e viene poi anche eletto come rappresentante degli studenti nel Consiglio di Facoltà.

Da un altro lato, egli opta per l'indirizzo politico-internazionale dell'allora Corso di laurea quadriennale in Scienze Politiche, per poi laurearsi brillantemente con il massimo dei voti e lode con una tesi su *Integralismo e politica di potenza. La guerra Iran-Iraq e i suoi effetti sul regime di Baghdad*, relatrice la professoressa Marta Petricioli.

Terminati gli studi universitari ed il servizio civile – durante il quale ha lavorato nel campo dei servizi sociali presso il comune di Terricciola, organizzando attività per i bambini – Guido Galli ha iniziato ad operare in vari paesi: nel 1992 in Messico, presso un ostello gestito da quaccheri; nel 1993, sempre in Messico, come osservatore elettorale; nel 1994 in Guatemala, dove ebbe il primo incarico come consulente da parte di una ONG, e dove successivamente ritornò per iniziare il

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suo lavoro per le Nazioni Unite, presso l'Ufficio per i rapporti legislativi e gli affari politici della Missione ONU (MINUGUA) in via di insediamento nel paese.

Nel 2000 venne trasferito in Afghanistan, dove operò prima come Protection Officer per l'Ufficio di Coordinamento degli aiuti umanitari (OCHA, Office for the Coordination of Humanitarian Affairs), e poi come Political Affairs Officer presso la Missione di assistenza dell'ONU (UNAM) insediata a Kabul.

Dopodiché, diresse a Stoccolma un programma per la costruzione della democrazia presso l'Istituto internazionale per la democrazia e l'assistenza elettorale (IDEA), assunse poi il ruolo di Desk Officer presso 1'OCHA a Ginevra e approdò infine ai quartieri generali di New York.

Guido Galli, però, desiderava 'lavorare sul campo', operando concretamente «per il rispetto dei diritti umani» (come ha ricordato sua madre) e per «proteggere chi subisce abusi o violenze da gruppi armati» (come disse lui stesso, parlando della sua missione in Afghanistan): così, nel 2007 colse l'opportunità di assumere l'incarico di Political Affairs Officer ad Haiti, dove purtroppo lo colse il terremoto.

Nel corso di un'intervista, parlando del suo lavoro nelle missioni umanitarie e di pace, Guido Galli ebbe anche modo di affermare che gli sembrava «tutto molto bello: è un po' come rifare l'Università, ma questa volta è l'Università della vita». Chi tra i colleghi e gli ex studenti della Facoltà lo ha conosciuto meglio, pensa sia una frase che gli appartenga totalmente.

Ebbene, la Facoltà di Scienze Politiche "Cesare Alfieri", istituendo il Premio Guido Galli, si è a suo tempo impegnata a mantenerne vivo il ricordo tra gli studenti, proprio perché si tratta di uno di loro, un ex studente la cui figura umana e professionale costituisce un'espressione particolarmente significativa dei valori caratterizzanti il peculiare progetto formativo sotteso ai vari Corsi di laurea triennale e magistrale afferenti allora alla Facoltà, ed oggi all'omonima Scuola.

Il Premio viene appunto assegnato annualmente ad una tesi di laurea, discussa a conclusione di uno dei Corsi di laurea coordinati dalla Scuola di Scienze Politiche "Cesare Alfieri", che abbia trattato, da un punto di vista internazionalistico, un tema di carattere economico, giuridico, politologico, sociologico o storico.

Possono presentare i loro lavori, entro una data di volta in volta stabilita, tutti coloro che hanno conseguito la laurea nel corso del precedente anno solare.

Una Commissione nominata dal Consiglio della Scuola, della quale fanno parte studiosi di ciascuna delle cinque anime disciplinari che caratterizzano la Scuola medesima, valuta le tesi presentate e assegna il premio, che consiste nella pubblicazione della tesi presso la Firenze University Press (FUP).

Dunque, con la pubblicazione della tesi di laurea di Michele Gerli, dal titolo *Beyond Nuclear Ambiguity. The Iranian Nuclear Crisis and the Joint Comprehensive Plan of Action*, discussa nel corso del 2017, prosegue la Collana "Premio Cesare Alfieri Cum Laude" presso la FUP.

La tesi è stata elaborata, nell'ambito del Corso di laurea magistrale in Relazioni Internazionali e Studi europei, in materia di Storia del sistema internazionale, relatrice la professoressa Bruna Bagnato.

INTRODUCTION

On the 14th of July 2015, the High Representative for Foreign Affairs and Security Policy, Federica Mogherini, and Iran's Minister of Foreign Affairs, Mohmmad Javad Zarif, announced in Vienna the finalization of the *Joint Comprehensive Plan of Action* (JCPOA), commonly referred as the "nuclear deal." The JCPOA was a significant mutual success that marked the conclusion of nearly 13 years of looming crisis, confrontation and prolonged impasse between the international community and the Islamic Republic. Unquestionably, the nuclear deal was a clear triumph for diplomacy, a significant precedent that paved the road to new promising developments in the Middle East and, potentially, in other regions of the world.

With no ambitions of completeness, the aim of this dissertation is to illustrate the trajectory of Iran's nuclear program with the adoption of a long-term, historic and descriptive perspective. The common thread of the whole thesis will be the concept of "nuclear ambiguity." Trailing the footsteps of Barzashka & Oelrich (2012), it will address nuclear ambiguity in these terms Barzashka & Oelrich (2012):

1. The dual application of nuclear energy constitutes the primary source of ambiguity. It is widely recognized that the atom can be developed both for civil and military purposes. The underlying challenge for the non-proliferation regime is that a State, who achieves a complete nuclear fuel cycle for civilian purposes, involuntarily gains the necessary technological expertise and material raw (i.e. enriched uranium or plutonium) exploitable as for military applications.
2. The previous challenge has been further exacerbated by the constraints of the international regime of non-proliferations. The most famous legal loophole is Article IV of the Treaty of Non-Proliferation of Nuclear Weapons (NPT). Indeed, it recognizes the "inalienable rights" of non-nuclear weapon States (NNWS) to "develop research, production and use of nuclear energy for peaceful purposes." This provision had been frequently used by several NNWS, including Iran, to justify their civilian program, while simultaneously running a clandestine military one.

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3. These two sources of ambiguity had been exploited by Iran since the times of the Shah. Even if Teheran openly condemned the use of nuclear weapons by officially committing to the provisions of the NPT, it developed a large civilian nuclear program with a possible military dimensions (PMD).

The *Joint Comprehensive Plan of Action* attempted to end this trend by limiting Iran's nuclear program only to peaceful goals and by creating an unprecedented inspection mechanism. In other words, the nuclear deal tried to go beyond the previous history of nuclear ambiguity.

As mentioned previously, the thesis will address the trajectory of the Iranian nuclear crisis from the origins of the nuclear program (1957) to the *Joint Comprehensive Plan of Action* (2015). The first chapter will open with a brief overview on the history of the Iranian nuclear ambitions and the ambiguous shift toward military purposes. Developed with the key assistance of the West, under Mohamad Reza Shah, the nuclear program faced a significant development. However, the nuclear projects were dismantled after the Islamic Revolution (1978-1979), then resumed during the Iraq-Iran war (1980-1988) and enhanced with military dimensions during the Rafsanjani (1989-1997) and Khatami Administrations (1997-2005).

The second chapter of the dissertation will focus on the primary source of nuclear ambiguity. It will provide some the basis of nuclear energy and describe the stages of the nuclear fuel cycle. Given the technicality of the issue, some of the basic notions (e.g. nuclear fission, enrichment or reprocessing), as well as the related facilities (e.g. research reactor, enrichment facility or heavy-water reactor) need to be embedded within an essential scientific background. Such an unusual perspective will enable the reader to have a better understanding of the specific issues of the nuclear negotiations and to critically assess the developments of the Iranian crisis.

The third chapter will address the second source of ambiguity, which is the international regime of non-proliferation. As it will be widely discussed, the original legal framework was the result of compromise between nuclear and non-nuclear weapon States and was designed with several flaws. These legal constraints were exploited by Iran, contributing in part to the nuclear crisis.

The forth chapter will get to the heart of the dissertation and will address the first nuclear crisis (2002-2005). Following the disclosure of two undeclared sites in 2002, the Iranian nuclear program and its PMD became a daily source of concern. Fearing the possible escalation of the crisis, in 2003 the Foreign Ministers of France, Great Britain and Germany (the EU3 or *Big Three*) decided to engage the Khatami Administration and to reach a diplomatic agreement. Despite some limited achievements (i.e. *Teheran Declaration* of 2003, the *Brussels Agreement* and *Paris Agreement* of 2004), the Iranian ambiguous attitude and the EU3 unwillingness to

make major concessions prevented both parties to reach a long-term solution to the standoff. The election of Mahmoud Ahmadinejad (2005-2013) and the failure of the EU3 paved way to a formal involvement of United States, Russia and China, leading to the creation of the P5+1 group, composed by the five permanent members of the Security Council of the United Nations (UNSC) plus Germany. After Iran's decision to resume enrichment, in February 2006 the IAEA Board of Governors (BOG) decided to defer the nuclear dossier to the UN Security Council. Given Teheran's reluctance to compromise and to accept the proposal of the P5+1, between 2006 and 2008, the UN Security Council adopted a Presidential Statement (2006) and five resolutions against Iran: 1696 (2006), 1737 (2006), 1747 (2007), 1803 (2008), 1835 (2008). In the meantime, the IAEA Director General attempted to solve all outstanding issues of the program with the finalization of a workplan with Teheran. The partial implementation of this framework was facilitated by the circulation of the 2007 US National Intelligence Estimate, which provided an assessment on Iran's nuclear intention and capabilities.

The sixth chapter will focus on the long phase of nuclear impasse (2009-2013). Despite the promising openings of President Obama, the Iranian disputed elections of June 2009 undermined the American efforts for a direct engagement with the Islamic Republic. After the failure of the fuel swap proposal of October 2009, the negotiations reached a new impasse. Although Brazil and Turkey attempted to negotiate a deal, in June 2010 the P5+1 responded with the adoption of UNSC resolution 1929, followed by strong unilateral punitive measures. Meanwhile, several States attempted to delay or undermine the nuclear program with the launch of a cyber malware, known as Stuxnet, and with the assassination of several Iranian nuclear scientists. This phase was further marked by new shocking revelations concerning Iranian ambiguous attitude and by a total diplomatic deadlock.

The seventh chapter will focus on the final negotiations (2013-2015) resulted in the nuclear deal. After the election of Hassan Rouhani (2013 -), in October 2013 the P5+1 and Iran decided to seriously engage and solve the crisis. These hard discussions delivered first the *Joint Plan of Action* in November 2013, followed by the *Joint Comprehensive Plan of Actions* in July 2015. The chapter will offer a concise overview of the most relevant provisions of the nuclear deal and will provide a further assessment of the agreement, identifying strengths and weaknesses. It will be argued that the JCPOA is not a classic agreement according to international law, but a political framework endorsed by UNSC resolution 2231. More specifically, it envisages:

1. Significant temporary limitations of the nuclear program, committed perpetually to peaceful purposes, and huge incentives for its implementation within a fixed implementation plan;

2. An unprecedent and intrusive inspection mechanism beyond the provisions of the NPT, the Safeguards Agreement and the Additional Protocol;
3. The compulsory clarification of all past and present issues of the nuclear program with PMD.

Therefore, despite wide criticism (i.e. sunset clauses, the exclusion of the ballistic program, etc.), it will be claimed that the JCPOA is a landmark framework that shall be defended and promoted by the international community as a successful precedent in other alarming settings. As conclusion, the dissertation will provide some considerations on the present days, focusing on existing threats and challenges to the implementation of the JCPOA.

★★★

In terms of methodology, given the extensive documentation on the nuclear crisis, the thesis will follow a chronological account of events, based on text analysis. It will refer mainly to the memoirs of the nuclear negotiators, which include: the diary of the IAEA Director General, Mohamed ElBaradei (1997-2009); the memoirs of Iran's chief negotiator Hassan Rouhani (2003-2005), and of the deputy chief negotiator, Seyed Hoseein Mousavian (2003-2007); the records of the French Ambassador to Iran, François Nicoullaud (2001-2005), and of the French Minister of Foreign Affairs, Laurent Fabius (2012-2016). It will also refer to several diplomatic cables, focused on the nuclear program and crisis, that were declassified by the US Intelligence Community (i.e. "The Iranian Nuclear Program, 1974-1978", available online at the National Security Archives) or revealed by WikiLeaks. Such a perspective will provide an interesting insight on the internal dynamics of the negotiations, usually not available to a larger public.

The dissertation will further provide the major documents of the nuclear crisis. This includes: nearly all the political frameworks that were discussed and negotiated during the standoff, from the *Teheran Declaration* to the *Joint Comprehensive Plan of Action*; the infinite production of confidential quarterly reports delivered by IAEA Director General, which will offer a technical account of the program and its PMD; and all the resolutions of the UN Security Council. Finally, the thesis will refer to existing literature and to the open-source press, providing the declarations of the major actors involved in the nuclear standoff (i.e. US and Iranian leaders). With respect to the JCPOA and its execution, the dissertation will be clearly policy-oriented. By assessing costs-benefits of the deal (paragraph 7.11), the author will recommend its "natural" implementation within the terms set forth.

LIST OF ACRONYMS

AEOI	Atomic Energy Organization of Iran
AIO	Aerospace Industries Organization
BOG	Board of Governors of the IAEA
BWR	Boiling Water Reactors
CENTO	Central Treaty Organization
CFSP	Common Foreign and Security Policy
CIA	Central Intelligence Agency
CTBT	Comprehensive Test Ban Treaty
EBW	Exploding Bridge Wire
FEP	Fuel Enrichment Plant
FFEP	Fordow Fuel Enrichment Plant
HEU	High-Enriched Uranium
IAEA	International Atomic Energy Agency
INTC	Isfahan Nuclear Technology Center
ISIS	Institute for Science and International Security
JHL	Jabr Ibn Hayan Multipurpose Laboratories
JCPOA	Joint Comprehensive Plan of Action
JPOA	Joint Plan of Action
LEU	Low-Enriched Uranium
LTBT	Limited Test Ban Treaty
MAP	Model Additional Protocol
MENFZ	Middle East Nuclear Free Zone
MEK	Mujahedeen-e-Khalq
MSA	Model Subsidiary Arrangement
MIX	Molybdenum, Iodine and Xenon Radioisotope Production Facility
MW	Megawatts
NIE	National Intelligence Estimate
NNWS	Non-Nuclear Weapon States
NPT	The Treaty on the Non-Proliferation of Nuclear Weapons
NWS	Nuclear Weapon States
PFEP	Pilot Fuel Enrichment Plant

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PHRC	Physic Research Center
PMD	Possible Military Dimensions
PWR	Pressurized Water Reactors
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of Petroleum Exporting Countries
R&D	Research and Development
SCRC	Supreme Cultural Revolution Council
SNSC	Supreme National Security Council
SSA	Standard Safeguards Agreement
SWU	Separative Works Unit
TNRC	Teheran Nuclear Research Center
UF_6	Uranium Hexafluoride
UK	United Kingdom
UN	United Nations
UNSC	United Nations Security Council
US	United States
USSR	Union of Soviet Socialist Republics
WMD	Weapons of Mass Destruction
WTO	World Trade Organization

PART I

INTRODUCTION TO THE NUCLEAR CRISIS

CHAPTER 1

THE HISTORY OF THE IRANIAN NUCLEAR PROGRAM

1. The Origins of Nuclear Program under the Shah (1957-1974)

The Iranian nuclear program has a long peculiar history that is rooted back in the '50s in midst of the bilateral confrontation between United States (US) and the Soviet Union (USSR).[1] After the successful coup against Prime Minister Mohammad Mossadeq (19 August 1953), Persia was regarded as a crucial partner within the strategic concept of the Northern Tier and the Central Treaty Organization (CENTO).[2] As a result, Mohammad Reza Shah (1941-1979) benefitted from this position and could further strengthen its economic, military and scientific ties with the West,

[1] According to Ennio di Nolfo, the hottest moment of the bipolar confrontation between the US and the Soviet Union, the so-called Cold War, took place during the years 1946-1953 and ended with Josef Stalin's death (March 5, 1953). In this phase, the issues that increased tension between the two blocks were, among others, the lack of consensus on the shared administration of occupied Germany (1945-1949), the Iran-Azerbaijan crisis (1946), the Greek civil war (1946-1949), the Turkish Straits Crisis (1946-1947), the US nuclear monopoly (1945-1949) and the Korean war (1950-1953). See Di Nolfo 2014: 212-290.

[2] Mohammad Mossadeq was the leader of the National Front and the Prime Minister of Persia from April 28, 1951, to August 19, 1953. As a symbol of Iranian nationalism since the Constitutional Revolution of 1905, he adopted a vocal agenda and nationalized the oil industry, expropriating the property of the Anglo-Iranian Oil Company, later British Petroleum (BP), that was largely controlled by the United Kingdom (UK). As a result, Mossadeq came into conflict with the Shah and the Western block, particularly with the UK and US. Fearing the fall of Iran behind the Iron Curtain, the US Central Intelligence Agency (CIA) and the British MI6 jointly launched *Operation TPAJAX* and *Operation Boot* and ended the political experience of Mossadeq. The event, which resulted in a coup d'état and a regime change, was considered later by Ayatollah Ruhollah Khomeini as the birth of the Iranian political consciousness. See Wilber, D. N. CIA Clandestine Service History: Overthrow of Premier Mossadeq of Iran, November 1952-August 1953, March 1954. The Northern Tier was a strategic concept of the Administration of Dwight D. Eisenhower. Developed by Secretary of State John Foster Dulles, Middle Eastern States, such as Turkey, Iraq and Iran, would have constituted a protective belt against the aggressive posture of the USSR. The concept of Northern Tier was embodied in the Baghdad Pact or Central Treaty Organization (CENTO), an agreement of cooperation originally signed between Turkey and Iraq (February 1955) and later extended to Great Britain, Iran and Pakistan. See Howard 1972.

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particularly with the US Administration of President Dwight D. Eisenhower (1953-1961).[3] In such a context, in 1957, after two years of negotiations within *Atoms for Peace* Program, Iran and United States signed their first agreement on the peaceful use of the atom.[4] Considered as the starting point of the program, the agreement – a brief preamble followed by 11 articles – came into force in 1959, paving the way to the US-Iranian partnership in the field.[5] Specifically, Persia pledged not to pursue nuclear weapons, receiving in exchange the US scientific and technical assistance to provide a five megawatts (MW) light water reactor and several kilograms of low-enriched uranium (LEU).[6] In 1957, the Nuclear Science Institute of CENTO was moved from Baghdad to Teheran, becoming the precursor of the Teheran Nuclear Research Center (TNRC), formally established in June 1959 within the University of Teheran.[7] Between 1963 and 1964, Iran signed and ratified the Limited Test Ban Treaty (LTBT), a multilateral agreement promoted by the US and USSR, which prohibited nuclear weapons tests or "any other nuclear explosion" in the atmosphere, in outer space, and under water.[8]

[3] Mohammad Reza Pahlavi was born in 1919 and came to power in 1941, in the aftermath of the Anglo-Soviet invasion and the resulting forced abdication of his father Reza Pahlavi (1925-1941). He ruled Iran until January 1979, when the events of the Islamic revolution force him to exile. He died in Egypt on July 27, 1980. See Pahlavi (1980). According to a US declassified Memorandum (1954), the level of Iranian aid envisaged by the US Administration only for the fiscal year of 1955 was in total $127,3 million. See NSC 1954.

[4] The *Atoms for Peace* was a speech pronounced before the United Nations General Assembly by the US President Dwight Eisenhower on December 8, 1953. While recognizing the dangers of the atomic age, the President acknowledged the advantages derived from the peaceful utilization of the atom. Starting from 1954, *Atoms for Peace* became the US policy in terms of international nuclear cooperation; it provided technology and educational resources to States that refused the military implications of nuclear energy. See IAEA, Atoms for Peace, Address by Mr. Dwight D. Eisenhower, President of the United States of America, to the 470th Plenary Meeting of the United Nations General Assembly, Tuesday, 8 December 1953, 2:45 p.m.

[5] The agreement came into force on 27 April 1959. See *Agreement for co-operation concerning civil uses of atomic energy. Signed at Washington, on 5 March 1957*, No. 4898, in United Nations, Treaty Series, vol. 342, p. 29.

[6] In article IX of the agreement, [the Government of Iran guarantees that:] "(b) No material, including equipment and devices, transferred to the Government of Iran or authorized persons under its jurisdiction, pursuant to this Agreement, by lease, sale, or otherwise will be used for atomic weapons or for research on or development of atomic weapons or for any other military purposes, …". On March 13, 1969, the agreement was extended for another 10 years (until 1979). See Sahimi 2004.

[7] The Teheran Nuclear Research Centre was equipped by Great Britain and was ran by British, Turkish, Pakistani and Iranian scientists. It was also attended by students from the CENTO members. See Patrikarakos 2012: 34-35.

[8] The negotiations of the LTBT between the United States and the Soviet Union started in the mid '50s. In 1958, the US and the USSR could not agree on a comprehensive ban but reached a temporary suspension of nuclear tests. After the Cuban missile

In this phase, the program was still at a preliminary stage since the Iranians were limited in terms of technic and scientific expertise required to develop and enhance nuclear technology. The turning point occurred in 1965, in the middle of the White Revolution, when Muhammad Reza Pahlavi, visibly dissatisfied with the lack of progress in the construction of the reactor, entrusted Dr. Akbar Etemad, the father of the Iranian nuclear program, to lead the TNRC.[9] Given his international formation and experience, Etemad solved the technical difficulties and inaugurated the facility in 1968[10]. In the same year, Persia signed the Non-Proliferation Treaty (NPT) on the first day it was open for signatures (July 1, 1968).[11] Ratified by the *Majilis* – the Parliament – in February 1970, the Shah wanted to prove to the West that Iran was responsible and "honorable", particularly in a sensitive area such as nuclear proliferation.[12]

Therefore, at the end of the '60s, the technical constraints and the legal commitments undertaken made it clear that the program was focused merely on post-graduate education and research activities in basic nuclear science and techniques with no military implications (Etemad 1987). However, this feature would change in the '70s due to a series of contingent circumstances. First, a power shift occurred with the British withdrawal from the Persian Gulf and the confirmation of the Iranian strategic importance within the Nixon Doctrine and the Twin Pillar Policy.[13] In this regard, following the visit of President Richard Nixon

crisis (1962), Kennedy and Khrushchev resumed talks and reached a final agreement that constituted the first step toward nuclear disarmament. However, not all the States (*e.g.* France and China) decided to sign the treaty. See Wenger, Gerber 1999.

[9] The White Revolution, term created by an Iranian conservative newspaper, was a set of ambitious reforms launched in 1963 by the Shah and proposed to modernize the country. See Pahlavi 1980: 93-97. Akbar Etemad was the father of the nuclear program. He studied electrical and nuclear engineering in Switzerland and France. In 1965, he returned to Iran and became a nuclear adviser for the government. Later, in 1974, he was nominated by the Shah President of the Atomic Energy Organisation of Iran (AEOI) that he directed until 1978. See Malik 2013.

[10] The facility was built in six years by the US company American Machine and Foundry (AMF). The reactor became critical in November 1967 and was supplied by 5.545 kilograms of enriched uranium, of which 5.165 kilograms were fissile isotopes, and 112 grams of plutonium. See NSA, *US Supplied Nuclear Material to Iran*, September 1967 to May 1976, Washington, 29 Jan. 1980, Non-Classified.

[11] See IAEA, *Treaty on the Non-proliferation of Nuclear Weapons*, INFCIRC/140, April 22, 1970.

[12] According to Iran's former Minister of Foreign Affairs Adeshir Zahedi, the 'honourable' decision to sign the NPT "as soon as possible" was made by the Shah with no-discussion or debate. As a result, many officials, Etemad included, disliked the NPT since they believed it threatened national sovereignty. See Patrikarakos 2012: 54-55.

[13] By the end of 1971, Great Britain formally withdrew from Qatar, United of Arab Emirates (UAE) and Bahrain. See Owen 1972. The Nixon Doctrine was defined in a famous speech delivered by President Richard Nixon on July 25, 1969, in Guam Island.

in Teheran (May 1972), the Shah received a "blank check" to purchase any conventional arms it sought.[14] Second, the Yom Kippur war and the global embargo decided in October 1974 by the Organization of Petroleum Exporting Countries (OPEC) that contributed to quadruple oil prices and revenues.[15] As far as Iran was concerned, the increase was huge and unexpected, with $5 billion of profits and a daily production of 6 million barrels, which enabled Mohammad Reza Shah to extensively raise domestic expenditure for its projects (nuclear program included).[16] Third, the first "peaceful nuclear explosion (PNE)" conducted by Indian government of Indira Gandhi on May 18, 1974.[17] The test surprised the United States, aware since the '60s of the military dimensions of the Indian program, and shocked the neighboring countries, particularly China, Pakistan and Iran, for the consequent alteration of the military balance in the region.[18]

According to this new strategic design, the United States decided to reduce their military presence in Asia and to "place greater emphasis on initiatives by regionally influential States to assure stability and security of their respective region." The corollary of the Nixon Doctrine in the Middle East was the Twin Pillar Policy, which recognized a preponderant role to Iran and Saudi Arabia within the region. See Kibaroğlu 2007: 228. See also Behestani, Shahidani 2014.

[14] By 1968, Iran was already America's largest single arms customer and was purchasing approximately $150 billion of arms annually. Following the visit of Nixon to Teheran, the Shah embarked in multi-billion-dollar arms spending, transforming the US-Iran relations qualitative and quantitively. See McGlinchey, Moran 2016.

[15] The IV Arab-Israeli war, known also as Yom Kippur war, began on October 6, 1973, during the holiest day of the Jewish calendar – the Yom Kippur or day of the Atonement – when Egypt and Syria decided to launch a surprise attack against Israel. On October 16, 1973, the Organization of Petroleum Exporting Countries (OPEC) proclaimed an oil embargo in response to the US decision to militarily re-supply Israel during the war. See Di Nolfo 2014.

[16] A wise economic management would have recommended a gradual spending of this amount of money- However, this policy was rejected by the Shah who insisted in spending all the oil revenues domestically and in the brief period, contributing to raise inflation and protests. See Mohaddes, Pesaran 2013.

[17] The Indian nuclear program was started in 1945 with the establishment of the Tata Institute of Fundamental Research. In 1956, India acquired from Canada a 40 MW research rector that was completed in the '60s in the location of Trombay. After the Sino-Indian war (1962) and the Pakistan-Indian war (1965), the program was oriented toward strategic objectives. Therefore, India decided not to sign the NPT (1968) and in May 1974, made its first detonation. The test was considered as a "peaceful nuclear explosion," technically speaking an explosion conducted for peaceful goals, and was called "Smiling Buddha." See Mushtaq, Hashmi 2012.

[18] According to a US secret National Intelligence Estimate, recently declassified and dated 21 October 1965, "India has the capability to develop nuclear weapons. It probably already has sufficient plutonium for a first device and could explode it about a year after a decision to develop one." See Director of Central Intelligence, SNIE 31-1-65, India's Nuclear Weapons Policy, October 21, 1965. Secret. The test was regarded as a nightmare by the Pakistan government of Zulfiqar Ali Bhutto that promptly began a secret nuclear program with the crucial help of Abdul Qadeer Khan. See Central

As a result, these events triggered an important qualitative leap within the Iranian program. On December 18, 1972, the Ministry of Water and Power made the first announcement on the intention to acquire nuclear reactors and began a study on the construction of a power plant (Sahimi 2004: 2). Later, on March 18, 1974, Mohammad Reza Shah revealed the ambitious project to produce 23,000 MW nuclear power energy by 1994 and acquire full nuclear fuel cycle (paragraph 2.2).[19] The original intention was to develop an advanced nuclear sector, symbol of modernity and pride, that would constitute a long-term alternative to thermal and hydroelectric power.[20] To reach this goal, in April 1974, he established the Atomic Energy Organization of Iran (AEOI), which was entrusted with the development of the civilian infrastructure, international cooperation and official representation of Iran in multilateral forums dealing with atomic energy.[21] He appointed Dr. Etemad (1974-1978) as its President and allocated $30,8 million for the fiscal year 1975 (in 1977, the budget reached the skyrocketing figure of $1.119,9 million).[22]

In order to develop the nuclear infrastructure of the country, Iran signed several agreements with Western partners. On June 27, 1974, it reached a 10 years' nuclear cooperation treaty with France that constituted the "mother" framework for other deals, such as the Framatome-AEOI contract for two 900 MW pressurized (light) water reactors in Darkhovin (November 1974), 40 km north of the city of Ahvaz, and the protocols related to the establishment of the Isfahan Nuclear Technology Center (November 1974-March 1977) (Mousavian 2012: 46-47). On March 3, 1975, Teheran signed with Washington a $15 billion trade agreement that included the acquisition of eight light-water reactors (worth $6,4 billion) with a capacity of 8,000 MW, although the sale was subjected to the signature of a new bilateral agreement of nuclear cooperation.[23] In

Intelligence Agency, *India [Redacted]*, «Central Intelligence Bulletin», May 20, 1974. Top Secret. See also Khalilzad 1979.

[19] Originally, the Shah planned to have 10,000 MW nuclear capacity by 1990. However, he changed his mind in 1974 after reading a study conducted by the Stanford Research Institute that suggested a 20,000MW nuclear capacity "as soon as possible". The plan was explained on the Tehran Magazine. See Sahimi 2004: 2.

[20] In 1960, the Shah envisaged nuclear energy as a direct replacement of oil. In *Mission for My Country*, he stated: "The oil we call the noble product will be depleted one day. It is a shame to burn noble product for the production of energy to run factories and lighthouses. About 70,000 products can be derived from oil. We plan to get as soon as possible 23,000MW from nuclear power stations." See Pahlavi 1961: 85-86.

[21] See U.S. Embassy Tehran Airgram A-76 to State Department, *The Atomic Energy Organization of Iran*, 15 April 1976, Confidential.

[22] See U.S. Embassy Tehran Airgram A-69 to State Department, *The Atomic Energy Organization of Iran*, 11 May 1977, Confidential.

[23] Indeed, the 1957 bilateral agreement dealt only with nuclear research. See Fuhrmann 2012: 83.

the same year, the AEOI purchased a 10% share of Eurodif, a European entity for uranium enrichment that involved France, Belgium, Spain, Sweden and Italy, and pledged to invest $1 billion in the construction of the facility.[24] On June 30, 1975, it reached a first cooperative agreement with (West) Germany, followed in July 1976 by a contract for the construction of six nuclear reactors, two of which (1300MW) to be built by German Kraftwerk Union in Bushehr, located on the south-western coast of Iran (Kibaroğlu 2006: 215). Between 1974 and 1978, Teheran signed also several deals with Great Britain, Canada, Australia and South Africa.[25] In the same period, thousands of Iranian students were attending Western universities and mastering their skills in nuclear physics and engineering abroad.[26]

2. The Shah's Ambiguous Shift (1974-1978)

In parallel with these developments, in May 1974, Teheran came under the full scope of the Safeguards Agreement, accepting the inspection regime of the International Atomic Energy Agency (IAEA or the Agency) "on all sources of fissionable material in all peaceful nuclear activities" within its sovereignty.[27] The Comprehensive Safeguards Agreement with the IAEA was envisaged by the NPT (Article III) and was consistent with the Persian long-standing official commitment on the peaceful use of the atom. To further strenghten this position, in 1974 the Shah proposed the establishment of a Middle East Nuclear Free Zone (MENFZ), paving the way to resolution 3263 (XXIX) of the General

[24] Eurodif was a consortium founded in 1973 and based in Tricastin (near Lyon, France). The Iranian participation to the entity was promoted by France through a complicated arrangement. Indeed, Teheran could not hold direct shares in the European consortium. Thus, France and Iran founded a new company, Sofidif, whose capital were shared by the French Atomic Agency (60%) and the AEOI (40%). Then, Sofidif acquired 25% share in Eurodif, enabling the AEOI to obtain 10% share of Eurodif. See Homayounvash 2016.

[25] In the latter case, in 1975, Teheran came to a secret memorandum with Pretoria that pledged to supply Iran with $700 million worth yellowcake in exchange of Teheran's commitment to build a uranium enrichment plant in South Africa. See O'Toole 1975.

[26] For instance, in 1974, the Massachusetts Institute of Technology signed an agreement with Persia to educate and train Iranian engineers in the field of nuclear energy. Moreover, at end of the 70s, hundreds of Iranian students were studying nuclear physics, engineering and related branches in German and French universities. See Kibaroğlu 2006: 214-215.

[27] See Paragraph 3. The Agreement between Iran and the Agency for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons was concluded in Vienna on June 19, 1973 and entered into force on 15 May 1974, pursuant to Article 25. See INFCIRC/214.

Assembly of the United Nations (UN).[28] Two years later, in an interview with the «New York Times», Prime Minister Amir Abbas Hoveida stated clearly "the atomic bomb does not interest us. We want to master nuclear technology" (New York Times 1976). Nonetheless, while reaffirming the official position on nuclear energy, Iran began to consider also the military application (Quester 1977). This ambiguous shift occurred during several interviews between 1974 and 1975. The first was given in June 1974 on the French weekly newspaper «Les Informations», where the Shah, replying to the question whether Teheran would one day possess the nuclear weapon, replied "certainly, and sooner that is believed, but contrary to India, we have first though of the people and then to technology."[29] Although the Embassy in Paris promptly denied the statement, claiming that this information was totally invented and without a basis, two days later, in an interview with *Le Monde*, he explained: "If in this region each little country tries to arm itself with armaments that are precarious, even elementary, but nuclear, then perhaps the national interests of any country at all would demand that it do the same. But I would find that completely ridiculous."[30]

In July, Mohammad Reza Shah was asked again about nuclear weapons and replied that "Pakistan and India…talking about nuclear strength might force Iran to reconsider its options" (Patrikarakos 2012: 60). Later, in September 1975, in an interview with the «New York Times» he reiterated his position: "I am not really thinking of nuclear arms. But if 20 or 30 ridiculous little countries are going to develop nuclear weapons, then I may have to revise my policies. Even Libya is talking about trying to manufacture atomic weapons" (Oakes 1975).

These ambiguous statements raised serious concerns within the outgoing Nixon administration (1969-1974), which was facing a very problematic dilemma. On one hand, it was eager to support a strategic ally in a key area and to negotiate a new agreement of nuclear cooperation, as requested insistently by the Shah. On the other, after of the Indian PNE, Washington strongly desired to prevent a dangerous "proliferation chain" in a fluid region as the Middle East (Soave 2009: 503). In this regard, in June 1974, the US Department of Defense noted that the annual production of plutonium from the planned 23,000 MW program would be equivalent to 600-700 warheads. Besides, the Memorandum

[28] The MENFZ was proposed in an interview (July 1974) and at the United Nations (September 1974). See Teltsch 1974. See also Ramberg 2008.

[29] See U.S. Embassy Paris cable 15305 to Department of State, *Interview with Shah*, 24 June 1974, Unclassified.

[30] See U.S. Embassy Tehran cable 5192 to Department of State, *Shah's Alleged Statement on Nuclear Weapons*, 25 June 1974, Confidential.

stated that the stability of the country was related to the remaining in power of Mohammad Reza Shah.

> In a situation of instability, domestic dissidents or foreign terrorists might easily be able to seize any special nuclear material stored in Iran for use in bombs. … An aggressive successor to the Shah might consider nuclear weapons the final item needed to establish Iran's complete military dominance of the region.[31]

In August 1974, the Central Intelligence Agency (CIA) estimated the prospects for further proliferation:

> Although it would take at least one decade to develop a nuclear weapons program … there is no doubt, however, of the Shah's ambition to make Iran a power to be reckoned with. If he is still alive in the mid '80s, if Iran has a full-fledged nuclear power industry and all the facilities necessary for nuclear weapons, and if other countries have proceeded with weapons development, we have no-doubt that Iran will follow suit.[32]

Finally, in July 1975, Jack Miklos, the Deputy Chief of the US Embassy explored the Shah's personal desire in nuclear power and stated it is possible that: "Iran's interest in acquiring nuclear knowhow and plutonium is, in part, motivated by the desire to preserve the option of developing nuclear weapons should the region's power balance shift toward the nuclear."[33]

As it is clear from these declassified documents, the United States was really concerned about the dual implication of the Iranian nuclear program. Thus, during the long negotiations for a new agreement of nuclear cooperation (1974-1978), Washington tried to limit Teheran from acquiring a full nuclear fuel-cycle without stringent safeguards (Burr 2009). Specifically, between 1974 and 1975, the Ford Administration (1974-1977) threatened to use a veto power over the reprocessing of US supplied nuclear fuel and insisted on the establishment of a multinational reprocessing facility.[34] Such an approach was despised by the Persian

[31] See Office of Assistant Secretary of Defence for International Security Affairs to Secretary of Defence, *Nuclear Energy Cooperation with Iran (U) – Action Memorandum*, Late June 1974, Confidential.

[32] See Central Intelligence Agency, *Prospects for further Proliferation of Nuclear Weapons*, Special National Intelligence Estimate, 23 August 1974. Top Secret.

[33] See Tehran Embassy cable 5939 to State Department, *Multinational Nuclear Centers: Assessment of Iranian Attitudes toward Plutonium Reprocessing*, 17 July 1975, Secret.

[34] See Deputy Secretary of State Robert Ingersoll to Assistant to the President for National Security Affairs [Kissinger], *Department of State Response to NSSM 219 (Nuclear Cooperation with Iran)*, 18 April 1975, Secret.

authorities, particularly by the Shah and Dr. Akbar Etemad, that considered Washington's proposals in conflict with Iran's sovereignty and argued that "Iran should have the full right to reprocess and control the management and operation of reprocessing facilities."[35] The deadlock continued until July 1978, when Teheran and the Carter Administration (1977-1981) overcame the differences and reached the US-Iran Nuclear Energy Agreement (Kibaroğlu 2006: 214). Preceded by an arrangement for the exchange of technology and the cooperation in safety (April 1977), the deal was supposed to facilitate nuclear partnership and regulate the transfer of equipment and material to Teheran.[36] In exchange for the delivery of the eight light-water reactors and the status of "most favored nation" for the reprocessing of the spent fuel, Iran guaranteed that no uranium would be enriched "unless the parties agree" (Article 6, paragraph 2) and reaffirmed that no material or equipment transferred should be used "for any nuclear explosive device or for research on or development of any nuclear explosive device, or for any other military purpose (Article 8)."[37]

To conclude, at the eve of the Islamic Revolution, it was clear that Iran was massively developing a nuclear program with the crucial partnership of Western countries, particularly the United States. Even if there was no direct proof of the Shah's intentions to acquire nuclear weapons, his ambiguous statements and the US repeated concerns over the likely military implications constituted a liable suggestion of the trajectory that he was willing to undertake. Decades later, this view would have been confirmed also by Dr. Akbar Etemad, the father of the program and the head of the AEOI, who confessed:

> I always suspected that part of the Shah's plan was to build bombs. … We talked for about three hours, and the Shah told me his ideas about Iranian defense strategy. He thought that Iran's conventional army was already the most powerful in the region and believed that Iran didn't need nuclear weapons at that moment. He also realized that if Iran developed nuclear weapons, the Europeans and the Americans wouldn't co-operate with it. But I think that if the Shah had remained in power, he would have developed nuclear weapons because now Pakistan, India and Israel all have them (Bahari 2008).

[35] See Tehran Embassy cable 11089 to State Department, *Shah's Interview by Business Week Given Prominent Coverage by English Language Kayhan*, 13 November 1975, Confidential. See also U.S. Embassy Tehran cable 7485 to State Department, *Iranian Counterproposals for Atomic Energy Agreement*, 23 July 1976, Confidential.

[36] See U.S. Embassy Tehran Airgram A-69 to State Department, *The Atomic Energy Organization of Iran*, 11 May 1977, Confidential

[37] See State Department cable 125971 to Embassy Tehran, *U.S.-Iran Nuclear Cooperation Agreement*, 17 May 1978, Confidential.

3. The Islamic Revolution and the Lost Decade (1979-1989)

The stormy events of the Islamic revolution (1978-1979) and the changed circumstances prevented the United States and Iran from signing and implementing the finalized agreement.[38] In August 1978, with the nomination of a new Government and the proclamation of the martial law, Dr. Akbar Etemad resigned (Burr 2009: 31). In September 1978, the US Embassy reported that the reassessment of the priorities within the nuclear program had "essentially paralyzed the decision-making process of in both AEOI and Ministry of Energy. … Nuclear activity with the exception of the four units under construction [two in Darkhovin and two in Bushehr] has come to a halt."[39] One month later, the State Department was still optimist on the future of the nuclear cooperation with Iran and reported: "We have been encouraged by Iran's efforts to broaden its non-oil energy base. We are hopeful that the US-Iran nuclear Energy Agreement will be finalized soon and that the American companies will be able to play a role in Iran's nuclear energy program" (Joyner 2016: 9).

However, the revolution and the fall of the Shah (16 January 1979) altered profoundly the regional scenario and contributed to wreck overnight the US-Iran relations and the Pahlavi's nuclear ambitions. "Neither East, nor West, only the Islamic Republic of Iran" was the new guiding principle, promoted in domestic and foreign policy by the Supreme Leader, Grand Ayatollah Ruhollah Khomeini (1979-1989).[40] The implication of this slogan was the abrupt interruption of the projects of moderniza-

[38] The Pahlavi regime was brought down by a heterogeneous coalition of actors (clergy, youth and leftist movements) under the charismatic leadership of Khomeini and the slogan of "Independence, Liberty and Islamic Republic." The revolution started in January 1978 with the suppression of an anti-Shah demonstration in Qom. The protests continued throughout the year and culminated in September 8, 1978 (the *Black Friday*), when the royal security forces opened fire on the demonstrators. The event triggered and spread the demonstrations all over the country, leading to the steady collapse of the Pahlavi's monarchy. Mohammad Reza Shah handed the government to Prime Minister Shapour Baktiar and decided to leave the country in January 1979. On February 1, 1979, Khomeini returned to Iran from France after 14 years of exile, paving the way to final disintegration of the regime. Finally, on April 1, 1979, a referendum declared the victory of the revolutionary forces and proclaimed the birth of the Islamic Republic of Iran. See Khosrokhavar 2004.

[39] See U.S. Embassy Tehran cable 9154 to State Department, *Nuclear Activities in Iran*, 21 September 1978, Confidential.

[40] In Farsi *Na Sharq, Na Gharb, Faqat Jumhuri-ye Islami*. Ruhollah Mousavi Khomeini was born in central Iran on 24 September 1902. In 1920s, he became a leading Shia religious scholar, obtaining the title of "Grand Ayatollah". In 1962, he was arrested for sharply criticizing the Western regime of the Shah. In 1964, he was exiled to Turkey and, then, moved to Iraq where he lived for 13 years. He returned to Iran in February 1979, becoming the Supreme Leader of the newly established Islamic Republic of Iran. He died on June 2, 1989. See Shah 2009.

tion, the immediate reject of every Western feature (*no Westoxification*) and the consequent unilateral termination of several international deals (Patrikarakos 2012: 95-99).

As for the nuclear program, in April 1979, the new President of the AEOI, Fereydoun Sahabi (1979-1981), declared that all the projects were under review. Immediately after the revolution, Washington suspended the transfer of enriched uranium to the TNRC, causing in turn the Iranian withdrawal from Eurodif.[41] During 1979, the US-Iranian relations continued to further deteriorate and, with the breakout of the Hostage Crisis, resulted in mistrust and open hostility.[42] On November 4, 1979, thousands of Iranian students seized the US Embassy in Teheran and took in hostage 52 American citizens for 444 days. The Hostage Crisis was a real humiliation for the Carter Administration and was generally considered the trigger event of the long-term hostility.[43] As a result, the United States, the "Great Satan" of the Islamic Republic, froze Iranian assets, imposed financial sanctions and ended all nuclear cooperation with Teheran (Joyner 2016: 11). Between 1979 and 1980, many other partners, *in primis* France and Germany, extinguished the contracts related to the delivery of power fuel and the construction of light-water reactors (e.g. Darkhovin and Bushehr). In June 1980, the Iranian authorities solemnly declared: "The construction of these reactors, started by the former regime on the basis of colonialism and imposed treaties, was harmful for the country from the economic, political and technical points of view, and was a cause of greater dependence on imperialist countries."[44]

With the end of the Western partnership, the collapse of the AEOI and the brain drain of Iranian scientists that followed the Islamic revolution, the nuclear program seemed to be at the end.[45] However, in April

[41] The Iranian termination of Eurodif's nuclear project triggered a 12 years controversy with France. Indeed, Teheran requested the repayment of the investment ($1 billion) that was made by the Shah in 1974. Initially, Paris refused to repay the debt, claiming that the money constituted a compensation for French companies hurt by the unilateral decision. However, in 1991, France paid more than $1 billion to solve all the outstanding issues of the controversy. See Greenhouse 1991.

[42] The contracts for the construction of two Framatome reactors in Darkhovin were canceled in April 1979 for default in payment. As for the two power plants in Bushehr, Kraftwerk Union withdrew in July 1979 for the same reason. The first reactor was around 80% complete, while the second was 45-70%. See Patrikarakos 2012: 98.

[43] After the signature of the Algiers Accords (January 19, 1980), the hostages were released on January 20, 1981, the day the new elected President Ronald Regan sworn in. See Mousavian, Shahidsaless 2014: 53-74.

[44] This declaration was issued by the Minister of Energy Hassan Abbaspur and the President Abulhassan Bani-Sadr. It was published on *Kayhan International* on June 20, 1980. See Patrikarakos 2016: 98.

[45] Akbar Etemead stated: "As regards the AEOI, there was a tendency to destroy everything within it, and many people - professional and otherwise - had a say in the

1984, the decreasing oil revenues and the energetic shortage, combined with the demographic growth and the adverse regional scenario, forced President Ali Khamenei (1981-1989) to officially review the priorities and eventually reverse the decisions taken.[46]

On September 22, 1980, in the midst of the Hostage Crisis, Saddam Hussein decided to take advantage of the situation and invaded the Iranian Province of Khuzestan. The event initiated the Iraq-Iran war, the so-called "imposed war" for Teheran, and lasted until in 1988 with an inconclusive stalemate and more than one million of casualties on both sides.[47] The conflict was a real shock for Iran; internationally isolated, financially drained and militarily ill-equipped, it suffered great damages and losses from the air, ballistic and chemical attacks. Nonetheless, the "imposed war" (1980-1988) and the Israeli airstrike against the Osirak reactor (June 1981) contributed to trigger a new shift in the strategic doctrine: the necessity to improve self-defense with deterrent tools towards the hostile initiatives of neighboring countries.[48] Moreover, these events probably encouraged Teheran to gradually reactivate the Shah's nuclear projects and to start developing autonomously a ballistic, chemical and biological program (Taremi 2005: 95-99). As in the final years of the Pahlavi, this shift occurred with ambiguity. In 1983, the Islamic Republic requested the IAEA to visit the nuclear research facilities, including the newly-inaugurated Isfahan Nuclear Technology Center (INTC), and assisted Iran in the production of uranium hexafluoride (UF_6), officially for peaceful purposes. Although the Agency was eager to provide support, the Reagan Administration (1981-1989) was concerned about

matter. The destructive forces of the Revolution inside and outside the AEOI succeeded in bringing nearly all the projects to a halt; all the major projects were cancelled or left dormant." See Etemad 1987: 214.

[46] In 1979, the Provisional Government Mehdi Bazargan decided to reduce oil production from 6 million barrels to around 4 million barrels per day. With the outbreak of the war against Iraq, the production and refining capacity was further reduced, making the initial cut permanent. See Mohaddes K., Pesaran 2013: 10-11. See also Høiseth 2015: 525.

[47] The Iraq-Iran war (1980-1988) began with the Iraqi rejection of the 1975 Algiers Accord on the settlement of the dispute between Baghdad and Teheran on their borders in Shatt al-Arab and Khuzestan. In September 1980, Saddam Hussein attacked, believing to take advantage of the Iranian revolutionary chaos and to achieve an overwhelming victory. Having the support of the United States, the Soviet Union, France, the Arab countries and China, Iraq repeatedly bombed Iranian cities ("War of the Cities") with air strikes, ballistic missiles and chemical raids. By 1982, Teheran regained all the territory lost, forcing Baghdad on a defensive stalemate. The situation remained unchanged until August 1988, when both parties were forced to accept an UN-mediated cease-fire. The final death toll was an estimated 1 million casualties for Iran and around 250,000-500,000 for Iraq. See Chubin, Tripp 1988.

[48] The military strike against the Iraqi reactor under construction in Osirak constituted an example of preventive attack against a nuclear program. This military option would have been suggested by Israel later, during the Iranian crisis. See Reiter 2005.

the military implications. Therefore, it directly intervened and discouraged the IAEA from assisting Iran (Hibbs 2003). A year later, in 1984, the Supreme Leader Ruhollah Khomeini issued a *fatwa*, a non-binding authoritative religious opinion, against nuclear weapons and declared their use "un-Islamic" (Porter 2014b). At the same time, the Islamic Republic attempted also to restore the previous contracts with France and Germany related to the construction of the power plants in Darkhovin and Bushehr. In both cases, these efforts failed due to the US pressure and the continuation of the conflict.[49] Furthermore, following the terrorist attacks against the US Embassy (April 1983) and the Marine barracks (October 1983) in Beirut, in January 1984 Washington designated Iran as a "State sponsor of terrorism" and declared a world ban on the sale of nuclear materials.[50] As a result, Teheran was completely isolated from the Western official market and was forced to turn to other suppliers, including within the secondary channels. In July 1985, with the visit to Beijing of Ali Akbar Hashemi Rafsanjani, Speaker of the Parliament (1980-1989) and the Commander in Chief, Iran signed a secret protocol that concerned the sale of three reactors for the INTC (Gaietta 2016: 44). Similarly, in 1987, it finalized a secret agreement with Islamabad that envisaged the training of Iranian specialists within the Pakistani nuclear laboratories, reactors and facilities (Kibaroğlu 2007: 235). In such a framework, the Islamic Republic approached the illegal proliferation network of Abdul Qadir Khan, the father of Pakistani bomb, and purchased the designs of the P-1 centrifuges, the blueprints for the advanced P-2 and other sensitive information on process of enrichment.[51]

[49] Indeed, the nuclear power plant in Bushehr was bombed six times (in March 1984, February 1985, March 1985, July 1986, and twice in November 1987), suffering serious damages in the entire core area of both reactors. Despite the Iranian complaints at the IAEA, the Agency could not condemn Iraq for the military strikes against the nuclear facility. See Sahimi 2004: Part V, p. 2.

[50] On April 18, 1983, a suicide bombing hit the US Embassy in Beirut, causing 63 victims, including 17 Americans. Later, on October 23, 1983, a truck bomb was launched against the Marine compound in Beirut killing 241 US citizens. In both cases, the responsible were members of a pro-Iranian terrorist movement called Islamic Jihad Organization. See Katzman 2017: 3.

[51] Abdul Qadeer Khan was born in India in 1936. He graduated in 1960 at University of Karachi (Pakistan) with a degree in metallurgy. Then, he continued its studies abroad, in West Germany and in the Netherlands, where he received a master's degree and a doctorate in metallurgic engineering. In the '70s, he worked for the URENCO group in the Netherlands, where he was able to illegally copy the designs of the European gas centrifuge. In 1974, Khan moved back to Pakistan and assisted Prime Minister Zulfikar Ali Bhutto in developing the Pakistani military nuclear program. In the '80s, he started an illicit proliferation network and began selling sensitive nuclear technology and information to North Korea, Libya and Iran. In the early 2000s, the network would have been penetrated by the US intelligence and gradually dismantled. See Corera 2006: 64-68.

Finally, in May 1987, it signed a $5,5 million agreement with Argentina on the delivery of 115,8 kg of 19,75% enriched uranium to the TNRC and the training of several Iranian scientists at the Jose Balseiro Nuclear Institute (Walrond 2009). After the supply of the uranium in 1993 under the IAEA's supervision, the cooperation with Iran ended due to US pressure (Mousavian 2012: 54).

Despite the Islamic revolution and the signature of these (secret) deals, it is interesting to note that the official position of the Iranian Government on nuclear energy and proliferation remained the same of the Pahlavi. In October 1986, the Permanent Representative at the UN, Mashhadi Ghahvechi, reaffirmed the stance on non-proliferation, sharply criticizing "the insane Cold War arms race that threatened all mankind."[52] Moreover, by the end of the '80s, Iran voted in favour of 20 disarmament resolutions, invoking urgent bilateral negotiations between nuclear and non-nuclear countries and praying the adoption of a comprehensive test ban treaty (Patrikarakos 2012: 119). Still, the Islamic Republic could not fade away the doubts, particularly in Washington, regarding the nuclear intentions. In this regard, several official statements helped to fuel the suspicion over the possible military applications of the program. As a remarkable example, in April 1988, the Speaker of Parliament and future President Rafsanjani was quoted to say: "Chemical and biological weapons are a poor's man atomic bomb and can be easily produced. We should at least consider them for our defence. Although the use of such weapons is inhumane, the war taught us that international laws are only drops of ink on a paper" (Cordesman, Seitz 2009: 10).

Similarly, in October 1988, while addressing the Revolutionary Guards, he delivered another ambiguous speech on weapons of mass destruction (WMD): "We should equip ourselves both in the offensive and the defensive use of chemical, bacteriological and radiological weapons. From now on you should make use of the opportunity and perform this task."

In conclusion, in the aftermath of the revolution, the colossal damages of the "imposed war" and the enormous financial constraints, together with the Western isolation and the lack of human capital and expertise limited the development of the nuclear projects, making the '80s a lost decade for the program ((Patrikarakos 2012: 125-129).

Nonetheless, the end of the conflict (August 1988) and the death of Khomeini (June 1989) vanished the domestic resistance towards the military applications, enabling the new leadership to finally relaunch the Iranian nuclear ambitions.

[52] See A/C.1/41/PV. 24 (1986), Statement by Amb. Mashhadi Ghahvechi, UN General Assembly, First Committee, New York, 29 October 1986.

4. The Quiet before the Storm (1989-2002)

Under the guidance of the new Supreme Leader Ayatollah Ali Khamenei (1989-) and the newly elected government of the President Ali Akbar Hashemi Rafsanjani (1989-1997), the nuclear program was prioritized and consolidated, making once again a significant qualitative leap.[53] At the beginning of the '90s, the Middle Eastern scenario underwent several major changes: the end of the Cold War and the American increased presence in the region; the invasion of Kuwait (2 August 1990) and the international intervention against Saddam Hussein (17 January-28 February 1991).[54] These events contributed to reaffirm the strategic value of modern and non-conventional military equipment to be used as deterrent and defensive tool toward the hostile initiatives of neighbouring countries (*in primis* Iraq and Israel, but also the United States) (Gaietta 2016: 51-53). Moreover, the first Persian Gulf War revealed the actual and astonishing dimensions of the Iraqi programs of mass destruction, particularly the massive nuclear weapon projects, raising serious concerns within the Iranian establishment and the International community.[55] As a result, the Islamic Republic continued to strenghten the international nuclear cooperation in the effort to autonomously develop a complete nuclear fuel cycle, permitted under Article IV of the NPT.

[53] Ayatollah Ali Khamenei was chosen as Supreme Leader of the Islamic Republic by the Assembly of the Leadership of the Experts on June 4th, 1989, two days after the death of Ruhollah Khomeini. He received an overwhelming support of 60 out of 74 votes. Ayatollah Ali Akbar Hashemi Rafsanjani was elected as President on July 28, 1989. His priorities were the economic recovery and the normalization of relations with the West, particularly with Europe. He was confirmed in 1993. See Mousavian, Shahidsaless 2014: 106-111.

[54] The first Persian Gulf War started in August 1990, when President Saddam Hussein ordered the invasion of Kuwait with the goal of cancelling the huge debt accumulated during the Iraqi-Iran war, acquiring the rich oil reserves of the country and expanding its influence in the region. However, following the adoption of several UN Security Council resolutions (particularly resolution 687), the US led-International Coalition began a military intervention (*Operation Desert Storm*) in January 1991; it resulted in an overwhelming victory and in the withdrawal of Iraq from Kuwait (end of February 1991). See Di Nolfo 2014: 394-395.

[55] According to the British government assessment on Iraq's programs on WMD (2005), "Iraq followed parallel programs to produce highly enriched uranium (HEU), electromagnetic isotope separation (EMIS) and gas centrifuge enrichment. … Iraq's declared aim was to produce a missile warhead with a 20-kiloton yield and weapons designs were produced for the simplest implosion weapons." Although the program was abandoned in 1991, after the Indian and Pakistani nuclear experiments of 1998, it continued nuclear research and tried to acquire some items that could be used in the construction of centrifuges for the enrichment of uranium. See Iraq's Weapons of Mass Destruction the Assessment of the British Government, pp. 13-14, 24-27 <https://fas.org/nuke/guide/iraq/iraqdossier.pdf>.

Firstly, in the early 1990s, Iran signed a memorandum of scientific and technical understanding with India and tried to acquire a 10 MW research reactor (Mousavian 2012: 54). Nonetheless, the operation failed due to the US pressure and the Indian concerns over the alleged partnership with Pakistan (Gaietta 2016: 79). Similarly, in January 1990, Teheran and Beijing announced the conclusion of a 10 years agreement that envisioned the Chinese delivery of a 27 MW research reactor. One year later, the Islamic Republic imported 1,8 metric tons (1000 kg) ton of UF_6 from China without declaring the material to the IAEA as it was required under the 1974 Safeguards Agreement (Mousavian 2012: 54). In the same period, Beijing was requested to build also a uranium conversion facility in Isfahan. In 1992, President Rafsanjani negotiated with Prime Minister Li Peng the sale of two 330 MW power plants, causing the American protests and the interruption of all nuclear cooperation (Kibaroğlu 2007: 235). Indeed, throughout the '90s, Washington was pursuing a policy of "dual containment" and succeeded in terminating many international partnerships (e.g. India, China and Argentina).[56] In October 1991, an US Nation Intelligence Estimate concluded that the Iranian leadership was seeking nuclear weapons, although the program was still disorganized and at its initial stages (Sciolino 1991).

With the advent of Clinton Administration (1993-2001), the United States adopted a new round of tough sanctions, such as the Iran-Iraq Arms Non-proliferation Act (1993) and Iran Non-proliferation Act (2000), in the attempt to curb Teheran (and Baghdad) from importing sensitive dual use technology.[57] In August 1992, the Islamic Republic reached two agreements with Russia concerning the establishment of a nuclear power plant and the peaceful use of the atom. In January 1995, the head of the AEOI Reza Amrollahi (1981-1997) and the Russian Minister of Atomic Energy Viktor Mikhailov finalized a contract (nearly $800 million worth) for the completion of one light water reactor in Bushehr and the training of specialists and students (Orlov, Vinnikov 2005: 50-51). The two parties signed also a secret protocol that committed Moscow to supply Teheran with military nuclear components, including a gas-centrifuge uranium enrichment facility. Despite the US diplomatic pressure to cancel the protocol and the technical difficulties faced in Bushehr, the

[56] The "dual containment" was a policy of the Clinton Administration that targeted both Iran and Iraq in the Persian Gulf. The goal was to prevent each one of the regional actors from becoming excessively powerful and thus potentially threaten the US security in the near East. It envisaged the adoption of political, economic and military measures. See Sabet 1999.

[57] The United States began to sanction national and foreign individuals and organizations that provide support to Iran's nuclear, chemical, biological and ballistic weapons programs. See Katzman 2017: 21-23.

government of Boris Eltsin decided to continue the nuclear cooperation with Iran (Patrikarakos 2012: 140-141).

Finally, between 1993 and 1999, the Islamic Republic resumed the secret clandestine partnership with the Pakistani illicit network of Abdul Qadir Khan; it acquired 500 components of the P-1 centrifuges and more detailed information and designs on the more efficient P-2 (Corera 2006: 70-71).

As in the previous stages of the program, the Iranian nuclear intentions were clearly ambiguous. On one hand, President Rafsanjani and the head of AEOI Amrollahi reiterated several times the traditional stance on nuclear energy and proliferation.[58] Throughout the '90s, this position was constantly confirmed by the IAEA that conducted four visits at the Iranian sites, concluding always that "the Iran's nuclear programme was peaceful and in conformity with international regulations."[59] Moreover, in September 1996, Teheran signed the Comprehensive Test Ban Treaty (CTBT) the very day it was open for signatures (although it has never been ratified).[60] On the other hand, several official statements contributed to raise doubts and suspects. In November 1991, President Rafsanjani held a meeting for the Supreme National Security Council (SNSC) with the participation of the highest authorities. At the end, he announced: "Iran must have nuclear weapons for the benefit of the region, only because the Arabs proved that they are incapable of doing so. Such weapons will be necessary for solidarity and to refresh Islamic unity".[61]

Similarly, in mid-1992, the Deputy President of Iran, Ayatollah Sayed Mohajerani declared: "Since Israel continues to possess nuclear weapons, we, the Muslims, must cooperate to produce an atomic bomb, regardless of UN efforts to prevent proliferation" (Hoodbhoy 1993: 43).

[58] In November 1990, President Rafsanjani re-emphasized Iran's need for atomic energy and reiterated the official rejection for nuclear weapons. In a speech before the IAEA 37th General Conference (September 1993), Amrollahi stated that the programme was completely peaceful and that was the first country to promote a MENFZ. In May 1995, President Rafsanjani told *ABC News* that Iran was not seeking nuclear weapons and challenged the US to prove its charges. See Albright 1995: 23.

[59] The visits occurred in November 1990, February 1992, November 1993, July 1997 and in May 2000. See Zak 2002: 19-22.

[60] The Comprehensive Test Ban Treaty (CTBT) is the corollary of the LTBT (1963) and bans any nuclear weapon test explosion or any other nuclear explosion. It established the CTBT Organization, located in Vienna, and a worldwide monitoring system in order to ensure the implementation of its provisions. Currently, there are 183 signatories and 164 State parties. China, Egypt, Iran, Israel and the United States have signed, but not ratified the treaty, while North Korea, India and Pakistan have never signed the treaty. See Hansen 2006.

[61] See *A Report on Iranian Efforts to Obtain Nuclear. Weapons*. Document Date: 01 Jan 1992. Conflict Records Research Center, Record Number: SH-MODX-D-001-291

In 1994, the deputy Speaker of Majilis and Secretary of the SNSC, Ali Akbar Veleyati, stated: "As a result of the military presence of the United States in the Persian Gulf, and with the fleet equipped with nuclear weapons at that, and because of the presence of nuclear weapons in neighbouring countries, the Islamic Republic has more reason than most to be worried in this respect" (Patrikarakos 2012: 161).

In January 1995, the US and Israeli intelligence jointly estimated that Teheran would need between seven and fifteen years to develop nuclear weapons, or five years or less if it succeeded in obtaining fissile material from abroad (Albright 1995: 24).

At the turn of the millennium, the program experienced an important acceleration with likely military implications. This shift was the result of a transformed domestic and regional scenario. Firstly, in May 1997, the reformist candidate Mohammad Khatami (1997-2005), who had campaigned for a policy of socio-economic reforms and international dialogue, unexpectedly won the presidential elections.[62] With a promising economic outlook, in August 1997 the AEOI was reorganized and Gholam Reza Aghazadeh (1997-2009) was appointed as head.[63] Secondly, in May 1998, the Indian government of Vajpayee ordered a nuclear test, inducing the Pakistani Prime Minister Sharif to respond for the first time with two nuclear detonations.[64] As in 1974, these experiments modified the military balance in the region, raising serious concerns in Teheran. Therefore, the AEOI started the construction of several nuclear sites, the majority of which were not declared to the IAEA in violation of the Safeguards Agreement:

[62] Mohammad Khatami was the first reformist President of Iran and was elected on May 23, 1997, with approximately 70% of the votes. His election was unexpected for the international community, particularly the United States, which unevaluated the propulsive force of the reformist movements, and for the Supreme Leader itself. Indeed, Ali Khamenei had supported the conservative candidate and Speaker of the Parliament, Ali Akbar Nateq Nouri, thus revealing for the first time since 1979 the political fracture between the popular will and the preferences of the Supreme Leader. See Mousavian, Shahidsaless 2014: 145-146.

[63] Gholam Reza Aghazadeh was the former Minister of Oil. He was close to the Supreme Leader Khamenei who probably requested both his nomination at the AEOI and an acceleration of the nuclear program. See Patrikarakos 2012: 141-143.

[64] The Indian nuclear tests were conducted on May 11 and 13, 1998, after the election of the nationalist candidate Atal Bihari Vajpayee, leader of the Bhartiya Janata Party (BJP). The decision was the result of the several features: the radical posture of the nationalist party; the pressure from the Indian scientific community that disliked the indefinite extension of NPT (1995) and the Comprehensive Test Ban Treaty (1996); finally, it was also a signal toward Pakistan, China and the other nuclear Sates. As a result, on May 28 and 20, 1998, the Pakistan government of Nawaz Sharif responded with two nuclear experiments that contributed "to set the score with India". See Walker 1998.

1. The yellowcake production plants near the uranium mines of Saghand and Gchine (both in 1999); the uranium mine in Saghand was visited by the IAEA in 1992;[65]
2. The industrial conversion plant in Isfahan (1999); this facility was declared to the Agency in July 2000 that received preliminary design information;[66]
3. The pilot-fuel enrichment plant (PFEP) and fuel industrial enrichment plant (FEP) in Natanz (around 2000); according to the plans, the PFEP was designed to host 1000 centrifuges divided into 6 cascades of 164 centrifuges; the FEP was an underground facility designed to host 50,000 centrifuges divided into 16 units of 18 cascades;
4. The heavy-water production plant in Arak (1997-2000); in 2004, the AEOI would start also the construction of a 40 MW heavy-water research reactor, labelled also as IR-40;
5. The pilot laser enrichment plant in Lashkar Abad (1998-1999) (Gaietta 2016: 74).

If completed and operational, these nuclear plants would enable Iran to reach complete and self-sufficient fuel cycle, to enrich uranium for peaceful and military purposes and to potentially obtain weapon grade plutonium (paragraph 2.1). Additionally, between 1997 and 2002, the AEOI conducted several enrichment experiments at the Kalaye Electric Company (KEC), an undeclared workshop located in the Southern outskirt of Teheran, that was involved in the use of imported UF_6 from China and centrifuges from the illegal network of Abdul Qadir Khan.[67]

It is interesting to note that the program underwent such an acceleration during the Presidency of Khatami, who was pursuing a policy of internal reforms and was trying to normalize Iran's status in the international and regional arena. In this regard, in 1998, the new Administration launched the "Dialogue among Civilizations", followed in May 1998 by the first official visit to Saudi Arabia, where Teheran and Riyadh concluded a Comprehensive Cooperation Agreement and issued a joint declaration on the elimination of WMD from the Middle East.[68]

[65] See IAEA, IAEA visit to Iran, Press Release, February 14, 1992, <https://inis.iaea.org/collection/NCLCollectionStore/_Public/44/128/44128185.pdf?r=1&r=1>.

[66] See IAEA Board Report GOV/2003/75, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, in IAEA, 10 November 2003, p. 5.

[67] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, GOV/2003/63, August 26, 2003, pp. 6-7.

[68] The "Dialogue among Civilizations" was introduced by President Mohammad Khatami in January 1998 as a respond towards the notion of clash of civilizations contained in the book *The Clash of Civilizations and the Remaking of world Order* (1996) by Samuel Huntington. See *Transcript of interview with Iranian President Mohammad Khatami*, in CNN, January 7, 1998. Available online. See also Keynoush 2016: 144-145.

This contradiction, which visibly emerged throughout 2002 with the outbreak of the nuclear crisis, was probably the combination of several factors: the domestic political balance (Supreme Leader-conservative forces vs the reformists), together with the reorganization of the AEOI and the likely lack of effective control of the Khatami's Administration on all nuclear activities (Gaietta 2016: 76-77).

With the advent of the Bush Administration (2001-2009) and the 9/11 terrorist attacks, the US-Iranian relations began to further deteriorate, despite Teheran's strong solidarity for the tragic events and the genuine willingness to cooperate in the post-Taliban regime in Afghanistan.[69]

Even if Iran was not related to 9/11, a terrorist attack of Sunni matrix with the alleged involvement of Saudi Arabia, on December 31, 2001, Teheran was listed by the US Department of Defense in the Nuclear Posture Review "among the countries that could be involved in immediate, potential or unexpected contingencies" that could require a US nuclear response.[70] On January 29, 2002, in his famous address to the State of the Union, President George W. Bush solemnly declared:

> Iran aggressively pursues these weapons and exports terror, while an unelected few repress the Iranian people's hope for freedom. … States like these, and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world. By seeking weapons of mass destruction, these regimes pose a grave and growing danger. They could provide these arms to terrorists, giving them the means to match their hatred. They could attack our allies or attempt to blackmail the United States. In any of these cases, the price of indifference would be catastrophic.[71]

In such a context, both sides were ready to enter the breaking nuclear crisis.

[69] George W. Bush was elected in November 2000 and sworn in as President of the US on January 20, 2001. On September 11, 2001, 19 hijackers took control of four commercial jets on the east coast of the United States. Two planes hit the two towers of the World Trade Center, the third flown into the Pentagon in Virginia, while the fourth crashed in Pennsylvania. The Iranian leadership and population expressed sympathy toward the government of the United States. On September 11, 2001, several Iranians held a candlelight vigil in Teheran, while President Khatami condemned the terrorist attacks and expressed its "deep regret and condolences to the American People." In addition, he made concrete proposals for cooperation on counterterrorism and on the future of Afghanistan. However, this was considered by Washington "too little, and too late." See Hunter 2014: 175-176.

[70] See Nuclear Posture Review Report, Submitted to Congress on 31 December 2001, Available online.

[71] See White House, President Delivers State of the Union Address, January 29, 2002, 9:15 PM. Available online.

CHAPTER 2

THE SCIENTIFIC BACKGROUND OF NUCLEAR ENERGY

The discovery of nuclear energy was one of the greatest and destructive human invention of the XX century.[1] It is widely recognized that the atom has a dual application and can be exploited for civil and military purposes. In the first case, it is used in a nuclear reactor to generate energy or conduct research, while in the second it is utilized mainly to develop a nuclear device (Dunnicliff, Iżewicz 2015: 22). Although the underlying theory of the atom is quite simple, the practical implementation of those principles is very technical. The purpose of the following paragraph is to provide a brief description of the basics of nuclear energy and a concise overview of the nuclear fuel cycle. Indeed, such an essential knowledge will enable the reader to have a better understanding of the specific issues of the nuclear crisis and to critically assess the Iranian developments.

1. Basic Concepts

Nuclear energy is produced when a critical mass of fissile material is bombarded with neutrons and split into atoms of lighter elements.[2] A fis-

[1] The implications of the atom were gradually discovered in the 1930s and in the early 1940s by several brilliant scientists, such as the Danish physicist Niels Bohr (1885-1962), who developed the nucleus theory, and Hungarian physicist Leo Szilard (1898-1964), who contributed to conceive the idea of chain reaction. Fearing the German nuclear discovery and the resulting military advantage, during the Second World War the United States began to investigate the potential development of atomic weapons and started the *Manhattan Project* (1942-1945). This colossal project resulted in construction of several vast facilities, such as the reactor in Oak Ridge (Tennessee), and in the production of the first uranium and plutonium nuclear devices. After the successful experiment in Alamogordo (New Mexico) in July 1945, the first nuclear bomb (*Little Boy*, 65 kg of 90% U-235 and 10% of U-238) was exploded on the Japanese city of Hiroshima on August 6, 1945. Three days later the US dropped another bomb (*Fat Man*, 6 kg of plutonium) over the city of Nagasaki, thus inducing the Japanese to surrender. See Bernstein 2014: 9-53.

[2] See the Glossary of the United States Nuclear Regulatory Commission, last update April 10, 2017. Available online at: <https://www.nrc.gov/reading-rm/basic-ref/glossary.html> (last access December, 2018).

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sile material is an isotope, an atom of a chemical element having the same number of protons in the nucleus (or same *atomic number*), but differs in neutrons (or *atomic weight*), that can undergo nuclear fission. During this process, the atom splits and releases an amount of energy – usually in the form of heat – and extra neutrons, that could induce the nearby atoms of the same element to break as well, resulting eventually in a "chain reaction." If the reaction is controlled, the energy released can be exploited in a nuclear power plant (e.g. pressurized water reactor) to heat water, produce steam, move a turbine and generate electricity. Conversely, if the reaction proceeds in a fast and incontrollable manner, it may result in an explosion, thus revealing the desired feature of an atomic bomb.

Moreover, nuclear energy can be also generated through thermonuclear fusion, a physic reaction by which two nuclei of lower atomic weight (e.g. hydrogen or its isotopes deuterium and tritium) combine and form a nucleus of higher atomic weight (e.g. helium), liberating a great amount of energy. Unfortunately, due to the very high temperature requested (100 million degrees or six times the temperature of the sun), a controlled fusion does not seem still possible, although some reactors are currently under development (e.g. ITER project).[3]

The most prominently fissile materials used in the nuclear industry are uranium and plutonium. Uranium is a radioactive heavy element with two principal isotopes: uranium 235 (U-235) and uranium 238 (U-238).[4] Uranium 235 represents only the 0,71% of uranium ore existing in nature since the remaining 99,29% is made of uranium 238.[5] The problem with U-238 isotope is that it is fissionable and fertile, but not fissile, meaning that it cannot be directly used to induce and sustain a continuous chain reaction.[6] To overcome this constraint, uranium needs to be enriched in order to increase the concentration of U-235 from U-238

[3] One of the most ambitious energy projects is ITER. Based in southern France, it involves 35 countries and aims to build the world's largest magnetic fusion device to prove the feasibility of thermonuclear fusion. See Carrington 2016.

[4] U-235 is composed of 143 neutrons and 92 protons, while U-238 composed of 146 neutrons and 92 protons. The other fissile materials used are uranium 233 (U-233), plutonium 239 (Pu-239) and plutonium 241 (Pu-241).

[5] The reason of such enormous difference lies in radioactivity and in the related time of decay. Uranium 238 needs 4,5 billion years to decay, while uranium 235 needs only 704 million years. So, almost all existing uranium-235 has already decayed, thus explaining its scarcity. See Bernstein 2014: 46-47.

[6] Technically speaking, fissile materials are a subset of fissionable materials. Fissionable elements consist of isotopes capable of undergoing nuclear fission after capturing either fast or thermal neutron. U-238 is not fissile, because it cannot be fissioned by thermal neutron. However, U-238 is a fertile material and can be converted into fissile isotopes, such as U-235. See Glossary of the United States Nuclear Regulatory Commission, last update April 10, 2017. Available online at: <https://www.nrc.gov/reading-rm/basic-ref/glossary.html> (last access December, 2018).

(paragraph 2). Therefore, depending on the concentration of U-235, it is possible to distinguish the level of enrichment in low-enriched uranium (LEU) and high-enrichment uranium (HEU). The first has a concentration lower than 20%, whereas the second has a concentration of 20% or higher and includes weapon grade uranium (more than 90%) (Jha 2003). Most of the power reactors require a fuel of U-235 enriched around 3 and 5%, while nuclear weapons need a critical mass of at least 15kg of U-235 enriched to 93,5%. Alternatively, it is possible to build a bomb with plutonium (Pu-239), which is more convenient in terms of weight (4 kg) but is more difficult to produce.[7] Indeed, Pu-239 does not exist naturally, but is a by-product derived by the reprocessing of the fuel used in the reactor.[8] Thus, the only way to obtain plutonium is to have a well-developed fuel cycle. In addition, it is possible to manufacture a weapon by combining U-235 and Pu-239. As for power reactors, there are mainly two varieties:[9]

1) Light-water reactors that use water as moderator and coolant; this type is the most common worldwide (in total 368 out of 447 existing reactors) and includes boiling water reactors (BWR) and pressurized water reactors (PWR);[10]
2) Heavy-water reactors (in total 47 out of 447), also known as Canadian Deuterium Uranium (CANDU), that use heavy water as both coolant and moderator and natural uranium in the form of UO_2 as fuel; thus, this type of reactor does not need the process of enrichment and has greater military implications since it produces a higher quantity of weapon grade Pu-239.[11]

[7] Pu-239 is constituted of 145 neutrons and 94 protons.

[8] See UN Museum, *How to build an atomic bomb*, available online at: <http://www.unmuseum.org/buildabomb.htm> (last access December, 2018).

[9] The other types of power reactor are: the light-water graphite reactor (in total 15 out of 447 existing reactors), which uses graphite as a moderator and water as a coolant; the gas cooled-reactor (in total 14 out of 447), which uses graphite as a moderator and carbon dioxide as a coolant; and the fast breeder reactor (3 out of 447) that uses fast neutrons to convert materials such as uranium-238 and thorium-232 into fissile materials. See Types of Reactors, in Canadian Nuclear Association, available online at: <https://cna.ca/technology/energy/types-of-reactors/> (last access December, 2018).

[10] A coolant is a substance, usually a liquid or a gas, used to reduce the temperature of a system by conducting away the heat produced in the core of a nuclear reactor. A moderator is a material, such as ordinary water, heavy water, or graphite, that is used in a reactor to slow down high-velocity neutrons, thus increasing the likelihood of fission. See Glossary of the United States Nuclear Regulatory Commission, last update April 10, 2017. Available online at: <https://www.nrc.gov/ reading-rm/basic-ref/glossary.html> (last access December, 2018).

[11] See IAEA (2002), Heavy Water Reactors: Status and Projected Development, Technical Report N. 407, p. 10.

Besides the reactors employed for producing electric energy, there are also research reactors. They are smaller and are mainly used for professional training, scientific research, and the production of medical radioisotopes. They may also operate with high enriched uranium.[12]

2. The Nuclear Fuel Cycle

The nuclear fuel cycle is a set of industrial processes that involve the nuclear fuel from production to disposal.[13] In the case of Iran, this was considered an objective to be accomplished since the times of the Shah. From a non-proliferation perspective, the underlying challenge of accomplishing a complete and self-sufficient fuel cycle lies in the achievement of nuclear independence from foreign assistance and the theoretical capacity to develop a bomb (*weaponization*) (Patrikarakos 2012: 42). The cycle is composed of three stages:[14]

1. The "front end", which consists in the preparation of the fuel to be used in a reactor; the uranium undergoes the steps of *mining*, *milling*, *conversion*, *enrichment* and *fuel fabrication*;
2. The "service period", where the fuel is regularly used during reactor operation to generate electricity for a period of 18-36 months;
3. The "back end" that consists in a series of further steps, such as the *interim storage* and the *re-processing* of the spent fuel, until the final *disposal* of nuclear waste.

If the spent fuel is not reprocessed, the fuel cycle is commonly referred to as "open fuel cycle", whereas if it is reprocessed and re-used, it is call as "closed fuel cycle".

Mining

The first stage of the fuel cycle begins with the mining of uranium ore on the surface, underground or in situ leaching, a mining process where the uranium is leached from the ore. A 1000 MW reactor, oper-

[12] In Iranian case, after the construction of a research reactor (TNRC), the AEOI opted for the light-water variety since it was considered more reliable and less conducive to a bomb. However, at the turn of the millennium, the Islamic Republic started the construction of a heavy water production plant in Arak, a facility that was meant to provide heavy water for the IR-40 reactor, thus raising serious concerns over the military applications of the program. See Patrikarakos 2012: 39.

[13] See Nuclear Fuel Cycle Overview, in The World Nuclear Association, last update March 2017, available online at: <http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/introduction/nuclear-fuel-cycle-overview.aspx> (last access December, 2018).

[14] See IAEA, Nuclear Fuel Cycle Information System, TECDOC-1613, April 2009, p. 9.

ating with 4,5% enriched uranium, usually requires a great quantity of uranium (between 20,000 and 400,000 tons).[15]

Milling

After mining, the raw material, which contains 0,1% of uranium, enters a mill facility – usually situated close to the mine – where it is ground in fine powder, purified through a chemical process and reconstituted in a solid form (uranium oxide or U_3O_8), known also as "yellow cake".[16] This substance contains 80% of uranium and represents a small amount of the initial ore (~250 tons) since 99% is constituted by waste (tailings). Additionally, U_3O_8 is the state, in which uranium is usually sold in international markets. According to a joint report of the OECD and IAEA, in 2013, the market price of U_3O_8 was USD 90/kgU, a low figure compared to the number of USD 354/kgU of June 2007.[17]

Conversion

Before it can be enriched, uranium needs to be in a gaseous form. So, the yellow cake enters a conversion plant where it undertakes a series of chemical processes and is converted at low temperature into uranium hexafluoride (UF_6).

Enrichment

Once it reaches the gas state, the UF_6 (~ 300 tons) enters the stage of enrichment, a process that raises the concentration of U-235 vis-à-vis U-238. There are three ways to enrich uranium:[18]

1. *Gas centrifuge*, the main process employed worldwide, where the UF_6 enters a cylinder and rotates at high speed. The rotation generates a centrifugal force that separates the isotopes of uranium: the heavier molecules of U-238 move toward the walls of the cylinder (where are extracted), while the lighter U-235 are collected in the center and fed

[15] Until the discovery of exploitable domestic resources, Iran depended upon foreign suppliers, (e.g. South Africa, Argentina and China). In 1981, the AEOI announced the discovery of uranium deposits in four locations. In 1985, it discovered nearly 5,000 tons of uranium ore in Saghand, in the province of Yazd, which became operational in the mid-90s. Between 1985 and 1993, Iran discovered 100-400 tons of uranium ore in Gchine, which became operative at the end of the '90s. See Gerardi, Aharinejad 1995: 211. See also Gaietta 2016: 65-66.

[16] At the end of the '90s, Iran started the establishment two milling facilities to produce uranium oxide close to the mines of Saghand and Gchine. Gaietta 2016: 74.

[17] See OECD-IAEA (2014), Uranium 2014: Resources, Production and Demand, NEA N. 7209, pp. 120-121.

[18] See Uranium Enrichment, The World Nuclear Association, last update March 2017, available online at: <https://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html> (last access December, 2018).

into another centrifuge. This process is repeated many times through a chain of series and parallel formations of centrifuges known as a *cascade*. In this phase, the difficulty lies in the preservation of UF_6 in optimal condition and in the creation of an efficient system of cascades. Moreover, the capacity of a centrifuge to separate U-235 from U-238 is expressed in Separative Works Units (SWU). To produce 1 kg of U-235 enriched to 3,5% are required around 208 SWU.[19] Normally, a very fast rotating centrifuge can produce about 5 SWU a year. So, it is easy to understand that this procedure requires a considerable number of working centrifuges and a great amount of time (Bernstein 2014: 48-49). At the end of the process, the UF_6 is enriched at the level desired.[20]

2. *Laser separation*, currently under development, that employs laser to separate the isotopes of uranium. This method uses the phenomenon of photoexcitation that increases the energy of the electrons within a specific isotope, enabling it to be separated.[21]
3. *Gas diffusion*, originally the first commercial process to enrich uranium and now obsolete, which uses the molecular diffusion to separate the isotopes of uranium. The UF_6 is pumped many times through special filters (porous barriers) where the U-235 molecules diffuse faster than the heavier U-238 and can be separated.

Fuel Fabrication

Once the UF_6 is enriched (~35 tons), the gas substance needs to be "fabricated" into fuel. Thus, it is processed into Uranium Dioxide (UO_2) powder, manufactured at elevated temperature into pellets (~27 tons) and loaded into long metal tubes, forming the fuel rods of the reactor core and entering the "service period".

Storage and Reprocessing

After 18-36 months, the rods are removed and temporarily stored in specially designed pools for several months (sometimes years). This procedure helps to refrigerate the spent fuel, which is emanating radiation and heat, before it can be reprocessed and recycled. Indeed, the substance

[19] To obtain this figure of Separative Working Unit, we considered the natural concentration of uranium 235 (0,71%) and the percentage of waste produced (0,25%).

[20] As it was described in chapter 1, paragraphs 3 and 4, between the '80s and the '90s, the AEOI attempted to obtain several samples and drawings of the Pakistani centrifuges (P-1 and P-2) with the purpose of acquiring and improving the process of enrichment. Before the conclusion of the Joint Plan of Action (JPA) in November 2013, the Islamic Republic would have installed about 15,400 centrifuges, 8,800 of which were enriching uranium. See Katzman, Kerr 2017: 4.

[21] This technology was under study in the plot laser enrichment facility of Lashkar Abad. See also Gaietta 2016: 72.

still contains 96% uranium, 3% of waste products and 1% of plutonium. Once the fuel rods are cooled, they are inserted in a reprocessing facility where a chemical reaction separates the various materials. The uranium is recovered and sent again to the stages of conversion and enrichment, thus "closing" the cycle, whereas the plutonium can be made into mixed oxide (MOX) fuel through the combination of plutonium and uranium and used in some reactors. Alternatively, plutonium can be stored and employed for the development of a nuclear device.

Disposal

Wastes are produced in almost all the previous phases and are labelled as high, medium and low-level wastes depending on the amount of radiation emitted. Although low-level wastes are produced in all the stages, intermediate and high-level wastes are generated during reactor operation and reprocessing. This material is converted in dry powder, processed with borosilicate glass, poured into a steel canister and finally disposed underground.

CHAPTER 3

THE NON-PROLIFERATION REGIME

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is generally considered the centerpiece of the contemporary regime of nuclear non-proliferation. Adopted in New York on June 12, 1968, the Treaty entered into force on March 5, 1970.[1] The NPT recognized a discriminatory nuclear oligopoly enshrined by the definition of two classes of States: Nuclear Weapon States (NWS), which are those – China, France, USSR (now Russia), UK and US – who had "manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967 (Article IX, para. 2)" and the Non-Nuclear Weapon States (NNWS), that are all the remaining.[2] The NPT was a great bargain between the two groups and was centred on three fundamental pillars: non-proliferation, peaceful use of nuclear energy and disarmament. On one hand, NNWS agreed not to acquire nuclear bombs (Article II) and received the "inalienable right" to develop or acquire peaceful nuclear technology alongside with the acceptance of IAEA safeguards over all fissile material within their jurisdiction (Article IV). On the other, NWS pledged not to assist NNWS in the transfer and development of any nuclear device (Article I) and agreed to "pursue negotiations in good faith

[1] In December 1961, the United Nations General Assembly approved a Resolution 1772 sponsored by Ireland calling on all States to adopt an agreement that would ban the further acquisition and transfer of nuclear weapons. In 1965, the Geneva disarmament conference began the draft of a nuclear non-proliferation treaty and completed its negotiations in 1968. On July 1, 1968, the NPT was opened for signature and entered into force in March 1970 with 43 Parties, including three of the five NWS (UK, USSR and US). China and France acceded both in 1992. See Bourantonis 1997.

[2] The discriminatory nature of the NPT was one of the major critics addressed by several NNWS, such as India and other Non-Aligned Countries. When the Treaty was negotiated, the NWS wanted to prevent the proliferation of weapons, while maintaining their nuclear status. Therefore, they decided here to draw a line. Indeed, by the 1st of January 1967 only United States (1945), the Soviet Union (1949), the United Kingdom (1952), France (1960) and China (1964) had manufactured and exploded a nuclear weapon. Coincidentally, these countries were or would have become (in the case of Communist China) Permanent Members of the United Nations Security Council. See Abe 2010: 221.

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on effective measures relating to cessation of the nuclear arms race and to nuclear disarmament" (Article VI) (Spies 2006: 402-403). As mentioned previously (paragraph 1), Iran signed the Treaty in 1968 and ratified it in February 1970. Although the NPT was supposed to expire after twenty-five years (Article X, para. 2), in May 1995 the Review and Extension Conference of the State Parties extended it indefinitely.[3] Moreover, following the discovery of the nuclear weapons programs in Iraq and North Korea (later Libya), in the early '90s the IAEA realized the non-proliferation regime was not well-equipped to detect undeclared activities and material in NNWS with a safeguard agreement.[4]

Therefore, in 1992 the IAEA Board of Governors (BOG) modified Code 3.1 of the General Part of subsidiary arrangements related to the information on new facilities.[5] In 1993, it launched the Programme 93+2 to strengthen the effectiveness and efficiency of the safeguards system, paving the way to the adoption of the Model Additional Protocol (MAP) in May 1997.[6] Currently, there are 191 members of the NPT, including

[3] See 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Decision 3, NPT/CONF.1995/32 (Part I).

[4] After the 1991 Persian Gulf War, the IAEA discovered that Iraq, although party to the NPT and in full compliance with its safeguards agreement, was developing an advanced and extensive weapons program. The Agency failed to expose a $10-15 billion Iraqi program that involved 20-30 sites and a staff of 20,000 people, thus revealing the limitations and loopholes of the entire safeguards regime. In 1993, North Korea threatened to withdraw from the NPT and refused to accept an IAEA inspection. So, the Agency declared that the country was not in compliance with the safeguards obligations and referred the case to the UNSC. Following the Chinese threat of a veto, in October 1994 the US and North Korea signed an Agreed Framework that temporarily solved the nuclear crisis. The Libyan program was developed with the external support of the Soviet Union, of Western and Japanese companies and the proliferation network of A.Q. Khan. After the discovery of the military implications, in the early 2000s, the program was dismantled. See Zak 2002: 2-7. See also Terrell, Hagen, Ryba Jr 2016: 185-187.

[5] The Board of Governors (BOG) is one of the two policy-making bodies of the IAEA, along with the annual General Conference of IAEA Member States. The Board examines and makes recommendations to the General Conference on the IAEA's financial statements, programme and budget. It considers applications for membership, approves safeguards agreements and the publication of the IAEA's safety standards. It also appoints the Director General of the IAEA, with the approval of the General Conference. The Board generally meets five times per year: in March and June, twice in September (before and after the General Conference) and in November. See IAEA, "Board of Governors", in *IAEA*, available online at: <https://www.iaea.org/about/governance/board-of-governors> (last access December, 2018). See also IAEA GOV/2554/Attachment 2/Rev.2, April 1, 1992.

[6] The Program was named 93+2 because it was initiated in 1993 and was expected to conclude in 1995, before the 1995 NPT Review and Extension Conference. The aim was to strengthen the safeguards system and to develop the IAEA's abilities to detect and have access to undeclared activities. The corollary of the Program 93+2 was the Model Additional Protocol, adopted in May 1997. See IAEA, Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards, INFCIRC/540.

the five nuclear States, and 129 parties that have Additional Protocols with the IAEA. India, Israel and Pakistan have never signed the NPT, while North Korea accessed it in 1985, but decided to withdraw in January 2003.[7] Another 19 States signed an individual Additional Protocol with the Agency, Iran included (in December 2003), but still have to make it operative.

The purpose of following paragraph is to provide a better understanding of the international legal obligations and the related challenges (and loopholes) of the non-proliferation regime. Indeed, differently from Pyongyang, even during the nuclear crisis, Teheran has never denounced the NPT and the 1974 Comprehensive Safeguards Agreement with the IAEA, but it has always claimed the respect of its legal obligations and peaceful nature of the program under Article IV of the Treaty.

1. The Legal Framework

If Article I of the NPT prohibits NWS to transfer or assist in the development of "nuclear weapons or other nuclear explosive device", Article II sets up the key obligation for NNWS:

> Each non-nuclear-weapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons or other nuclear explosive devices or of control over such weapons or explosive devices directly, or indirectly; not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices; and not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices.

Although Article II covers only two scenarios, the "transfer" and the "manufacture" of a bomb, it does not exclude nuclear sharing, a practice frequently employed during the Cold War, which allowed NNWS to host nuclear weapons on their territory without an independent control.[8] The term "nuclear weapons or other nuclear explosive device" shall be interpreted not only as a prohibition of a completed bomb, but, if combined with Article III, para 2 (*see below*), also of the components and the material meant to be used for the construction of a nuclear de-

[7] India, Pakistan, and Israel repeatedly stated that the NPT and the requirement to renounce a nuclear deterrent option were not consistent with vital national security conditions. In December 2002, North Korea announced the restart of the 5MW and one month later announced its withdrawal from the NPT. See Ogilvie-White 2010: 120-123.

[8] The nuclear sharing was a practice used by military alliances such as the North Atlantic Treaty Organization (NATO) and the Warsaw Pact. See Spies 2006: 405-406.

vice (Ronen 2010: 10). Indeed, if interpreted differently, a NNWS could accomplish a full fuel cycle and fabricate (without assembling) all the parts of a nuclear explosive, thus complying with the NPT (Spies 2006: 407). Moreover, the dual nature of nuclear technology might complicate the evaluation of a situation, making it more challenging to establish whether there has been a violation of Article II or not (Dunnicliff, Iżewicz 2015: 22). A NNWS may develop a complete fuel cycle in full respect with the provisions of the Treaty (or run a covert military program) and then decide to withdraw, claiming that "extraordinary events have jeopardized the supreme interests" (Article X, para. 1).[9] The prevailing solution is to consider that the activities required to build a nuclear explosive ("manufacture"), prohibited under Article II, should be regarded as a violation of the safeguards system covered under Article III (Spies 2006: 409). However, the Iraqi case demonstrated that the respect of the Safeguards Agreement was not a sufficient assurance of the State compliance with Article II of the NPT.[10]

Article III, para. 1, defines the minimum obligation with regards to the safeguards:

> Each Non-nuclear-weapon State Party to the Treaty undertakes to accept safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency in accordance with the Statute of the International Atomic Energy Agency and the Agency's safeguards system, for the exclusive purpose of verification of the fulfilment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices. Procedures for the safeguards required by this Article shall be followed with respect to source or special fissionable material whether it is being produced, processed or used in any principal nuclear facility or is outside any such facility. The safeguards required by this Article shall be applied on all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.

[9] Article X, para. 1, regulates the national sovereign right of a Party to withdraw from the NPT. The State shall give notice of such withdrawal to all other parties and to the UNSC three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests. See Azaran 2005: 420.

[10] Following the last round of inspections conducted, in April 1990, the IAEA called the cooperation of Iraqi nuclear official with the Agency "exemplary" and that "Iraq's nuclear expert have made every effort to demonstrate that Iraq is a solid citizen in the NPT regime". See Zak 2002: 5.

The respect of the safeguards system is the main instrument for verifying the peaceful nature of a program and the State compliance with the NPT. According to Article III, para. 1, each NNWS shall conclude with the IAEA an agreement for the application of the safeguards on all nuclear material in the territory, jurisdiction or control of the State with the exclusive objective of preventing the "diversion of nuclear energy from peaceful uses to the manufacture of nuclear weapons and other nuclear explosive devices". In this regard, the Agency concludes three types of agreement with NNWS and non-NPT parties:[11] 1) Comprehensive Safeguards Agreements with NNWS parties to the NPT; 2) Voluntary Offer Safeguards Agreements with NNWS parties to the NPT; and 3) Item-specific Safeguards Agreements with non-NPT parties. Most of the Safeguards Agreements (in total 174), including the one reached with Iran, which was finalized in June 1973 and entered into force in May 1974 (chapter, paragraph 2), are of the first type. The agreement shall be in line with the Agency's safeguards system, specifically with the Standard Safeguards Agreement (SSA) delivered as reference in June 1972, and the IAEA's Statute.[12]

As Article III, Article 28 of the SSA defines the restricted objective:

> The Agreement should provide that the objective of safeguards is the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.

The scope of the provision is also limited since non-nuclear material or components, which might be use for the construction of a bomb, do not fall under the supervision of the Agency.

The two final sentences of Article III, para. 1 (*Procedures for safeguards required…*) have been interpreted as a nexus between the Safeguards Agreement and the NPT, meaning that the non-compliance with a Safeguards Agreement implies a violation of article III of the Treaty (Ronen 2010: 13). Yet, due to the restricted objective and scope of the safeguards, a violation or a non-compliance with Article III does not automatically trigger an infringement of Article II, provided there is no link with the development of a nuclear device (Spies 2006: 426).

[11] See IAEA Safeguards Legal Framework, in IAEA, available online at: <https://www.iaea.org/topics/safeguards-legal-framework> (last access December, 2018).

[12] See IAEA, The Structure and Content of Agreements between the Agency and States required in connection with the Treaty on the Non-Proliferation of Nuclear Weapons, INFCIRC/153, June 1972. See also IAEA Statute, available online at <https://www.iaea.org/about/statute#a1-12> (last access December, 2018).

Moreover, a Comprehensive Safeguards Agreement is not exhaustive in its formulation and usually refers to a subsidiary arrangement (Article 39, SAS); this agreement, concluded on a bilateral basis and based on a model document, explains how safeguards shall be applied.[13] According to Code 3.1 of the General Part of the Model Subsidiary Arrangement (MSA), States are required to report preliminary design information on a new facility "normally no later than 180 days before the facility is scheduled to receive nuclear material for the first time."[14] In February 1976, Iran and the IAEA reached a subsidiary arrangement in line with the MSA (Joyner 2016: 131). Article III, para. 2, of the NPT requires:

> Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this Article.

This paragraph has two main implications. The first is that the material and the equipment exported from a NPT Party shall be under the safeguards system, even if the recipient is not Party of the Treaty.[15] The second is the creation of export control regimes with the establishment of several formations of States, such as the Zangger Committee or the Nuclear Suppliers Group, that voluntarily restricted the export of dual use material or equipment.[16] These regimes have been severely criticized by many developing States, Iran included, who claim that such practices are discriminatory, not directly envisaged by the NPT, economically harmful and contrary to Article III, para. 3, and to the

[13] See IAEA (1998), The Evolution of IAEA Safeguards, International Nuclear Verification Series, No. 2, IAEA, p. 44.

[14] See IAEA, Subsidiary Arrangement to the Agreement between the Government of … and the International Atomic Energy Agency for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons. SG-FM-1170.

[15] In the latter case, the non-NPT party is invited to have item-specific safeguards agreement with the IAEA. See Spies 2006: 414.

[16] The Zangger Committee, named after its first Chairman Professor Claude Zangger, was formed in the early 70s to serve as interpreter of Article III, para.2, of the NPT. It accounts 39 members, including the five nuclear States, and maintains a list of equipment exportable only if safeguards are applied to the recipient facility (the *Trigger List*). The Nuclear Suppliers Group is a formation of 48 nuclear suppliers established in 1975 with the intent to prevent nuclear proliferation through the implementation guidelines for the export of materials, equipment and technology. See Dunn 2009: 152.

right to the peaceful use of nuclear energy under Article IV.[17] Indeed, Article III, para. 3, affirms:

> The safeguards required by this Article shall be implemented in a manner designed to comply with Article IV of this Treaty, and to avoid hampering the economic or technological development of the Parties or international co-operation in the field of peaceful nuclear activities, including the international exchange of nuclear material and equipment for the processing, use or production of nuclear material for peaceful purposes in accordance with the provisions of this Article and the principle of safeguarding set forth in the Preamble of the Treaty.

Article III, para. 3, contributes to limit and balance the implementation of the safeguards with the peaceful use of nuclear energy and the sovereign right of economic and technological development. Article IV stipulates:

> 1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty.
> 2. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. 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.

Thus, Article IV attempts to balance the obligations and the rights of NNWS in the Treaty. It enables NNWS to develop a complete nuclear fuel cycle without any restriction and discrimination, provided that the party complies (in good faith) with Article I and II of the NPT. As it was described in paragraph 2, a State with a full fuel cycle is technically capable to manufacture a bomb. So, the reference to the "inalienable right" has been often used as a recurring defensive argument and cover for nuclear weapons, thus becoming a legal loophole (Dunn 2009: 158-159). Therefore, the NPT Review Conference attempted to extend the scope of the provision in order to include the compliance with the Safeguards Agreement under Article III: "The inalienable right of all

[17] See e.g. the Statement of Reza Amrollahi at the IAEA 38th General Conference, 20 September 1994.

parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with articles I, II as well as III of the Treaty."[18]

The violation by failure to comply with the Safeguards Agreement should affect the inalienable right to peaceful use of nuclear energy. Still, this interpretation was always rejected by many developing countries, Iran included, since the limitation was considered far beyond the letter of the Article IV, para. 1 ("without discrimination and with Articles I and II of this Treaty") (Ronen 2010: 15).

Under a Comprehensive Safeguards Agreement, a NNWS must provide the IAEA Secretariat with a list of all nuclear material and facilities that is obliged to declare pursuant the terms of agreement (Article 8, SSA).[19] This include any nuclear material of a composition and purity suitable for fuel fabrication or for being isotopically enriched, and any nuclear material produced at a later stage in the fuel cycle, (Article 34 (c), SSA). In addition, a NNWS shall report in advance the import of nuclear material in quantities in excess of one effective kilogram (Article 95, SSA) and shall provide design information on new facilities and on new locations outside of facilities where nuclear material is used (Article 98.1, SSA). The time limit for the provision of design information on new facilities (Article 42, SSA) shall be specified in the subsidiary arrangement (Code 3.1. "normally no later than 180 days"), while the information on the new locations outside the facilities shall be provided on a timely basis (Article 49, SSA). Therefore, this stage requires a cooperative approach and mutual trust between the State and the Agency. Afterwards, the Secretariat verifies if the declarations are correct and complete.[20] If there are some irregularities or discrepancies during the process, the Secretariat attempts to solve them through direct consultations with the State and/or additional inspections in loco.

[18] Decision 2, Principles and Objectives for nuclear Non-Proliferation and Disarmament, para. 14, NPT/CONF.1995/32. See also 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons Final Document, NPT/CONF.2000/28 (Part I and II), p. 8.

[19] With over 2,560 professional support staff, the Secretariat is responsible for implementing the Agency's programs and activities, including the detection of safeguards violations by member states. it is headed by the Director General and comprises six major departments ranging from safeguards to nuclear safety and security. See IAEA *Employees & Staff: Strength Through Diversity*, in *IAEA*, available online at: <https://www.iaea.org/about/staff> (last access December, 2018).

[20] The requirement of completeness (e.g. if the list contains everything that should have been declared) was further specified by the IAEA Board in 1992 and in 1997 with the adoption of the Model Additional Protocol. Ronen 2010: 12.

At the end, the Director General reports the conclusion to IAEA Board and certifies whether the State has complied with the safeguards, and thus with Article III of the NPT, with no declared material diverted to military purposes, or not. In case of not compliance, the Board may call the State to take urgent action to ensure the verification of non-diversion (Article 18, SSA). If the BOG finds that the Agency is not able to verify that there has been no diversion of nuclear material required to be safeguarded under the Safeguards Agreement, it may report the case to the UN Security Council and the General Assembly (Article 19, MSA). This decision is taken by a simple majority of members voting and present (Article 37, Rules of Procedure). Additionally, according to the IAEA Statute, the BOG may report a situation of non-compliance to the United Nations also in the cases of violation of health and safety regulations (Article XII.B.2), violations of conditions of an Agency project (Article XI.F.6) or if the matter falls within the competence of the UNSC (Article III.B.4).[21] In such cases, the IAEA may adopt:

> direct curtailment or suspension of assistance being provided by the Agency or by a member, and call for the return of materials and equipment made available to the recipient member or group of members. The Agency may also, in accordance with article XIX, suspend any non-complying member from the exercise of the privileges and rights of membership (Article XIII.C).

As it is clear, the current regime of non-proliferation requires a co-operative approach from each Party of the NPT that shall declare to the IAEA all nuclear material, activities and facilities. However, the dual nature of nuclear energy combined with a non-transparent attitude of a Party might complicate the IAEA's capacity to reasonably assess and certify the purpose of a nuclear program and the intentions of a State.[22] For these reasons, following the disclosure of the weapons programs of Iraq and North Korea (later Libya), in April 1992 the BOG requested to modify the standard of Code 3.1, General Part of the MSA, according to which the preliminary design information on new facilities must be reported to the IAEA "as soon as the decision to construct or authorize has been taken, whichever is early."[23] Moreover, a State must report modifications to existing facilities, as well as the early provision of information on new locations outside of facilities where the nuclear mate-

[21] In the latter case, if the actions are necessary to for the maintenance of international peace and security, as envisaged under chapter VII of UN Charter.

[22] See Dunn 2009: 154-155.

[23] See IAEA GOV/2554/Attachment 2/Rev.2, April 1, 1992.

rial is used. This new revision requested by the IAEA would have been always refused by Iran until the breakout of the nuclear crisis.[24]

On May 15, 1997, the BOG adopted the Model Additional Protocol, a reference document meant to increase the Agency's mandate to detect possible undeclared activities and material in a specific location of a State (Hirsch 2004: 140-152). While voluntarily accepting an Additional Protocol to a Safeguards Agreement, a NNWS is obliged to undertake all the provisions of the MAP and expand the IAEA's rights of access to information and locations ("complementary access").[25] Once the protocol is implemented, the State shall expand the scope of its declaration and shall include a wider range of activities, such as the manufacture of special designed components, which would be essential to produce nuclear materials for nuclear weapons (Article 2, MAP). The Agency may conduct also visits and collect local-area environmental samples from any site, regardless of whether it has been declared pursuant the Safeguards Agreement (Article 4 and 5, MAP). Even if some States (Canada and Australia) have exhorted the NPT Review Conference to consider the Additional Protocol mandatory under Article III, para. 4, NNWS are not legally obliged to accept it (Asada 2009: 74). Therefore, as mentioned before, today only 129 NNWS have an Additional Protocol with the Agency. Of these, 19 States, Iran included, have signed it, but still have to bring it into force.

[24] See IAEA, Implementation of the NPT safeguards agreement in the Islamic Republic of Iran, GOV/2003/40, June 6, 2003, pp. 1-2.

[25] See IAEA, Additional Protocol, available online at: <https://www.iaea.org/topics/additional-protocol> (last access December, 2018).

PART II

THE NUCLEAR CRISIS

CHAPTER 4

THE FIRST NUCLEAR CRISIS (2002-2005)

1. The Breakout of the Nuclear Crisis

On August 14, 2002, Alireza Jafarzadegh, the speaker of an exiled opposition group named the National Council of Resistance of Iran (NCRI), held a press conference in Washington DC.[1] At the presence of several press agencies and journalists, he disclosed the full details of two "top secret" nuclear facilities that were allegedly under construction in the Islamic Republic: the gas uranium enrichment plant in Natanz and the heavy-water production plant in Arak.[2] Initially, these revelations were nothing new for the United States and the International Agency. Indeed, the US, British and Israeli intelligence communities were probably aware since the end of 2001 of the existence of such facilities due to the progressive unveiling of Pakistani deals with North Korea, Libya and Iran (Lewis 2006). Though, they decided not to publicly release the material gathered in order to collect further evidence and strike a mortal blow at the entire proliferation network of Khan (Hibbs 2002: 1). However, nearly three months before the NCRI's press conference, Washington reportedly briefed the Agency on Iran's clandestine activities and provided the coordinates and the satellite images of the two sites, which were thus under investigation in Vienna.[3] Additionally, the international

[1] The National Council of Resistance of Iran is a formation based in Paris and established in 1992 by the Mujahedeen-e-Khalq (MEK) or People's Mujahidin Organization of Iran (PMOI) which was supposed to be a Parliament in exile. The MEK ran a bombing campaign first against the Shah and later against the Islamic government. On August 30, 1981, the group bombed a meeting of Iran's national security council, killing President Mohamad Ali-Rajaji along with Prime Minister Mohammad-Javad Bahonar. In 1997, the MEK was designated by the US State Department as terrorist organization. See McGreal 2012.

[2] In his statement, Jafarzadeh omitted any reference to the specific type of facility under construction at Natanz ("top secret nuclear project in Natanz") but identified the Arak site as a "heavy water project." See NCRI 2002.

[3] On December 14, 2002, IAEA Director General Mohamed ElBaradei confirmed that the IAEA knew about Iran's undeclared nuclear activities in June 2002. See Associated Press 2002.

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public opinion was focused on the Iraqi nuclear file (from October 2002 also on North Korea) and did not consider the NCRI a reliable source since it was regarded as a terrorist group with frequent inaccurate information disclosed in the past.[4]

As a result, the disclosure of Natanz and Arak did not trigger immediately the nuclear crisis.

On September 16, 2002, at the 46th annual session of the IAEA General Conference held in Vienna, the Director General of the Agency Mohamed ElBaradei invited the President of the AEOI and Vice-president of Iran Gholam Reza Aghazadeh to confirm the allegations and provide additional information on the two suspected facilities.[5] Although he reassured that Iran was "embarking on a long-term plan to construct nuclear power plants with a total capacity of 6000 MW within two decades" and was willing to invite the Agency by October 2002, the inspection was repeatedly postponed, raising suspects that Iran was covering up evidence.[6]

In December 2002, the *CNN* released the first commercial satellite images gathered by the US-based Institute for Science and International Security (ISIS) and confirmed the nature of the two facilities under construction, thus creating a media hype with great international coverage (Ensor 2002). The Spokesman of the US State Department Richard Boucher strongly accused Teheran of "actively working to develop nuclear weapons capability" concluding that program was "not peaceful and certainly not transparent" (CNN 2002). "I can categorically tell you that Iran does not have a nuclear weapons program," replied Mohammed Javad Zarif, Iran's Ambassador to the UN, while the Iranian Foreign Minister Kamal Kharrazi promptly clarified the nuclear activities are "totally transparent, clear and peaceful and there is no secret and obscure point about it" (BBC 2002). These statements occurred at the height of the North Korean crisis represented by the withdrawal of Pyongyang from the NPT (January 10, 2003) and at the eve of the military inter-

[4] In September 2002, during his address ah the UN General Assembly, President Bush accused Iran of violating the UN obligations, a "material breach" that was confirmed in November 2002 with the adoption of UNSC resolution 1441. In October 2002, North Korea revealed that it had continued to pursue a nuclear program in violation of a 1994 agreement. See King, Hamilos 2006. See also Sanger 2002. See Lewis 2015.

[5] Mohamed ElBaradei was an Egyptian diplomat and Director General of the IAEA from 1997 to 2009. See IAEA, Biography of Dr. Mohamed ElBaradei, in IAEA, available online.

[6] According to ElBaradei, Iran provided a "long list of excuses" for postponing the visit. See ElBaradei 2011: 113. See also "Statement by H.E. Reza Aghazadeh Vice-President of the Islamic Republic of Iran and President of the Atomic Energy Organization of Iran at the 46th General Conference of the International Atomic Energy Agency Vienna, 16 September 2002", in IAEA.

vention in Iraq (March 20, 2003).[7] Still, from the NCRI revelations to the Iranian attitude, it was clear that Teheran was hiding something and was not sufficiently collaborating with the IAEA, which was willing to inspect the sites as soon as possible. The nuclear crisis had begun.

On 9 February 2003, President Mohammad Khatami was forced to acknowledge on national television the existence of several nuclear installations: the mining and milling plants in Saghand, the Uranium Conversion Facility (UCF) under construction in Isfahan and the pilot fuel enrichment plant in Natanz (Sahimi 2004: Part V, 2). He stated that Iran had discovered reserves and extracted uranium with the determination to master the entire nuclear fuel cycle for civilian purposes (De Luce 2003).

Few days later, on February 21-22, 2003, an IAEA high-level delegation, led by Director General ElBaradei, Deputy Director General for Safeguards Pierre Goldschmidt and Director of the Division of Safeguards Operations Olli Heinoinen, could visit the two nuclear sites.[8] In Teheran, the team met with President Khatami along with the Speaker of the Majlis, Mehdi Karroubi, the Chairman of the Expediency Council and former President Rafsanjani and the head of the AEOI Aghazadeh, who all reassured that the program had exclusively peaceful objectives (Elbaradei 2011: 118). During the inspection, ElBaradei was formally informed of the existence of an indigenous enrichment program in Natanz with the construction of a pilot fuel enrichment plant (PFEP), which was nearly to completion with nearly 100 IR-1 centrifuges (of the 1000 planned) installed, and a large underground industrial fuel enrichment plant (FEP).[9] The PFEP was scheduled to start operating in June 2003 with the installation of all centrifuges by the end of the year, whereas the FEP was planned to start accepting centrifuges (50,000 in total) in 2005.[10] In this regard, the President of the AEOI stated that Teheran was complying with the legal obligations since it was required to inform the Agency "no later than 180 days before the facility was scheduled to re-

[7] On December 24, 2012, North Korea reopened a sealed plutonium reprocessing plant in violation of the 1994 Agreed Framework. On January 10, 2003, Pyongyang announced the governmental decision to withdraw from the NPT, stating: "we have no intention of producing nuclear weapons and our nuclear activities at this stage will be confined only to peaceful purposes such as the production of electricity." As for Iraq, on January 9, Hans Blix affirmed that had not found so far any "smoking gun in Iraq" even if Baghdad had failed to answer "many questions" about its weapons programmes. On February 5, 2003, the US Secretary of State, Colin Powell, addressed the UN Security Council, laying out the evidence of Iraq's ongoing WMD programmes. See Stevenson 2002. See The Guardian 2003. See King, Hamilos 2006.

[8] See IAEA, *Iran Agrees to Provide Early Design Information of Nuclear Facilities*, February 25, 2003.

[9] See IAEA Director General, GOV/2003/40, p. 2.

[10] *Ibidem*, p. 6.

ceive nuclear material" (standard Code 3.1, MSA) (Elbaradei 2011: 114). He reassured that the gas centrifuge enrichment program, started only five years earlier, in 1997, was based on extensive modelling and simulation, including tests of centrifuge rotors both with and without inert gas. Such tests were carried out at the Amir Khabir University and the AEOI in Tehran, using open sources data with no nuclear material received or enrichment activity conducted.[11] According to ElBaradei, given the considerable size of the facilities in Natanz, it was unlikely that the Iranians wanted to hide them for long. Their intention was probably to delay the IAEA reporting and inspection as far as legally permissible under the Safeguards Agreement until the concerned plants were completed and the needed knowledge or technology acquired (Elbaradei 2011: 114). Finally, the head of the AEOI confirmed the construction of a heavy-water production plant in Arak – a type of facility that usually is not subject to IAEA safeguards or inspection regime unless there is an Addition Protocol with the Agency – with no legal obligation to declare it.[12]

The members of the IAEA high-level delegation were genuinely astonished by these findings. Firstly, they did not expect to discover a program developed to this extent with nuclear facilities that resulted to be on a larger scale and much closer to completion than previously imagined (Patrikarakos 2012: 179). Secondly, they found even more difficult to believe that these projects were the product of open source and indigenous researches. Indeed, centrifuges are very sophisticate and difficult machines that require at least some nuclear material to assess their efficiency and performance. As a result, it was practically impossible that Iran had mastered such technology without some form of foreign assistance. Besides, it was even more implausible that the AEOI had installed perfectly working centrifuges without testing them in loco or in another undeclared facility (ElBaradei 2011: 115). These suspects continued to rise when China confirmed that in 1991 it had transferred to Iran 1,8 metric tons (1000 kg) of UF_6, a material potentially useful to test centrifuges.[13] Moreover, as noticed by the Deputy for Safeguards Olli Heinoinen, the IR-1 centrifuges installed in the PFEP were based on early European designs and were similar to the Pakistani P-1 model.[14] The Islamic Republic was still hiding something and was not telling the complete story.

[11] See IAEA Director General, GOV/2003/40, p. 6.

[12] See IAEA Director General, GOV/2003/40, p. 2.

[13] See IAEA Director General, GOV/2003/40, p. 2. See also Kan 2011: 11.

[14] As it was described in paragraph 1.3, the centrifuges were based on European designs and were similar to the Pakistani model due to the Iranian cooperation with the Pakistani clandestine proliferation network of A. G. Khan. Indeed, in the '70s, Khan worked for the URENCO group in the Netherlands, where he was able to illegally copy the designs of the European gas centrifuge. See Patrikarakos 2012: 178.

On February 20, 2003, the Agency received some open source revelations concerning the existence of a AOEI workshop, named Kalaye Electric Company (KEC) and located in the southern outskirt of Teheran, that was allegedly supposed to have tested centrifuges related somehow to Natanz.[15] The delegation was willing to visit the workshop and requested the AEOI to proceed. The problem was that the IAEA was lacking the legal right and authority to inspect the site since Iran had never declared the KEC under the 1974 Safeguards Agreement and never ratified/implemented an Additional Protocol. Facing the growing dissatisfaction of the delegation, the Iranian officials recognized that the facility had been used in the past to produce centrifuge components but reassured that all testing was carried out using simulation studies with no operations involving the use of nuclear material in the site or in any other location in the Islamic Republic.[16] Even if the centrifuges production plant was another installation that did not need to be reported, in light of a policy of transparency promised by President Khatami, the team was resolute to visit the site and take some environmental samples.

The inspection would have been granted to limited parts of the workshop in March and to the entire facility in May, while the first samples would have been collected only in August 2003.[17] In a letter to the Agency dated February 26, 2003, the Islamic Republic informed the Agency that was willing to accept modifications to its Subsidiary Arrangements and the revision of the Code 3.1, General Part of the MSA, as requested by the BOG in April 1992 (paragraph 3.1).[18] Additionally, in response to the IAEA's demands concerning the nuclear program, the Iranian authorities acknowledged the secret receipt in 1991 of natural uranium in the form of UF_6 (1000 kg), UF_4 (400 kg) and UO_2 (400 kg), which was stored within the undeclared Jabr Ibn Hayan Multipurpose Laboratories (JHL) located inside the Teheran Nuclear Research Center.[19] Even if China was not mentioned, the head of the AEOI explained that Teheran was not obliged to report the material pursuant Article 34 (c) and 95 of the 1974 Safeguards Agreement (chapter 3, paragraph 1) since the total amount of natural uranium did not exceed one effective kilogram. Moreover, while most of the UF_4 had been converted into uranium metal in 2000 at the JHL, a material that has few peaceful applications, the UF_6 was reported not to be used in any centrifuge or enrichment tests and was still stored inside three cylinders within the undeclared labo-

[15] These revelations were made once again by the NCRI opposition group on February 20, 2003. See NCRI 2003a.

[16] See IAEA Director General, GOV/2003/40, p. 2.

[17] See IAEA Director General, GOV/2003/63, p. 3.

[18] *Ibidem*.

[19] *Ibidem*.

ratory (Elbaradei 2011: 117). As for the Uranium Dioxide, the Iranian officials informed the Agency that it had processed part of the 400 kg of UO_2 in the Uranium Conversion Facility under construction in Isfahan. The UO_2 was further used for isotope production and tested for some chemical processes in the undeclared Molybdenum, Iodine and Xenon Radioisotope Production Facility (MIX) inside the TNRC.[20] After these experiments, the remaining nuclear waste was reported to be solidified and eventually transferred to a waste disposal site in Isfahan and Anarak. Finally, during the high-level discussions, the IAEA delegation recommended Iran to agree on a more intrusive monitoring regime through the negotiation and conclusion of a binding Additional Protocol (Traynor 2003a).

These revelations, presented partially at the IAEA Board meeting (17-18 March), were received in Washington with a mix of satisfaction and concern. On one hand, while facing a significant loss of credibility in run-up to the war in Iraq, in the case of Iran the "unilateralist cowboys" of the Bush Administration were proved to be right (Patrikarakos 2012: 180). On the other, as stated by Secretary of State Colin Powell, Natanz showed that Teheran was "much further along, with a far more robust nuclear weapons development program than anyone said it had" (CNN 2003a).

In March 2003, the IAEA was granted permission to inspect the undeclared JHL facility and to collect some environmental samples in PFEP in Natanz. In Teheran, the inspectors noted that one of the small cylinders in which the UF_6 was stored was lighter than previously declared (1,9 kg). The Iranian officials promptly explained that little amount of material was missing due to a leak, which was noticed only one year earlier.[21] However, it was in Natanz where the IAEA technicians made the most significant discovery. After having collected some samples, the scientific analysis revealed in mid-June 2003 (after the first Director General's report) the presence high-enriched uranium, contradicting the previous declarations made by Teheran.[22]

In a letter dated 5 May 2003, the Iranian authorities provided preliminary design information for the undeclared JHL facility and informed the Agency of its intention to start in 2004 the construction of a 40 MW heavy-water research reactor at Arak (labelled also as IR- 40).[23] In the letter, the Iranian officials further notified the IAEA of the plan

[20] See IAEA Director General, GOV/2003/40, p. 5.

[21] See IAEA Director General, GOV/2003/40, p. 4.

[22] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, GOV/2003/63, August 26, 2003, p. 2.

[23] See Aghazadeh 2003. See also IAEA Director General, GOV/2003/40, p. 3.

to commence building in 2003 of a fuel manufacturing plant in Isfahan. Similarly, in May 2003, the NCRI openly revealed the existence of a biological weapons facility in Lavizan-Shian and a laser enrichment plant in Lashkar Abad (NCRI 2003b and 2003c). In the latter case, at the end of May 2003, the AEOI was forced to acknowledge a laser program and two sites near Hashtgerd (Lashkar Abad and Ramandeh).[24]

Under pressure by international community and fearing a military intervention, particularly after the "Mission accomplished" in Iraq, in May 2003 the Iranian authorities decided to send to the Bush Administration via the Swiss Ambassador in Teheran a complete package for a broad-based negotiation to solve the crisis and remove thirty years of hostility with the US.[25] With the green light of the Supreme Leader, Teheran proposed a bilateral dialogue based on "mutual respect", asking Washington to halt the hostile behaviour and the rectification of status of Iran (removal from the "axis of evil"), the abolishment of all sanctions and the pursuit of anti-Iranian terrorists. In turn, the Islamic Republic would have offered full transparency on the nuclear program, the end of any material support for the Lebanese and Palestinian opposition groups and the coordination for establishment of democratic institutions in Iraq.[26] Despite the diplomatic opportunity and the interest of the State Department, Vice President Dick Chaney dismissed the proposal ("we don't negotiate with the evil") and increased pressure on Iran.[27]

2. Disclosure

On June 6, 2003, the Director General Mohamed ElBaradei presented to the 35 members of the IAEA Board of Governors the first report on the implementation of the Safeguards Agreement in the Islamic Republic, which mentioned the past legal failures and called for more inspections. In the eight-page document, ElBaradei stated that the Iranian authorities had failed to meet their obligations under the 1974 Comprehensive Safeguards Agreement with respect to five issues:[28]

[24] See IAEA Director General, GOV/2003/40, p. 3.

[25] "Mission accomplished" was a famous speech pronounced by President Bush on the flight deck of the USS Lincoln, during which he declared an end to major combat in Iraq. See CNN 2003b. In the absence of formal diplomatic relations, the Government of Switzerland if the US conduit to Teheran. See Porter 2012.

[26] See *Talking to Teheran*, in «Conflicts Forum», January 22, 2007, available online. See also Davenport 2017.

[27] See BBC 2007a.

[28] IAEA Director General, GOV/2003/40, p. 7.

1. Failure to declare the import of natural uranium in 1991, and its subsequent transfer for further processing;
2. Failure to declare the activities involving the subsequent processing and use of the imported natural uranium, including the production and loss of nuclear material, where appropriate, and the production and transfer of waste resulting therefrom.
3. Failure to declare the facilities where such material (including the waste) was received, stored and processed.
4. Failure to provide in a timely manner updated design information for the MIX Facility and for Teheran Nuclear Research Center (Jabr Ibn Hayan Multipurpose Laboratories).
5. Failure to provide in a timely manner information on the waste storage at Isfahan and at Anarak.

Presented several days before the formal convening of the IAEA Board (16-19 June), the report triggered mixed reactions. On one hand, the United States made it very clear that it would have not tolerated the construction of a nuclear weapon (CNN 2003c). Supported by Great Britain, Canada and Australia, it considered Iran's non-compliance with the 1974 Safeguards Agreement and the reluctance to sign the Additional Protocol as an evidence of the non-peaceful purpose of the program. As a result, the US delegation strongly urged the Board to adopt a non-compliance resolution and report the matter to the UN Security Council in order to impose more binding punitive measures (Mousavian 2012: 67). Nonetheless, this request turned to be a minority within the IAEA Board. On the other, Cuba called for the removal of the Iranian nuclear program from the agenda of the BOG, while the Non-Aligned Movement (NAM) issued a declaration supporting Iran's full transparency and cooperation with the IAEA and opposing referral to the United Nations.[29] Most European States, as well as Russia, China and the Director General ElBaradei, adopted a middle ground position. Even if they were all concerned about the past legal failures and demanded the immediate acceptance of the Additional Protocol, they wanted more time to discover all aspects of the program.[30] Moreover, given the US "successful" war in Iraq (the disaster of "peace" was yet to come), they believed that a non-compliance finding and referral to the UN Security Council could escalate the crisis

[29] The Non-Aligned Movement was formed during the Cold War (1961), mainly on the initiative of former Yugoslav President Josip Broz Tito. It is an organization of 120 States that seeks to "create an independent path in world politics that would not result in member States becoming pawns in the struggles between the major powers." See Ogilvie-White 2007.

[30] See IAEA Director General, *Introductory Statement to the Board of Governors*, IAEA, Vienna, June 16, 2003.

and could be exploited by the Bush Administration as pretext to launch another military operation (Patrikarakos 2012: 184). Similarly, the Iranian authorities felt "a threat, a sense of danger," and wanted to avoid at all costs any referral, fearing that, once in the agenda of the UN, sanctions or military force would have likely followed.[31]

On June 19, 2003, the Board of Governors issued a statement expressing concern for Iran's past legal failures to report the nuclear "material, facilities, and activities as required by its safeguards obligations."[32] It called on Teheran to promptly rectify all problems identified in the report and to unconditionally conclude and implement the Additional Protocol as a confidence-building measure (Kerr 2003a). The BOG further encouraged Iran not to introduce any nuclear material in the centrifuges and to fully cooperate with the Agency in environmental sampling.[33] Despite the clear warning, on June 25, 2003, the AEOI decided to continue with the enrichment program and injected UF_6 into the first centrifuge for a single machine testing at the PFEP.

Two weeks later, on July 9, 2003, an IAEA delegation led by ElBaradei visited the Islamic Republic to discuss the implementation of safeguards (Fathi 2003). The Director General met again with the Iranian representatives (Khatami, Kharrazi and Aghazadeh) and reaffirmed the importance of an urgent solution of the outstanding issues and the conclusion of the Additional Protocol. Indeed, from the non-transparent attitude and the various inconsistent declarations, it was clear that Teheran had been trying to cover the evolution of its nuclear activities in the likely attempt to save time, complete the nuclear plants and acquire the needed knowledge or technology (Gaietta 2016: 91). Though, the risk of referral to the UN Security Council, combined with the threat of a military operation, required a change of approach and an increased cooperation with the Agency (Menašrî 2003: 1). Thus, in a letter dated July 23, 2003, the Iranian authorities proposed a timetable for action in relation to the outstanding safeguards issues; it invited the IAEA inspectors to take some environmental samples at the Kalaye Electric Company and to visit the two nuclear sites near Hashtgerd (Ramandeh and Lashkar Abaad) allegedly involved in laser enrichment activities.[34] On August 9-12, 2003, as scheduled, the AEOI held a technical discussion with the Agency. The Iranian officials recognized that the gas centrifuge enrichment program had been started in 1985 and not in 1997 as

[31] See Rouhani 2005.

[32] See IAEA Media Advisory, *Statement by the Board, 19 June 2003 (Issued by the Chairwoman)*, available online.

[33] See IAEA Director General, GOV/2003/63, pp. 1-2.

[34] See IAEA Director General, GOV/2003/63, pp. 2-7.

previously reported. They admitted that they had obtained the drawings and components of the centrifuges through a "foreign intermediary" in 1987, even if they claimed that they had not received any help to assemble them or provide training and had not conducted any experiments with inert or UF_6 gas. They further described the program as having three stages: the first (1985-1997) with all the activities located in the AEOI premises in Teheran; the second (1997-2002) with all activities concentrated in the Kalaye workshop; the last stage (early 2002-present) with all activities in Natanz.[35]

As for the Kalaye Electric Company, the IAEA technicians noted that, since their first "limited" visit in March 2003, the installation registered "considerable modifications" prior to the inspection, which were probably made to hidden undeclared nuclear activities conducted inside. With this respect, the AEOI authorities justified such structural alterations with the transformation of the workshop from a storage facility into a laboratory for non-destructive analysis.[36] Nevertheless, after having taken some environmental samples on August 12, 2003, in September the analysis confirmed the suspects and revealed the presence of both HEU and LEU particles, thus contradicting once again the Iranian declarations in this regard.[37]

As for the traces of high-enriched uranium discovered in the PFEP in Natanz, the inspectors explained that subsequent analysis revealed the presence of two types of particles. Impressed by the environmental capabilities of the Agency, the AEOI recognized that the centrifuge components imported from abroad were probably already contaminated with traces of HEU. Finally, the IAEA inspectors confirmed the existence of a "substantial" laser program, although the two nuclear sites near Hashtgerd appeared not to be directly related to laser activities. Specifically, the suspect facility in Ramandeh was part of the Karaj Agricultural and Medical Centre, a research center established in 1991 and involved in the production of isotopes, while the site in Lashkar Abad was a laser laboratory belonging to the Iranian atomic agency.[38]

On August 19, 2003, in a letter to the Agency, the AEOI provided further information on the genesis of the program and began testing a small ten-machine cascade with UF_6 in Natanz.[39] One week later, the Permanent Representative of Iran to the IAEA, Ali Akbar Salehi, informed the Director General that Iranian authorities were ready to ne-

[35] *Ibidem*.

[36] *Ibidem*.

[37] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, November 10, 2003, GOV/2003/75, p. 3.

[38] See ElBaradei 2011: 117. See IAEA Director General, GOV/2003/75, p. 7.

[39] See IAEA Director General, GOV/2003/75, pp. 3, 7.

gotiate the Additional Protocol (Mousavian 2012: 71). This request was followed by the release of the second report on the Implementation of the Safeguards that was made available by ElBaradei for the Board meeting scheduled for September 8-12. The document provided a better understanding of the Iranian nuclear activities and recognized that Tehran had demonstrated an "increased degree of co-operation" in relation to the amount and detail of information provided to the Agency and in allowing access requested to additional locations and the taking of environmental samples. However, the Director General noted that "information and access were at times slow in coming and incremental and some of the information was in contrast to that previously provided by Iran."[40] On such a basis, on September 12, 2003, the Board of Governors adopted by consensus a resolution, tabled by Japan and cosponsored by Australia and Canada, in which it:

1. Called on Iran to provide accelerated co-operation and full transparency to allow the Agency to provide at soon as possible the assurances required by Member States;[41]
2. Called on Iran to ensure that there were no further failures to report material, facilities and activities that it was obliged to report pursuant to its Safeguards Agreement;
3. Called on Iran to suspend all further uranium enrichment-related activities, including the further introduction of nuclear material into Natanz;
4. Decided that it was essential and urgent that Iran remedy all safeguards failures "by taking all necessary actions by the end of October 2003" to ensure the verification of non-diversion;
5. Requested all third countries to co-operate closely and fully with the Agency in the clarification of open questions concerning the Iranian nuclear program;
6. Requested Iran to sign, ratify and fully implement the Additional Protocol "promptly and unconditionally", and, as a confidence-building measure, to act in accordance with it;
7. Asked the Director General to submit a report, in November 2003 or earlier if appropriate, on the implementation of the resolution, enabling the BOG to draw definitive conclusions.

In case of failure to comply with all these requests by October 31, it was implicit in the language of text that the Board would have taken Iran to the "doorstep of the UN Security Council" (Rouhani 2005). As

[40] See IAEA Director General, GOV/2003/75, p. 10.

[41] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on 12 September 2003, GOV/2003/69.

in the previous session held in June, the IAEA Board meeting sparked different reactions. On one hand, the United States expressed satisfaction with the adoption of the resolution. Even if the preliminary findings of non-compliance would have justified an immediate referral to the UNSC, the White House realized that the European partners, as well as China and Russia, would have never supported it (Gerami, Goldschmidt 2012: 5). Therefore, Washington decided to give Iran "one last chance to stop its evasions" and to prove the peaceful purposes of the nuclear program (Johnson 2003).

On the other, Teheran welcomed the 50-day ultimatum with a mix of rage and surprise. Before the text was unanimously passed (without a vote), the entire Iranian delegation – at that time member of the IAEA BOG – left the room, threatening an immediate retaliation. On September 14, 2003, this position further was specified by Ambassador Ali Salehi in an interview with *Der Spiegel,* where he stated that, in case of forced disruption of all enrichment activities, the Islamic Republic would have taken "appropriate measures", such as the reduction or the interruption of cooperation with the Agency or even the withdrawal from the NPT (Kerr 2003b). Despite the rhetorical threat, the Iranians did not expect such a resolution, due probably to a different evaluation of the gravity of the crisis between the IAEA and the Foreign Ministry, and were facing considerable domestic pressure, mainly on the issue of the Additional Protocol (Rouhani 2005). In this regard, just after the Board's decision, several conservative papers publicly opposed the adoption of such Protocol, claiming that it would have been signed under Western pressure, whereas the Secretary of the Guardian Council, Ayatollah Ahmad Jannati, openly invoked the withdrawal from the NPT.[42] As stated later by Hassan Rouhani in his intervention to the Supreme Cultural Revolution Council (SCRC), "things were said about the public opinion and matters of prestige, and these are all completely right … It seems that we have nothing else to do but to be preoccupied with the nuclear issue all day and all night. … the public is very sensitive about this issue. Whatever we do, we must have the support of the public" (Rouhani 2005). Like in the times of the Shah, the program was commonly regarded as a symbol of national pride (Macfarquhar 2005). Moreover, the Khatami Administration was facing a crucial dilemma (Rouhani 2005):

[42] The Guardian Council is one of the most influential bodies in the Islamic Republic. It is composed by six theologians appointed by the Supreme Leader and six jurists nominated by the judiciary and approved by the Majilis. Members are elected for six years with half the membership renewed every three years. The Council approves all bills passed by Parliament and has the power to veto them if it considers them inconsistent with the constitution and Islamic law. It can also bar candidates from standing in elections to parliament, the presidency and the Assembly of Experts. See Patrikarakos 2012: 190.

> Would presenting a complete picture of our past nuclear activities solve the problem? If we presented a complete picture, that picture itself could take us to the UN Security Council. If we did not present a complete picture, this would have been considered a violation of the resolution, and we would go to the UNSC on the grounds that we had violated the resolution.

On September 15, at the 47th annual session of the IAEA General Conference, Vice President Aghazadeh reaffirmed Iran's full commitment to the non-proliferation responsibilities and the willingness to continue to collaborate with the Agency (Iran News 2003). However, the discovery of both LEU and HEU at the Kalaye Electric Company, followed by the progressive disclosure of the Pakistani clandestine network, contributed to further intensify the pressure on Iran.

On September 25, the IAEA inspectors publicly reported the results of the environmental samples collected in the Kalaye workshop, prompting the vocal reaction of the United States. According to the White House spokesman, Scott McClellan, the new findings were another confirmation "of a long-standing pattern of evasions and deception to disguise the true nature and purpose of Iran's nuclear activities" (Barringer 2003). One week later, a German flagged-cargo vessel, named *BBC China* and headed to Tripoli, was intercepted and redirected to the Italian port of Taranto. Once the ship was inspected, the joint team of CIA and MI6 agents discovered several centrifuge components for the secret Libyan program, which were reported to be produced by a Malaysian company (Corera 2006: IX-X). Even if the interception of the vessel was kept secret for several months, the discovery set in motion a chain of events that led eventually to dismantling of the Libyan WMD program and the public disclosure of the proliferation network of Abdul Qadir Khan with the resulting involvement of Pakistan in the Iranian nuclear projects (Albright, Hinderstein 2005).

3. The Intervention of the EU3 and the Teheran Declaration

The recent developments concerning the nuclear program were regarded with great concern. On one side, Western European States, as well as Russia and China, wanted to avoid at all costs a finding of non-compliance and referral to the UNSC, fearing that this would led to another military escalation in the Middle East (Gerami, Goldschmidt 2012: 5). As a result, they decided to step in and to solve the crisis through diplomatic means. Such an initiative was taken first by the French Foreign Ministers, Dominique De Villepin, who had already visited Teheran in late April 2003 (AFP 2003). Specifically, following the IAEA Board meeting held

in June, De Villepin realized that the French action would not be adequately effective or credible without a multilateral diplomatic coordination. So, he decided to address the other European traditional powers (Great Britain and Germany) and convinced his counterparts (Jack Straw and Joschka Fisher), paving the way to the creation of the "negotiation troika" or EU3.[43] On August 6, 2003, the EU3 Foreign Ministers, followed later by the Russian colleague (Igor Ivanov), sent a joint letter to their Iranian counterpart, demanding the urgent suspension of the gas enrichment program, the "zero centrifuge formula", and the signing and implementation of an Additional Protocol "without delay or precondition" (Mousavian 2008: 149). With this request, the EU3 Foreign Ministers wanted to demonstrate that, despite their relative convergence with the Bush Administration, they were pursuing their own agenda and were ready to negotiate with Iran (Mousavian 2008: 149). Few months later, this initiative would trigger resentments in the European Union (EU) as Italy, at that time head of EU Presidency (June-December 2003), Spain and the Netherlands felt "out of the loop" and questioned the European representativeness of the three countries.[44] The issue was solved in late December 2003 with the inclusion of High Representative for Common Foreign and Security Policy (CFSP), Javier Solana, into the talks. Still, this offer was regarded by many Iranians as premature or fruitless as they did not believe that the three Ministers would accept the invitation to visit Teheran, even if De Villepin was willing to come even before the Board meeting of September, or "would not be able to do anything in front of the US, even if they wanted" (Rouhani 2005).

On the other side, the Islamic Republic took the recent developments concerning the program very seriously. In view of the imminent and certain referral to the UN Security Council, on October 6, the Iranians transferred the responsibility of the nuclear dossier from the AEOI and the Foreign Ministry to a strategic committee within the Supreme National Security Council.[45] The committee was composed by the Secretary of the SNSC, Hassan Rouhani, the Foreign Minister Kharrrazi, the Minister of Defence Ali Sharnkhani, the Minister of Intelligence Ali Younessi and the Representative of the Supreme Leader to the SNSC Ali Akbar Velayati (Gaietta 2016: 93). Given the impossibility to negotiate with Washington, after several meetings the committee had no

[43] See Interview with François Nicoullaud, French Ambassador to Iran (2001-2005), at Sciences Po, Paris, Spring 2017.

[44] In the case of Italy, initially the government of Silvio Berlusconi was not interested in the nuclear negotiations with Iran and decided not to sign the joint letter of the EU3 (August 6, 2003). See Hadian, Neda 2016: 51. See also Sauer 2007.

[45] "No matter which option we chose, it was argued, our case would end up at the UN Security Council" (Rouhani 2005).

choice but to invite the EU3 Foreign Ministers, who promptly accepted the offer, and appointed Rouhani as chief negotiator.[46] The priority of the upcoming negotiations was "to find a way to present a complete picture of the past nuclear activities, without being sent to the UN Security Council" (Rouhani 2005). Specifically, Rouhani adopted a strategy aimed at keeping the crisis under control by transforming "existing threats into opportunities" and proposing voluntary concessions on the nuclear issue in exchange of similar incentives by the international community (Patrikarakos 2012: 192). On October 16, 2003, at the invitation of the Iranian Government, the Director General visited Teheran to discuss and clarify with Hassan Rouhani all outstanding safeguards issues, from the traces of nuclear material in the testing of centrifuges to the existence of laser isotope enrichment and the details of the heavy water program (BBC 2003a). This meeting was crucial. During his discussion with ElBaradei, Rouhani stated that the Islamic Republic was ready to turn the page in its relations with the IAEA; he promised that the authorities would provide a full disclosure of Iran's past and present nuclear activities in the following weeks. Finally, he expressed the readiness to conclude an Additional Protocol and, pending its entry into force, to act in accordance with such protocol and with a policy of full transparency (ElBaradei 2011: 120). Later, on October 19, 2003, a delegation of Iranian officials, led by deputy negotiator Hossein Mousavian, met the Political Directors of the EU3 Foreign Ministries, that were entrusted with the discussion of a preliminary deal and the solution of all technical issues before the ministerial summit.[47] Despite the lack of agreement on a final draft, on October 21, 2003, the EU3 Foreign Ministers decided to come to Teheran (Patrikarakos 2012: 196). After a formal meeting with President Khatami and Foreign Minister Kharrazi, the EU3 started negotiating with Hassan Rouhani and his delegation.[48]

As remembered by the French Ambassador to Iran, François Nicoullaud (2001-2003), the Iranians welcomed such discussions with a mix of

[46] Hassan Fereydoun Rouhani was born in 1948. During the rule of the Shah, he was arrested several times. In 1977, he fled and joined Khomeini in exile in France. After the revolution, Rouhani was elected to the legislative assembly, serving five consecutive terms between 1980 and 2000. During the war, he served as the commander of Iran's air defences. In 1989, he was appointed secretary of the Supreme National Security Council, a position that he occupied until 2005. See Naji 2017.

[47] The objective of the meeting was to prepare the ministerial summit and to create the conditions for its success. Indeed, it would have been embarrassing for an Ambassador to have its minister travel and have negotiations to collapse. See Nicoullaud 2016a: 109.

[48] The Iranian delegation was led by Hossein Mousavian and included: Iran's Ambassador to the UN, Javad Sharif, Iran's Ambassador to the UN in Geneva, Reza Alborzi, the Adviser of the Foreign Minister, Cyrus Nasseri, and the Vice President of the AEOI, Mohammad Saeedi. See Gaietta 2016: 97.

proud satisfaction and perceptible tension. On one hand, they were very pleased to receive such a degree of collective attention by three European Foreign Ministers, a circumstance that was reported to have never occurred in the history of Iran. On the other, given the precarious situation and the negotiating inexperience, they knew that the result of these discussions would be crucial for the future of the country.[49] This was further confirmed by Rouhani in his intervention to the SCRC: "in the Islamic Republic, we had never had before political negotiations with this degree of gravity" (Rouhani 2005).

After several hours of intense negotiations (and consultations with the supreme authorities), the EU3 and Iran agreed on a common statement, the *Teheran Declaration*, that was presented with mutual satisfaction to the press. On one side, the Islamic Republic reaffirmed the peaceful nature of the program and the commitment to fully engage with the IAEA to address all outstanding issues and clarify possible failures. Additionally, as a confidence-building measure:

i) the Iranian Government has decided to sign the IAEA Additional Protocol and commence ratification procedures. As a confirmation of its good intentions it will continue to co-operate with the agency in accordance with the protocol in advance of its ratification
ii) while Iran has a right within the nuclear non-proliferation regime to develop nuclear energy for peaceful purposes it has decided voluntarily to suspend all uranium enrichment and reprocessing activities as defined by the IAEA (BBC 2003b).

The scope of suspension was one of the most divisive issues addressed during the negotiations. On one hand, Iran wanted to limit suspension on a voluntary and temporarily basis only to the introduction of UF_6 in the centrifuges as it was privately agreed four days before with the Director General. On the other, the EU3 desired a broad and permanent suspension with the implementation of the "zero enrichment" precondition with no UF_6 produced in the first place (Patrikarakos 2012: 198). Eventually, both parties decided to compromise and to defer the issue to the Agency.

Though, the lack of an explicit definition of suspension within the *Teheran Declaration* would spark soon disagreement over the scope of "enrichment and reprocessing activities".

In return for Iran's disclosures, transparency and collaboration, the EU3 agreed to recognised the right of the Islamic Republic to enjoy the peaceful use of nuclear energy in accordance with the NPT and to

[49] See Interview with François Nicoullaud, French Ambassador to Iran (2001-2005), at Sciences Po, Paris, Spring 2017.

"open the way to a dialogue on a basis for longer term cooperation"; the EU3 clarified that "the Additional Protocol is in no way intended to undermine the sovereignty, national dignity or national security of its state parties". Finally, it acknowledged that the "full implementation of Iran's decisions, confirmed by the IAEA's Director General, should enable the immediate situation to be resolved by the IAEA Board" (BBC 2003b). This paragraph was a clear message to the Bush Administration, who reacted cautiously calling *Teheran Declaration* a "positive step" if Iran were to comply, that the EU3 partners would have kept the dossier within the framework of the Agency with no referral to the UN Security Council, provided the respect of the commitments taken and "the satisfactory assurances" concerning the nuclear program (Macaskill, De Luce, Borger).

On October 23, ElBaradei received a letter, dated 21 October, from Iranian Vice President and head of the AEOI Aghazadeh in which he reaffirmed Iran's intention to provide a full understanding of the program "with a view to removing any ambiguities and doubts about the exclusively peaceful nature of the nuclear activities and starting a new phase of confidence and cooperation."[50] In the letter, he acknowledged that the Islamic Republic had carried out:

1. Experiments on the conversion of some of the UF_4 to UF_6 and on the conversion of UO_2 to UF_4 with the nuclear material imported in 1991 and reported previously to the IAEA;
2. The undeclared irradiation of 7 kg of depleted UO_2 targets and the subsequent extraction of small quantities of plutonium (3 kg) at the Teheran Nuclear Research Center between 1988 and 1992;
3. A limited number of gas-enrichment tests, conducted in 1999 and 2002 at the KEC with 1,9 kg of UF_6 stored at the JHL, which was previously declared to be missing due to a leak;
4. Laser enrichment tests conducted between 1991 and 2003, using 30 kg of previously undeclared uranium metal imported.

Attached to the letter, there was an Annex with further specifications regarding the conversion activities and the heavy-water program.[51] As it was stated by ElBaradei in his 2011 memoir, "none of these activities pointed explicitly to a nuclear weapons program, but together they constituted a fairly comprehensive nuclear fuel cycle program most of it conducted in secret" (ElBaradei 2011: 121).

Few days later (27 October-1 November 2003), in a follow up meeting with an IAEA technical team, the Iranian officials provided additional

[50] See IAEA Director General, GOV/2003/75, p. 4.

[51] *Ibidem*, Annex 1.

information, concluding that all nuclear material had been declared to the Agency. They further reported that Teheran had not enriched uranium beyond 1.2% and reaffirmed the foreign contamination of the centrifuge components.[52]

On November 10, 2003, Ambassador Ali Akbar Salehi delivered a letter to the Director General in which it communicated his Government's acceptance of the Additional Protocol. It further informed ElBaradei that the Islamic Republic had decided to suspend, with effect from 10 November 2003, all enrichment and reprocessing activities in Iran, specifically: "to suspend all activities on the site of Natanz, not to produce feed material for enrichment processes and not to import enrichment related items."[53] The same day, the Director General circulated a new confidential report on the implementation of the safeguards, as envisaged by the Board's resolution adopted in September (Traynor 2003b). In the document, ElBaradei reported that:[54]

> Iran has now acknowledged that it has been developing, for 18 years, a uranium centrifuge enrichment programme, and, for 12 years, a laser enrichment programme. In that context, Iran has admitted that it produced small amounts of LEU using both centrifuge and laser enrichment processes, and that it had failed to report a large number of conversion, fabrication and irradiation activities involving nuclear material, including the separation of a small amount of plutonium.

ElBaradei reported that the Islamic Republic had covered many aspects of its activities with resultant breaches of its obligation to comply with the provisions of the Safeguards Agreement. Such a "policy of concealment" continued until mid-October 2003, with cooperation being "limited and reactive, and information being slow in coming, changing and contradictory". However, he concluded, there was "no evidence (to date) that the previously undeclared nuclear material and activities referred to above were related to a nuclear weapons program", even if it will take time to assess that Iran's program was "exclusively for peaceful purposes."[55] These final remarks were reiterated by the Director General in his Introductory Statement to the Board of Governors convened on November 20, sparking the vocal reaction of the United States.[56] Specifi-

[52] See IAEA Director General, GOV/2003/75, p. 7.

[53] See IAEA, *Iran to Sign Additional Protocol and Suspend Uranium Enrichment and Reprocessing*, Press Release, November 10, 2003.

[54] See IAEA Director General, GOV/2003/75, p. 8.

[55] *Ibidem*, p. 10.

[56] See IAEA Director General, *Introductory Statement to the Board of Governors*, IAEA, November 20, 2003.

cally, the US Ambassador Kenneth Brill strongly accused the Agency of "dismissing important facts that had been disclosed by its own investigation" and invited the Board to adopt a resolution referring the Iranian "non-compliance" to UN Security Council (ElBaradei 2011: 122). Nevertheless, the members if the EU3 and the Islamic Republic received the support of Russia, China and the Non-Aligned Movement and succeeded in adopting a satisfactory text on November 26, 2003. Although there was no reference to Iran's "non-compliance" with the resulting referral to the United Nations, the BOG stressed that in case of "any further Iranian serious failures" it would consider "all options at its disposal", including implicitly the referral to Security Council.[57] Few weeks later, on December 18, 2003, the Islamic Republic finally signed the Additional Protocol and agreed to act in accordance with its provisions, pending its formal ratification by the *Majilis*, thus granting the IAEA with broader rights of information and access to the sites (BBC 2003c).

The *Teheran Declaration* was a mutual success and a watershed moment in the nuclear crisis. On one side, the Foreign Ministers of the EU3 were able to negotiate and obtain an increased cooperation between Iran and the Agency, the suspension of the enrichment – although not with the desired formula – and the precious signature of the Additional Protocol. They prevented the Islamic Republic from leaving the NPT by strengthening the safeguards regime with more intrusive inspections than required under the 1974 Safeguards Agreement. Most at all, they contributed to reduce the risk of military escalation and the replication of the Iraqi disaster by creating a diplomatic framework for conflict management that would have lasted until the conclusion of the *Joint Comprehensive Plan of Action* in July 2015 (Alcaro, Bassiri Tabrizi 2014: 15).

On the other side, given the narrow room for manoeuvre, the Iranian authorities succeeded in bringing the nuclear crisis under control and transforming a "political and security dispute" in a "technical and legal one" (Mousavian 2012: 108). Specifically, they prevented the referral to the UN Security Council and avoided the permanent suspension of enrichment and reprocessing activities by conceding a voluntary and temporary limitation and the signature of the Additional Protocol. With these results, they could claim with satisfaction to have secured an important "victory" and demonstrate that Iran was a major country and a credible negotiator partner in the region (Patrikarakos 2012: 196). Still, the continuation of the Iranian non-transparent attitude and the constraints of the EU3, mainly the lack of political and economic lever-

[57] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on 26 November 2003, GOV/2003/81, paragraph 8.

age, would soon undermine the deal, paving to the failure of the *Teheran Declaration* and, ultimately, of the European intervention.

4. The Brussels Agreement

The events and the new findings concerning the Iranian nuclear program contributed to fade away the optimism around the *Teheran Declaration*. On December 19, 2003, President Muammar Ghedaffi disclosed the existence of a secret WMD program and revealed, inter alia, that Libya had ordered thousands of P-2 centrifuges and obtained a warhead design from the illicit proliferation network of Abdul Qadir Khan; Ghedaffi further announced the dismantling the program by declaring all activities to the Agency and inviting the IAEA to inspect all facilities and monitor the commitments taken, including the signature of the Additional Protocol.[58] These disclosures triggered the Pakistani investigations over the network of Khan and the governmental admission of the involvement of Pakistan in the Iranian program (Traynor 2003c).

As a result, the Agency began to suspect a substantial cooperation between A.Q. Khan and the Islamic Republic involving the acquisition of sensitive nuclear information and technology as found in Libya. On January 20, 2004, during a meeting with the IAEA technical team, the Iranian officials were forced to acknowledge that they had received in 1994 P-2 centrifuge drawings from foreign sources and had conducted related research and development activities. Such activities consisted in the manufacture of several models of rotors and terminated in June 2003 with the removal of all centrifuge equipment to the Pars Trash Company in Teheran. As it was noticed by the IAEA, the Islamic Republic had not declared such information in the letter sent by the head of the AEOI Aghazadeh on October 21, 2003, or at the November BOG where it was supposed to provide a full disclosure of its nuclear activities. With this respect, the Iranian authorities responded that they did not want to hide the P-2 designs and related work, but they had neglected to include them due to time pressure in preparing the document. Later, in a further discussion with the Agency (February 2004), they explained that they were not obliged to report the information under the Safeguards Agreement, but only under the Additional Protocol.[59] "We have not lied," Rouhani remembered. "In all cases, we have told them the truth. But in some

[58] Libya pledged also to eliminate ballistic missiles beyond a 300-km range and all chemical weapons stocks and munitions; it further committed to accede to the Chemical Weapons Convention. See Squassoni 2006: 1-2.

[59] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, February 24, 2004, GOV/2004/11, p. 8.

cases, we may not have disclosed information in a timely manner." Anyway, "the P-2 issue undermined the confidence-building process; it was a serious blow to that process" (Rouhani 2005). Similarly, the deputy chief negotiator Mousavian confirmed this version of events, providing a further interesting insight concerning the informational asymmetries of the nuclear program (Mousavian 2012: 353):

> Neither I nor other members of Khatami's nuclear negotiation team had any insider information about the technical dimension dimensions of Iran activities … . In fact, I believe that even Khatami, the President at the time, Rouhani, the Secretary of the Supreme National Security Council responsible for the nuclear file, and Kharrazi, the foreign minister, heard about the P-2 centrifuge issue for the first time from the IAEA and the foreign media and had no previous information on the matter.

Meanwhile, the IAEA requested additional clarification about some experiments conducted with bismuth metal, a nuclear material not covered under the Safeguards Agreement that, once irradiated, produces polonium-210 (Po-210), an intensely radioactive isotope with military dimensions (e.g. neutron initiator of a nuclear weapon). The Iranians replied that these experiments were part of a study on neutron sources for industrial applications that were conducted and abandoned 13 years earlier.[60] Finally, the scope of suspension contributed to further increase disagreement between the Islamic Republic and the international community. Indeed, the *Teheran Declaration* referred unclearly to suspension "as defined by the IAEA", while the Board resolution adopted in November welcomed Iran's decision to voluntarily suspend "all enrichment related and reprocessing activities" with no specific limitation.[61] However, the Iranian authorities decided to interrupt only the introduction of fed material (UF_6) into the nuclear centrifuges and continued to assemble centrifuges, 120 between November and mid-January 2004, and to manufacture their components under existing contracts.[62]

All these elements required a major clarification between the parties concerned that resulted in the *Brussels Agreement* concluded on February 23, 2004. Under this new political framework:

1. Iran extended the scope of suspension and decided to suspend the assembly and testing of centrifuges and the domestic manufacture of centrifuge components, including those related to the existing contracts, to the furthest extent possible.

[60] See IAEA Director General, GOV/2004/11, p. 5.
[61] See IAEA Board of Governors, GOV/2003/81, paragraph 10.
[62] See IAEA Director General, GOV/2004/11, p. 11.

2. Iran pledged to provide additional explanations on the nuclear activities omitted in the letter dated October 21, 2003.
3. The EU3 promised in return to do its best to remove the dossier from the IAEA agenda in the Board meeting in June 2004 and supply Iran with advanced nuclear technology (Mousavian 2008: 167).

Despite the significant content and the potential implications involved, the *Brussels Agreement* came immediately under considerable pressure from the United States, who strongly criticized the European partners and "ultimately forced them to retreat from their commitments" (Rouhani 2005). Indeed, the Libyan example of complete "nuclear surrender", combined with the Israeli demands for a military solution and the several voices of interests for a comprehensive negotiation within the Bush Administration, made it clear that the *Brussels Agreement* would constitute an obstacle to the American strategic goals and interests in the region (ElBaradei 2011: 131).

On February 24, 2004, the Director General circulated his fourth report on the implementation of the safeguards in Iran, which was made available for the Board session planned for March. Despite Iran's active cooperation with the Agency and the expansion of the scope of suspension, ElBaradei reported that the omissions of any reference to the P-2 centrifuge designs and related activities represented a "matter of serious concern". Additionally, Teheran was still slow to provide requested information regarding the origin of both low- and high-enriched uranium found in the centrifuge components inside Natanz and the Kalaye Electric Company workshop. In this regard, few days later, the AEOI authorities would even postpone an IAEA's inspection at the PFEP and other nuclear related sites on the grounds of the approaching of the Iranian new year, giving once again "the impression that they had something to hide."[63] Finally, Teheran needed to clarify the nature and scope of its laser isotope enrichment research and the purpose its activities related to the production and intended use of polonium 210.[64]

All these issues gave the United States, joined by Australia, Canada and Japan, the opportunity to present a harsh draft resolution at the BOG meeting held between March 8 and 13, 2004. Despite the heavy political pressure and the US attempts to undermine the *Brussels Agreement*, the EU3 and Iran, supported by the NAM, succeeded in moderating the language of the draft (Traynor 2004). "In the end," ElBaradei reported, "everyone signed off on a consensus resolution (adopted on March 13) that pleased both the Iranians and the Americans"

[63] *Ibidem*, pp. 127-128.
[64] See IAEA Director General, GOV/2004/11, p. 12.

(ElBaradei 2011: 129). On one side, the Board criticized Iran's incomplete cooperation and lack of transparency despite the commitments taken with the *Teheran Declaration*, but decided not to refer the case to the UNSC. On the other, the Board decided to "defer until its June meeting … consideration of progress in verifying Iran's declarations, and of how to respond to the above-mentioned omissions," giving the United States another chance to report Teheran's non-compliance to the United Nations.[65] Still, at the end of the meeting the EU3 delegations reaffirmed its determination to bring the case to normality in the next meeting of June 2004, although with three important conditions (Mousavian 2008: 168):

1. The urgent ratification of the Additional Protocol by the *Majilis*;
2. The Director General's confirmation regarding the completeness of Iran's declaration and progress on the various issue in the next Board meeting;
3. No more failures and omissions found in the Islamic Republic.

In early April 2004, the IAEA Director General visited once again Teheran, where the Iranian authorities agreed to accelerate cooperation with the Agency on all the outstanding issues identified.[66] In a technical meeting, the AEOI officials were forced to acknowledge that, contrary to earlier statements, they had imported magnets suitable for use in P-2 centrifuges from Asian suppliers and attempted to buy nearly 4,000 others from a European intermediary.[67] The AEOI further announced the suspension of the production of centrifuge components as of April 9, 2004, followed in late May 2004 by the initial declaration under the Additional Protocol. Though, the decision to suspend was taken with a delay of nearly two months from the *Brussels Agreement* and was not comprehensive as three private workshops continued the production.[68] The chronological lag created some discontent within the EU3 that had the impression that Teheran have only agreed to suspend activities in those areas where they did not have technical problems (Rouhani 2005). This feeling was further reinforced by Iran's decision to conduct hot tests of the UF_6 production line at UCF that was inaugurated in Isfahan on March 28, 2004. The initiative was regarded by the IAEA as a violation of the commitments taken as the hot testing with UF_6 would

[65] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on March 13, 2004, GOV/2004/21, paragraph 9.

[66] See IAEA, *IAEA and Iran Agree on Action Plan*, Press Release, April 7, 2004.

[67] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, June 1, 2004, GOV/2003/34, p. 5.

[68] See IAEA Director General, GOV/2003/34, p. 8.

technically amount to the production of feed material for enrichment processes. Still, the Iranian officials replied that "the decision taken for voluntary and temporary suspension was based on clearly defined scope which did not include suspension of production of UF_6."[69] Once again, the issue of suspension was source of disagreement. Finally, the revelations made by the Institute for Science and International Security concerning the site of Lavisan-Shian, located in north of Teheran and allegedly involved in the production of biological weapons, contributed to raise questions over Iran's attitude and full transparency. Following the NCRI's disclosure in May 2003, the US based think-tank had obtained some satellite pictures in August 2003, showing the existence of several buildings inside a secure perimeter. In March and May 2004, ISIS collected new images of the site, making a shocking discovery: the facilities were completely razed to the ground with the removal of the top soil.[70] In late-April 2004, the NCRI provided more detailed information of the facility, claiming that it was allegedly involved in several nuclear activities with potential military applications (NCRI 2004). After the Kalaye workshop, these findings suggested that Iran was attempting to conceal the real nature of its activities and to defeat the IAEA's environmental sampling capabilities.

Most of these developments were reported in the Director General's report that was issued on June 1, 2004. In his introductory statement to Board meeting (June 14-18, 2004), ElBaradei stated the information related to the origin of the particles of HEU and LEU had not been "sufficient to resolve this complex issue." As for the P-2 centrifuges, the information provided had been "changing and at times contradictory." "Clearly, this pattern of engagement on the part of Iran is less than satisfactory … It is essential for the integrity and credibility of the inspection process that we are able to bring these issues to a close within the next few months."[71] These conclusions, combined with the American political pressure and Iran's non-transparent attitude, convinced the EU3 to infringe their obligations under the *Brussels Agreement* concerning the normalization of the case in the Board meeting of June and to present a new resolution, which was adopted on June 18, 2004. The BOG deplored the lack of "full, timely and proactive cooperation"; it called on Iran to take all "necessary steps" to help resolve the outstanding issues and, as a further confidence-building measure, to voluntarily reconsider its decision to begin production testing at the UCF and to start construction of

[69] See IAEA Director General, GOV/2003/34, p. 4.

[70] See ISIS, *Lavisan-Shian, Nuclear Sites*, Nuclear Iran, available online.

[71] See IAEA Director General, *Introductory Statement to the Board of Governors*, IAEA, June 14, 2004.

a heavy-water research reactor.[72] Finally, the resolution did not provide a new deadline for compliance with the implicit result that the nuclear dossier would have remained within the Board's agenda.

As expected, the Iranian authorities reacted with firm anger and strongly accused the European partners of being unable to keep their promise and finalize a deal without the United States (Mousavian 2008: 172). Hence, on June 23, 2004, they sent a letter to the Director General and the EU3 Foreign Ministers, in which they considered the *Brussels Agreement* null and void and conveyed the intention "to resume under IAEA supervision manufacturing of centrifuge components and assembly and testing of centrifuges as of 29 June 2004" (Fidler 2004). The decision, which resulted in the downgrading of the negotiations between the EU3 and Iran, was a clear message both to the international community and the internal opinion that Teheran would not accept any unilateral obligation or concession without a political bargain on the issue of suspension (Gaietta 2016: 100). Indeed, given the large conservative victory at the Parliamentary elections of February 2004, the reformist Administration was under strong domestic pressure and was forced to postpone the formal ratification of the Additional Protocol (De Luce 2004). Moreover, following the collapse of the *Brussels Agreement*, several representatives openly invoked Iran's withdrawal from the NPT (AFP 2004a and 2004b). Thus, during the summer, the Iranian officials decided to respond with the adoption of more a rigid approach and announced the conversion of 37 tons of UF_6 in Isfahan with effect starting from August 19, leading to political escalation at the Board meeting scheduled for September (Gaietta 2016: 100.

5. From Brussels to Paris

The developments concerning the Iran's nuclear activities and the investigation of the military site in Lavisan-Shian constituted the core of the sixth confidential report circulated by the Director General on September 1, 2004. Specifically, following the formal letter dated 23 June 2004, the AEOI officials removed and returned to the IAEA the seals that were set as a measure for monitoring Teheran's suspension in Natanz and other related nuclear facilities. They further resumed the production of centrifuges components, assembled and tested about 70 rotors

[72] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on June 18, 2004 GOV/2004/49.

as of mid-August 2004.[73] In the same period, the Agency succeeded in convincing Pakistan, a State non-party to the NPT from which most of the Iran's contaminated components originated, to collect environmental samples in its nuclear installations. "The samples of Pakistan correlated strongly with most of the high-enriched uranium found at Natanz and the Kalaye Electric Company. The evidence was not yet conclusive, but it tended to support Iran's explanation" (ElBaradei 2011: 138).

As for the facility in Lavisan-Shian, allegedly involved in potential military applications, the case was discussed at the Board meeting of June 2004, following which the Agency requested and obtained the authorization to inspect the site and to take environmental samples within. In this regard, the Iranian authorities provided a description and chronology of the activities conducted, including at the Physics Research Center (PHRC), a facility established at Lavisan-Shian in 1989 and suspected by the IAEA of involvement in possible nuclear weaponization efforts. However, they reported that no nuclear material and activities related to fuel cycle were carried out and the facility was demolished in response to a decision ordering the return of the site to the Municipality of Tehran after a dispute between the Municipality and the Ministry of Defence.[74] These conclusions were partially confirmed by the results of the samples, even if the the detection of nuclear material would be "very difficult in light of the razing of the site."[75]

The IAEA Board meeting started on September 13, 2004, in a politically charged atmosphere. In his introductory statement, ElBaradei reported that the Agency was making steady progress in understanding the nature and extent of Iran's nuclear program. With this respect, he confirmed,

> no additional undeclared activities on the part of Iran have come to light … and some previously outstanding issues, namely Iran's declared laser enrichment activities and Iran's declared uranium conversion experiments, have reached the point where any further follow-up needed will be carried out as part of routine safeguards implementation.

Still, more time was needed to assess the program and to "bring the remaining outstanding issues to resolution within the next few months and provide assurance to the international community."[76] Despite these

[73] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, September 1, 2004, GOV/2004/60, pp. 3-4.

[74] See IAEA Director General, GOV/2004/60, p. 8.

[75] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, November, November 15, 2004, GOV/2004/83, p. 22.

[76] See IAEA Director General, Introductory Statement to the Board of Governors, *IAEA*, September 13, 2004.

conclusions, the US, cautiously supported by the members of the EU3, requested the referral to the UNSC, while China and Russia remained strongly opposed.

To further complicate the situation in Vienna, on September 15, 2004, *ABC News* published a series of satellite photos gathered by ISIS regarding a "unreported" military site in Parchin, that was allegedly involved in the research, testing, and possibly production of nuclear weapons (Albright 2004). As stated by ElBaradei (ElBaradei 2011: 139): "This was no-sense and an unsubtle attempt to convince Member States that the IAEA was someway biased … We knew that Parchin was a military production facility where Iran manufactured and tested chemical explosives and we would continue to probe Iran about the site, but at this stage, we had no evidence whatsoever of nuclear related activity there." After intense negotiations between all parties, on September 18, 2004, the Board adopted its fifth resolution, requesting the Director General to present a new report with "a recapitulation of the Agency's findings on the Iranian nuclear program since September 2002." On this basis, the Board "will decide whether or not further steps are appropriate", thus threatening to find Iran in non-compliance if it refused to fully cooperate with the Agency.[77]

"Therefore," Rouhani remembered with frustration, "the upcoming IAEA report to the IAEA Board of Governors will reiterate all the previous violations, what Iran has done wrong in the past, how many false statements it has made, and what it has tried to hide" (Rouhani 2005). As a result, the nuclear dossier was again at the doorstep of the UNSC with a new impelling deadline at the horizon (25 November 2004). Though, the approaching of the BOG meeting gave the chance to the EU3/EU, the three European powers joined by the High Representative Solana, to launch a new round of talks. At the beginning of the negotiations (late-September 2004), the positions between the two parties were wide apart. On one side, the EU3/EU was demanding (Mousavian 2008: 145-147):

1. To fully suspend all enrichment-related and reprocessing activities without delay; in case of acceptance, it would have normalized the situation in the next meeting of November and opened immediate negotiations for a longer-term deal. Conversely, if Iran had refused, the EU3/EU would have backed the referral of the nuclear dossier to the UN Security Council.
2. To adopt all necessary measure for the ratification of the Additional Protocol by the end of 2005 and to open all its nuclear installation to the IAEA inspections;

[77] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on September 18, 2004, GOV/2004/79.

3. To replace the heavy-water reactor with a light-water and provide "objective guarantees" on the lack of diversion on the program. These guarantees were a red line for the European negotiators.

In case of compliance, the EU3/EU would recognize Iran's rights to the peaceful use of nuclear energy; it would have provided political and economic incentives, such as the prosecution of the Mujahedeen-e-Khalq (MEK) individuals – a terrorist organization related to the NCRI – the opening of trade talks, the support of Iran's accession to the World Trade Organization (WTO) and Iran's inclusion to the greater Middle East Initiative.[78]

On the other side, these requests were considered unacceptable by Iran for several reasons (Mousavian 2008: 175):

1. The suspension was unlimited and the EU3/EU was threatening Iran with referral to the UNSC;
2. Iran was "obliged" to ratify the Additional Protocol by the end of 2005; it was further requested to ratify the Comprehensive Test Ban Treaty.
3. The full transparency and the "objective guarantees" demanded would have resulted in the permanent interruption of the program – the Iranian red line within the negotiations – and in requests beyond the limits of the Additional Protocol.

Additionally, the talks were facing another significant constraint. As confessed by Rouhani: "we do not have any trust in them [the Europeans]. Unfortunately, they do not trust us, either. They think we are out to dupe them, and we think in the same way, that they want to trick and cheat us. Therefore, we should build trust, step by step and in practice" (Rouhani 2005).

After several weeks of negotiations, on November 15, 2004, the EU3/EU3 and the Islamic Republic were able to reach a compromise and sign a deal, known as the *Paris Agreement*.[79] According to the new political framework, the E3/EU recognised "Iran's rights under the NPT exercised in conformity with its obligations under the Treaty, without discrimination." Conversely, in line with Article II of the

[78] The WTO is an international organization, established in 1995, dealing with international trade There are currently 164 State members. The Greater Middle East Initiative was a US set of proposals, presented by the Bush Administration in April 2004 and meant to reform the Middle East and other Muslim countries such as Turkey, Iran and Pakistan. See Wittes 2004.

[79] See IAEA Director General, Communication dated 26 November 2004 received from the Permanent Representatives of France, Germany, the Islamic Republic of Iran and the United Kingdom concerning the agreement signed in Paris on 15 November 2004, November 26, 2004, INFCIRC/637.

NPT, Iran reaffirmed that it would not seek to acquire nuclear weapons; it further committed to full cooperation and transparency with the IAEA and agreed to continue implementing voluntarily the Additional Protocol, pending its ratification. Moreover, "as a voluntary (and temporary) confidence building measure" (and not as a legal obligation), Teheran decided to continue and extend its suspension to include "all enrichment related and reprocessing activities." This time, to avoid any future ambiguity and disagreement, the parties promptly specified the scope of suspension:

1. The manufacture and import of gas centrifuges and their components;
2. 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
3. all tests or production at any uranium conversion installation.

Suspension would be implemented before the Board session of November and would be sustained during the negotiations of a "mutually acceptable agreement on long-term arrangements." Such a deal would provide "objective guarantees" on the peaceful purposes of the program and "firm guarantees" on nuclear, technological and economic cooperation and "firm commitments" on security issues. To achieve this goal, the EU3/EU would launch a steering committee and three working groups to discuss the incentives on political, security, technology and nuclear matters. Additionally, the E3/EU would support the Director General in inviting Iran to join the Expert Group on Multilateral Approaches to the Nuclear Fuel Cycle, thus recognizing Iran's rights and capabilities in the nuclear sector. Once suspension would be verified, the E3/EU would resume the negotiations with Teheran on a Trade and Cooperation Agreement and would actively support the opening of Iranian accession negotiations at the WTO. Finally, while reiterating their support for solution within the IAEA, the E3/EU and Iran confirmed their determination to combat terrorism, including the activities of Al Qaida and other terrorist groups such as the MEK. They further confirmed their continued support for the political process in Iraq aimed at establishing a constitutionally elected Government (Meier 2013: 16).

The *Paris Agreement* was promptly implemented by the Islamic Republic and received the endorsement of the IAEA Director General. In his latest confidential report issued on the same day, ElBaradei stated that all declared nuclear material had been accounted for, with no diversion of such material to prohibited activities. Though, he added, "the Agency is not yet in a position to conclude that there are no undeclared nuclear materials or activities in Iran". Giving the undeclared nature of significant aspects of the program and past patterns of concealment, "this conclusion

can be expected to take longer than in normal circumstances."[80] These positive remarks were reiterated at the Board meeting convened on November 25, 2004. Within this framework, ElBaradei further confirmed the voluntary suspension of Iran's enrichment related and reprocessing activities in line with the articles of the *Paris Agreement*.[81]

These encouraging developments set the Board of Governors in a positive mood and enabled the adoption of a satisfactory resolution on November 29, 2004. The BOG recognized the positive steps regarding the suspension and the clarification of all the outstanding issues with the Agency. Despite the "strong concern that Iran's policy of concealment up to October 2003 resulted in many breaches of its obligations to comply with its NPT Safeguards Agreement", it not only deferred the finding of non-compliance, but decided also that all future verification of the program would have been within the exclusive competence of the Director General.[82]

The newly re-elected Bush Administration did not oppose the resolution, although it expressed its dissatisfaction.[83] Specifically, the US Ambassador Jackie Sanders delivered a nine-page statement to the Board where she accused the IAEA of irresponsibility and affirmed that Iran's clandestine nuclear weapons program posed "a growing threat to international peace and security". She further declared that the United States might refer Iran to the Security Council unilaterally, as any other member of the UN, and reserved all its options in this regard (Sciolino 2004). Similarly, President Bush expressed skepticism: "It looks like there is some progress, but to determine whether or not the progress is real there must be verification. I am looking forward to that verification" (Bush 2004). On the other side, Rouhani described the BOG endorsement of the *Paris Agreement* as a "great victory" and an "historical opportunity" for Iran and Europe to prove the world that unilateralism was condemned (BBC 2004). Likewise, the Supreme Leader stated: "the Islamic Republic of Iran will definitely not abandon its nuclear activities, and this is our red line" (NTI 2004). The *Paris Agreement* was another watershed moment in the history of the Iranian nuclear crisis. With a package of mutual concessions, it prevented a new referral to

[80] See IAEA Director General, GOV/2004/83, p. 23.

[81] See IAEA Director General, Introductory Statement to the Board of Governors, *IAEA*, November 25, 2004.

[82] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, Resolution adopted by the Board on November 29, 2004, GOV/2004/90, paragraph 4.

[83] President George W. Bush was confirmed on November 4, 2004. Following his inauguration in January 2005, former National Security Adviser, Condoleezza Rice, replaced Colin Powell as Secretary of State.

UN Security Council and paved the way to comprehensive negotiations for a longer-term agreement on the nuclear issue. However, as in the case of the *Teheran Declaration* and the *Brussels Agreement*, the Iranian attitude and the lack of political and economic leverage within the EU3/EU would have soon proved the fragility of the new framework and the constraints of the European intervention.

6. The Collapse of the Paris Agreement

The negotiations for a long-term agreement on the nuclear issue started in mid-December 2004 and were more difficult than expected (Kerr 2005a). On one side, the EU3/EU were under considerable pressure from the United States, that were pushing for a permanent suspension of all enrichment and reprocessing activities and the dismantlement of the related facilities. Thus, the European negotiators were demanding new concessions in exchange for all the incentives promised (Gaietta 2016: 103). On the other side, the Iranians expressed their frustration since the EU3/EU were not able to keep their promise and hold "substantive, quick and realistic negotiations" with Teheran (Dombey 2004). Indeed, after the conclusion of the *Paris Agreement*, Rouhani believed that the duration of the suspension was linked to the duration of the negotiations. "And as I said before, when we say the duration of the negotiations, we are talking about a few months. There is no talk of years" (NTI 2004). Still, despite the dissatisfaction, on January 17, 2005, the Iranian delegation presented to the EU3/EU a complete package of 33 articles within the Political and Security Working Group (Davenport 2017). Such a proposal envisaged inter alia (Mousavian 2008: 161):

1. full cooperation on major security matters including terrorism;
2. the elimination of all WMD in the Middle East and controls of WMD technologies;
3. Iran's commitment not to pursue WMD and the full implementation of all WMD conventions;
4. exchanging intelligence and combating organized crime and drug trafficking;
5. the general peace and stability of the Persian Gulf.

Nevertheless, the offer was dismissed by the EU High Representative Javier Solana since it did not "provide concrete guarantees that its program had only peaceful ends" (Dombey 2004).

On January 20, 2005, the Bush Administration began its second term in office. In his State of the Union, George W. Bush reaffirmed the American position towards Iran: "We are working with European allies to make clear to the Iranian regime that it must give up its uranium en-

richment program and any plutonium reprocessing, and end its support for terror" (Weisman, Sciolino, Sanger 2005). Several weeks later, President Bush visited Europe to discuss the issue with his counterparts, particularly with German Chancellor Gerard Schroeder and French President Jacques Chirac, and to quell speculations over an American imminent attack against Iran's nuclear facilities (Fletcher, Richburg 2005). Following the visit, he expressed this willingness to join the European Union in offering the Islamic Republic a set of political and economic incentives, including Iran's membership in the WTO. This notable change in approach was the result of a tactical reflection that a united front on the nuclear issue – "carrots now and a stick later" – would have been more effective (Wright 2005).

At the IAEA meeting held in late February 2005, for the first time in two years, the nuclear program was not on the Board's agenda with no report delivered by the Director General, a fact that the Iranians promptly presented to the domestic public as a positive development. In this regard, on March 2, 2005, ElBaradei stated that the Agency was making "good progress" in verifying the program while underlining the need for Teheran to be "more transparent."[84] Though, the negotiation with the Europeans was not producing concrete "deliverables" since the Iranians wanted to resume some aspects of their nuclear operations as soon as possible (ElBaradei 2011: 143). So, on March 23, 2005, the Islamic Republic submitted another offer to the EU3/EU, providing an incremental and phased approach on the "objective guarantees" and the "firm guarantees" (Davenport 2017):

1. The limitation of the enrichment program, which should not exceed the number of 3000 centrifuges assembled, installed and tested at industrial FEP of Natanz, and a policy declaration of no reprocessing;
2. The resumption of the UCF by July 2005 and the conversion of all enriched uranium in fuel rods;
3. The ratification of the Additional Protocol and the implementation of a law banning permanently the development of nuclear weapons;
4. The implementation of monitoring measures during the negotiations, such as the voluntary implementation of the Additional Protocol and the continuation of IAEA inspections;
5. An EU declaration recognizing Iran as a major source of energy for Europe;
6. Iran's guaranteed access to advanced nuclear technology along with contracts for the construction of nuclear plants in Iran by the EU

[84] See IAEA, Safeguards in Iran: IAEA Chief Stresses Need for More Transparency, *Press Release*, March 2, 2005.

7. The normalization of Iran's status under G8 export controls regulations.[85]

Despite the important content of the proposal, which set a clear limitation to Iran's nuclear fuel cycle, the offer was turned down by EU3/EU. Specifically, the Europeans could not agree on the provisions concerning the resumption of the conversion activities (once again the issue of suspension was source of argument), whereas the Bush Administration strongly opposed any agreement that included Iran's right to enrichment (Mousavian 2012: 168-169). On the other side, with the imminent presidential elections scheduled for June 2005, the Iranian negotiators were under considerable political pressure, particularly from the conservative and radical forces, and wanted to send a strong message to the Iranian public opinion that the nuclear program was still ongoing (El-Baradei 2011: 143).

On April 29, 2005, Teheran issued a revised document that reiterated some of the items contained in the previous offer, although it focused more on short-term and confidence-building measures. The key points were the following (Davenport 2017):

1. Iran's adoption of the IAEA Additional Protocol;
2. Resumption of the conversion activities in Isfahan and a policy declaration of no reprocessing;
3. Enrichment suspension for six months and continuous presence of IAEA inspectors;
4. Establishment of joint task forces on counter-terrorism and export control;
5. A EU declaration recognizing Iran as a major source of energy for Europe.

Once again, the proposal was rejected by the EU3/EU since it did not provide satisfactory guarantees on the issue of suspension, conversion and non-diversion for military purposes.

In May 2005, the US Director of National Intelligence circulated a top-secret *National Intelligence Estimate* (NIE) *on Iran's Nuclear Intentions and Capabilities*, assessing "with high confidence" that Teheran was currently determined to develop nuclear weapons despite its international obligations and international pressure; it further assessed "with moderate confidence" that Iran was unlikely to make a warhead "before early-to-

[85] The group of 8 is a forum of major industrialized countries. Known as the G7 before the inclusion of Russia in 2008, it included United States, United Kingdom, Russia, Canada, France, Germany, Japan and Italy.

mid next decade."[86] Furthermore, given the heated electoral campaign, the Europeans decided to defer the discussions of a longer-term deal with the newly elected Iranian President, who many believed would have been the Chairman of the Expediency Council and former President Rafsanjani (Gaietta 2016: 104-105).

To express their disagreement with the pace of the talks and the lack of counter-proposal from the EU3/EU, on May 9, 2005, Iran announced the successful conversion of 37 tons of UF_6 into the UCF in Isfahan (Dareini 2005). Such a decision triggered a diplomatic crisis and new a round of negotiations in Geneva, which Teheran described as a "last chance" for the Europeans to offer adequate incentives for halting the resumption of its conversion and enrichment activities (AFP 2005a). In Geneva, the EU3/EU obtained two more months to present their final plan on the nuclear issue. Though, the Supreme Leader Khamenei warned that the elections would have not altered Iran's position, meaning that the permanent suspension would never been negotiated in the future (Gerami, Goldschmidt 2012: 12).

On June 25, 2005, the ultraconservative runner and former mayor of Teheran, Mahmoud Ahmadinejad (2005-2013), won surprisingly the ninth presidential elections with a landslide victory (62%) against the pragmatic candidate Rafsanjani.[87] Such an unexpected turn of events contributed to complicate the ongoing nuclear negotiations between Iran and the EU3/EU (Tait 2005). Indeed, during the electoral campaign, Ahmadinejad openly supported the program, labelled as a "result of Iranian people's scientific development", and accused the negotiators of being "traitors" (Sanger 2005). Moreover, the newly elected President further regarded both the *Teheran Declaration* and *Paris Agreement* to be worse than the Russian imposed treaties of Golestan (1813) and Turkmenchai (1828), which forced the Qajar dynasty to cede vast parts of territory in Southern Caucasus, considered the most humiliating agreements in the Iranian history (Mousavian 2012: 190). Therefore, the Europeans were strongly determined to reach a final deal before the resumption of the UCF in Isfahan and the formal inauguration of the new Presidency in

[86] See Office of the US Director of National Intelligence, Iran: nuclear intentions and capabilities, National Intelligence Estimate, November 2007.

[87] Mahmoud Ahmadinejad was born in 1956. During the Revolution, he was one of the student leaders who organized demonstrations. After the foundation of the Islamic Republic, he joined the Revolutionary Guards and fought in the Iraq-Iran conflict. Following the war, he served in various positions until 1993, when he was appointed governor of the Ardabil province. In early-2000s, he helped to establish the "Developers of an Islamic Iran" party and won the municipal elections in Teheran (February 2003). In May 2003, he was appointed Mayor of Teheran. In 2005, when he was still mayor, he announced his candidacy for the Presidential elections and was largely considered a political outsider. See BBC 2005a.

early August 2005. On July 18, 2005, Rouhani sent an official letter to the EU3/EU, offering (Davenport 2017):

1. The resumption of the conversion activities under the IAEA supervision;
2. The suspension of uranium enrichment for another two months;
3. Arrangements to import material for uranium conversion and the export of UF_6 to South Africa.
4. Negotiations for the industrial FEP and an optimized IAEA monitoring mechanism in Natanz.

The proposal was the last concession of the Iranian delegation, led by Hassan Rouhani, before Mahmoud Ahmadinejad was officially confirmed by the Supreme Leader (August 3) and formally sworn in (August 6). One more time, it was turned down by the European negotiators. On July 27, 2005, departing President Khatami warned "whether the Europeans mention our right [to the peaceful nuclear technology] in their would-be proposals or not, we will definitely resume work in Isfahan … the decision to start activities in Isfahan had already been made by the ruling system" (Fathi 2005). Indeed, the European inflexibility and endless refusal to the Iranian initiatives had convinced the Supreme Leader, who had lost his patience and believed that Iran should have not compromised anymore, to make a drastic change in policy and approach (Patrikarakos 2012: 217).

On August 1, 2005, in line with the proposal delivered in March 2005, Iran informed the IAEA about its decision to resume the conversion activities.[88] It was the end of the *Paris Agreement*. On August 2, the Governments of France, Germany and Great Britain reacted by issuing a joint statement: "were Iran to resume currently suspended activities, our negotiations would be brought to an end, and we would have no option but to pursue other courses of action."[89] Though, this communication did not hinder the EU3/EU to put forward, on August 5, the *Framework for a Long-Term Agreement*, a complete package of political and economic incentives meant to solve the nuclear standoff with Iran (Traynor 2005). According to the proposal, whose content was mainly drafted by the French delegation and delivered in advance to the Iranians, the European were ready to take the following steps (Davenport 2017):

1. Arrangements for the long-term supply of light-water reactors and their nuclear fuel;

[88] See IAEA, Communication dated 1 August 2005 received from the Permanent Mission of the Islamic Republic of Iran to the Agency, *IAEA*, INFOCIRC/648.

[89] See IAEA, Communication dated 2 August 2005 received from the Permanent Missions of France, Germany and the United Kingdom to the Agency, International Atomic Energy Agency (IAEA), INFCIRC/649.

2. The joint construction of a research reactor and related scientific activities;
3. Establishment of a buffer store of the nuclear fuel located in a third country;
4. EU recognition of Iran as a long-term source of fossil fuel energy for Europe;
5. EU-Iran collaboration in a variety of political-security areas, including Iraq and Afghanistan, terrorism and drug trafficking;
6. Iran's access to international markets and the continued support for the accession to World Trade Organization;
7. The strengthening of economic cooperation in key sectors, including civil aviation.

In return, the Islamic Republic was required:

1. To suspend all enrichment related and reprocessing activities and to continue suspension for the duration of negotiations;
2. To make a 10 years-commitment not to pursue fuel cycle activities other than the construction and operation of light water power and research reactors; this request implied the suspension of all mining, milling, conversion and enrichment activities with the shut-down of all major sites.
3. To solve all questions raised under the Safeguards Agreement and Additional Protocol, and continue cooperation with the IAEA, with all facilities under safeguards under all circumstances.
4. To ratify the Additional Protocol by the end of 2005 and to fully implement it in the meantime.
5. To make a legally-binding commitment not to leave the NPT.[90]

Given the degree of the requests, the Foreign Ministry Spokesman, Hamid Reza Asefi, judged the offer as "inacceptable" mainly because "Iran's right to enrich uranium was not included" (BBC 2005b). He further stated that Iran would have never accepted such a restriction and noted that what was previously agreed was a "suspension" and not a "cessation" of the enrichment activities (Meier 2013: 7). Moreover, the *Framework for a Long-Term Agreement* was further criticized by El-Baradei. In his 2011 memoir, he considered the proposal "meagre", with a "patronizing tone, bordering on arrogant." Not only the EU3/EU refused to offer complete nuclear power technology to Iran – the French company Areva was unwilling to jeopardize its relations with

[90] See IAEA, Communication Dated 8 August 2005 Received from the Resident Representatives of France, Germany and the United Kingdom to the Agency, *IAEA*, INFCIRC/651.

the United States – but in contradiction with the deals of Teheran and Paris, it translated the obligation to provide "objective guarantees" into a ban on fuel nuclear cycle activities (ElBaradei 2011: 144). This was a considerable strategic mistake, which marked the definitive failure of the European diplomatic intervention.

On August 7, the IAEA Board held an emergency meeting on the Iranian nuclear crisis. The Director General requested "all parties to exercise maximum restraint, to desist from taking any unilateral action and to try to go back to where we were a week ago."[91] Though, one day later, ElBaradei confirmed that Iran had started to feed uranium ore concentrate into the first part of the process line at the UCF in Isfahan.[92] The EU3/EU warned the Islamic Republic that "any such resumption of currently suspended activities, including uranium conversion, will only further heighten international concern about the real objective of Iran's nuclear program."[93] The same day, President Ahmadinejad appointed the hardliner, Ali Larijani, who replaced the resigning Rouhani, as Secretary of the SNSC and chief negotiator of the Iranian delegation.[94]

On August 10, 2005, the Board of Governors adopted a resolution, urging Iran to re-establish full suspension of all enrichment related activities and to re-instate the IAEA seals that had been removed at uranium conversion facility in Isfahan. The resolution further requested the Director General to provide a comprehensive report on the implementation of Iran's NPT Safeguards Agreement by September 3, 2005.[95] The nuclear dossier was once again in the Board's agenda. The Iranian negotiator and adviser of the Foreign Minister, Cyrus Nasseri, reacted with a declaration, clarifying Teheran's position concerning nuclear en-

[91] See IAEA Director General, IAEA Chief Briefs Press on Iran, *Press Release*, August 9, 2005.

[92] See IAEA Director General, Iran Starts Feeding Uranium Ore Concentrate at Uranium Conversion Facility, *Press Release*, August 8, 2005.

[93] See Communication dated 8 August 2005, INFCIRC/651.

[94] Ali Larijani was a conservative politician close to Khamenei. From 1992 to 1994, he served as Minister of Culture and Islamic Guidance. In 1994, he was appointed head of national broadcasting, which he directed until 2004. In 2004, he affirmed that the nuclear negotiation team had exchanged "a pearl for a lollipop." The new negotiating team included Hossein Mousavian, the only member of the previous team, and two members of the SNSC, Ali Monfared and Ali Hosseini-Tash, respectively Brigadier General and Commander of the Islamic Guard Corps. See Fathi, Brinkley 2005. See also Gaietta 2016: 113.

[95] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran and related Board resolutions, Resolution adopted on 11 August 2005, BOG/2005/64, paragraph 3 and 5.

ergy and the WMD. In one of his last statements before being arrested on false corruption charges, Nasseri affirmed:[96]

> The Leader of the Islamic Republic of Iran, Ayatollah Ali Khamenei has issued the fatwa that the production, stockpiling, and use of nuclear weapons are forbidden under Islam and that the Islamic Republic of Iran shall never acquire these weapons. President Mahmoud Ahmadinejad, who took office just recently, in his inaugural address reiterated that his government is against weapons of mass destruction and will only pursue nuclear activities in the peaceful domain.[97]

The *Paris Agreement* was officially dead and all parties were ready to enter the second nuclear crisis with a more confrontational attitude.

[96] Cyrus Nasseri was arrested in August 2005 for a scandal regarding the exploitation of the South Pars natural oil field. See Jefferson 2005. See also Naseri 2005.

[97] The fatwah was issued by Khamenei in September 2004. See Sabouri 2016.

CHAPTER 5

THE SECOND NUCLEAR CRISIS (2005-2008)

1. Toward the UN Security Council

On September 2, 2005, the Director General circulated a new confidential document on the implementation of the safeguards in the Islamic Republic. In his report, ElBaradei focused on all Iran's past violations and developments since November 2004 concerning the two remaining outstanding issues: the origin of LEU and HEU particle contamination and the chronology of the centrifuge enrichment activities. With respect of the first, the Agency tended to support Teheran's statement about the foreign origin of most of the observed HEU contamination. However, the IAEA was unable to draw a definitive conclusion on the LEU contamination and could not verify Iran's declaration regarding the centrifuge program. With this respect, given the repeated requests, Teheran failed to deliver additional information on a range of activities and did not provide access to the sites and the dual use equipment in Lavisan-Shian and Parchin. Thus, ElBaradei assessed, the Agency's legal authority to pursue the verification of possible nuclear weapons related activity was "limited" and, after two and a half years, was still not in a position to conclude that there were "no undeclared nuclear materials or activities in Iran."[1]

Few weeks later, on September 17, 2005, President Ahmadinejad visited New York for the UN High-Level Ministerial Week, where he addressed the General Assembly (Brinkley 2005). It was the first important international test for the new Administration and its President. It was a disaster. Regardless of any diplomatic courtesy and etiquette, Ahmadinejad launched a wide aggressive rhetoric attack with a style that would have become sadly known in the years yet to come:[2]

[1] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, September 2, 2005, GOV/2005/67, pp. 11-12.

[2] See Permanent Mission of Iran, Address by H.E. Dr. Mahmood Ahmadinejad President of the Islamic Republic of Iran before the Sixtieth Session of the United Nations General Assembly New York, 17 September 2005.

Michele Gerli, *Beyond Nuclear Ambiguity. The Iranian Nuclear Crisis and the Joint Comprehensive Plan of Action*,
ISBN (online PDF) 978-88-6453-865-5,

> Ironically, those who have actually used nuclear weapons, continue to produce, stockpile and extensively test such weapons, … blatantly violate their obligations under the NPT, have refrained from signing the CTBT and have armed the Zionist occupation regime with WMDs, are not only refusing to remedy their past deeds, but in clear breech of the NPT, are trying to prevent other countries from acquiring the technology to produce peaceful nuclear energy.

While reaffirming Iran's commitments on the peaceful use of nuclear energy and religious prohibition on nuclear weapons, the President further criticized the non-proliferation regime, mainly the failure of Article IV of the NPT, and any attempts to impose a nuclear "apartheid":

> How can one talk about human rights and at the same time blatantly deny many the inalienable right to have access to science and technology with applications in medicine, industry and energy and through force and intimidation hinder their progress and development? Can nations be deprived of scientific and technological progress through the threat of use of force and based on mere allegations of possibility of military diversion?

As a further confidence-building measure, Ahmadinejad proposed "a partnership with private and public sectors of other countries in the implementation of uranium enrichment program" (AP 2008). Finally, "in keeping with Iran's inalienable right to have access to a nuclear fuel cycle," he expressed the readiness to continue the technical and legal cooperation with the Agency.[3]

The speech disgusted the Europeans and contribute to fade away any residual hesitation over Iran's referral to the Security Council, which was to be discussed in Vienna later that month. At the IAEA Board meeting (September 19-24, 2005), the EU3, supported by the United States, Australia, Canada, Japan and other like-minded member States (e.g. India and South Korea), presented a draft resolution calling for the Islamic Republic to be referred to the UNSC. Such an initiative was opposed by both Russia and China, that partially succeeded in tempering the wording by removing all references to referral. At the end, with the abstention of Moscow and Beijing, the Board passed a resolution, the first adopted by vote against the "Spirit of Vienna" (22 ayes, 12 abstentions and 1 nay), stating that Iran's many failures and breaches of its obligations to comply with the Safeguards Agreement constituted "non-compliance in the context of Article XII.C of the Agency's Statute

[3] See Permanent Mission of Iran, Address by H.E. Dr. Mahmood Ahmadinejad President of the Islamic Republic of Iran before the Sixtieth Session of the United Nations General Assembly New York, 17 September 2005.

(paragraph 3.1)."[4] The text found also that the history of concealment, the nature of the activities and the resulting absence of confidence that the program was exclusively for peaceful purposes had given "rise to questions that are within the competence of the Security Council." In conclusion, the Board urged Iran:[5]

1. To implement transparency measures, which extend beyond the formal requirements of the Safeguards Agreement and Additional Protocol, and to include access to individuals, documentation relating to procurement, dual use equipment, certain military workshops and research and development locations;
2. To re-establish full and sustained suspension of all enrichment and reprocessing activities,
3. To reconsider the construction of a research reactor moderated by heavy water;
4. To promptly ratify and implement in full the Additional Protocol and, pending ratification, to continue to act in accordance with its provisions.

In case of failure to comply, the Board would decide the timing and content of the report required under Article XII.C, thus referring the Islamic Republic to the UN Security Council (Langenbach, Olberg, Du Preez 2005). As stated by ElBaradei, such a threat was meant to persuade Teheran to resume suspension (ElBaradei 2011: 146). However, the Iranians would have reacted by raising the stakes.

Following the adoption of the resolution, Foreign Minister Manouchehr Mottaki, who replaced Khamal Kharrazi on August 25, 2005, reacted by stating that Iran would end its adherence to the Additional Protocol and cancel the "voluntary and temporary concessions," such as the suspension of the enrichment-related facilities, "unless the resolution was corrected and if there was no insistence on its implementation" (Kerr 2005b). Similarly, other conservative representatives stated that Iran should have withdrawn from the NPT in case of referral (BBC 2005c). Five days later, on September 28, the *Majilis* adopted a draft law that called the government to suspend the implementation of the Addi-

[4] The "Spirit of Vienna" is a customary practice, according to which all Board's decision are taken by consensus. The countries who voted in favor were: Argentina, Australia, Belgium, Canada, France, Ecuador, Germany, Ghana, Hungary, India, Italy, Japan, Netherlands, Peru, Poland, Portugal, Singapore, Slovakia, South Korea, Sweden, United Kingdom, and United States. The countries who abstained were Algeria, Brazil, China, Mexico, Nigeria, Pakistan, Russia, South Africa, Sri Lanka, Tunisia, Vietnam, and Yemen. Venezuela was the only country who voted against.

[5] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran and related Board resolutions, Resolution adopted on September 24, 2005, GOV/2005/77, paragraphs 1, 2 and 4.

tional Protocol and the inspections in case of referral to the UNSC or "until the Iran's legitimate right to pursue nuclear technology" was acknowledged (AP 2005).

In October 2005, the EU3 Foreign Ministers expressed their interest in resuming negotiations with the Islamic Republic within the framework of the *Paris Agreement*, according to which talks would have proceeded after the suspension of all activities related to the nuclear fuel cycle. The Iranian officials replied positively, although they clarified that they would have returned to the negotiation table only in the absence of any precondition (no "zero enrichment" formula) and with the recognition of the "natural, national and legal rights" to full nuclear cycle technologies (Langenbach, Olberg, Du Preez 2005). Moreover, to facilitate such resumption of talks, they provided the Agency with sensitive documents, allowed for greater access in Parchin and enabled the IAEA inspectors to interview two individuals involved in the discussions with the proliferation network of Khan.[6] Though, the unfortunate speech of Ahmadinejad on the annihilation of Israel "Zionist" regime, given on October 26, contributed to undermine these efforts and to increase pressure on Iran (MacAskill, McGreal 2005). On November 4, 2005, Russia delivered to the Islamic Republic an offer, which seemed in line with the speech made by President Ahmadinejad in his address to the UN General Assembly (Davenport 2017):

1. The establishment of a joint uranium-enrichment plant located in Russia;
2. The continuation of conversion activities at the UCF in Isfahan;
3. The suspension of the other phases of the nuclear fuel cycle in Iran.

The proposal, which would have transferred the most important part of the nuclear fuel cycle abroad, was unanimously rejected by Iran's Supreme National Security Council. Though, with the approaching of the Board meeting (November 24) and the risk of losing Russia's support, the Iranians decided to reply with interest and invite the Europeans to resume negotiations (Mousavian 2012: 217). On November 18, 2005, the Director General issued the eighth confidential report on implementation of the NPT safeguards in the Islamic Republic. The report disclosed new worrying information regarding the possible military dimension (PMD) of Iran's program. Specifically, in a technical meeting with the IAEO officials, the Agency was provided with a series of documents, date from the late 1970s to the late 1980s, acquired by intermediaries belonging to the procurement network of Abdul Qadir Khan. Among all

[6] See IAEA Director General, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, November 18, 2005, GOV/2005/87, pp. 2, 4.

the material shown, there was a 15-pages document, probably disclosed by mistake, describing the procedural requirements for "the casting and machining of enriched, natural and depleted uranium metal into hemispherical forms," which was unequivocally related to the construction of a weapon.[7] Following the discovery of some experiments conducted with Polonium-210 (early 2004), one more time the IAEA found other credible evidence on the military dimension of the program.[8] Still, the Iranian authorities replied that the "uranium metal document" was provided on the initiative of procurement network, that must have included erroneously with the other documentation on the P-1 centrifuges in 1987, and not at the request of the AEOI authorities.[9]

Despite the worrying finding, on November 24, 2005, the IAEA Board decided once again to defer Iran's referral to the UNSC in order to give Moscow more time to explore the proposal on the establishment of joint uranium-enrichment plant in Russia. Given the implications of the offer, the United States and the EU3/EU further expressed their support to the Russian plan. However, in the effort to buy time, the Iranians would have dragged their feet until early-March 2006, when they formally rejected the offer of transferring all enrichment activities abroad (AP 2008).

On January 3, 2006, the Islamic Republic informed the Agency of its intention to resume from 9 January "those research and development (R&D) on the peaceful nuclear energy program which has been suspended as part of its expanded voluntary and non-legally binding suspension."[10] The official communication was followed one week later by the removal of the IAEA seals on enrichment equipment and material at Natanz and other related locations (BBC 2006a).

This decision was probably the result of several factors. The first was the popularity within the public opinion. According to a survey conducted in late January 2006 by the *Iranian Students Polling Agency*, 85.4 % of the Iranians interviewed backed the continuation of the program (Herzog 2006). Moreover, as it was assessed by ElBaradei: "No tangible progress was in sight. Iran was feeling bold: oil prices were high; China was dependent on Iranian oil and gas; and Russia, still constructing the reactor at Bushehr, was concerned at maintaining its good relations with neighbouring Iran" (ElBaradei 2011: 191).

[7] See IAEA Director General, GOV/2005/87, p. 2.

[8] The combination of a neutron detonator with two or more hemispheres – necessary to keep the high-enriched uranium sub-critical – creates a nuclear bomb. See Jha 2003.

[9] See IAEA Director General, GOV/2005/87, p. 3.

[10] See IAEA, Iran To Resume Suspended Nuclear Research and Development, *Press Release*, January 3, 2006.

Therefore, the Iranian authorities believed that referral to the UNSC was only a "political bluff" and that it would never take place (Mousavian 2012: 189, 221). They further imagined that there would be no negative repercussions, that the European partners would soon resume the nuclear negotiations and would agree on a moratorium on industrial scale enrichment (ElBaradei 2011: 192). This was a terrible mistake.

On January 10, 2006, the Director General expressed serious concern about Iran's decision.[11] Similarly, White House Spokesman Scott McClellan said that Teheran was risking a "nuclear escalation." He added: "If Iran continues on this path and we realize that the negotiations have run their course, I think the international community is prepared to move to the next step."[12] On the same page, the Governments of France, Germany and United Kingdom condemned Iran's decision by issuing a joint communication: "we believe the time has now come for the Security Council to become involved to reinforce the authority of IAEA Resolutions."[13] Immediately, the Iranian officials threatened to block IAEA inspections and to end all voluntary cooperation with the Agency; they further exhorted the Europeans to resume negotiations (Anderson, Deane 2006). Few days later, the IAEA Board announced a special meeting to be held on February 2, 2006.

On January 30, the Foreign Ministers of China (Li Zhaoxing), France (Michel Barnier), Germany (Frank-Walter Steinmeier), Russia (Sergey Lavrov), the United Kingdom (Jack Straw), the United States (Condoleezza Rice) and the EU High Representative (Javier Solana) met in London to discuss the following steps to be adopted at the upcoming session in Vienna. Following intensive discussions, the Ministers reached a common stance towards the Iranian crisis. It was the birth of the P5+1 (or often labelled as EU3+E3), the five UNSC Permanent Members plus Germany. Specifically, the P5+1 decided to take the following steps:[14]

1. Underlined their commitment to the NPT and determination to prevent the proliferation of nuclear weapons;
2. Called on Iran to restore in full the suspension of enrichment-related activity, including R&D, under the supervision of the IAEA;
3. Agreed that the extraordinary IAEA Board meeting should report to the Security Council its decision on the steps required from Iran,

[11] See Press Briefing by Scott McClellan, *The White House*, January 10, 2006.

[12] See IAEA, Iran Begins Removal of IAEA Seals at Enrichment-related Locations, *Press Release*, January 10, 2006.

[13] See IAEA, Communication dated 13 January 2006 received from the Permanent Missions of France, Germany and the United Kingdom to the Agency, *IAEA*, INFCIRC/662, January 18, 2006.

[14] See IAEA, Foreign Ministers Issue Statement on Iran, *Press Release*, January 31, 2006.

and should also report to the Security Council all IAEA reports and resolutions, as adopted, relating to this issue;
4. Agreed that the UNSC should await the Director General´s report to the March Board meeting;
5. Confirmed their resolve to continue to work for a diplomatic solution to the Iran problem.

The position of the P5+1 was later translated in the Board resolution that was adopted on February 4, 2006.[15] Once again, the text was passed by vote with an overwhelming majority (27 ayes, 3 nays and 5 abstentions).[16] Venezuela, Syria and Cuba were the only NAM members who voted against Iran's referral to the UNSC, while Colombia and Egypt, that had recently joined the BOG, decided to vote in favour. Other States, such as Russia, China, Brazil, Sri Lanka and Yemen, who had abstained in September 2005, changed their stance and supported the resolution. It was the definitive end of the unity of the NAM on the Iranian nuclear crisis (Ogilvie-White 2007: 468-473). As expected, President Ahmadinejad reacted with firm anger and, in line with the law adopted in September 2005, ordered the suspension of the voluntary implementation of the Additional Protocol starting from February 6, 2006. He further specified that the future collaboration with the IAEA would have been based only on the obligations under the NPT Safeguards Agreement. Meanwhile, the AEOI officials announced the resumption of the enrichment activities in Natanz (Anderson, Kessler 2004). Four days later, during the celebrations for the 27th anniversary of the Islamic Revolution, President Ahmadinejad gave a solemn speech, in which he reaffirmed his position concerning the nuclear issue. In front of thousands of cheering Iranians, he stated (CNN 2006): "So far, the Islamic Republic of Iran has been after nuclear research based on the NPT and within the rules of the IAEA, but if you want to violate the Iranians' right with the same regulations, you should know that the Iranians would revise their policies".

Although he assured that Iran would have not withdrawn from the NPT, the government would have realized enrichment not though negotiations, but through resistance. It was the beginning of the "confron-

[15] See IAEA Board of Governors, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran and related Board resolutions, Resolution adopted on February 4, 2006, GOV/2006/14.

[16] States that voted for the February 2006 resolution: Argentina, Australia, Belgium, Brazil, Canada, China, Colombia, Ecuador, Egypt, France, Germany, Ghana, Greece, India, Japan, Norway, Portugal, Russian Federation, Singapore, Slovakia, Slovenia, South Korea, Sri Lanka, Sweden, United Kingdom, United States and Yemen. States who voted against: Cuba, Syria, Venezuela; States who abstained: Algeria, Belarus, Indonesia, Libya, South Africa.

tational diplomacy" of the Ahmadinejad Administration (Haji-Yousefi 2010).

2. Resolution 1696 (2006)

On February 27, 2006, in accordance with the Board resolution adopted in early-February, the Director General issued a new document on the implementation of safeguards. In his report, ElBaradei reiterated the measures meant to solve all pending issues and described the new developments since November 2005. In this regard, the IAEA conveyed the results of the environmental samples collected in Parchin and confirmed the lack of nuclear material. Moreover, in early 2006, the Agency was provided with additional documentation on the Iran's effort to acquire dual use items at the PHRC within the military facility of Lavisan-Shian.[17] Similarly, the IAEA invited the Iranian authorities to discuss some information related to three "alleged studies" with potential nuclear applications (Porter 2010). The projects were contained on a laptop, obtained in early 2004 by the US Intelligence from an anonymous source and shared in late 2005, and regarded (Broad, Sanger 2007): the drawing for the construction of an underground plant to produce UF_4 (the "Green Salt Project"); the blueprint of a tunnel designed to test high explosives; and the procedures needed to modify the nose cone of a medium-range ballistic missile (Shahab-3) (Gaietta 2016: 108). Although the Iranian officials dismissed the alleged studies as "issues related to baseless allegations," all these elements, if taken together, were pointing to a nuclear weapons program. Finally, the Director General reported the state of the enrichment activities resumed in Natanz. With this respect, the AEOI started the installation of 3000 centrifuges at the industrial FEP and started enrichment by testing a 10-machine and 20-machine cascades at the PFEP of Natanz. In conclusion, ElBaradei reaffirmed that, given the inadequacy of information on the P-2 centrifuges, the existence of a generic document on the fabrication of nuclear weapon components and the lack of clarification about the role of the military in the nuclear program, the Agency could not confirm that there was no undeclared nuclear materials or activities.[18] As a result, on March 8, 2006, during the regular session of the Board, the Director General transmitted the report to the UNSC, which began closed-door consultations on

[17] See IAEA Director General, Implementation of NPT Safeguards Agreement in the Islamic Republic of Iran, 27 February 2006, GOV/2006/15, p. 7.

[18] See IAEA Director General, GOV/2006/15, pp. 8-9.

March 17.[19] The same day, the SNSC agreed to have bilateral talk with the United States on Iraq. It was the second time since 1979 – the first offer was made in May 2003 and was rejected by Washington (chapter 4, paragraph 1) – that the Iranians proposed a direct negotiation with the United States (Knickmeyer, Branigin 2006).

On March 29, 2006, the President of the Security Council issued a Statement, a non-binding document, on the Iranian nuclear dossier:[20]

1. The Security Council expressed "serious concern" about Iran's decision to resume enrichment-related activities, including research and development, and to suspend cooperation with the IAEA under the Additional Protocol.
2. It called upon Iran to take the steps required by the IAEA Board of Governors to build confidence in the exclusively peaceful purpose of its program and to resolve all outstanding issues.
3. It expressed the importance of re-establishing full and sustained suspension of all enrichment-related and reprocessing activities, including R&D, to be verified by the IAEA.
4. Finally, it requested the Director General to put forward in 30 days a report on the process of Iranian compliance with the steps requested by the IAEA Board.

Given the lack of binding resolution under chapter VII of the UN Charter ("Action with respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression"), the members of the P5+1 embraced a strategy of "wait and see." This approach was strongly suggested by Moscow and Beijing and was meant to ease the continuation of the talks based on the Russian proposal. However, once again the confrontational declarations of President Ahmadinejad contributed to complicate the process. On April 11, 2006, in the holy city of Mashhad, he triumphally declared that Iran had joined "the club of the nuclear countries" possessing nuclear technologies as it had succeeded in enriching uranium to the level needed for industrial power reactors (Tait, MacAskill 2006).

More specifically, the head of the AEOI Aghazadeh stated that Iran had stockpiled 110 tons of UF_6, injected in the first unit of 164 centrifuges at the PFEP, and enriched uranium to 3,6% (The Guardian 2006).

These developments were communicated by the Director General in his report to the IAEA Board and the Security Council, issued on April 28, 2006, in which ElBaradei confirmed Iran's non-compliance with the

[19] See IAEA, Report on Iran's Nuclear Programme Sent to UN Security Council, *Press Release*, March 8, 2006.

[20] See UN, Statement by the President of the Security Council, S/PRST/2006/15, March 29, 2006.

measures requested by the UNSC Presidential Statement.[21] The P5+1 held a new round of discussions in Paris and New York, where the United States, the United Kingdom and France presented a new draft resolution under chapter VII of the UN Charter.[22] Nevertheless, the P5+1 could not agree on the further steps to be adopted in the shorter term.

On May 8, 2006, President Ahmadinejad sent a 18-pages letter to President Bush, in which he gave his perspective on the international situation, sharply criticizing the United States on a wide range of topics (Afghanistan, Iraq, abuses of detainees and support for Israel) and offering ways to move forward (WP 2006). Even if Iran considered the letter an important diplomatic initiative – the third since the Islamic Revolution – the Bush Administration dismissed the document (Vick, Lunch 2006) Similarly, during a meeting held with ElBaradei in May 2006, Ali Larijani reiterated Iran's interest in direct talks with Washington and conveyed the readiness to discuss not only the nuclear issue, but also other regional topics such as Iraq, Afghanistan, Hezbollah and Hamas (ElBaradei 2011: 194).

On May 9, 2006, the EU3 announced that they would put forward a revised package of multilateral incentives and began further consultations within the framework of the P5+1. This initiative was followed by the US withdrawal of any reservations regarding a direct negotiation with Teheran. Indeed, on May 31, Secretary of State Condoleezza Rice declared "as soon as Iran fully and verifiably suspended its enrichment and reprocessing activities, the United States will come to the table with our EU-3 colleagues and meet with Iran's representatives" (Cornwell 2006). Iran's Foreign Minister Mottaki replied with interest, but rejected the precondition of suspension (Tran 2006). The following day, the P5+1 agreed on a new proposal, which was largely based on the European *Framework for a Longer-Term Agreement* (August 2005) and the Russian plan (November 2005). The offer was further presented by Javier Solana in Teheran on June 6, 2006. On one side, the P5+1 would (Davenport 2017):

1. Reaffirm Iran's right to nuclear energy for peaceful purposes in conformity with the NPT;
2. Provide light-water reactors through joint projects, in line with the IAEA Statute and the NPT;
3. Include Teheran in an international consortium based in Russia and meant to enrich the UF_6 produced in Iran;

[21] See IAEA Director General, Implementation of NPT Safeguards Agreement in the Islamic Republic of Iran, GOV/2006/27, April 28, 2006.

[22] See UN, UN Security Council considers action on Iran's nuclear programme, *UN News Center*, May 3, 2006.

4. Establish a 5-year buffer stock of fuel under the supervision of the IAEA;
5. Cooperate on civil aviation, telecommunications, high-technology, agriculture and other areas;
6. Agree to suspend the discussion of Iran's nuclear program in the UN-SC based on the resumption of negotiations.

On the other side, Teheran was required to:
1. Commit to address all outstanding issues through full cooperation with the IAEA;
2. Suspend all enrichment-related and reprocessing activities to be verified by the Agency; suspension will continue for the duration of the talks.
3. Resume the Implementation of the Additional Protocol.

Finally, the P5+1 package envisaged the establishment of a multilateral mechanism to review this "moratorium" on suspension, which was based on two conditions (Mousavian 2012: 245-246):
1. The confirmation by the IAEA that all outstanding issues and concerns reported by the IAEA, including those activities with military nuclear dimensions, had been resolved;
2. The confirmation that were no undeclared nuclear activities or materials in Iran and the restore of the international confidence in the peaceful nature of Iran's nuclear program

The respect of these conditions would be difficult and time consuming, paving the way to an indefinite suspension of all enrichment related and reprocessing activities.

The reaction of the Iranians to the multilateral offer was elusive and ambiguous (Kerr 2006). Even if in mid-June President Ahmadinejad regarded the package as a "step forward", no official answer was given (BBC 2006b). Following the persistent requests of the P5+1 to provide a response by the end of June 2006, the President stated that Teheran would hopefully reply by late August (NYT 2006). Therefore, the delay and the Iranian stalling approach was regarded with suspicion. On one hand, the Bush Administration and others believed that Iran would use the time to enhance its enrichment capacity. On the other, the IAEA Director General considered the request for more time as the result of the slow pace of Iran's domestic decision making and checks and balances (ElBaradei 2011: 197).

Anyway, after a new inconclusive meeting between Solana and Larijani, on July 12, the P5+1 expressed "profound disappointment" over the Tehran's refusal to suspend uranium enrichment and to respond to the generous package. In an attempt to convince the Iranians to accept the multilateral package, they threatened to return to the United Nations for punitive measures (Moore 2006).

The timing was terrible. The same day, after eight Israeli soldiers had been killed and two captured, the Israeli Defence Forces launched a wide-scale attack against Hezbollah in southern Lebanon, initiating a 34-days conflict that ended with 1,150 victims and 750,000 displaced (Hafez 2008). The discussion on the Second Lebanese War crossed the Iranian nuclear program at the Security Council, sparking strong criticism for the creation of double standard and treatment. In this regard, the US and the UK refused to consider Israel's actions under chapter VII of the UN Charter and would have opposed to a resolution calling for a cease-fire until August 11, 2006. "This war in Lebanon was not considered a threat to international peace and security but the laboratory-scale activity in Iran was," reacted with anger UN Secretary General Kofi Annan (ElBaradei 2011: 200). Indeed, following the persistent lack of an official reply from the Iranian side, on July 31, the UN Security Council had finally decided to pass a text under article 40 of the UN Charter.[23] According to resolution 1696, the UNSC:[24]

1. Called upon Iran without further delay to take the steps, which are essential to build confidence and resolve outstanding questions, as required by the IAEA BOG in its February 2006 resolution;
2. Demanded that Iran should suspend all enrichment-related and reprocessing activities, including R&D, to be verified by the IAEA;
3. Endorsed the proposals of the P5+1, with the support of the EU High Representative, for a long-term comprehensive arrangement;
4. Called upon all States to exercise vigilance and prevent the transfer of any items, materials, goods and technology that could contribute to Iran's enrichment-related and reprocessing activities and ballistic missile programs;
5. Requested by 31 August a report from the Director General of the IAEA primarily on whether Iran had established full and sustained suspension of all activities mentioned;
6. Expressed its intention, in the event that Iran had not by that date complied with this resolution, then to adopt appropriate measures under Article 41 of chapter VII of the Charter of the United Nations to persuade Iran to comply with this resolution and the requirements of the IAEA.

[23] Article 40 of chapter VII of the UN Charter stipulates: "In order to prevent an aggravation of the situation, the Security Council may, before making the recommendations or deciding upon the measures provided for in Article 39, call upon the parties concerned to comply with such provisional measures as it deems necessary or desirable. … The Security Council shall duly take account of failure to comply with such provisional measures." See UN, Charter of the United Nations, available online.

[24] See UN, Resolution 1606 (2006), S/RES/2006/1696, 31 July 2006.

Again, the Russian and Chinese reluctance towards sanctions convinced the P5+1 to embrace a gradual approach in the effort to force Iran to suspend enrichment and resume negotiations. Tough, as confessed by ElBaradei, "it was hard to imagine a less sensible, more divisive action than Resolution 1696." Given the ongoing inspections and the lack of any conclusive proof concerning the nuclear weapons program, the text was of dubious legality and the alleged "threat to international peace and security" seemed to be based on Iran's future intentions (ElBaradei 2011: 199). Still, resolution 1696 was a serious blow to the Islamic Republic (Mousavian 2012: 251-252). It designated the nuclear program as "threat to international peace and security"; it made suspension of enrichment, which was previously acknowledged as "voluntary and not legally binding," and the ratification of the Additional Protocol as mandatory; it included the ballistic program; it threatened to adopt sanctions under article 41 (measures not involving the use of armed force) of the UN Charter.[25] On August 22, 2006, Ali Larijani Iran presented a 21-page response to the P5+1 package, indicating that the Islamic Republic was willing to engage in "serious" and "constructive" talks but rejecting the unconditional suspension of enrichment as a precondition for negotiations (ISIS 2006). He further stated that Iran was willing to implement the Additional Protocol on a voluntary basis and to discuss the issue of suspension, but only during the negotiations with the P5+1. Finally, Larijani expressed the readiness to commit to a permanent membership to NPT in order to dispel fears of a "breakout scenario" in the style of North Korea (ElBaradei 2011: 204).

On August 26, President Ahmadinejad inaugurated the heavy-water plant in Arak, a site that the IAEA had repeatedly requested to reconsider, and reiterating Iran's nuclear ambitions (Dareini 2006). The following day, he awarded several scientists and technicians for their commitment in nuclear activities, thus challenging the international community – the UNSC deadline was approaching – and reinforcing the idea that nuclear technology was a matter of national pride (MEMRI 2006).

On August 31, 2006, in accordance with resolution 1696, the Director General issued a new report on the implementation of the safeguards, where ElBaradei confirmed Teheran's non-compliance with the actions requested by the Security Council. Moreover, he reported that the Agency had found traces of HEU on the equipment belonging to the Teheran

[25] Article 41 of chapter VII of the UN Charter dictates: "The Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, … These may include complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication, and the severance of diplomatic relations." See UN, Charter of the United Nations, available online.

Faculty of Technology, which was transferred to the PHRC in Lavisan-Shian.[26] Despite the deadline, in New York the P5+1 could not agree on the measures to be further adopted. The United States was calling for tough sanctions (Linzer 2006a); the members of the EU3 felt that dialogue was possible (Flicking 2006); Russia spoke against sanctions as a dead-end street, while China advised for more patience (ElBaradei 2011: 204). At the end, the P5+1 decided to appoint Javier Solana to conduct a new round of negotiations with Ali Larijani in Vienna scheduled for early September 2006.

3. Resolution 1737 (2006)

The discussions between Solana and Larijani started on September 9 and seemed quite promising (Dempsey 2006). On one hand, Iran was available to discuss a two months suspension as a voluntary, non-binding and temporary measure, during which it would not have launched new cascades for enrichment. On the other, the P5+1 would have suspended their efforts to pass a resolution under article 41 of chapter VII of the UN Charter and adopt sanctions against Iran (Ignatius 2007). This approach was denominated by ElBaradei "double suspension" or "freeze for freeze."[27] On September 20, 2006, the United States and the four partners agreed to set another deadline (early October) to give Solana more time to reach a compromise with the Islamic Republic (Kessler 2006). However, once again Teheran infringed the time limit and decided not to suspend enrichment. On October 3, Mohammad Saeedi, deputy chief of the AEOI, proposed France to create a consortium for the production of enriched uranium inside Iran through Eurodif and Areva (AP 2006). The US and the EU3 rejected the plan, claiming that was a "stalling technique" that seemed to have the intention of "distracting" from the UNSC request to suspend enrichment activities (Sciolino 2006). With this respect, on October 24, the Director General confirmed that Iranian technicians had assembled the second line of 164 centrifuges at the PFEP and were days away from using it (Linzer 2006b). Few weeks later, in a new report on the implementation of the safeguards, ElBaradei reported that the Agency had found new traces of high-enriched uranium and plutonium at a nuclear waste storage of Karaj and invited the AEOI authorities to provide further clarifications.[28]

[26] See IAEA Director General, Implementation of NPT Safeguards Agreement in the Islamic Republic of Iran, August 31, 2006, GOV/2006/53, p. 5.

[27] Areva is a French multinational group, owned by the French State (90%), specialized mainly in nuclear energy. See ElBaradei 2011: 243.

[28] See IAEA Director General, Implementation of NPT Safeguards Agreement in the Islamic Republic of Iran, November 14, 2006, GOV/2006/64, p. 3.

In early November 2006, the EU3 presented a new draft resolution within the Security Council, calling for punitive measures against Teheran, such as travel bans against Iranian officials, freezing all Iran's foreign assets, suspension and restriction of the IAEA's technical assistance. These actions were considered provocative and counterproductive by Russia and China, who suggested a steady approach and the adoption of "symbolic" sanctions under chapter VII (ElBaradei 2011: 210). On December 23, 2006, following intensive discussions between the P5+1 and the softening of the wording, the Security Council unanimously approved resolution 1737 (Gootman 2006). According to the text, adopted under Article 41 of chapter VII of the UN Charter:[29]

1. Iran should without further delay suspend all enrichment-related and reprocessing activities, including R&D, and work on all heavy water-related projects, including the construction of a research reactor moderated by heavy water, to be verified by the IAEA;
2. All States should "take the necessary measures to prevent the supply, sale or transfer … of all items, materials, equipment, goods and technology which could contribute to Iran's enrichment-related, reprocessing or heavy water-related activities, or to the development of nuclear weapon delivery systems;"
3. All States are called to freeze the assets of people associated with companies or involved in the nuclear and missiles programs, excluding those related to previous contractual commitments;
4. A special committee was established to follow up on the Iranian nuclear issue.The committee would be charged with seeking information about the economic exchanges between all countries and Iran; reviewing the cooperation between Iran and the Agency; creating a list of individuals, companies and institutions to be inspected or be subjected to sanctions; and with reporting every 90 days to the Security Council.
5. The UNSC requested within 60 days [February 21] a report from the Director General on whether Iran had established "full and sustained suspension of all activities mentioned in this resolution, as well as on the process of Iranian compliance with all the steps required by the IAEA Board and with the other provisions of this resolution;"
6. In the event Iran had not complied with this resolution, the UNSC should "adopt further appropriate measures under Article 41 of chapter VII of the Charter of the United Nations to persuade Iran to comply with this resolution and the requirements of the IAEA."

The resolution excluded the equipment and the nuclear fuel for light-water reactors, enabling Russia to continue the construction of the power

[29] See UN, Resolution 1737 (2006), S/RES/1737, December 23, 2006.

reactor in Bushehr. It further took out travels ban, although it requested all countries to inform the committee of the UNSC about the transit through their territories of any person or representatives of groups referred in the resolution (Mousavian 2012: 259-261). As for the individuals targeted, the document sanctioned, inter alia: the AOEI Vice President for Research and Development; the Director of the PFEP; the Construction Project Manager of the PFEP; the Operational Manager for the heavy-water research reactor; the Director of the Mesbah Energy Company; and the Director of the Aerospace Industries Organization (AIO). The resolution targeted also several societies involved in the production and testing of centrifuges (e.g. Kalaye Electric Company), the Mesbah Energy Company and three companies under the AIO. Though, at Russia's insistence, the AEOI, as well as AIO, were not affected (Gaietta 2016: 122).

Iran's Permanent Representative to the UN, Javad Zarif, condemned the initiative, declaring that "a nation was being punished for exercising its inalienable rights."[30] Similarly, the Foreign Minister Mottaki labelled the UNSC decision as illegal and against the Charter of the UN (Beaumont, Tait 2006). In Teheran, President Ahmadinejad dismissed the resolution as a "piece of paper" and warned that the sanctions would not prevent his country from developing its nuclear program (RFERL 2006). Likewise, on December 24, Iran's chief negotiator Larijani affirmed that Iran would start soon the installation of 3,000 centrifuges at the industrial fuel enrichment plant of Natanz (AFP 2005). On December 27, 2006, the *Majilis* adopted a new bill, which obliged the Government to review its cooperation with the Agency and required the President to accelerate the nuclear activities (Bozogmehr 2006). This initiative was followed in late-January 2007 by Iran's decision to bar 38 IAEA inspectors from entering the country (Karimi 2007). "If we had not yet reached a point of no return," concluded ElBaradei, "the stakes had been certainly raised" (ElBaradei 2011: 211).

4. Resolution 1747 (2007)

Following the adoption of resolution 1737, the negotiations for a diplomatic solution resumed at the initiative of the Director General. At the World Economic Forum held in Davos (Switzerland) in January 2007, ElBaradei re-proposed the "double suspension" or "time out."[31] In this

[30] See Statement by Mohammad Javad Zarif, Permanent Representative of the Islamic Republic of Iran before the Security Council 23 December 2006, *Iranian.com*, December 29, 2006.

[31] See IAEA, Dr. ElBaradei Calls for "Timeout" on Iran Nuclear Issue, *Press Release*, January 29, 2007.

regard, Iran would suspend the insertion of UF_6 in the centrifuges, which would continue spinning without feedstock material ("warm standby"), whereas the international community would interrupt the implementation of sanctions within the UN Security Council (ElBaradei 2011: 244). Although the P5+1 took into consideration the offer, the US and the EU3 were facing a huge deficit of trust. This feeling was further reinforced by the circulation of a new confidential report on the implementation of the safeguards, delivered in line with UNSC resolution 1737, where the Director General confirmed Iran's non-compliance with the February 21 deadline (Linzer, Lynch 2007). More specifically, ElBaradei reported the developments regarding Iran's enrichment capacities. Since November 2006, the Islamic Republic had continued to operate single machines, as well as the 10-, 24- and 164-machine cascades, and to feed UF_6 intermittently into these machines at the PFEP. Between November 2006 and February 2007, nearly 66 kg of UF_6 was declared by the AOEI officials as having been fed into the process and enriched to levels below 5%. Additionally, the Agency was informed that two 164-machine cascades were installed and were operating under vacuum (with no gas) and another two were in the final stages of installation. Finally, while reiterating the inability "to verify the absence of undeclared nuclear material and activities", the Director General concluded:[32]

> Iran has not suspended its enrichment related activities. Iran has continued with the operation of PFEP. It has also continued with the construction of FEP, including the installation of cascades, and has transferred UF6 to FEP. Iran has also continued with its heavy water related projects. Construction of the IR-40 Reactor, and operation of the Heavy Water Production Plant, are continuing.

These remarks convinced the P5+1 to negotiate further sanctions under article 41 of the UN Charter (Lynch 2007a). Moreover, at the IAEA session of March, the Board decided to freeze 22 out of 55 aid projects, thus downgrading the cooperation between the IAEA and the Islamic Republic (Heinrich, Strohecker 2007). On March 24, 2007, the UN Security Council unanimously approved resolution 1747. According to the new text:[33]

1. All States were called upon to exercise vigilance and restraint regarding the entry into or transit through their territories of individuals who were engaged in, directly associated with or providing support

[32] See IAEA Director General, Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolution 1737 (2006) in the Islamic Republic of Iran, February 22, 2007, GOV/2007/8, pp. 2-5.

[33] See UN, Resolution 1747 (2007), S/RES/1747, March 24, 2007.

for Iran's proliferation nuclear activities or for the development of nuclear weapon delivery systems;
2. "Iran should not supply, sell or transfer directly or indirectly … any arms or related materiel, and that all States shall prohibit the procurement of such items from Iran."
3. All States were called upon "to exercise vigilance and restraint in the supply, sale or transfer directly or indirectly … of any battle tanks, armoured combat vehicles, large calibre artillery systems, combat aircraft, attack helicopters, warships, missiles or missile systems."
4. All States and international financial institutions were called upon "not to enter into new commitments for grants, financial assistance, and concessional loans, to the government of the Islamic Republic of Iran, except for humanitarian and developmental purposes;"
5. The UNSC encouraged Iran to engage with the June 2006 proposals, presented by the P5+1 with the support of the EU High Representative.
6. It requested within 60 days a further report from the Director General on whether Iran had established full and sustained suspension of all activities listed in resolution 1737, as well as on the process of Iran's compliance with all steps required by the BOG and with resolution 1747.

The resolution targeted 28 new individuals, many of them belonging to the Revolutionary Guard Corps, as well as several entities associated with the military industry and Iranian banks (e.g. Bank Sepah and its subsidiary), that were not listed in the previous UNSC resolution (Gaietta 2016: 124). Once again, Iran reacted by raising the stakes. Foreign Minister Mottaki considered the decision as "unlawful, unnecessary and unjustifiable" and that "pressure and intimidation" would have not forced the Islamic Republic to abandon its right to develop nuclear energy under the NPT (Lynch 2007b). On 29 March 2007, the Iranian officials informed the IAEA that they had "suspended" the implementation of the modified Code 3.1, "accepted in 2003, but not yet ratified by the Parliament," and that they would have reverted to the implementation of the original version of it, which required the submission of design information for new facilities "normally not later than 180 days before the facility is scheduled to receive nuclear material (chapter, 3, paragraph 1)."[34] On April 9, 2007, during the celebrations of the "National Nuclear Technology Day", President Ahmadinejad solemnly declared that Iran

[34] See IAEA Director General, Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran, GOV/2007/22, May 22, 2007, p. 3.

had become among the countries of the world producing nuclear fuel on industrial scale.[35] This announce, which was regarded with skepticism by many members of the P5+1, was followed by another event linked somehow to the nuclear dossier: the arrest of Hossein Mousavian on espionage charges (April 30, 2007).[36]

The initiative was a political manoeuvre orchestrated by the Ahmadinejad Administration. Indeed, Mousavian had been deputy chief negotiator of Rouhani and was the only member of the previous negotiating team who retained his position in the nuclear delegation of Ali Larijani. Moreover, he supported a pragmatic approach in foreign policy and was very close to important personalities, such as Rafsanjani, Rouhani, Khatami and Karroubi, belonging to the pragmatic and reformist wing of the Iranian political spectrum (and all main competitors of Ahmadinejad). The arrest was a clear message meant to intimidate anyone who criticized the government and supported of a pragmatic negotiation with the P5+1, with a view to the parliamentary consultations of March 2008 and the presidential elections of 2009 (Mousavian 2012: 279-285).

5. The Work Plan

On May 23, 2007, the Director General issues a new document on the implementation of the safeguards in the Islamic Republic. In his report, he described once again the developments of Iran's enrichment activities and reported that the AEOI had installed nearly 1300 centrifuges with eight 164-machine cascades operating simultaneously. According to the Agency, this number would have increased during the year as two other similar cascades (320 centrifuges) were being tested under vacuum and three more (500 centrifuges) were under construction.[37] Finally, the report confirmed Iran's non-compliance with the measures requested by the UNSC (De Young 2007). Given the deadlock of the talks, ElBaradei pointed out all possible scenarios (ElBaradei 2011: 251):

1. Iran's return to zero enrichment and full suspension. This option seemed the most unlikely.

[35] The "National Nuclear Technology Day" was established by the Ahmadinejad Administration to praise the day in 2006, when the Iranian had succeeded in enriching uranium at 3,6% at the PFEP of Natanz. See Linzer 2007.

[36] Hossein Mousavian was a diplomat. He served as Iranian Ambassador to Germany (1990-1997). Later he was the head of the Foreign Relations Committee of the SNSC (1997-2005) and deputy chief nuclear negotiator (2003-2005). From 2005 to 2007, he served as foreign policy adviser to the Secretary of the SNSC, Ali Larijani. See Borger 2007.

[37] See IAEA Director General, GOV/2007/22, p. 2.

2. The international acknowledgment of a reduced program of R%D in exchange for a long suspension of industrial scale enrichment. Iran would have further allowed the IAEA to conduct robust inspections to be able to verify the absence of undeclared nuclear activities and to solve all outstanding issues.
3. The continuation of the status quo with new possible sanctions of the Security Council and the continuation of Iran's enrichment program towards the industrial scale level.
4. The use of military force against the nuclear facilities.

According to the Director General, the only available option was the second one. In an interview with «The New York Times», ElBaradei clarified his position and affirmed: "we believe they pretty much have the knowledge about how to enrich. From now on, it is simply a question of perfecting that knowledge. People will not like to hear it, but that's a fact." Therefore, he concluded,

> from a proliferation perspective, the fact of the matter is that one of the purposes of suspension – keeping them from getting the knowledge – has been overtaken by events. The focus now should be to stop them from going to industrial scale production, to allow us to do a full-court-press inspection and to be sure they remain inside the treaty (Sanger 2007a).

These declarations provoked the vocal reaction of the Bush Administration and of the newly elected French government of Nicolas Sarkozy, who both invited ElBaradei to keep a neutral stance as the Director General of the IAEA. However, once again the P5+1 decided to defer the adoption of new punitive measures and wait the outcome of a further round of negotiations between the EU High Representative and Iran's chief negotiator scheduled for May 31, 2007.[38] Even if Solana and Larijani could not agree on the challenging issue of suspension, the discussions resulted promising and suggested there were signs of agreement on the horizon.

On 24 June 2007, the Director General and Ali Larijani announced that Iran and the IAEA would start drafting a "work plan" meant to address all outstanding issues of the nuclear program within the following 60 days.[39] To reach this goal, as an act of goodwill, the Iranian authorities decided to issue one-year multiple entry visas for fourteen IAEA inspectors and accepted the designation of five additional ones. They further agreed with the request to inspect the IR-40 research reactor in Arak, which was visited by the inspectors at the end of July 2007.

[38] See *Larijani and Solana to meet on Thursday*, «Mehr News», May 27, 2007.

[39] See IAEA, IAEA and Iran Agree to Draft "Work Plan" to Address Nuclear Stand-Off, *Press Release*, June 22, 2007.

On August 21, following intense discussions and meetings, the IAEA and the Islamic Republic were able to reach an agreement on "the Modalities of Resolution of the Outstanding Issues."[40] The work plan was based on a three months agenda and intended to answer to all remaining ambiguities with a progressive approach, starting from the less complex issues (plutonium, P-1 and P-2 centrifuges, contamination at the Teheran Faculty of Technology) to the more challenging ones (uranium metal document, plutonium-210, the Gchine mine and "the alleged studies"). A few days later, in his report on the implementation of the safeguards in Iran, ElBaradei reported some good news. Given Teheran's increased cooperation – *de facto* equal to the implementation of the Additional Protocol – and the clarifications provided, he concluded that the Agency could resolve the issues concerning the plutonium separation tests and the contamination with high-enriched uranium at the TNRC and at the Karaj waste storage.[41] Later, at the September Board session, the Director General re-proposed the "double time-out" of both enrichment and sanctions as a possible framework for negotiations to be resumed.[42]

The work plan was a significant step towards a de-escalation of the nuclear crisis and an important diplomatic achievement of both ElBaradei and Larijani. Though, such initiative came immediately under heavy mediatic fire from Western partners, particularly the United States (Edelat, Shahabi 2007). On one hand, the Bush Administration feared that a drastic improvement in Iran's collaboration with the Agency would weaken the opportunity of new sanctions within the UN Security Council (ElBaradei 2011: 257-258). On the other, the Americans were under considerable pressure since several parties of the conservative establishment, as well as their allies (e.g. France), were seriously speculating over a military solution.[43] Most of all, in the aftermath of the Israeli strike against a Syrian nuclear plant (September 6), the second raid after Osirak in 1981 (chapter 1, paragraph 3), Washington feared that a military action would follow against the Iranian nuclear facilities (Sanger 2007b). As for the Europeans, they were concerned that the framework would allow the Iranians to sidestep the sanctions and the multilateral negotiations or even exit with

[40] See IAEA, Communication Dated 27 August 2007 from the Permanent Mission of the Islamic Republic of Iran to the Agency Concerning the Text of the 'Understandings of the Islamic Republic of Iran and the IAEA on the Modalities of Resolution of the Outstanding Issues', *IAEA*, INFCIRC/711.

[41] See IAEA Director General, Implementation of NPT Safeguards Agreement in the Islamic Republic of Iran, August 30, 2007, GOV/2007/48, pp. 2-3.

[42] See IAEA DG, Introductory Statement to the Board of Governors, *IAEA*, September 10, 2007.

[43] In August 2007, President Sarkozy called the Iranian nuclear stand-off "the greatest crisis" of current times, saying the world had "a catastrophic alternative: an Iranian bomb or the bombing of Iran." See Borger, Chrisafis 2007.

a "clean bill" (Meier 2013: 11). Therefore, the US and the EU3 openly accused ElBaradei of being a "free rider" and severely criticised the fact that he reached its "own" agreement with Iran without any consultations with the P5+1 and regardless the demands of the UNSC (suspension was not precondition of the framework) (WP 2007). Still, despite criticism, in late September the P5+1 endorsed the plan, urging Iran to "produce tangible results rapidly and effectively by clarifying all outstanding issues and concerns," and deferred discussions for new measures after the IAEA report of November (BBC 2007b).

As for the Iranians, despite the clear success, the work plan was the last diplomatic initiative of Ali Larijani. On October 20, 2007, the spokesman of the government, Gholam Hossein Elham, publicly announced his resignation and replacement with the deputy foreign minister, Saeed Jalili, a political ally and close friend of President Ahmadinejad (Wright 2007: 44). This manoeuvre, which contributed to reinforce even more the conservative establishment, was severely criticized by many, particularly by the Supreme Leader's adviser, Ali Akbar Velayati, who affirmed that it would be better if the resignation had not taken place at such a time of tensions (NYT 2007). Indeed, just few days later, the Bush Administration imposed new unilateral sanctions (Executive Orders 13382 and 13224) against three Iranian banks, including the largest (Bank Melli), and branded the Revolutionary Guards Corps a proliferator of weapons of mass destruction (Starr, Ighani 2014).

The real reason behind the removal/resignation of Larijani was probably the unsolvable differences with President Ahmadinejad. On one hand, Larijani was a moderate conservative (and potential competitor), who desired a pragmatic solution with the P5+1. On the other, Ahmadinejad was a supporter of an aggressive and idealistic stance with international community and, in several occasions, did not hesitate to contradict his chief negotiator (Mousavian 2012: 277-279).

6. The US National Intelligence Estimate

The departure of Ali Larijani did not hinder Iran's cooperation with the Agency and the implementation of the agreed work plan. Indeed, before the release of the IAEA report of November 2007, the Agency was provided with new supporting documentation concerning the centrifuge program, including the uranium metal document, and concluded that the information received was consistent with its finding.[44] The solution of

[44] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran, November 15, 2007, GOV/2007/58, pp. 2-5.

these outstanding issues allowed the Agency and the Islamic Republic to discuss more sensitive questions, from the nuclear activities involving polonium-210 to the three "alleged studies" with potential military applications. Such process was facilitated by the public disclosure (December 3, 2007) of a new US National Intelligence Estimate on Iran's Nuclear Intention and Capabilities. The NIE was issued by sixteen intelligence agencies belonging to the US National Intelligence Council and contributed to curtail the considerations contained in the previous estimate of May 2005 (chapter 4, paragraph 6) (MacAskill 2007). In this regard, the declassified document:[45]

1. Assessed with high confidence that until fall 2003, Iranian military entities were working under government direction to develop nuclear weapons. The program was halted primarily in response to international pressure, thus indicating that Iran's decisions followed a cost-benefit approach.
2. Judged with high confidence that the halt had lasted at least several years and assessed with moderate confidence Tehran had not restarted its nuclear weapons program as of mid-2007;
3. Continued to assess with moderate-to-high confidence that Iran did not have a nuclear weapon;
4. Judged with moderate confidence that the earliest possible date Iran would have been technically capable of producing enough HEU for a weapon was late 2009, although it was very unlikely;
5. Judged with moderate confidence Iran probably would have been technically capable of producing enough HEU for a weapon sometime during the 2010-2015-time frame. Though, all agencies recognized the possibility that this capability might not be attained until after 2015.
6. Judged with high confidence that Iran would have not been technically capable of producing and reprocessing enough plutonium for a nuclear weapon before about 2015.
7. Assessed with moderate confidence that convincing the Iranian leadership to forgo the eventual development of nuclear weapons would have been difficult given the linkage with Iran's key national security and foreign policy objectives and given the considerable effort from at least the late 1980s to 2003 to develop such weapons.

The publication of NIE had a significant impact on the international public opinion and contributed to dissolve the clouds of wars and the prospects of new imminent sanctions within the UN Security Council (Landau

[45] See Office of the US Director of National Intelligence, "Iran: nuclear intentions and capabilities", National Intelligence Estimate, November 2007.

2008). The Bush Administration, who only in October had suggested that a nuclear armed Iran could led to "World War III," reacted with a mixt of surprise and embarrassment and made an inexplicable attempt to minimize the new findings (Baker 2007). In this regard, the President considered the estimate a "warning signal" and a confirmation that Iran was still a threat (BBC 2007c). Similarly, the French Foreign Minister, Bernard Kouchner, argued that the US estimate would not affect the P5+1 position because the Islamic Republic remained in non-compliance with Security Council's demands (Meier 2013: 11). On the same page, the Israeli defence minister, Ehud Barak, affirmed that although the program was halted in 2003, "as far as we know it has probably since revived it" and warned that Israel was still considering the military option (McCarthy 2007).

On the other side, ElBaradei received the new NIE "with great interest" and affirmed that the new assessment was consistent with the IAEA's statements concerning the lack of concrete evidence of an ongoing nuclear weapons program or undeclared nuclear facilities in Iran.[46] Moreover, in his memoir, the Director General further confessed (ElBaradei 2011: 269): "it was a breath of fresh air. It validated the Agency's assessment of the Iranian nuclear threat and was a vindication of my past few years of vigorous advocacy for a diplomatic solution. As in the case of Iraq, the Agency's analysis and instincts had proved to be on target."

As for the Iranians, President Ahmadinejad declared victory over the United States and affirmed that the Islamic Republic would have continued ahead with its nuclear program (Reuters 2007). Given the resulting implications of the National Intelligence Estimate, the positive IAEA report of Iran's cooperation under the work plan and the increasing nuclear developments, Teheran was clearly in a position of strength. Nevertheless, it was only a temporary success. Indeed, even if the estimate diminished the chance of imminent punitive measures, still it confirmed that Iran had conducted in the past nuclear activities with military dimensions. The failure to provide a complete clarification to these issues, as well as the continuous refusal to accept suspension, would pave the way to a new round of sanctions.

7. Resolution 1803 (2008)

In mid-January 2008, the IAEA Director General conducted its sixth official visit to Iran. Accompanied by Deputy Director General, Heinonen, ElBaradei met with President Ahmadinejad, the new chief ne-

[46] See IAEA Director General, "Statement by IAEA Director General on New U.S. Intelligence Estimate on Iran", *Press Release*, December 4, 2007.

gotiator and Secretary of the SNSC Jalili, Foreign Minister Mottaki, the President of the AEOI Aghazadeh and with the Supreme Leader Ali Khamenei.[47] The last meeting was of particular significance. While reiterating that Iran would "never be brought to its knees," Khamenei rejected the possibility of renewed suspension of enrichment activities. He further expressed the readiness to implement the Additional Protocol – once the UN Security Council had returned the Iranian file to the Agency – and to engage with the West "on all issues of regional security and trade." In conclusion, he reaffirmed that the Iranian program had no military dimensions since it would have been against Islam (ElBaradei 2011: 273-274).

The visit was overall positive. The Iranians committed to discuss all outstanding issues in four weeks, particularly the ones with military applications, as established in the work plan (BBC 2008a). Though, few days later, the members of the P5+1 held informal discussions in Berlin and agreed on a new draft resolution under article 41 of the UN Charter, a move which was considered a tactic meant to increase the pressure and to get the Iranian authorities to fulfill their promises (Tait 2008). "To put it another way," stated ElBaradei, "the council issued a verdict before the deliberation. … Not only was this a procedural fault, it gave the impressions – perhaps accurately – that the council was taking action on predetermined political objectives rather than on the facts" (ElBaradei 2011: 281). The conviction to adopt punitive measures was later reinforced by Iran's new ballistic test (February 4) – the launch of a rocket capable of carrying satellites (Safir) – and the circulation of a new report on the implementation of the safeguards in the Islamic Republic (February 22). The launch demonstrated Iran's technological capabilities and contributed to rise concerns about the possible military diversion of the program (BBC 2008b). As for the new IAEA report, ElBaradei confirmed the definitive resolution of four outstanding issues: the source of contamination of HEU at the Teheran Faculty of Technology; the experiments with polonium-210, the use of uranium from the Gchine mine; and the procurement activities of the former head of the PHRC. These developments were welcomed by the Director General with satisfaction: "while there had been a few minor delays, the Iranians had held steadily to their commitment to the work plan. It was the more consistent and committed cooperation we had experienced in years" (ElBaradei 2011: 279). Though, there was one remaining issue that was considered a "matter of serious concern" and critical to an assessment of a possible military dimension of the program: the "alleged studies." With this respect, the

[47] See AFP, IAEA chief heads to Iran as nuclear probe enters final stage, *Agence France Presse*, January 10, 2008.

Agency was provided with additional clarifications and documentation, but was not allowed to have direct access to the individuals supposedly involved in the projects. In addition, the IAEA needed an understanding of the role of the uranium metal document and further clarifications regarding some military related institutions that were lacking from Teheran. As for the enrichment activities, in mid-January 2008, the Agency was informed about Iran's decision to install and test a single machine and a 10-machine cascade with new generation centrifuges (IR-2) at the PFEP. These activities took place under IAEA surveillance in late January 2008. Finally, the document concluded that "contrary to the decisions of the Security Council, Iran had not suspended its enrichment related activities, … and had also continued construction of the IR-40 reactor and operation of the heavy-water production plant." Moreover, except for the issue of the three "alleged studies," "the Agency had no concrete information about possible current undeclared nuclear material and activities" in Iran.[48]

The new IAEA report triggered different reactions among the concerned parties. On one side, Iran's chief nuclear negotiator, Saeed Jalili, considered the document as a "success," proving the legitimacy of the position of Teheran and the baseless stance of the Western accusations (AFP 2008a). Similarly, the Supreme Leader Khamenei praised President Ahmadinejad for the management of the nuclear dossier, in which "the Iranian nation had honestly and seriously achieved a great victory" (BBC 2008c). On the other, US Secretary of State, Condoleezza Rice, affirmed that the Agency's report provided "a very strong case" for moving forward with a third round of sanctions (AFP 2008c). Anyway, as it was assessed by ElBaradei, "everyone read from the report selectively" (ElBaradei 2011: 281).

On March 3, the UN Security Council approved resolution 1803 with the only abstention of Indonesia, a non-aligned country who joined the UN Security Council in January 2008. According to the text:[49]

1. The UNSC welcomed the work plan reached between Iran and the IAEA to resolve all outstanding issues regarding the nuclear program and progress made in this regard, even if stressed the importance to clarify these issues and re-establish international confidence in the exclusively peaceful nature of the program;
2. All States were called upon to "exercise vigilance and restraint regarding the entry into or transit through their territories of individuals (and entities) who are engaged in, directly associated with or provid-

[48] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006) and 1747 (2007) in the Islamic Republic of Iran, February 22, 2008, GOV/2009/4.

[49] See UN, Resolution 1803 (2008), S/RES/1803, March 3, 2008.

ing support for Iran's proliferation sensitive nuclear activities or for the development of nuclear weapon delivery systems." This provision included also those actors or third parties, who acted on behalf of those subjects mentioned in the resolution 1737 and 1747.
3. All States were called upon to "exercise vigilance over the activities of financial institutions in their territories with all banks domiciled in Iran, in particular with Bank Melli and Bank Saderat, and their branches and subsidiaries abroad."
4. All States were called upon "to inspect the cargoes to and from Iran, of aircraft and vessels, at their airports and seaports, owned or operated by Iran Air Cargo and Islamic Republic of Iran Shipping Line," provided there were reasonable grounds to believe that the aircraft or vessel were transporting goods prohibited under this resolution or under resolutions 1737 and 1747.
5. The UNSC requested within 90 days a further report from the Director General on whether Iran has established full and sustained suspension of all activities mentioned in resolution 1737, 1747 and 1803, as well as on the process of compliance with all the steps required by the IAEA Board.

As in the case of the previous resolutions, the new text mentioned 13 new individuals (Annex I) and 12 entities (Annex III) involved in Iran's nuclear program. The resolution was overall harsh; it targeted the whole banking system, making Iran's financial and commercial transaction abroad much harder, and imposed a land, maritime and air sanction regime similar to the one inflicted against Iraq during the '90s. The reaction from the Iranian side was firm and swift. In a statement before the vote, Iran's Ambassador to the UN, Mohammad Khazee, described the resolution as "politically motivated, illegal, and illegitimate" (BBC 2008d). Likewise, Foreign Minister Mottaki defined the decision "unjust" and accused the UNSC of politicizing the dossier (Mousavian 2012: 301).

On the other side, on March 5, in line with a dual track policy ("sanctions and negotiations"), the P5+1 delivered a communication to the Director General, conveying their interest in resuming talks with Iran to be conducted on their behalf by the EU High Representative.[50] Such requests were promptly rejected by President Ahmadinejad, who stressed that Teheran would not have "any negotiation with any individual and organisation outside the framework of the Agency" (BBC 2009a). During the National Day of Nuclear Technology (April 9), he further announced

[50] See IAEA, "Communication Dated 4 March from the Governor for the Russian Federation and the Resident Representatives of China, France, Germany, the United Kingdom and the United States of America Concerning UN Security Council Resolution 1803 (2008)," INFCIRC/723.

plans to double the numbers of centrifuges (from 3,000 to 6,000) and to expand the enrichment capacity with a new and more effective type of centrifuge (IR-3) (BBC 2008e). These remarks, which were considered not believable by the US Administration, were mainly directed to the domestic opinion and contributed to increase tension.

8. The 2008 Proposal

On May 2, 2008, after a round of consultations in London, the UK Foreign Secretary, David Miliband, declared that the P5+1 would present a new offer to the Islamic Republic (BBC 2008f). This announcement was followed on May 13 by a letter, written by Iran's Foreign Minister Mottaki, to the UN Secretary General, Ban Ki Moon, and the Foreign Ministers of the P5+1 (Borger 2008a). In the letter, Mottaki proposed a package for "a comprehensive agreement" meant to establish long-term cooperation between all parties. The offer contained vague suggestions for regional collaboration on a wide range of issues, such as energy, drug control and environment (Borger 2008b). As for the nuclear area, the Islamic Republic was ready to make the following considerations:

1. Obtaining a further assurance about the non-diversion of the nuclear activities of different countries.
2. Establishing enrichment and nuclear fuel production consortiums in different parts of the world- including in Iran.
3. Cooperation to access and utilize peaceful nuclear technology and facilitating its usage by all States.
4. Nuclear disarmament and establishment of a follow up committee.
5. Improved supervision by the IAEA over the nuclear activities of different states.
6. Joint collaboration over nuclear safety and physical protection.
7. An effort to encourage other states to control the export of nuclear material and equipment.

Finally, Mottaki affirmed that Teheran was ready to start "serious and targeted negotiations," to be evaluated after a specific period (maximum of 6 months), to produce a "tangible result."[51] The package was coldly received by the P5+1 and represented the Iranian counter-proposal to the P5+1 multilateral offer that was scheduled to be discussed in following weeks in Teheran. Meanwhile, on May 26, 2008, the Director General

[51] See UN, "Letter dated 17 June 2008 from the Permanent Representative of the Islamic Republic of Iran to the United Nations addressed to the President of the Security Council", S/2008/397.

released a new document on the implementation of the safeguards. In his report, ElBaradei confirmed that Iran had continued the enrichment activities with the operation of 3,000 centrifuges and the installation of four other sets of cascades. As for the "alleged studies," during a technical meeting with the Iranian officials, the IAEA inspectors presented the documentation received, provided to the Agency by several States, and concluded that the information appeared to be "generally consistent." Though, given Iran's poor cooperation, the Agency was still requiring an understanding of the role of the uranium metal document – an identical one was found in Pakistan – and some clarifications concerning some activities of military related institution. In conclusion, the IAEA had not detected the actual use of nuclear material connected with the "alleged studies."[52]

Few days later, during a technical briefing within the Board, the Deputy Director General, Olli Heinonen, showed the information, gathered by the intelligence of about ten countries, which tended to support the claims that the Islamic Republic had engaged in weaponization studies. Among all the documents (outlined in the Annex to the IAEA report), the only one, whose authenticity was alarmingly confirmed, was the 15-page document related to the conversion of UF_6 into metallic uranium hemispheres (AFP 2008d). These revelations contributed once again to increase tension between Iran and the P5+1, although they not hinder the renewed efforts of dialogue. On June 14, 2008, a delegation led by the EU High Representative and including the political directors of the P5+1 – except for the US – presented in Teheran a new package of multilateral incentives for a "comprehensive, long-term and proper solution of the Iranian nuclear issue" (Borger 2008c). For the first time, the Bush Administration was formally on board and committed to the document with the signature of Secretary of State Rice (Beaumont 2008). "As long as Iran verifiably suspends its enrichment-related and reprocessing activities" as requested by resolution 1803, the P5+1 were looking forward to discussing the June 2006 proposal (paragraph 2) and were ready:[53]

1. To recognize Iran's right to develop research, production and use of nuclear energy for peaceful purposes in conformity with its NPT obligations;
2. To treat Iran's nuclear program in the same manner as that of any NNWS party to the NPT once international confidence in the exclusively peaceful nature of the program is restored.

[52] See IAEA Director General, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006), 1747 (2007) and 1803 (2008) in the Islamic Republic of Iran," May 26, 2008, GOV/2008/15.

[53] See UN,"Letter dated 16 June 2008 from the Chargé d'affaires a.i. of the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations addressed to the President of the Security Council", S/2008/393, June 17, 2008.

Moreover, as further topics to be discussed during the negotiations, the P5+1 proposed (Davenport 2017):

1. Technological and financial assistance for Iran's nuclear energy program;
2. Reaffirmation of the UN Charter obligation to refrain from the use and threat of use of force in a manner inconsistent with the Charter of the UN;
3. Cooperation on Afghanistan, including drug-trafficking, refugee return, reconstruction, and border controls;
4. Steps towards normalizing economic and trade relations, including support for WTO membership for the Islamic Republic.
5. Further details on the prospect for cooperation on energy, agriculture, environment and infrastructure, civil aviation, and social development and humanitarian issues.

In conclusion, the representatives of the P5+1 further proposed in Teheran that preliminary talks could have begun under a six-week "freeze-for-freeze" framework (paragraph 3) (Crail 2008).

Given the lack of any substantial innovation, the Iranians reacted with moderate interest. While refusing the precondition of suspension, they agreed to consider the timetable of the offer (AFP 2008b). Though, the discussions of the package were slowed by the events. On June 23, in line with UNSC resolution 1803, the European Union ratified the decision to freeze the the assets of Bank Melli (BBC 2008g). The initiative was condemned by Iran's foreign ministry spokesman, Mohammad Ali Hosseini, claiming that the EU approach was contradictory given the fact that two separate packages, one put forward by Iran and one by the P5+1, were currently under consideration (BBC 2008h). On July 9, the Iranian authorities conducted another "provocative" ballistic test, sparking the vocal reaction of Western countries (BBC 2008i). The test was followed by the announcement of a new round of talks between the P5+1 and the Islamic Republic scheduled in Geneva in mid-July (AFP 2008e). On July 19, the representatives of the P5+1 met Iran's chief negotiator to discuss a plan for future cooperation. The meeting was attended for the first time by US Undersecretary of State, William J. Burns, becoming the first high-level discussion between Iran and the US since 1980. In Geneva, Saeed Jalili presented a non-paper in which he proposed a new timeline for a comprehensive agreement between the P5+1 and Iran. The offer envisaged three stages (Davenport 2017).

1. *Preliminary Talks*: in this phase, Jalili and Solana (representing the P5+1) would have a maximum of three rounds of talks, where they will reach an agreement on modality and next phases of talks. Meanwhile the parties will establish committees with determined agendas.

2. *Initiation of negotiations*: after the completion of the first stage, negotiations will start at the ministerial level. At the beginning of this phase all States will meet the following requirements:
   A. The P5+1 will refrain from taking any unilateral or multilateral action – or sanctions – against Iran, both inside and outside the UNSC. The group will further discontinue certain unilateral measures taken by one or some of its members;
   B. Iran will continue to cooperate with the Agency;
   In this stage, a minimum of four meetings will take place between Solana, the Foreign Minister of the P5+1, and Jalili, Iran's Foreign Minister and the President of the AEOI. The negotiations would be governed by the following principles:
   A. Participants would avoid raising any points that can potentially hinder the progress of talks;
   B. Discussion would focus on common grounds;
   C. The parties will agree on a timetable, list of issues to be discussed and priorities;
   D. Negotiations would end with the release of a joint statement on the agreement reached;
   E. Following the statement, three specialized committees would finalize those agreements;
3. *Negotiations*: after the completion of the second stage, the P5+1 will discontinue sanctions and existing UNSC resolutions, whereas Iran in turn will implement the agreed action. During the third phase, the parties will start to negotiate a comprehensive agreement related to their "collective obligations" on economic, political, regional, international, nuclear, energy, security and defence cooperation. Following the conclusion of such agreement, the nuclear issue would be taken out of the UNSC agenda and returned to the IAEA to be addressed on an ordinary basis.

Given the unbalance nature of the non-paper, which reflected only Iran's concern, the P5+1 refused the offer and invited the Iranian authorities to accept the multilateral June proposal within two weeks (Borger 2008d). In case of reject from the Iranian side, it was implicit that the six partners would adopt further measures. As a result, the Geneva ended without a common position (AFP 2008f).

President Ahmadinejad reacted by stating that the Iranian people would not retreat "one iota in the face of oppressing powers" (BBC 2008j). Similarly, former President Rafsanjani rejected the two-weeks deadline and affirmed that Iran was ready to talk without an impelling ultimatum (AFP 2008g). To further complicate the situation, on July 26, Ahmadinejad gave a speech in Mashhad, in which he rejected any moves to slow down the enrichment activities and stated that the Islamic Republic had nearly 6,000

centrifuges, nearly twice the number of only a few months earlier (Leyne 2008). On August 6, after the breach of the deadline, the Iranian officials delivered a letter to P5+1 (Black 2008). With no reference to the ultimatum or the "freeze for freeze" framework, the document expressed Iran's readiness to provide a "clear response" to the multilateral proposal and receive in exchange answers to its questions and ambiguities (AFP 2008h). Iran's stalling approach and refusal to comply with the measures requested paved the way to fourth UNSC resolution.

9. Resolution 1835 (2008)

Following the lack of a clear response, on August 7, the P5+1 began immediate consultations. Despite the political deadlock over the conflict in Georgia, the conviction to adopt new UNSC measures against Iran was reinforced by the release of a new IAEA report (September 15).[54] In the confidential document, ElBaradei confirmed the expansion of the enrichment activities and the lack of any substantial progress on the "alleged studies" and other associated issues.[55] Additionally, on September 23, President Ahmadinejad delivered a confrontational speech in New York. In his statement in front of the UN General Assembly, he accused Western countries of pursuing a "bullying" attitude and opposing other nations' progress in order "to impose their will." He further attacked Israel, stating "the Zionist regime was on a definite slope to collapse and there was no way for it to get out of the cesspool created by itself and its supporters" (AFP 2008i). These defiant declarations contributed to newly unify the international community. As a result, on September 28, the UN Security Council unanimously approved resolution 1835. Although it did not introduce new sanctions, the text reaffirmed the multilateral commitment for a diplomatic solution and called upon Teheran to fully comply under the obligations of all previous resolutions.[56] Though, given the imminent presidential elections in the United States (November 2008) and the upcoming consultations in Iran (June 2009), all parties concerned were not willing to compromise on the nuclear issue and adopted a "wait and see" attitude, with the resulting suspension of all diplomatic initiatives.

[54] A series of clashes between Georgian and South Ossetian forces prompted Georgia to launch an aerial bombardment and ground attack on South Ossetia and Russia to intervene. The conflict would have paralysed the UNSC.

[55] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007) and 1803 (2008) in the Islamic Republic of Iran, September 15, 2008, GOV/2008/38.

[56] See UN, Resolution 1835 (2008), S/RES/1835, September 28, 2008.

CHAPTER 6

NUCLEAR IMPASSE (2009-2013)

1. The Openings of Obama and the Iranian Elections of June 2009

On November 4, 2008, the democrat senator from Illinois, Barack Obama, won the presidential elections. As expected, the victory had important consequences for the Iranian nuclear crisis. During the electoral campaign, the democrat candidate did not refrain to openly criticize the Bush Administration for its policies in the Middle East and for its refusal to dialogue with "rogue States", including with Iran (Obama 2008). While reaffirming that he would do anything in his power to keep Teheran from acquiring a nuclear weapon ("all options on the table"), at the same time Obama expressed the readiness to talk with Iran without setting any precondition (Gordon, Zeleny 2007). This idea to open direct diplomatic channels was shared at that time by many other American leaders. In March 2008, former Secretary of State, Henry Kissinger, had publicly stated the United States should have been ready to negotiate directly with the Islamic Republic (Hall, Schneider 2008). Similarly, in May 2008, former President Jimmy Carter had strongly criticised George W. Bush, claiming it had been a "serious mistake and terrible departure" from the actions of previous presidents not to engage with countries with whom the US had major differences (Lo Dico 2008). On the same page, in September 2008, during a remarkable forum held in Washington, five former secretaries of State, three republicans (Colin Powell, James Baker and Henry Kissinger) and two democrats (Madeleine Albright and Warren Christopher), all expressed their support for a diplomatic engagement (Reuters 2008). Such pragmatic approach was partially adopted by the outcoming Bush Administration with the participation of Undersecretary Burns in the Geneva talks of July 2008. Though, it was only with Obama that this policy of discontinuity would have been launched. After the elections, on November 6, 2008, President Ahmadinejad delivered an unprecedented message to Barack Obama. In his letter, he congratulated for the result and expected the new Presidency to make major changes in domestic and foreign policy based on "justice, respect for human rights, friendship and non-interference in other countries"

Michele Gerli, *Beyond Nuclear Ambiguity. The Iranian Nuclear Crisis and the Joint Comprehensive Plan of Action*,
ISBN (online PDF) 978-88-6453-865-5,

affairs (Fathi 2008). Despite the exceptional initiative, the first Iranian congratulatory letter to a newly-elected US President since the Islamic Revolution, Obama adopted a cautious attitude and decided not to reply (Tait, MacAskill 2009).

In his inaugural speech (January 20, 2009), Obama underlined the change of policy towards the Muslim World, thus addressing implicitly the Iranian authorities. Specifically, he stated (NYT 2009a): "We seek a new way forward, based on mutual interest and mutual respect. To those leaders around the globe who seek to sow conflict or blame their society's ills on the West, know that your people will judge you on what you can build, not what you destroy".

The speech was followed later by other significant initiatives that marked the shift of policy. On March 5, Secretary of State, Hilary Clinton, invited Iran to take part to an international conference on the stabilization of Afghanistan to be held in The Hague on March 31, 2009 (Landler 2009). Two weeks later, the President delivered a videotape with Persian subtitles on Nowruz (Iranian new year). In the message, he spoke directly to the "Iranian people and leaders" – thus acknowledging indirectly their legitimacy – for the first time in 30 years. He further reiterated the pledge to a diplomatic solution of a wide range of issues, including the nuclear program (Borger 2009). On April 8, in line with the approach of direct engagement, the State Department declared that the United States would join the P5+1 in the negotiations with the Islamic Republic. The statement and the request for multilateral talks was surprisingly welcomed by President Ahmadinejad, provided that the shift in policy was "honest" (Landler, Fathi 2009). Later, in early May, Obama sent a letter to the Supreme Leader, delivered by the Swiss Embassy, addressing the prospect of "cooperation in regional and bilateral relations" and a resolution of the nuclear crisis (Slavin 2009). Although Khamenei's response was reported to be rather "disappointing," few days before the political elections in Iran (June 12), the US President sent a second letter to the Ayatollah (TWT 2009). Given the imminent consultations, Khamenei decided not to reply, with the likely intention also to respond to the US lack of respect to Ahmadinejad's congratulatory letter of November (Gaietta 2016: 154). On May 19, following a meeting with Israeli Prime Minister Benjamin Netanyahu, President Obama seemed to set a deadline, stating that he intended to "gauge and do a reassessment by the end of the year" on whether the diplomatic approach with Iran was producing results (Stolberg, Kershner 2009). Finally, on June 4, Barack Obama addressed the Muslim world at the Cairo university. In his famous speech, the President distanced himself from the policy of regime change and exporting democracy pursued by the previous Administration. With respect to the Islamic Republic, he stated that he was "willing to move forward without preconditions on the basis of mutual respect"

and to promote a wider initiative of nuclear disarmament at an international level (NYT 2009b). Though, these unprecedented openings were challenged by Iran's disputed elections of June. On June 12, 2009, the Iranian voters were called to confirm or choose a new President among four candidates approved by the Guardian Council: the serving President Ahmadinejad; the former Prime Minister, Mir-Hossein Mousavi; the former commander of the *Pasdaran* Mohsen Reza'i; and the former speaker of the *Majilis,* Mehdi Karroubi.[1] Even if Khamenei suggested anti-Western runners, the polls indicated a tight race between Ahmadinejad and Mousavi (The Economist 2009). On one side, during the campaign, Ahmadinejad promised to improve the economic conditions for the poor and to fight corruption. On the other, Mousavi promoted a pragmatic platform and strongly accused the incumbent President of economic mismanagement (inflation was at 25%) and foreign adventurism. Although he defended Iran's nuclear rights and claimed that the program was not negotiable, he supported a policy of détente with the P5+1 and was willing to reciprocate Obama's openings (Patrikarakos 2012: 246-248). However, the elections of June 2009 were patently rigged. On June 13, Iran's Minister of Interior announced that President Ahmadinejad was confirmed, reporting 62,63% of the vote (24 million of voters) over Mousavi's 33,8% (14 million) (Black 2009a). The same day, the Supreme Leader endorsed the result and invited all candidates to accept it (Black, Dehghan, Siddique 2009). Mousavi reacted by stating that an extensive fraud had taken place and called Guardian Council to invalidate the outcome. Similarly, Mehdi Karroubi and former President Rafsanjani declared that there had been widespread electoral violations and challenged the validity of the result (Mousavian 2012: 340-341). In the following days and weeks, hundreds of thousands of Iranians clothed in green – the colour of Mousavi's campaign – took the streets to oppose the re-election of President Ahmadinejad. In turn, the government of responded by shutting down internet, expelling foreign journalists, arresting and killing many demonstrators and supporters of the so-called "Green Movement" (Jeffrey 2009). The presidential election of June 2009 had significant domestic and international repercussions. On one side, it contributed to complicate the resumption of multilateral negotiation and the rapprochement with the United States. In the first days of protests, President Obama adopted a low-profile stance and did not weight in publicly, claiming that it was "up to Iranians to make decisions about who Iran's leaders will be." The following week, after the remarkable escalation of violence, Obama took a tougher position and strongly condemned "these unjust actions" (Levs 2012). Similarly, the US Ambassador

[1] See Jones, S., Steinfeld R. 2009, Iranian presidential elections 2009.

to the UN, Susan Rice, denounced what she described as "show trials" for demonstrators, although she insisted that offer of dialogue was "still on the table" (AFP 2009). These remarks induced Khamenei to believe that the new US policy of engagement was futile.

As for the Iranians, the disputed elections undermined the domestic and international legitimacy of both the President and the Supreme Leader, but it contributed to reinforce the hardliner control over the entire system. In this regard, the first notable victim was the head of the AEOI, Gholam Reza Aghazadeh, who was forced to step down in mid-July (Gaietta 2016: 157). Even if he had led the AEOI for 12 years and a change was to be expected, he paid the political price for its support to Mousavi, who had nominated him Minister of Oil in the '80s. Aghazadeh was replaced by Ali Akbar Salehi, a former Permanent Representative to the IAEA (1999-2003) during the Khatami Administration, a choice that received wide consensus across all the political spectrum (BBC 2009b).

The departure of Aghazadeh occurred simultaneously with another important change within the administration of the IAEA: the official nomination of Yukiya Amano as new Director General. Given the imminent end of ElBaradei's third mandate (30 November 2009), on July 2, the Board succeeded in appointing the Ambassador of Japan with 23 votes out of 35 members.[2] In a cable disclosed by Wikileaks in 2010, the advent of Amano was welcomed with great satisfaction by the US Mission in Vienna due to his vision "as a neutral and impartial party to Iran's safeguards agreement" and "the very high degree of convergence between his priorities and our own agenda at the IAEA (implementing safeguards and UNSC/Board resolutions)" (The Guardian 2010). Anyway, the disputed elections of June 2009 and the resulting huge deficit of legitimacy convinced the Iranian officials to open a new round of negotiations on the nuclear issue.

2. The Fuel Swap Proposal

On September 9, 2009, Iran issued a five-page offer to the P5+1, expressing the readiness to hold "comprehensive, all-encompassing and constructive" negotiations on wide range of issues. Specifically, it envisaged (Davenport 2017):

1. Cooperation to address terrorism, drug trafficking, organized crime, and piracy;
2. The reform of the UN Security Council;

[2] See IAEA, Board Formally Appoints Yukiya Amano as IAEA Director General, *Press Release*, July 3, 2009.

3. The codification of rights for the use of space;
4. The promotion of a "rule-based" and "equitable" IAEA oversight function;
5. The promotion of NPT universality and WMD non-proliferation.

The proposal was similar to the previous packages and did not contain any reference to Iran's program, particularly the issue of suspension and the compliance with the UNSC measures (Linzer 2009). The day after, White House spokesman, Robert Gibbs, declared that "the offer is still being evaluated" by the United States and its allies (Gibbs 2009). Though, given the unsatisfactory quality of the package, the US Administration was not willing to engage in a grand bargain with the Iranians on this basis. Conversely, after the disputed elections of 2009, Ahmadinejad was desperately seeking for an international achievement to be domestically invested for his political legitimacy. On September 13, he delivered a further message to ElBaradei, saying that "he was ready to engage in bilateral negotiations [with the US], without conditions and on the basis of mutual respect" (ElBaradei 2011: 295). Though, like in the case of the congratulatory letter, Obama decided not to reply. Meanwhile, following Iran's request to the Agency concerning the refuel of the Teheran Research Reactor (June 2009), Washington conducted three secret rounds of negotiations (Calabresi 2009). Specifically, the reactor was mainly used to produce medical radioisotopes and was expected to run out of fuel, 116 kg of 19,75% LEU purchased by Argentina (chapter 1, paragraph 3), in late 2010 (Fitzpatrick 2010). The negotiations included also representatives from the Agency, Russia and France. In early September, the United States came up with an ingenious proposal: in return for a supply of the fuel, Iran would transfer 70% of its 5% LEU, nearly 1,200 kg, to Russia. Coincidentally, 1,200kg of 5% LEU was approximately the amount needed to produce enough weapons-grade uranium for a single warhead. Then, Moscow would enrich such uranium up to 20%, whereas France would further convert it into fuel rods to be later shipped to the Teheran Research Reactor (Davenport 2017). The package was an important opening potentially capable of defusing or postponing tension. The Islamic Republic would demonstrate that the enrichment activities were conducted only for peaceful purposes, while the international community would receive the needed assurances on the non-diversion of the 5% low-enriched uranium stockpiled (ElBaradei 2011: 294). The fuel swap offer was scheduled to be discussed with the Iranian authorities in early October. In the meantime, the world made another shocking discovery regarding Iran's nuclear program.

On September 21, in a letter to the Director General, the Iranian authorities informed the Agency of the existence of a new undeclared facility under construction, even if they did not specify the location,

size or when the construction had begun. The site, located in Fordow (20 km north of the city of Qom) was publicly disclosed by President Obama on September 25, during a press conference with Gordon Brown and Nicolas Sarkozy at the G-20 of Pittsburgh (Sanger, Broad 2009). The Fordow Fuel Enrichment Plant (FFEP) was in an underground mountain complex near a *Pasdaran*'s military base and was designed to be heavily shielded from air attacks. The US and the other western intelligences were aware of this facility since 2006 but decided not to inform the IAEA to gather more credible evidence (and hopefully find a "smoking gun"). The Iranians declared that FFEP was a "pilot-scale enrichment plant" designed to produce LEU. Moreover, they stated that according to the original version of Code 3.1 of the Subsidiary Arrangement they were not legally obliged to notify the IAEA of its existence 180 days before the introduction of the nuclear material. In this case, the site was still under construction.[3] Conversely, the US Intelligence believed that the facility was a built to house just 3,000 centrifuges, too many for a pilot plant and not nearly enough for a civilian program, which normally requires at least 50,000 centrifuges. Still, the small number was more than enough to enrich weapon grade uranium (above 90%) and manufacture a nuclear weapon every year (Borger, Wintour 2009). In addition, given the obligations of the UNSC resolutions, the Safeguards Agreement and the revised version of Code 3.1 of the Subsidiary Arrangement, which was implemented from 2003 to 2007, the Iranians were legally obliged to inform the IAEA of its decision to build the site.

In a further discussion with the Agency, they agreed to let the inspectors visit the facility within the end of October 2009 and provided additional information on the nature of the installation.

With this respect, in a letter to the IAEA, the head of the AEOI Salehi declared:[4]

> The Natanz Enrichment Plant was among the targets threatened with military attacks. Therefore, the Atomic Energy Organization requested the Passive Defence Organization to allocate one of those aforementioned centers for the purpose of a contingency enrichment plant, so that the enrichment activities shall not be suspended in the case of any military attack. In this respect, the Fordow site, being one of those constructed and prepared centers, allocated to the Atomic Energy Organization of

[3] See IAEA Director General, "Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran", November 16, 2009, GOV/2009/74, pp. 2-4.

[4] See IAEA Director General, GOV/2009/74, p. 3.

Iran in the second half of 2007. The construction of the Fordow Fuel Enrichment Plant then started. The construction is still ongoing. Thus, the plant is not yet ready for operation and it is planned to be operational in 2011.

The disclosure of the FFEP contributed to increase tension between Iran and the P5+1, although it did not undermine the multilateral talks concerning the Teheran Research Reactor.

On October 1, 2009, the parties met in Geneva, where US Under Secretary of State, William J. Burns, and Iran's chief negotiator, Saeed Jalili, had another historical conversation (AP 2009a). Following the meeting, the Iranian delegation agreed in principle to the fuel swap proposal. President Obama described the session in Geneva a "constructive beginning with hard work ahead," while President Ahmadinejad presented it as great victory (Lee 2009). Given the implications of the offer, the Iranian Administration came under significant domestic pressure. Indeed, during the discussions of the package, the Iranian President had not coordinated his action with the SNSC, particularly with the Supreme Leader, the final decision maker on foreign policy. Moreover, the proposal was strongly criticized by the opposition, among them the new Speaker of the *Majilis* Larijani, the former chief negotiator Rouhani and the reformist leader Mousavi, who all wanted to prevent an international success of Ahmadinejad with America. Hence, given the wide internal resistance, the Iranian delegation began rise several objections, from the French exclusion from the swap proposal to the option of a direct engagement with Washington. "We were at an impasse," as ElBaradei remembered. "I called on Salehi, who to my surprise said they would deliver the entire twelve hundred kilograms if the United States were their counterpart in the agreement instead of Russia and France" (ElBaradei 2011: 306-307). At the end, on October 21, after intensive discussions, the Director General circulated a final draft of the proposal in Vienna (Davenport 2017):

1. Iran would have exported 1,200 kg of LEU in a single batch before the end of the 2009;
2. Russia would have enriched Iran's LEU to 19,75%, producing 120 kg of 20% enriched uranium;
3. France would have manufactured and delivered the fuel bars for the research reactor it about one year after the conclusion of the agreement, prior to the depletion of the current fuel supply;
4. The United States would have worked with the IAEA to improve the safety and control the implementation at the Teheran research reactor.

The package was promptly accepted by Russia, France and the United States (the so-called Vienna Group), inducing the Agency to set a two

days deadline for Iran.[5] Once again, the Iranians adopted a stalling attitude. The head of the AEOI Salehi reported that President Ahmadinejad could accept the offer only if the LEU had remained in the Islamic Republic until the Iranians had previously received the fuel (Sanger, Erlanger, Worthoct 2009). He further offered to store the 5% LEU on the Island of Kish in the Persian Gulf under IAEA custody and control. Though, this option made the United States pretty uncomfortable, which proposed in turn to ship the LEU to a trustworthy State, such as Turkey or Kazakhstan (ElBaradei 2011: 310). In November 2009, Salehi was convened by the Supreme Leader, who rejected the fuel swap package as proposed by the Vienna Group. Khamenei further declared that the exchange would take place only on Iranian territory as a simultaneous swap of batches of 400 kg of 5% LEU with the fuel for the research reactor. This position was communicated on November 19 by Foreign Minister Manouchehr Mottaki (AP 2009b).

It was the end of the fuel swap proposal. Even if the negotiations continued with the mediation of Turkey, on November 27, the IAEA Board of Governors adopted a new resolution against Iran, the first since February 2006 (chapter 4, paragraph 1). The text was adopted by a vote (25 ayes, 3 nays and 6 abstentions) with the opposition of Cuba, Malaysia and Venezuela. The Board urged the Islamic Republic to comply "fully and without delay" with the obligations under the UNSC resolutions, and to meet the requirements of the Board, "including by suspending immediately construction at Qom" (Black 2009b). It further urged the Iranians to implement modified Code 3.1 of the Subsidiary Arrangement and to confirm that they had "not taken a decision to construct, or authorize construction of, any other nuclear facility" previously not declared to the Agency."[6] In his last introductory statement before the Board, ElBaradei considered Teheran's refusal to accept the proposal as disappointing.[7] Once again, Iran responded by raising the stakes.

[5] See IAEA, IAEA Statement on Proposal to Supply Nuclear Fuel to Iranian Research Reactor, *Press Release*, October 23, 2009.

[6] The six abstaining states were Afghanistan, Brazil, Egypt, Pakistan, South Africa, and Turkey. See IAEA Board of Governors, Implementation of the NPT safeguards agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran Resolution adopted by the Board of Governors on 27 November 2009, GOV/2009/82, paragraph 1, 3 and 5.

[7] See IAEA Director General, Introductory Statement to the Board of Governors, *IAEA*, November 26, 2009.

3. The Joint Teheran Declaration

On January 2, 2010, Foreign Minister Mottaki gave the Vienna Group one-month deadline to accept Iran's offer on the Teheran research reactor. In case of refusal, he stated that Iran would indigenously enrich its own uranium up to 20% (Slackmanan 2010a). The counter-proposal envisaged the simultaneous swap of 5% LEU in smaller batches of 400 kg on Iranian soil or in Turkey (AP 2009c). However, the terms of the counter-offer were already considered technically outdated and inadmissible since they would not delay Iran's ability to manufacture a nuclear warhead. The ultimatum was followed by a letter, dated February 8, in which the AEOI formally notified the Agency about the decision to start enrichment activities up to 20% at the PFEP of Natanz.[8] The initiative was condemned by the IAEA and the international community. On February 10, the US made a last-ditch attempt to prevent Teheran from reaching the 20% threshold and proposed to assist the Iranians in buying medical isotopes on the international market (Kessler 2010a). Though, the next day, during the celebrations of the 31th anniversary of the Revolution, President Ahmadinejad announced that the Islamic Republic had already produced its first batch of 20% enriched uranium and could enriched it even further if it had decided to do so. Although these remarks were regarded with skepticism by the Obama Administration ("claims based on politics, not on physics"), the achievement was later confirmed by the Agency (Slackmanan 2010b).

On February 18, 2010, the new IAEA Director General, Yukiya Amano, circulated his first report on the implementation of the safeguards in Iran. Contrary to ElBaradei, who had always been cautious in presenting his conclusions, Amano seemed to be more forceful and blunter (Reuters 2010a). In his report, the harshest since the beginning of the crisis, he described with more explicit terms the possible military dimension of the nuclear program and related outstanding issues. Among the activities the IAEA had attempted to discuss there were:

1. Activities involving high precision detonators fired simultaneously;
2. Studies on the initiation of high explosives and missile re-entry body engineering;
3. A project for the conversion of UO2 to UF4, known as "the green salt project";
4. and various procurement related activities.

According to extensive documentation available, "collected from a variety of sources over time," Yukiya Amano confirmed that the information

[8] See IAEA, IAEA Statement on Iranian Enrichment Announcement, *Press Release*, February 8, 2010.

was broadly "consistent and credible," raising concerns about the "possible existence in Iran of past or current undisclosed activities related to the development of a nuclear payload for a missile." Moreover, since August 2008, Teheran had refused to discuss these matters with the Agency or to provide any further clarification and access (to locations and/or people), asserting that these claims were "baseless" and the documentation "based on forgeries." In short, the report accused the Islamic Republic of pursuing military nuclear and ballistic activities, "which seemed to have continued beyond 2004," thus contradicting the 2007 US National Intelligence Estimate (chapter 5, paragraph 6) (Sanger, Broad 2010). In addition, the Director General criticized Teheran for the construction of Fordow plant without informing the Agency, for the continuous failure to abide to the IAEA Board and UNSC resolutions and for the unwillingness to implement the Additional Protocol and the revised version of Code 3.1. Finally, while confirming the non-diversion of declared nuclear material, Amano stated that the Iranians had not provided the "necessary cooperation to confirm that all material in Iran was in peaceful activities."[9] Again, the report came under heavy fire. On one side, in line with a dual track policy (negotiations and sanctions), the United States and the European Union reacted by increasing the diplomatic pressure on Iran and started discussing about new punitive measures (Schlamp 2010). This approach was cautiously shared by Russia, but was opposed by China, who had even refused to engage substantially on the issue of sanctions (Van Kemenade 2010). On the other side, on February 22, 2010, the AEOI announced that Iran would have built ten more enrichment plants, two within 2011, and had identified nearly twenty locations for such facilities (Cowell 2010a). As for the IAEA report, in a letter dated 24 February, they defined it as "unprofessional, politicized and baseless" (Cowell 2010b). In a further communication to the Agency (March 1), the Iranian officials sent an explanatory note to the document with a detailed outline of all controversial issues covered within. More specifically, they deplored the absence of a paragraph stressing that all declared material was accounted for and remained peaceful under the supervision of the Agency. They decried also the failure to mention the previous Director General's judgement concerning the absence of evidence of a nuclear weapons program in Iran. Finally, they criticized the fact the United States and other Western countries did not provide the Islamic Republic with the original documentation related to the "alleged studies."[10]

[9] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran, February 18, 2010, GOV/2010/10.

[10] See IAEA, "Communication dated 1 March 2010 received from the Permanent Mission of the Islamic Republic of Iran to the Agency regarding the implementation of safeguards in Iran", March 2, 2010, INFCIRC/786.

On April 6, the Obama Administration released the 2010 Nuclear Posture Review. Differently from the 2001 review of President Bush (chapter 1, paragraph 4), the fifty-page document narrowed the circumstances in which America would have used nuclear force (Sanger, Baker 2010). While strongly committing the United States to final goal of non-proliferation and elimination of nuclear devices, the Obama Administration pledged "not to use or threaten to use nuclear weapons against non-nuclear weapons states that were party to the nuclear NPT and in compliance with their nuclear non-proliferation obligations." However, this guarantee might not apply in the case of North Korea and Iran, who in pursuit of their ambitions, had violated "non-proliferation obligations, defied directives of the UNSC, pursued missile delivery capabilities, and resisted international efforts to resolve through diplomatic means the crises they created."[11] In a manner similar to the previous document, the 2010 review placed Teheran alongside Pyongyang, two completely different cases of nuclear defiance, issuing another warning to the Iranian leadership: if you don't follow the rules, all options are on the table, including a pre-emptive nuclear strike (Mousavian 2012: 375).

On April 9, during the celebrations of the Nuclear Technology Day President Ahmadinejad, announced that Iran had developed a new "third generation" centrifuge, further claiming that the new model "had a separation power ten times that of the first generation." Later, the head of AEOI Salehi confirmed that the P-2 centrifuges were currently being used to enrich uranium up to 5%, whereas other similar sites were being developed with suitable natural defences (BBC 2010). This proclamation was followed by a new diplomatic initiative conducted by Turkey and Brazil. In a letter dated April 20, Obama invited Prime Minister Erdogan and President Lula to secure a deal, "stating that to transfer 1,200 kg of low-enriched uranium abroad would build confidence and reduce regional tensions by substantially reducing Iran's LEU stockpile" (Kessler 2010b). Thus, on April 27, Brazil's Foreign Minister, Celso Amorim, declared that Brasilia would work with Ankara to formulate a more acceptable framework, based on the IAEA proposal of October 2009, and to avoid a fourth round of sanctions (Pomeroy 2010). Following trilateral talks in Iran, on May 17, Erdogan, Lula and Ahmadinejad issued the *Joint Teheran Declaration*. According to the text (Borger 2010):

1. The three countries recalled "the right of all State Parties, including the Islamic Republic of Iran, to develop research, production and use of nuclear energy (as well as nuclear fuel cycle including enrichment activities) without discrimination;"

[11] See US, Nuclear Posture Review Report, April 2010, p. 3.

2. Iran agreed to deposit 1,200 kg of LEU in Turkey within one month of the conclusion of an implementation agreement; the LEU would continue to be the "property" of Iran. Iran and the IAEA might keep observers to monitor the safekeeping of the LUE in Turkey;
3. Pending the positive approval of the declaration, the Vienna Group would provide in return 120 kilograms of 20%-enriched fuel for the Teheran Research Reactor within one year;
4. If the deal was not accepted by the Vienna Group, Turkey would transfer the LEU back to Iran.

The *Joint Teheran Declaration* was an unexpected and limited success for Turkey and Brazil and demonstrated that political will of external actors to solve the nuclear standoff with Iran (Parsi 2014: 47).

On one side, in line with a foreign policy of "zero problems with neighbors," Ankara wanted to de-escalate the nuclear crisis and improve the bilateral relations with the Islamic Republic (Akbarzadeh, Barry 2017: 983). As for Brasilia, President Lula saw a precious chance in promoting Brazil (and himself) as rising stars on the global stage and in creating new commercial opportunities with the region (Fujii, Diehl 2010). On the other, the Administration needed new political allies – Brazil and Turkey were at that time non-permanent members of the UN security Council – and a legitimizing achievement. However, the architects of the deal miscalculated the concerns of the United States and the other partners of the P5+1. On May 19, Secretary of State Hilary Clinton announced the reached agreement with Russia, China and the other major powers of the UNSC on a draft resolution against Iran and dismissed the *Joint Teheran Declaration* as an Iranian political manoeuvre (Kessler, Lynch 2010). In a letter to the IAEA Director General, on June 9, the governments of France, Russia and the United States outlined the constraints of the Turkish-Brazilian deal (Reuters 2010b).

1. The Declaration did not address the production or retention of 19.75 % enriched uranium.
2. It asserted a right for Iran to engage in enrichment activities even though several UNSC resolutions prohibited Iran from pursuing such activities;
3. It did not indicate that Iran was willing to meet with the P5+1 to address the international community's concerns about its nuclear program;
4. Unlike the proposal of October 2009, it did not set a precise date for removal of the 1,200 kg of 3.5 percent LEU from Iran.
5. The timeline for the full delivery of the fuel assemblies (for the research reactor) was unrealistic;
6. It stated that Iran's LEU would be the "property" of Iran while in Turkey. The previous proposal stated the IAEA would maintain "custody" of the LEU throughout the process;

7. Important technical details of the fuel resupply arrangement were not addressed, such as the future of the 1,200 kg of LEU after the delivery of the fuel.

Most at all, given Iran's enrichment rate (115 kg/month), the LEU stockpiled (nearly 2400 kg) and the launch of the new generation centrifuges, it would take only one year to replace the uranium involved in the *Joint Teheran Declaration*.

4. Resolution 1929 (2010)

On May 31, Amano issued his second report on the implementation of the safeguards. In the document, the Director General confirmed the installation of a new cascade of 164 centrifuges and the enrichment of 5,7 kg of UF_6 up to 19,7%. He further reported that Iran had refused to submit information regarding design and timing of the new sites planned to be constructed.[12] On June 9, the Security Council approved resolution 1929 with the positive vote of all the permanent members. Only Brazil and Turkey voted against, while Lebanon decided to abstain. Even if the new text reaffirmed many actions contained in previous resolutions, it added new measures, including "smart sanctions" against individuals and entities (especially the Islamic Revolutionary Guard Corps) involved in the program. The document was the harshest resolution ever adopted against Iran and targeted the whole banking system and economy. According to the most important new provisions:[13]

1. All States should "prevent the provision to Iran by their nationals or from or through their territories of technical training, financial resources or services, advice, other services or assistance related to the supply, sale, transfer, provision, manufacture, maintenance or use of such arms and related material;"
2. Iran should not undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology;
3. All States were called "to inspect all cargo to and from Iran, in their territory, including seaports and airports, if the State concerned had information that provides reasonable grounds to believe the cargo contains items the supply, sale, transfer, or export" of which was prohibited by the previous UNSC resolutions.

[12] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran, May 31, 2010, GOV/2010/28.

[13] See UN, Resolution 1929 (2010), S/RES/1929, June 9, 2010.

4. All States "should prohibit the provision of fuel or supplies, or other servicing of vessels, to Iranian-owned or -contracted vessels, including chartered vessels, if they had information that provided reasonable grounds to believe they were carrying items the supply, sale, transfer, or export of which were prohibited" under all UNSC resolutions;
5. All Member States were called upon "to communicate to the Committee any information available on transfers or activity by Iran Air's cargo division or vessels owned or operated by the Islamic Republic of Iran Shipping Lines (IRISL) to other companies that might have been undertaken in order to evade the sanctions of all UNSC resolutions;"
6. All States were called upon to prevent the provision of financial services, including insurance or re-insurance, or the transfer to nationals or entities organized under their laws (including branches abroad) of any financial or other assets or resources;
7. All States were called upon "to take appropriate measures that prohibit in their territories the opening of new branches, subsidiaries, or representative offices of Iranian banks, and also that prohibit Iranian banks from establishing new joint ventures, if they had reasonable information to believe that these activities could contribute to Iran's proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems." In the preambular part of the resolution, it warned to exercise vigilance on the transaction of the Central Bank.
8. The UNSC requested the Secretary-General to create for an initial period of one year, in consultation with the Committee, a group of up to eight experts ("Panel of Experts"), under the direction of the Committee, to monitor the implementation of all sanctions, report violations and provide recommendations for continuous improvement in the implementation of sanctions;
9. It further requested within 90 days a report from the Director General on whether Iran had established full and sustained suspension of all activities mentioned in line with the previous Council demands.

The resolution was followed by similar unilateral initiatives conducted by several States. On June 24, 2010, the US Congress overwhelmingly approved (408-8 in the House, 99-0 in the Senate) a new bill against Iran's energy and banking sectors. The new draft, signed into law by President Obama on July 1, imposed penalties (worth more than $5 million over 12 months) on state-own and private entities that supplied the Islamic Republic with refined petroleum products. It deprived foreign banks and entities of access to the US financial system in case of business with Iranian banks or the Islamic Revolutionary Guard Corps (Reuters 2010c). Finally, it imposed sanctions against the Central Bank and any other financial institution, listed by the Department of Treasury and engaged in proliferation activities or support of terrorist groups (Mousav-

ian 2012: 390). Likewise, on July 26, the European Union announced a comprehensive and robust set of sanctions in the areas of trade, financial services, energy, transport, as well as additional designations for visa ban and asset freeze, beyond the language of the UNSC resolutions agreed (Patterson 2013). The United States and the European Union were shadowed by South Korea, Japan, Australia and Canada, whereas Russia and China strongly opposed the adoption of any unilateral sanctions against Iran. Overall, the UNSC and unilateral measures had a significant impact on the Iranian economy, and to a lesser extent to Teheran's main trading partners, resulting in a drastic decrease of oil exports and in a depreciation of the national currency (paragraph 8) (Fathollah-Nejad 2014). Though, the sanction regime failed to alter Iran's nuclear trajectory. While severely harming the civil society, it cemented the domestic power structure and the conviction that the program was irreversible. Indeed, on June 28, President Ahmadinejad announced the postponement of the nuclear negotiations with the P5+1 until late August 2010. He further stated that the decision was a punishment "for them so that they will learn the protocol of talking to other nations" (Erdbrink 2010). As a result, there would be no multilateral meetings until December 2010.

5. Stuxnet and the Assassination of Iranian nuclear scientists

In June 2010, a Belarusian company, named *VirusBlockAda*, discovered a computer worm – malicious program or code that spread automatically from computer to computer and can replicate itself hundreds of thousands of time – commonly known as Stuxnet. According to researchers at Symantec, a US internet security provider, it was reported that during the summer the "W32 Stuxnet" had affected over 60,000 computers in the world (e.g. China, India, Pakistan, Russia, Great Britain, Indonesia and other countries), but particularly in the Islamic Republic (Farwell, Rohozinski 2011).

On September 27, the Iranians recognized that the virus had infected more than 30,000 computers, including personal laptops owned by employees of the nuclear facility of Bushehr. Given the sophistication and the huge resources needed to write the worm, they further asserted that only a foreign organization or State (US or Israel) could do something similar (Erdbrink, Nakashima 2010). Later, it became clear that the Iranian nuclear sites, particularly the IR-1 centrifuges in the FEP of Natanz, were the initial target, even if worm spread accidentally beyond the intended objective. On November 23, the head of the AEOI Salehi confirmed that "one year and several months ago, Westerners sent a virus to [our] country's nuclear sites." Though, he minimized the effects, claiming that the Iranian technicians had "discovered the virus exactly at the

same spot it wanted to penetrate because of our vigilance and prevented the virus from harming" (Albright, Brannan, Walrond 2010). Similarly, on November 29, President Ahmadinejad admitted that "[western governments] succeeded in creating problems for a limited number of our centrifuges with the software. Fortunately, our experts discovered that, and today they are not able [to do that] anymore" (Madrigal 2010).

Stuxnet was described as the "most refined pieces of malware ever discovered," breaking down the doors of a new era of cyberwar (Halliday 2010; see also Beaumont 2010). Indeed, the virus was developed to hide and "silently" hit the Iranian plants running on two specific type of Siemens software (program logic controller S&-315 and S&-417) operating in the control systems. Given the fact that the nuclear sites were not connected to public Internet ("air-gapped"), Stuxnet was probably introduced, mistakenly or not, by an insider with the use of intermediary device, such as an USB stick (Falliere, Murchu, Chien 2011). The virus consisted in two codes designed to sabotage frequency-converter drives, supplied by two companies (the Finnish Vacon and the Iranian Fararo Paya) and used to control the speed of IR-1 centrifuges in cascades of 164. After it had infected the control systems and monitored the frequency, the worm affected the rotational speed of the machines, normally operating at 1,064Hz. By intermittently spinning the centrifuges between 2Hz and 1,410Hz, intervals for which they were not designed, it caused severe stress and ultimately damaged the machinery (Nicoll, Delaney 2011). Moreover, by secretly recording the normal operations of the plant, Stuxnet was indicating that everything was normal, while actually the centrifuges were tearing themselves apart. "This may have been the most brilliant part of the code," an US official would later confess (Sanger 2012b).

According to the IAEA, in November 2009, 3,936 centrifuges were being fed with UF_6 and an additional 4,756 centrifuges had been installed with a total figure of 8,692 IR-1 machines.[14] Few months later, in February 2010, the Agency reported that 11 out of 18 cascades (1,804 centrifuges) installed in module A26 were "disconnected," thus suggesting a major setback.[15] Although the IR-1 centrifuges had always experienced systematic technical problems (due to poor designing and flawed components), the breakage rate reported was higher than usual. Nevertheless, the Iranians were able to camouflage the difficulties since the production of LEU seemed not to be affected and continued to increase steadily (from 80 kg to 115 kg per month). Overall, more than 1,000 centrifuges were damaged by Stuxnet, which succeeded in de-

[14] See IAEA Director General, GOV/2009/74, pp. 1-2.
[15] See IAEA Director General, GOV/2010/10, p. 2.

laying the installation of new centrifuges (Warrick 2011). In November 2010, the Agency reported that the Iranians were modifying six of the cascades to contain from 164 to 174 centrifuges in the likely effort to by-pass the effects of the malware (which targeted only cascades of 164 IR-1 centrifuges). Similarly, in mid-November, the FEP stopped enriching uranium, although only temporarily.[16] As for the creators of virus, in January 2011 the «New York Times» reported that Stuxnet was allegedly the result of a US-Israel partnership and was probably tested in Dimona complex of Israel (Broad, Markoff, Sanger 2011). This revelation followed several declarations that provided useful hints on the authorship of the worm. In January 2011, in his retirement speech before the Knesset, Mossad Chief, Meir Dagan, stated that due to a series of malfunctions and failures Iran would have not been able to produce a nuclear weapon before 2015 (Melman 2015). Similarly, during a press conference, the Obama's chief strategist for combating WMD, Gary Samore, sidestepped a Stuxnet question, adding (with a smile): "I'm glad to hear they are having troubles with their centrifuge machines, and the US and its allies are doing everything we can to make it more complicated" (Broad, Markoff, Sanger 2011).

In June 2012, the «New York Times»' journalist, David E. Sanger, disclosed the history of Stuxnet. According to Sanger, the virus was part of a wider operation, code-named "Olympic Games", launched in 2006 by the Bush Administration and meant to sabotage the Natanz nuclear site. The worm was presumably developed by the United States in partnership with Israel and was tested using Libyan P-1 centrifuges, which were obtained by Ghedaffi in 2003 (chapter 4, paragraph 4). The Operation "Olympic Games" was then disclosed to Obama during the transition period (November 2008-January 2009) and was continued under the new Administration. After the failure of the fuel swap proposal of October 2009, the United States (and Israel) decided to reduce the stockpile of LEU with alternative means, thus leading to the Stuxnet cyber-attack (Sanger 2012a). However, cyber-warfare was not only the instrument used to undermine Iran's nuclear program. On January 12, 2010, Masoud Ali Mohammadi, a prominent nuclear physicist at the Tehran University, was killed outside of his home in a motorcycle bomb explosion. Even if the Ahmadinejad Administration accused Israeli and/or US intelligence services, given the political ties of Mohammadi with the Green Movement, the responsibility of the killing was not clear (Borger, Dehghan 2010a). On March 31, Shahram Amiri, a senior nuclear scientist

[16] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, November 23, 2010, GOV/2010/62, p. 2.

who disappeared in Saudi Arabia under mysterious circumstances, was reported to have defected to the United States and to be closely cooperating with the CIA. The Amiri case was considered "an intelligence coup" and showed the existence of an ongoing intelligence war behind the scenes of the diplomatic negotiations (Cole 2010).

On November 29, Majid Shahriari, a nuclear engineer and member of the *Pasdaran* allegedly involved in relevant nuclear or ballistic activities, was killed by a motorcycle bomb explosion. The same day, Fereidoun Abbasi, another prominent nuclear physicist and future head of the AEOI, was injured (Borger, Dehghan 2010). The same modality – lauching explosive magnetic charges against targets – was used against Mostafa Ahmadi Roshan, a chemistry expert and a director of Natanz in January 2012. This attack was preceded in July 2011 by the assassination of Darious Razeinejad, a scientist reportedly involved in nuclear research with military dimensions (Meikle 2012). These operations, reportedly conducted by the Israeli and US intelligence services, were meant to delay the Iranian nuclear activities by targeting the "brains" of the nuclear program and were shadowed by other mysterious episodes (Hecker, Milani 2015). In October 2011, the United States disclosed a plot designed to kill the Saudi Ambassador in Washington DC and accused senior members of the Islamic Guards Corps (Savage, Shane 2011). Even if the Iranian Government dismissed the charges, in mid-November the UN General Assembly voted (116 ayes, 9 nays and 40 abstentions) an unprecedented resolution condemning terrorism in all forms and specifically the alleged Iranian plot (Vaccarello 2011). During the same days, an explosion hit a *Pasdaran*'s military base outside Teheran, killing Brig. Gen. Hassan Moghaddam, one of the top commanders involved in the ballistic missiles program, alongside with 16 other persons. The case was considered an "accident" (NYT 2011). Tension would reach the peak at the end of November 2011, when several hundred of Iranian demonstrators, protesting the adoption of new unilateral sanctions, stormed the British Embassy in Teheran, taking in hostage six persons. The event was unanimously condemned and prompted the abrupt rupture of diplomatic relations between Iran and the Great Britain (Worth, Gladstone 2011). Overall, all these episodes contributed to complicate the negotiations with the P5+1, stalling since October 2009, and the definition of a genuine diplomatic solution to the nuclear crisis.

6. The Russian Step-by-Step Plan

On December 6, 2010, Iran's chief negotiator Saeed Jalili and the new EU High Representative Catherine Ashton held a round of talks in Geneva, the first over a year (Richter 2010). The inconclusive meet-

ing was preceded by the release of a new report on the implementation of the safeguards. In his report, the IAEA Director General confirmed the continuation of the enrichment activities in spite of the Board and UNSC resolutions. Specifically, since February 2007, the Islamic Republic had produced 3,183 kg of LEU with 29 (4,816 centrifuges) out of 54 cascades (8,426 centrifuges) currently operating at the FEP. Out of this amount, 415 kg of LEU were further enriched, resulting in nearly 33 kg of UF_6 up to 20% produced at the PFEP since February 2010. Yukiya Amano further reported that Fordow plant was included in R&D and in the production of LEU.[17] Finally, he confirmed the completion of the core-loading, started in August 2010, of the Bushehr reactor, which was ready to be become operational after 37 years of construction (MNA 2010). Meanwhile, in Teheran, the head of the AEOI Salehi solemnly declared that Iran had become self-sufficient in the production of uranium yellowcake (AP 2010). This announcement was followed by a notable change within the conservative Administration. On December 13, Ahmadinejad abruptly dismissed Foreign Minister Mottaki while he was on an official visit to Senegal (Yong 2010). Such decision was the result of a personal conflict regarding the priorities and direction of foreign policy between the President and the Supreme Leader, to whom Mottaki was solidly related (Gaietta 2016: 170-171). Mottaki was replaced by Ali Akbar Salehi, who retained the leadership of the AEOI until February 2011, when Fereidoun Abbasi was appointed to lead the Organization (CNN 2011a).

In the first months of 2011, while the multilateral negotiations were facing a complete deadlock – in January a new inconclusive round of talks took place in Istanbul – the Iranian officials boosted the program. In January 2011, Salehi announced that Iran was one of the few countries capable of producing domestically fuel pellets and rods for nuclear and research reactors (CNN 2011b). One month later, during the annual celebrations of the Revolution, President Ahmadinejad unveiled four new prototypes of home-built satellites, scheduled to be launched in 2012 (Reuters 2011). Similarly, in April 2011, the head of the AEOI announced that Iran would increase the production of 20% uranium and built four or five reactors for research and medical purposes (Crail 2011). Despite these statements, the Agency continued to monitor the developments of Iran's nuclear activities. In the IAEA document on the implementation of safeguards, released on May 24, Yukiya Amano reported that the Agency had received further information "related to possible past or current undisclosed nuclear activities that seemed to point to the existence of possible military dimensions." Though, given Iran's poor

[17] See IAEA Director General, GOV/2010/62, pp. 2-4, 8.

cooperation with the Agency, the Director General was unable to conclude that all nuclear material in Iran was in "peaceful activities."[18] Once again, the Iranian officials responded by raising the stakes and, on June 9, announced that they would install a first cascade of a new generation of centrifuges at Fordow. They further declared that they would transfer the 20% enrichment activities from Natanz to Fordow under the IAEA supervision and tripled the production of 20% enriched uranium (TT 2011). Given the implications of this decision and the increasing tension, in mid-July 2011, the Russian Foreign Minister Sergey Lavrov presented in Washington the so-called "step-by-step plan" (Arshad 2011). According to draft of the proposal, which resembled the offer delivered by Rouhani in March 2005 (chapter 4, paragraph 6), there were four steps meant to build trust between all parties involved (Davenport 2017):

Step 1

1. Iran would limit enrichment at Natanz; it would not install and produce any new centrifuges;
2. The P5+1 would suspend some UN sanctions, including financial sanctions and ship inspections.

Step 2

1. Iran would implement revised Code 3.1 of the Subsidiary Arrangement, limit enrichment at 5%, and allow greater IAEA monitoring over its centrifuges.
2. The P5+1 would suspend most UN sanctions and gradually lift all unilateral sanctions.

Step 3

1. Iran would implement the Additional Protocol.
2. The P5+1 would suspend all UN sanctions in a phased manner.

Step 4

1. Iran would suspend all enrichment-related activities for 3 months.
2. The P5+1 would lift all sanctions and begins to implement the group's proposed incentives.

After a meeting with the Russia's National Security Council secretary Nikolai Patrushev in Teheran, President Ahmadinejad accepted the proposal and "was ready to prepare suggestions for cooperation in

[18] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, May 25, 2011, GOV/2011/29, pp. 6-9.

the nuclear sphere" (RT 2011). According to former negotiator Hossein Mousavian, "the Russian plan was the most realistic package put forward by a member of the P5+1 since 2003 that could lead toward a final resolution of crisis over Iran's nuclear program" (Mousavian 2012: 409). However, the "step-by-step" plan did not gain traction due to the dissatisfaction of the United States and other Western partners for a series of reasons. Specifically, the plan failed to mention the outstanding issues concerning the possible military dimensions and did not include the suspension of the construction of the research reactor in Arak. Overall, given the immediate benefits of the offer (e.g. de-escalation of the crisis), these minor concerns might have been addressed in a further stage of plan during the implementation of the Additional Protocol (Gaietta 2016: 179). Once again, the Western inflexibility led to another missed chance to solve the nuclear standoff.

In the meantime, during his annual visit at the United Nations, President Ahmadinejad announced the release of two American hikers, imprisoned for more than two years in Iran (Goodman, Cowell 2011). This humanitarian gesture came along with a new confidence-building offer. During an interview, dated 21 September, Ahmadinejad proposed to suspend to production of 20% enriched uranium in return of fuel supplies from the United States for the Teheran Research Reactor (Kristoff 2011). Though, on September 22, following a meeting with the political directors of the P5+, the EU High Representative set out the multilateral line of action. By reaffirming "the full implementation" of the UNSC resolutions and the 2008 June proposal (chapter 5, paragraph 8), Catherine Ashton officially rejected both the Russian plan and the Iranian offer (TNA 2011).

7. Diplomatic Impasse

On November 8, 2011, the Director General submitted a new document on the implementation of safeguards (Borger 2011a). In the report, Yukiya Amano expressed "serious concerns" regarding possible military dimension to Iran's nuclear program. More specifically, he provided a detailed assessment of all existing documents, enclosed in the Annex, according to which Teheran:

1. Attempted to procure nuclear related and dual use equipment and materials by military related individuals and entities;
2. Attempted to develop undeclared pathways for the production of nuclear material;
3. Acquired nuclear weapons development information and documentation from a clandestine nuclear supply network. In this regard, it had also sought information on how to convert highly enriched uranium into a metal (the so-called uranium metal document);

4. Worked on the development of an indigenous design of a nuclear weapon including the testing of components. With this respect, Iran had developed Exploding Bridge Wire (EBW) detonators. In 2000, it had built a large explosion containment vessel at the military site of Parchin and studied how to integrate a new spherical payload in the re-entry vehicle of the Shahab 3 missile. In 2008 and 2009 had allegedly conducted nuclear device modelling studies.

In conclusion, the IAEA Director General concluded:[19]

> After assessing carefully and critically the extensive information available to it, the Agency finds the information to be, overall, credible. The information indicates that Iran has carried out activities relevant to the development of a nuclear explosive device. The information also indicates that prior to the end of 2003, these activities took place under a structured programme, and that some activities may still be ongoing.

As in the previous cases, the IAEA report triggered mixed reactions. On one side, the United States and the European partners called for a new round of sanctions against the Islamic Republic. Though, Russia and China criticized the Agency and firmly rejected this approach as unacceptable, thus suggesting a major breakdown of the unity of the P5+1 (Borger 2011b). On the other, Iran's Foreign Minister Salehi dismissed the document as "advertising campaign" with baseless and fabricated evidence (Reynolds 2011). Similarly, the representative of the Non-Aligned Movement issued a statement, noting "with concern the possible implications of the continued departure from standard verification language in the summary of the report" (Matthew 2011). Despite sharp criticism and the divisions, on November 18, the IAEA Board of Governors adopted a new resolution, expressing "deep and increasing concern about the unresolved issues regarding the Iranian nuclear program, including those which need to be clarified to exclude the existence of possible military dimensions." It further stressed the importance of dialogue and urged Iran to comply "fully and without delay with its obligations under relevant resolutions of the UN Security Council."[20] The text was the result of a compromise between the members of the P5+1 and excluded future immediate actions within the UNSC. There-

[19] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, November 8, 2011, GOV/2011/65, p. 10.

[20] See IAEA Board of Governors, Implementation of the NPT safeguards agreement and relevant provisions of United Nations Security Council resolutions in the Islamic Republic of Iran Resolution adopted by the Board of Governors on 18 November 2011, GOV/2011/69, paragraphs 1-3.

fore, in line with the dual track policy, the United States and other Western partners decided to adopt new unilateral punitive measures against Teheran. On November 21, the US Department of Treasury named the Iranian Central Bank and the entire banking system as a "primary money laundering concern." Likewise, Great Britain, France and Canada announced new measures aimed at shutting off Iran's access to foreign banks and credit (Landler 2011). In the case of the UK, the first State to impose sanctions against the Central Bank, the initiative was followed by the assault to the British embassy in Teheran and the swift rupture of diplomatic relations (paragraph 5). Overall, these events contributed to increase tension. In late December 2011, Iran's Vice-President, Mohammad Reza Rahimi, warned that "not a drop of oil will pass through the Strait of Hormuz" if sanctions would have been widened (BBC 2011). The United States responded immediately by writing to Ayatollah Khamenei and warning that the closing of the Strait – a strategic waterway where 16 million of barrels (nearly 40% of the world's oil) flowed through every day – would be considered as a "red line" (Bumiller, Schmitt, Shankerjan 2012). On January 1, 2012, the AEOI officials announced that the Islamic Republic had successfully tested the first domestically produced nuclear fuel rod for the Teheran Research Reactor (TT 2012). Few days later, the IAEA reported that the Iranians had begun enriching uranium up to 20% at Fordow, a decision regarded by the United States as a "further escalation" in the row (BBC 2012a). As a result, on January 23, the European Union formally agreed to impose an unprecedented oil embargo on the Islamic Republic, starting from July 1. The EU further set additional restrictions on the Central Bank and in the trade of gold, precious metals and diamonds (BBC 2012b). Meanwhile, between January and February 2012, the Agency and Iran held two rounds of talks in Teheran. Following the precedent of the 2007 work plan (paragraph 5.5), the discussions were supposed to deliver a document "on a structured approach" meant to clarify all outstanding issues, particularly the possible military dimension of the program.[21] Though, the meetings resulted in a failure, leaving once again the initiative to the P5+1.[22] On April 14, 2012, the six partners and the Islamic Republic met in Iran for the first time after 15 months of "epistolary diplomacy." The session was defined positive by all participants, who, pursuing the example of the Russian plan of 2011 and the IAEA "structured approach," agreed to meet again and

[21] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, February 24, 2012, GOV/2012/9, p. 2.

[22] See IAEA, IAEA Expert Team Returns from Iran, *Press Release*, February 22, 2012.

to work on a new framework with step-by-step action (Erlanger 2012). The representatives of the P5+1 and Iran held further talks in Baghdad (May 23-24) and in Moscow (June 18-19), where both parties decided to present and discuss two packages (CNN 2012). On one side, the six partners offered the "stop, ship and shut" proposal, regarded as an update version of the fuel swap of October 2009, according to which (Gaietta 2016: 173-174):

Iranian Actions:
1. It would stop all 20% enrichment activities.
2. It would ship all 20% enriched uranium to a third country under IAEA custody.
3. It would shut down the Fordow Fuel Enrichment Plant.
4. Iran would provide greater access to the IAEA and clarify all outstanding issues.

P5+1 Actions
1. The members of the P5+1 would provide fuel supplies for the Tehran Research Reactor.
2. They would cooperate in acquiring a light water research reactor to produce medical isotopes.
3. The United States would provide spare parts for Iranian commercial aircraft.

On the other side, the Islamic Republic proposed a five-step package (Davenport 2017):

Step 1 – Guidelines
1. Iran would emphasize the legal commitments under the NPT and its opposition to nuclear weapons based on the Supreme Leader's *fatwa*.
2. The P5+1 would recognize Iran's nuclear rights based on Article IV of the NPT.

Step 2 – Transparency Measures
1. Iran would continue broad collaboration with IAEA and would transparently cooperate with the Agency on "possible military dimension."
2. The P5+1 would end unilateral and multilateral sanctions outside of the UNSC resolutions.

Step 3 – Confidence Building Steps
1. Iran would cooperate with P5+1 to provide enriched fuel for Teheran Research Reactor.
2. P5+1 would terminate the UN sanctions and remove Iran's nuclear file from UNSC agenda.

Step 4 and 5 – Strengthening Cooperation on Mutual Interests and Joint Cooperation

1. All parties would start and boost cooperation on designing and building nuclear plants, research reactors and light water reactors, nuclear safety and security, nuclear fusion.
2. All Parties would start cooperating on regional issues, such as the political situation in Syria and Bahrain, combating piracy and countering narcotics activities.

Even if the talks were unexpectedly constructive, given the persisting differences and lack of trust, the room for a deal was small. On one side, Iran's lead negotiator Saeed Jalili expressed the willingness to scale down the enrichment activities up to 20% in return for substantial concessions. However, he reaffirmed that enrichment was non-negotiable and there was "no reason or excuse to have doubts regarding the peaceful aims of Iran's nuclear program" (Barry, Gladstone 2012). On the other, the six partners adopted an inflexible stance and were not ready to make any major concession (e.g. sanctions relief), although they wanted to keep open a channel of dialogue (Borger 2012). During the follow-up meeting convened in Istanbul on July 3, 2012, the P5+1 and Iran discussed the technical aspects of the proposals in the attempt to find a common ground for a deal (Davenport 2012). Though, the talks ended with nothing, reaffirming the long-standing diplomatic impasse.[23]

To complicate the situation, on August 24, the Director General confirmed the enduring lack of a final "structured approach paper" for the clarification of all outstanding issues with Iran.[24] This announcement was followed by the release of a new report on Iran's nuclear program. In the document, Amano reported the steady installation of centrifuges at the FFEP and the increased amount of 20% enriched uranium. As for the possible military dimension, the IAEA made another astonishing discovery in relation to the military site of Parchin (chapter 4, paragraph 5). After the notification of the location where the containment vessel was allegedly situated, in February 2012 the Iranians started extensive activities, from significant ground scraping and landscaping to the destruction of five buildings. Like in the first phases of the nuclear crisis, the Islamic Republic was hiding something and covering up evidence.[25]

[23] See EU, Statement by the Spokesperson of High Representative Catherine Ashton following the meeting of experts of E3+3 and Iran, *Delegation of the European Union to Turkey*, July 4, 2012.

[24] See IAEA, Statement After Iran Talks, *Press Release*, August 24, 2012.

[25] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, August 30, 2012, GOV/2012/37, pp. 8-9.

These developments were addressed during the IAEA meeting of 10-13 September 2012, where the Board of Governors adopted a new resolution. The Board urged Iran to increase cooperation with the IAEA and restore international confidence in the exclusively peaceful nature of the program "on the basis of reciprocity and a step-by-step approach and consistent with the NPT."[26] Few days later, on September 18, Catherine Ashton and Saeed Jalili met in Istanbul to discuss the "common points" reached during the technical meeting of July 2012. These talks were not considered a formal negotiation (BBC 2012c). Indeed, with the imminent presidential elections in the United States (November 6) and the upcoming consultations in Iran (June 2013), the two major negotiating parties had narrowed margins for diplomatic manoeuvre and adopted a "wait and see" attitude.

On September 27, in a speech at the UN General Assembly, Israeli Prime Minister, Benjamin Netanyahu, drew a "red line" for the nuclear program, declaring alarmingly that Iran would be capable of developing a weapon in less than one year ("next spring or at most next summer"). If the Islamic Republic crossed that red line – i.e. if it amassed nearly 250kg of 20% enriched uranium, the minimum amount of material needed for a single warhead – Netanyahu implicitly raised the possibility of a preemptive military strike (Heller 2012). Despite these aggressive rhetoric declarations, the speech revealed that the military option was always in the background (Gregory 2016). It further showed that not all the members of the international community were interested in a diplomatic solution to the nuclear standoff with Iran. Following the re-election of President Obama, Yukiya Amano circulated a new document on the implementation of safeguards. The Director General reported that Teheran had installed 10,414 centrifuges at the industrial plant of Natanz and 2,784 at the Fordow plant. He communicated that Iran had produced 232,8 kg of UF_6 enriched up to 20% of, which 96,3 kg were converted in U_3O_8 (since May 2012). Even if U_3O_8 was needed to produce the fuel for the Teheran Research Reactor, it contributed to reduce the amount of 20% enriched uranium, thus momentarily defusing international tension.[27] At the end of 2012, the negotiations were still stalling with no considerable progress in sight.

[26] See IAEA Board of Governors, Implementation of the NPT safeguards agreement and relevant provisions of United Nations Security Council resolutions in the Islamic Republic of Iran Resolution adopted by the Board of Governors on 13 September 2012, GOV/2012/50, paragraphs 1 and 5.

[27] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, November 16, 2012, GOV/2012/55, pp. 2-4.

On December 21, the European Union adopted new sanctions against Iran and introduced a new prohibition on transfers of funds between the EU and Iranian banks; it further prohibited the import, purchase, transport or swap of natural gas, key naval equipment and graphite and raw or semi-finished metals.[28] Likewise, on January 3, 2013, the United Stated approved new measures against the Iranian oil sector with the National Defence Authorization Act for 2013. In the meantime, Iran's Foreign Minister Salehi requested the Supreme Leader a formal authorization to open a secret and direct channel with the Obama Administration. Given the American interest in a bilateral negotiation, secretly conveyed in 2012 through the Omani Sultan Qaboos, and the overall impact of sanctions, a change in approach was strongly required. Even if Khamenei was not optimist on the outcome of a direct dialogue with Washington, he gave his permission and set the conditions, limiting the discussions only on the nuclear issue (Carmon, Savyon, Mansharof 2015). In February 2013, the Agency acknowledged the failure to finalize a "structured approach document" to clarify all outstanding issues with Iran, thus deciding to partially suspend this initiative.[29] Still, on February 26, 2013, after nine months of impasse, the P5+1 and the Islamic Republic could resume negotiations in Almaty, in Kazakhstan. The meeting was followed by a technical session in Istanbul (March 18) and a new round of discussions in Almaty (April 5-6). The P5+1 offered a revised version of the package presented in 2012 with some new elements. More specifically, they proposed (Davenport 2017):

Iranian actions:

1. Iran would halt all 20% enrichment activities.
2. It would transfer part of its 20% enriched uranium to a third country under IAEA custody.
3. It would "suspend" [and not shut] all operations at the Fordow facility.
4. It would solve all remaining issues and implement the Additional Protocol and revised Code 3.1.

P5+1 Actions

1. The members of the P5+1 would provide fuel supplies for the Tehran Research Reactor.
2. They would cooperate in acquiring a light water research reactor to produce medical isotopes.

[28] See EU adopts additional financial sanctions against Iran, *Lexology*, January 8, 2013.

[29] See IAEA, Remarks by Deputy Director General Herman Nackaerts, *Press Release*, February 14, 2013.

3. The United States would provide spare parts for Iranian commercial aircraft.
4. The P5+1 would provide "sanctions relief on sales of precious metals and petrochemicals products" and would "not impose any new proliferation related sanctions on Iran."

The overall duration of the multilateral proposal was six months, with the possibility of renewal. Meanwhile, all parties would negotiate a long-term agreement in accordance with the following guidelines (Gaietta 2016: 179):

1. To restore international confidence in the exclusively peaceful nature of the nuclear program;
2. To respect Iran's right to peaceful nuclear energy.
3. To terminate sanctions.

As for the Iranians, in April they delivered a first draft, which resembled to the five-step plan of May 2012. Given the P5+1 dissatisfaction with this proposal, they presented a new offer (Davenport 2017).

Iranian Actions

1. Iran would freeze the installation of centrifuge at Fordow;
2. It would continue talks with the IAEA;
3. It would continue converting 20% enriched uranium UF_6 into U_3O_8;
4. It would suspend enrichment of uranium up to 20%.

P5+1 Actions

1. The P5+1 would lift all sanctions against Iran.
2. The P5+1 would recognize Iran's nuclear rights.

With respect to the two packages discussed in 2012, the proposals of 2013 were much more realistic and attentive to the respective concerns. On one side, the P5+1 were ready to discuss the recognition of Iran's nuclear rights in exchange for a partial relief of the punitive measures. On the other, the Iranians were willing to suspend the most sensitive part of enrichment, a position never embraced before, even if they were demanding in return the abrupt revocation of all UN, multilateral and unilateral sanctions. Despite the partial convergence, the P5+1 and the Islamic Republic could not reach a common position. Meanwhile, between March and April, the US and Iran held two rounds of secret talks in Oman with the mediation of Sultan Qaboos. The back-channel talks were conducted by Undersecretary William J. Burns with the assistance of the US President's adviser Jack Sullivan (Burns 2016). Given Iran's inability to make major political decisions, all parties decided to suspend the diplomatic initiatives and agreed to resume negotiations after the elections of June 2013.

CHAPTER 7

THE JOINT COMPREHENSIVE PLAN OF ACTION (2013-2015)

1. The Wind of Change

On June 14, 2013, the Iranian people were called to elect a new President among eight candidates, previously confirmed by the Guardian Council (Sherrill 2014). Given the legal limitation to two consecutive terms and the isolation within the Iranian political system, outcoming President Ahmadinejad was not standing for re-election. Therefore, the major competitors were four conservative runners and one reformist: the Secretary of the SNSC and nuclear negotiator Saeed Jalili; the mayor of Teheran Mohammad Baqer Qalibaf; the adviser of the Ayatollah Khamenei in foreign policy Ali Akbar Velayati; and the former chief negotiator Hassan Rouhani. Moreover, the Guardian Council decided to exclude two controversial candidates: former President Ali Akbar Hashemi Rafsanjani and Ahmadinejad's aide Esfandiar Rahim-Mashaei (Dehghan 2013a). Given the precedent of the disputed election of 2009 (chapter 6, paragraph 1), the diplomatic impasse with the P5+1 and the disastrous economic outlook, these consultations were crucial. More specifically, the economy was facing huge challenges, mainly due to the impact of sanctions: the GDP was shrinking (–5,5%); the national currency (the rial) was falling with an inflation rate out of control (45%); the unemployment was skyrocketing (13% with a youth unemployment rate at 27%); the oil sector was collapsing (–50%) with a large slump in investments (Khajehpour 2013). Crippled by a mix of unprecedented sanctions, economic mismanagement and international political isolation, Teheran found itself in the most difficult period since the Iraq-Iran war (chapter 1, paragraph 4). It was clear that a change was urgently needed to be made (Khalaji 2015).

On June 15, the reformist candidate Hassan Rouhani won the elections with 50,71% of the vote (18 million of voters) over Qalibaf's 16,56% (6,1 million) and Jalili's 12% (4,2 million) with a turnout at 73% (BBC 2013a). The result had a considerable impact in Iran's domestic and foreign policy. During the campaign, Rouhani adopted a pragmatic platform ("hope and prudence"), invoking greater freedom of press and

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speech, including women right's issues, and questioning the expansion of the security apparatus. He further promised a rational approach in economy and a solution to the nuclear impasse with the P5+1 and diplomatic isolation (e.g. end of sanctions) (Bakhash 2013). On June 15, the Obama Administration, who had just adopted new punitive measures against Iran's currency and auto-industry, congratulated with the new-elected President, expressing the readiness "to engage the Iranian government directly in order to reach a diplomatic solution that would fully address the international community's concerns about the nuclear program" (Wasson 2013; see also Gladstone 2013). The US interest for a direct bilateral talk with Teheran was also conveyed by Obama in several letters to Rouhani, dated August 2013, and through the mediation of Omani Sultan Qaboos (Landler 2013; see also The Guardian 2013a).

After his inauguration, on August 6, President Rouhani called for "serious and substantive" negotiations with the international community about the nuclear program. During the following weeks, in the attempt to de-politicize the nuclear issue, he transferred the dossier from the Supreme National Security Council to the Foreign Ministry and selected a pragmatic group of negotiators. Former US-educated Ambassador to the UN (2002-2007), Mohammad Javad Zarif, became Minister of Foreign Affairs and head of the Iranian delegation (Dehghan 2013b); Abbas Araghchi, the only member from the previous team, was nominated Deputy Minister for international affairs and deputy chief negotiator; Majid Takht Ravanchi was appointed as Deputy Minister for European and American affairs; former Foreign Minister Ali Akbar Salehi returned to lead the AEOI, while Reza Najafi became the Iran's Permanent Representative to the IAEA in Vienna (Gaietta 2016: 187). In the meantime, several diplomatic overtures had taken place. On August 7, British Prime Minister David Cameron wrote to Rouhani, expressing hope that his election would create an opportunity for an improvement of the relations between London and Teheran (Dehghan 2013b). During the same days (August 6-7), the Italian Deputy Foreign Minister, Lapo Pistelli, visited Teheran, becoming the first European high-level official to meet the Rouhani Administration (Negri 2013). On August 19, the United States declassified and published several CIA documents concerning the 1953 coup against Iranian Prime Minister Mossadeq, officially admitting the American (and British) involvement in the operation (chapter 1, paragraph 1) (Dehghan, Norton-Taylor 2013). These initiatives were positively welcomed by the Iranian authorities that responded in turn with similar encouraging openings. On September 5, President Rouhani and the Foreign Minister Zarif both greeted the Jewish people for the new year ("Happy Rosh Hashanah") and condemned the Holocaust, thus distinguish themselves from the previous Administration (Tait 2013). Few weeks later, in a speech to commanders of the *Pasdaran*, the Supreme

Leader openly gave the green light for a negotiation with the US and the other partners of the P5+1, labelled as "very good and necessary" (Esfandiary 2013). On September 23, President Rouhani visited New York for the UN high-level ministerial week. Differently from Ahmadinejad's first address to the General Assembly (chapter 5, paragraph 1), Rouhani publicly acknowledged the Holocaust and focused on the nuclear program in a dramatic shift of tone (TOI 2013):

> Nuclear weapon and other weapons of mass destruction have no place in Iran's security and defence doctrine, and contradict our fundamental religious and ethical convictions. Our national interests make it imperative that we remove any and all reasonable concerns about Iran's peaceful nuclear program. …
>
> The Islamic Republic of Iran, insisting on the implementation of its rights and the imperative of international respect and cooperation in this exercise, is prepared to engage immediately in time-bound and result-oriented talks to build mutual confidence and removal of mutual uncertainties with full transparency.

On September 25, during an interview with «The Washington Post», President Rouhani further reiterated the commitment to reach a diplomatic solution as soon as possible. As similarly stated in the aftermath of the *Paris Agreement* (chapter 4, paragraph 6), when he was leading the Iranian delegation: "the shorter it is the more beneficial it is to everyone. If it's three months that would be Iran's choice, if it's six months that's still good. It's a question of months not years" (Ignatius 2013).

The following day, the Foreign Ministers of the P5+1, including US Secretary of State John Kerry, encountered their Iranian counterpart. This meeting marked the highest-level direct personal contact between Iranian and American representatives since the Islamic Revolution (BBC 2013b). During the session, defined by Ashton as "substantial", Zarif gave an energetic presentation in perfect English and agreed to hold the first round of negotiations in Geneva in mid-October (Fabius 2016). Meanwhile, in Vienna, Iran's Permanent Representative Najafi met the IAEA Deputy Director General for Safeguards, Herman Nackaerts, and agreed to encounter again and start "substantial discussions on the way forward to resolve all outstanding issues" at the end of October 2013.[1] Finally, on September 27, Barack Obama and Hassan Rouhani held the first direct talks between US and Iranian leaders since 1979, exchanging pleasantries

[1] See IAEA, Remarks by Deputy Director General Nackaerts After Talks with Iran, *Press Release*, September 27, 2013.

in a 15-minute telephone call (Borger, Roberts 2013). The conversation raised hopes for a mutual solution of the nuclear crisis.

2. The Joint Plan of Action

On October 15-16, the High Representative Ashton, with the policy directors of the P5+1, met Foreign Minister Zarif and his Deputy minister Araqchi in Geneva. During the first session, Zarif delivered a Power Point presentation – for the first time the negotiations were entirely in English – on Iran's proposal, titled "Closing unnecessary crisis and opening new horizons" (Gordon, Erdbrink 2013). The proposal contained several interesting ideas (Fabius 2016: 13):

1. A common objective: Iran's peaceful exercise of its right to nuclear power, including enrichment, and sanction relief;
2. A first phase which would address: the production and stockpile of 20% enriched uranium; the level of activities at Natanz and Fordow; the increased IAEA monitoring; financial transactions and oil revenues; and restrictions on petrochemical products, automobiles and precious metals;
3. A final phase which would implement the Supreme Leader's *fatwa* against nuclear weapons, in return for R&D and enrichment at Natanz and Fordow, operation of the Arak research reactor under limited conditions, cooperation on civilian nuclear applications and international monitoring by the IAEA, along with relief from all sanctions.

Overall, the offer was general and did not tackle the possible military dimension of the program. Moreover, Iran was requesting full and immediate suspension of sanctions, while the members of the P5+1 were willing to concede only a partial suspension and a commitment from the UNSC and the EU not to adopt new ones. Even if the differences were still significant, the atmosphere was "substantive and forward looking", confirming the openings of Rouhani (IV 2013).

Few weeks later, on October 28-29, the IAEA Director General Yukiya Amano and Iran's Deputy Foreign Minister Abbasi Araghchi met in Vienna. Given the failure of the "structured approach" document, the Iranian delegation decided to present a new framework containing "practical measures" to "strengthen cooperation and dialogue with a view to future resolution of all outstanding issues." The Agency and Iran agreed to encounter again on November 11.[2] Meanwhile, on Novem-

[2] See IAEA, Joint Statement by IAEA and Islamic Republic of Iran, *Press Release*, October 29, 2013.

ber 7, 2013, the multilateral negotiations resumed in Geneva. The parties could reach consensus on the length of the first phase of an interim deal, which would be six months. The same day, the US chief negotiator, Wendy Sherman, circulated a new proposal, which was the result of the American bilateral back-channel in Oman. The offer was in line with the Zarif's plan of October and constituted the ground for a new discussion on a ministerial level (November 8-10). Although the differences were narrowed, French Foreign Minister Laurent Fabius raised several objections, inducing the talks to suddenly break down (Nicoullaud 2016b: 57). In this regard, Fabius criticized the US black-channel approach and pointed out five constraints (Fabius 2016: 14-15):

1. The text failed to mention Iran's explicit commitment not to develop or obtain nuclear weapons;
2. It did not address the question of enrichment over the long term;
3. It did not include a satisfactory plan for handling the stockpile of uranium enriched up to 20%
4. It did not limit the production of centrifuges to those needed to replace broken ones;
5. It did not suspend all activities associated with the construction of the Arak research reactor and the manufacture or testing of its fuel.

Despite the deadlock, Ashton and the Ministers agreed to set a new session for November 20 at the political director's level. In the meantime, talks in Teheran made substantial progress. On November 11, the Director General Amano and the head of the AEOI Salehi signed the *Joint Statement on a Framework for Cooperation*. Both parties agreed to proceed in a step-by-step manner and "strengthen their cooperation and dialogue aimed at ensuring the exclusively peaceful nature of Iran's nuclear program through the resolution of all outstanding issues." More specifically, the Islamic Republic and the Agency agreed to take the following actions within three months from the date of the joint declaration[3]:

1. Providing (further) mutually agreed relevant information and managed access to the Gchine mine in Bandar Abbas and to the heavy-water production plant;
2. Providing information on all new research reactors;
3. Providing information with regard to the identification of 16 sites designated for the construction of nuclear power plants;
4. Clarification of the announcement made by Iran regarding additional enrichment facilities;

[3] See IAEA, IAEA, Iran Sign Joint Statement on Framework for Cooperation, *Press Release*, November 11, 2013.

5. Further clarification of Iran's announcement with respect to laser enrichment technology.

The *Framework for Cooperation* confirmed the Rouhani Administration's genuine will to fully engage and solve all outstanding issues. Indeed, the measures listed went beyond the legal obligations of the 1974 Safeguards Agreement and the original version of Code 3.1. Moreover, some preliminary information concerning the Gchine mine and the Arak production plant had already been provided within the framework of the 2007 IAEA work plan (chapter 5, paragraph 7) (Gaietta 2016: 193). These developments were conveyed by the Director General in his report, dated November 14, on the implementation of safeguards. In the document, the IAEA reported the *de facto* suspension of the program since the previous report of August 2013. Indeed, Amano stated:[4]

1. The amount of 5% and 20% enriched uranium, respectively 7154,3 kg and 196 kg, and their rate of production remained unchanged;
2. No additional IR-2m centrifuges had been installed at the FEP; none of the 1,008 centrifuges IR-2m already installed had been fed with UF_6;
3. The number of IR-1 centrifuges installed (6,250) and in operation (9,150) at the Natanz FEP remained unchanged;
4. The number of IR-1 centrifuges installed (2,710) at the Fordow plant remained unchanged;
5. No additional major components had been installed at the Arak research reactor.

This positive news created an encouraging atmosphere for the multilateral talks in Geneva. After a session of the political directors, on November 22, negotiations resumed at a ministerial level. Differently from the previous meeting, the EU High Representative received the mandate to negotiate on behalf of the P5+1 and discuss the five key issues raised by French Minister (Fabius 2016: 16). Finally, after days of hard bargaining, on November 24, Mohamad Javad Zarif and Catherine Ashton signed the *Joint Plan of Action* (JPOA), a six-months framework meant to guide negotiations for "a mutually-agreed long-term comprehensive solution" within 6 or 12 months (Gearan, Warrick 2013). The core of the deal, based on the proposals discussed in Istanbul and Almaty (chapter 6, paragraph 7), required Iran to freeze or scale back parts of the program in return for temporary relief on some economic sanctions

[4] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, November 14, 2013, GOV/2013/56.

(worth $7 billion). More specifically, while reaffirming that under no circumstances it would seek or develop any nuclear weapons, during a six-month period, Iran would undertake the following "voluntary measures" (The Guardian 2013b):

1. From the existing uranium enriched up to 20%, it would retain half as working stock of 20% UO_2 for fabrication of fuel for the Teheran Research Reactor; the remaining part of 20% UF_6 would be diluted to no more than 5% with no use in the reconversion line.
2. It would not enrich uranium over 5%.
3. It would convert the newly enriched UF_6 up to 5% to UO_2.
4. At Natanz, it would not feed UF_6 into the centrifuges installed but not operating. It would not install additional centrifuges and would replace existing ones with machines of the same type.
5. At Fordow, it would not enrich over 5% in the four cascades operating and increase the enrichment capacity. It would not feed UF_6 into the other twelve cascades, which would remain in a non-operative state. It would replace existing centrifuges with machines of the same type.
6. At Arak, it would not commission the reactor or transfer fuel or heavy water to the site and would not test additional fuel or produce more fuel for the reactor or install remaining components.
7. The centrifuge production would be dedicated to replacing damaged machines.
8. No new sites for enrichment, no reprocessing or construction of a site capable of reprocessing.
9. Enhanced monitoring.

Given the degree of the measures, the French concerns were fully addressed. In return, during the same period, the members of the P5+1 would undertake the following voluntary actions:

1. They would pause efforts to further reduce Iran's crude oil sales, enabling Iran's current customers to purchase their current average amounts of crude oil. For such oil sales, EU and US sanctions on associated insurance and transportation services would be suspended.
2. They would enable the repatriation of an agreed amount of revenues held abroad ($4.2 billion).
3. They would suspend US and EU sanctions on Iran's petrochemical exports, gold and precious metals, as well as U.S. sanctions on Iran's auto industry and associated services.
4. They would license the supply and installation in Iran of spare parts for safety of flight for Iranian civil aviation and associated services.
5. They would establish a financial channel to facilitate humanitarian trade for Iran's domestic needs using Iranian oil revenues held abroad.
6. They would commit not to adopt new nuclear-related UNSC, EU and US sanctions.

Moreover, the P5+1 and the Islamic Republic would establish a Joint Commission to monitor the implementation of these short-term measures and to address all potential issues that might arise. The IAEA would be responsible for verification of nuclear-related measures and would be assisted by the Commission to facilitate the solution of past and present issues of concern. The long-term agreement would build on these measures and would "enable Iran to fully enjoy its right to nuclear energy for peaceful purposes under the relevant articles of the NPT in conformity with its obligations." It would involve a "mutually defined enrichment program with practical limits and transparency measures" meant to ensure the peaceful nature of Iran's nuclear activities. It would involve a reciprocal, step-by-step process, and would produce the comprehensive lifting of all UNSC sanctions, as well as multilateral (e.g. EU) and unilateral sanctions related to the nuclear program (The Guardian 2013b).

The *Joint Plan of Action* was warmly welcomed by the US Administration. "While today's announcement is just a first step, it achieves a great deal." Obama said, "For the first time in nearly a decade, we have halted the progress of the Iranian nuclear program, and key parts of the program will be rolled back" (Borger, Dehghan 2013). Similarly, Ayatollah Khamenei, wrote a letter to President Rouhani, praising the agreement as the "basis for further intelligent actions," adding: "without a doubt the grace of God and the prayers of the Iranian nation were a factor in this success" (Blair 2013). On the same page, the IAEA Director General welcomed the JPOA and expressed the readiness of the Agency to fulfil its role in verifying the implementation of nuclear related measures.[5] On the other side, given the emerging implications of a long-term resolution of the Iranian crisis, several voices were raised against (Cohen 2013). Israeli Prime Minister Netanyahu strongly disagreed with the previous declarations, stating: "what was concluded in Geneva last night is not a historic agreement, it's a historic mistake." Likewise, many US Republican senators, such Marco Rubio and Mike Rogers, chairman of the House Intelligence Committee, criticized the JPOA (Yan, Levs 2013). As for Saudi Arabia and the other Gulf countries (e.g. United Arab Emirates, Qatar and Kuwait) they expressed anxiety over the deal, although maintaining a discrete silence (Black 2013). Though, as happened in the unsuccessful cases of the *Teheran Declaration* (2003) and the *Paris Agreement* (2004), the interim framework was the first and the easiest part of the entire process. The actual challenge was the conclusion of a long-term and comprehensive deal acceptable for all parties involved in the negotiations, as well as the definitive solution of the PMD of the program.

[5] See IAEA, Statement by IAEA Director General on Geneva Agreement, *Press Release*, November 24, 2013.

Despite the good will of Iran and the determination the IAEA and the P5+1, the upcoming negotiations would only confirm the struggle for a genuine solution of the crisis.

3. The First Extension of the JPOA

On December 9, the P5+1 and Iran convened a technical session in Geneva to discuss the implementation of the *Joint Plan of Action*, whose decision had been voluntarily postponed. Despite the progress, on December 12, the meeting was suddenly interrupted on the pretext of the US decision to sanction five companies accused of helping Iran's nuclear and missile program (Sanger 2013). The initiative was regarded by Araqchi as a violation of the spirit of the JPOA. Though, few days later, the White House reassured the Iranians that the President would veto any law introducing additional sanctions and damaging the diplomatic multilateral effort (Stoil 2013). Meanwhile, after the inspection at the heavy-water production plant in Arak, on December 11, the AEOI and the IAEA held technical talks under the *Framework for Cooperation* in Vienna. Both parties agreed to discuss the next practical steps and to meet in Teheran on January 21, 2014 (later postponed to February 8).[6] Following a new session (December 30-31), the P5+1 and Iran convened on January 9, 2014. On January 12, they could finally reach a technical agreement for the implementation of *Joint Plan of Action*, which would start as of January 20. Moreover, the Agency agreed to provide monthly updates on the IAEA monitoring and verification in relation in relation to the JPOA.[7] The same day, Amano issued a report on the status of the program, thus confirming Iran's compliance with the provisions of the deal.[8]

In early February, the IAEA and the Islamic Republic resumed discussions within the *Framework for Cooperation* in Teheran. During the session, the two sides reviewed the initial steps and agreed to the second set of actions to be implemented by May 15.[9]

1. Providing mutually agreed relevant information and managed access to the Saghand mine in Yazd, the Ardakan concentration plant and the Lashkar Abad Laser Centre;

[6] See IAEA, Statement by IAEA and Iran Following Technical Talks in Vienna, *Press Release*, December 11, 2013.

[7] See IAEA Director General, Monitoring and Verification in the Islamic Republic in relation to the Joint Plan of Action, January 17, 2014, GOV/2014/2, p. 2.

[8] See IAEA Director General, Status of Iran's nuclear program in relation to the Joint Plan of Action, January 20, 2014, GOV/INF/2014/1, p. 1.

[9] See IAEA, IAEA and Iran Conclude Talks in Connection with Implementation of Framework for Cooperation, *Press Release*, February 9, 2014.

2. Submission of an updated Design Information Questionnaire for the IR-40 reactor
3. Taking steps to agree on the conclusion of a Safeguards Approach for the IR-40 reactor;
4. Providing information on source material, which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, including imports of such material and on Iran's extraction of uranium from phosphates;
5. Providing information and explanations for the Agency to assess Iran's stated need or application for the development of Exploding Bridge Wire detonators.

The latter was the only issue mentioned in the IAEA report of November 2011 with PMD (paragraph 6.7). Few days later, on February 17-20, the six world powers and Iran, coordinated by the EU High Representative, began the negotiations for a long-term agreement in Vienna (Smith-Spark 2014). The conversation remained general. The Iranian negotiators intended to limit the talks only on the issues identified by the JPOA, excluding the crucial areas of R&D, the ballistic program and the possible military dimension (to be discussed only with the Agency). On the other, the US and France strongly insisted to include the issues of R&D and the PMD, labelled as indispensable, while Russia strongly supported Iran's request to omit the missiles program. At the end, the parties identified the "building blocks" for a comprehensive solution and a set a tight timetable, which envisaged political and technical meetings about every two weeks (Fabius 2016: 18). Meanwhile, on February 20, the IAEA Director General issued his quarterly report on the implementation of safeguards, where he reiterated Iran's observance of the *Joint Plan of Action*. More specifically, the IAEA reported that enrichment above 5%, as well as the installation of new IR-2m and IR1 centrifuges, was not taking place at Natanz and Fordow; the Iranians were downgrading the amount of 20% UF_6 (total amount 160,6 kg) and maintaining a constant rate of production of 5% UF_6; they were abstaining from installing additional components and from manufacturing and testing fuel for the IR-40 reactor. Moreover, in line with the new measures agreed with the IAEA, the Islamic Republic submitted an updated Design Information Questionnaire and provided access to several centrifuge workshops and storage facilities.[10]

[10] See IAEA Director General, Implementation of NPT Safeguards Agreement and Relevant Provisions of Security Council resolutions in the Islamic Republic of Iran, February 20, 2014, GOV/2014/10, p.1.

On March 7-8, the P5+1 and Iran held an experts meeting. The United States were ready to recognize "limited, discrete, constrained, monitored and verified" enrichment program based on Iran's practical needs (Ravid 2014). Though, the Iranians adopted a hardline stance on enrichment. Similarly, the Americans and Russians proposed two alternative conversion projects for the Arak plant. In this case, Teheran seemed to be more flexible and open to some design changes (Reuters 2014). The following day, the EU High Representative Catherine Ashton visited Teheran to meet with the Iranian authorities (Rouhani, Zarif, Araqchi, Salehi and Velayati) in the attempt to narrow the differences with a view to the next political session of mid-March 2014 (Hafezi 2014).

On March 17-18, Foreign Minister Zarif proposed to start the drafting phase of the long-term deal in May. As for the sanctions, the Iranians were pushing for a relief of "nearly all sanctions starting from Day One", while the US offered an approach by stages and by categories. As for enrichment, no remarkable progress was made (Fabius 2016: 19). Moreover, both parties were facing huge domestic pressure. On one side, 83 US senators, well above the two-thirds required to override a presidential veto, delivered a letter to President Obama, urging him to reject Iran's inherent right to enrichment. They further stated that "any agreement must dismantle Iran's nuclear program and prevent it from ever having a uranium or plutonium path to a nuclear bomb" (Shabad 2014). On the other, the Iran's hardliners rejected every limitation of the program and the dismantling of nuclear facilities (Gaietta 2016: 204). In addition, they expressed strong dissatisfaction for the inability to withdraw the promised oil revenues and funds released and for delays in the supply of spare parts for the Iranian civilian aviation (Norma, Malas, Faucon 2014). To complicate the situation, Ayatollah Khamenei began distancing himself from the Rouhani Administration, stating that the "resistance economy," a strategy meant to promote self-reliance against sanctions, would be the long-term policy (IRNA 2014).

In the aftermath an inconclusive technical meeting (April 3-5), the P5+1 and Iran resumed talks on April 7. The parties discussed the PMD and the issue of enrichment with no concrete results.

On April 9, during the celebrations of National Nuclear Technology Day, Khamenei reiterated Iran's stance, stating "the activities of the Islamic Republic in the area of nuclear research and development would not stop in any way. None of the nuclear achievements of the country can be given up" (Tisdall 2014a). Meanwhile, the discussions with the Agency were proceeding smoothly.

On April 17, the Director General issued the monthly report on Iran's nuclear program, confirming the implementation of the measures requested under the JPOA and the second step of the *Framework for Cooperation*,

except for the issue of Exploding Bridge Wire detonators.[11] With this respect, during a technical meeting on April 26, the Islamic Republic provided additional documentation and explanations to prove its stated need and application of EBW. For the first time since August 2008, Teheran was addressing an outstanding issue with PMD. In a letter dated April 30 and during a second session convened on May 20, 2014, the Iranians showed that simultaneous firing of EBW detonators was tested for civilian application (Fabius 2016: 20).

On May 6-9, the six world powers and Iran continued technical discussions in New York on the sidelines of the preparations for the 2015 Review Conference of the Parties to the NPT. The meeting constituted the basis for a new round scheduled in Vienna for the following week. On May 13-14, the parties began drafting the long-term agreement, called by Foreign Minister Zarif "Joint Comprehensive Plan of Action (JCPOA)" (Fabius 2016: 20). Despite the little progress, there were still significant differences regarding the number of centrifuges and the duration of the JCPOA. Indeed, the Iranians were demanding thousands of centrifuges beyond the number agreed in the JPOA (8,000) and a brief period of implementation (five years). On the other side, the P5+1 were pushing for a significant reduction of the centrifuges and for a duration up to twenty years (Gaietta 2016: 207). On May 20, the IAEA and Iran agreed to the third set of practical measures to be implemented, pursuant to the *Framework for Cooperation*, by 25 August 2014.[12]

1. Exchanging information with the Agency with respect to the allegations related to the initiation of high explosives, including the conduct of large-scale high explosives experimentation in Iran.
2. Providing mutually agreed relevant information and explanations related to studies made and/or papers published in Iran in relation to neutron transport and associated modelling and calculations and their alleged application to compressed materials.
3. Providing mutually agreed information and arranging a technical visit to a centrifuge research and development center.
4. Providing mutually agreed information and managed access to centrifuge assembly workshops, centrifuge rotor production workshops and storage facilities.
5. Concluding the safeguards approach for the IR-40 reactor.

[11] See IAEA Director General, Status of Iran's Nuclear Programme in relation to the Joint Plan of Action, April 17, 2014, GOV/INF/2010/10.

[12] See IAEA, Joint Statement by Iran and IAEA, *Press Release*, May 21, 2014.

As in the case of EBW detonators, both parties were determined to resolve the outstanding issues with possible military dimension, listed in the famous IAEA report of November 2011.

Three days later, the IAEA Director General released the report on the implementation of safeguards, where he confirmed the Iran's neutralization of nearly all 20% enriched uranium.[13] As for the EBW, despite Iran's active cooperation and information unveiled, the Agency decided not to close the file, thus adopting a systemic approach and sparking strong resentment within the Islamic Republic.[14] Given the persisting differences with the P5+1, in June the Iranians decided to open parallel channels. On June 8-9, they held a meeting in Geneva with the American delegation, led by Undersecretary of State William J. Burns (AJ 2014). This bilateral conversation was followed on June 13 by a further session with the Russians in Rome (IFP 2014). Though, no substantial progress was achieved. In addition, given the continuation of the IAEA assessment on EBW, Teheran decided to suspend cooperation with the Agency, refusing to reengage on the new set of practical measures as long as the file continued to remain open (Porte 2014a). The same impasse was acknowledged few days later in Vienna (June 16-20) within the framework of the negotiations with the P5+1. Indeed, the Iranian negotiators were not willing to make the necessary concessions, making clear that no final deal would be reached before July 20, the deadline that marked six months after the implementation of the JPOA (Fabius 2016: 20).

After another inconclusive round in Vienna (July 7-13), on July 19 Catherine Ashton and Mohammad Javad Zarif announced that they would extend the multilateral discussions for a comprehensive solution through November 24, one year from the conclusion of the JPOA (BBC 2014). Besides the extensions of the provision of the interim deal, Iran committed to convert all its 20% enriched uranium in UO_2 for the Teheran Research Reactor in return for $2,8 billion of restricted assess (Kerry 2014). Finally, both parties agreed to resume negotiations after August 2014.

4. The Second Extension of the JPOA

On August 17, the Director General visited Teheran to meet with the Iranian authorities and discuss the implementation of the third set of measures under the *Framework for Cooperation*. With this respect, the Iranians were facing huge difficulties in disclosing information related

[13] See IAEA Director General, GOV/2010/28, p. 1.

[14] See IAEA, Communication Dated 4 June 2014 Received from the Permanent Mission of the Islamic Republic of Iran to the Agency Regarding the Report of the Director General on the Implementation of Safeguards in Iran, INFCIRC/866.

to the initiation of high explosive and to neutron transport calculations. As for the issue of the EBW detonators, Yukiya Amano confirmed the civilian application of their use, although with a significant specification: "The Agency will need to consider all past outstanding issues, including EBWs, integrating all of them in a system and assessing the system as a whole."[15]

Few weeks later, in his quarterly report on Iran's nuclear activities, the Director General informed the IAEA Board of Governors that Iran had missed the 25 August deadline to address the measures agreed with the Agency. Still, Amano confirmed the steady implementation of the JPOA and the completed neutralization of all stockpiles of 20% enriched uranium.[16]

On September 18, Iran and the P5+1 resumed negotiations in New York on the sidelines of the UN General Assembly (Paivar 2014). As in the previous cases, little progress was accomplished. During the summer, American negotiators came up with two encouraging propositions that suggested a political change of the US position. The first proposal regarded the issue of enrichment, where they proposed the technical reconfiguration of centrifuges' cascades, rather than defining the exact number of operating machines. The objective of this reconfiguration was to extend the breakout time, the period needed to enrich enough uranium to produce a nuclear weapon. The second regarded sanctions. In this regard, the US put forward the "standalone proposal," according to which the UN Security Council would adopt a new binding resolution endorsing the long-term agreement and revoking all previous resolutions and nuclear-related sanctions (Fabius 2016: 21-22). Following a technical session between the Islamic Republic and the IAEA (October 9) in Teheran, the parties met once again in Vienna on October 14.[17] The Iranians agreed to a reduction of their centrifuge capacity, even if they showed no flexibility on sanction relief (Fabius 2016: 22). Overall, the meeting was constructive, inducing the parties to believe that a final agreement could be reached before the deadline of November. Though, these hopes soon faded away. After a round in Oman (November 11), the six major powers and Iran convened a session on November 18, where the discussions reached a new impasse. In the attempt to break the political deadlock, the Foreign Minister of the negotiating countries flew

[15] See IAEA, IAEA Director General Comments on Visit to Iran, *Press Release*, August 17, 2014.

[16] See IAEA Director General, Implementation of NPT Safeguards Agreement and Relevant Provisions of Security Council resolutions in the Islamic Republic of Iran, September 5, 2014, GOV/2014/43.

[17] See IAEA, IAEA and Iran Hold Technical Meetings in Tehran, *Press Release*, October 9, 2014.

to Vienna and held several rounds of intensive negotiations (Borger, Ackerman 2014). During these talks, the Iranians proposed two "new ideas," which seemed to be quite promising: the reduction of the enrichment capacity through the reconfiguration of centrifuges; and a phasing mechanism over fifteen years that committed the program to industrial purposes, with an upper range of 80,000 Separative Work Unit (Fabius 2016: 24-25). Even if both parties could agree on several challenging issues, the differences were still significant (particularly on sanctions relief). Therefore, once again the P5+1 and Iran agreed to extend the *Joint Plan of Action* with the objective to conclude a comprehensive deal by June 30, 2015 (Sanger, Gordon 2014). In addition, during this period, the Islamic Republic agreed to manufacture fuel assemblies for the Teheran Research Reactor and to provide greater access to the IAEA in exchange for 5 billion of sanction relief (with monthly instalments of nearly $700 million) (Gaietta 2016: 215).

The decision to extend talks avoided a total collapse of negotiations but had potential dangerous implications. On one side, after the midterm elections of November 2014, President Obama lost the political majority in the Congress. With the Republican control of both Houses, the scenario of new punitive measures or the reject of the final comprehensive deal was very likely (The Guardian 2014). Similarly, Israel and the Gulf countries continued to express their hostility to a solution of the crisis ("no deal is better than a bad one"), raising again the threat of pre-emptive military strike (Tisdall 2014b). On the other, the Rouhani Administration was facing a huge domestic criticism with several calls to replace the Foreign Minister Zarif and other members of the negotiating team (Tisdall 2014c). Moreover, given the precarious economic outlook, the prospect of new sanctions or the continuation of the diplomatic impasse might have induced the Iranian negotiators to adopt a harder stance or even withdraw from previous concessions (Bozogmehr 2014). It was clear that the second extension of the JPOA had increased the stakes and reduced the time for a final agreement.

5. Toward the Joint Comprehensive Plan of Action

The multilateral talks resumed in Geneva on December 15 and were good and substantive. The parties agreed to negotiate first the general policy framework by March 30, 2015, followed later by a technical agreement before June 30. On January 18, the six major powers and the Islamic Republic continued talks in Geneva. The United States were still proposing the reconfiguration of the centrifuges' cascades, with an initial reduction to 5,000 IR-1 machines, raising to 7,800 after six-and-a-half years and with no significant variation for almost 8 years. As for

the other issues, the Americans wanted only IR-1 centrifuges for R&D (eventually, IR-2 m at the end of the agreement), the conversion of the Arak heavy-water reactor and the shutdown of Fordow (Fabius 2016: 25). Given the restrictive implications of the offer, the Iranian negotiators rejected this proposal. Though, during the multilateral session of February 18-20, they raised an interesting counter-proposal: a reduction of the enrichment capacity by about one-third over ten years (6,000 IR-1 with 500 kg of UF6 at 3.5 % or 6,600 with 300 kg) with no reconfiguration of the machines. Even if there was no final consensus on the offer, the positions were increasingly closer (Fabius 2016: 27). Meanwhile, the IAEA Director General issued his quarterly report and confirmed Iran's compliance under the interim deal, including with the additional provisions of the extension.[18] Following the discussions between the Director General and Deputy Minister Araghchi (February 24), on March 9, 2014, Amano and Zarif met in Tehran in order to discuss the implementation of the *Framework for Cooperation*. Both parties exchanged information on two remaining outstanding issues with PMD and decided to encounter again in mid-April 2015.[19] In the meantime (March 2-5), the P5+1 and Iran held a new meeting in Montreux, Switzerland. This session was crucial. The Iranian agreed to guarantee a breakout time of at least one year for a period of ten years and confirmed the final figure of centrifuges, which would be 6,104. As for the issue R&D, Fordow and, particularly, sanctions relief, the positions were still far (Fabius 2016: 28). Despite these developments, President Obama was confronted with two significant challenges. On March 3, Prime Minister Netanyahu delivered a spectacular speech to a joint session of US Congress. In his address, he decried the American policy of engagement and the ongoing multilateral negotiations, claiming that a deal would "not prevent Iran from developing nuclear weapons" (The Washington Post 2015). The following week, 47 Republican senators signed and delivered a provocative "open letter to the Leaders of the Islamic Republic," stating that the Iranian "may not fully understand our constitutional system" and warning that any deal reached without legislative approval could be revised by the next president "with the stroke of a pen" (NYT 2015a).

The talks between the P5+1 and Iran continued in Lausanne in two sessions. During the first (March 18-20), the American negotiators reaffirmed the "standalone" proposal combined with a general "snap-back" mechanism, although they did not provide specific details in this regard. The negotiating parties further discussed the specific mechanism for re-

[18] See IAEA Director General, Implementation of NPT Safeguards Agreement and Relevant Provisions of Security Council resolutions in the Islamic Republic of Iran, February 19, 2015, GOV/2015/15, p. 1.

[19] IAEA, IAEA Statement, *Press Release*, March 10, 2015.

solving disputes within the Joint Commission of the JPOA (paragraph 7.5) and the sensitive issue of the PMD (Fabius 2016: 30-31). During the second session (March 26-April 2), the six world powers and the Islamic Republic examined all previous issues, reaching agreement on the general framework of the final deal. In this context, the "snap-back" mechanism was developed in a peculiar way: sanction relief was provided at the end of a given period, unless a permanent member of the UNSC opposed it, making it possible to automatically reintroduce sanctions in case of an Iranian violation without the risk of a veto (paragraph 5) (Fabius 2016: 31-32). On April 2, with two days of delay on the schedule, the new EU High Representative, Federica Mogherini, and Foreign Minister Zarif announced the policy framework of the *Joint Comprehensive Plan of Action* (Borger, Lewis 2015). The key parameters, disclosed in a fact sheet by the US delegation, represented the core of the deal (chapter 7) (CNN 2015). Following the definition of the political structure of the JCPOA, the parties were supposed to draft the main text, started in May 2014 and abandoned later in July, and the technical annexes. After a meeting between the IAEA and Iran in Teheran (April 15), the multilateral negotiations resumed in Vienna in April (22-24).[20] Talks continued intensively in New York (April 27-May 7) on the sidelines of the 2015 NPT Review Conference and throughout all the month of May (Fabius 2016: 33-34). Meanwhile, the Obama Administration was facing new difficulties on the domestic front. Following the adoption within the Senate Foreign Relations Committee in mid-April, on May 7th the senate approved (98-1) a bill authored by Republican Senator Bob Corker. The new law allowed the US Congress, controlled by the Republican Party, to review the JCPOA and to express a vote of approval or disapproval. Moreover, during the 30 days of Congressional review, the bill inhibited the President from waiving sanctions against the Islamic Republic (Siddiqui 2014). Though, the internal challenges were not the only problems that the American negotiators were confronting. Between May and June, the Iranians decided to stick to the policy framework of Lausanne and adopted a stalling attitude on a wide range of technical issues (e.g. access to military sites, PMD resolution, the transition plan for Fordow and sanctions) in the attempt to gain time and obtain more favorable conditions (Fabius 2016: 33-36). Despite these questionable efforts, in June the negotiations gained momentum and continued in Vienna beyond the agreed deadline (BBC 2015). Finally, on July 14, after fourteen days of uninterrupted talks, Federica Mogherini and Mohammad Javad Zarif announced the conclusion of *Joint Comprehensive Plan of Action* (Borger 2015).

[20] See IAEA, IAEA and Iran Held Technical Meeting in Tehran on 15 April, *Press Release*, April 16, 2015.

The EU High Representative stated that the JCPOA would "open the way to a new chapter in international relations", showing that diplomacy can overcome decades of tension. "This is a sign of hope for the entire world," she concluded. Similarly, Zarif described the agreement as a "win-win" solution but not perfect. He further added: "I believe this is a historic moment. We are reaching an agreement that is not perfect for anybody but is what we could accomplish. Today could have been the end of hope, but now we are starting a new chapter of hope" (The Guardian 2015).

As expected, the finalization of the nuclear deal triggered other mixed reactions within the international community. President Obama praised the agreement, saying that it would permanently block Iran from producing a nuclear weapon. "To put in perspective," said Obama, "Iran currently has a stockpile that could produce up to ten nuclear weapons. Because of this deal, that stockpile will be reduced to a fraction of what would be required for a single weapon. This stockpile limitation will last for 15 years." US Secretary of State Kerry further added that deal was "a step away from specter of conflict, towards possibility of peace" (Westcott, Ellison 2015). On the same page, British Prime Minister David Cameron, Russian President Vladimir Putin, UN Secretary General Ban Ki Moon and Director General Amano, who all warmly welcomed the JCPOA.[21] On the other side, Israeli Prime Minister Netanyahu denounced the nuclear agreement, defining it as "a bad mistake of historic proportions" (Beaumont 2015). As for the Iranians, President Rouhani declared that the comprehensive deal showed that constructive and diplomatic engagement works. "With this unnecessary crisis resolved, new horizons emerge with a focus on shared challenges" (NYT 2015b).

After nearly 13 years of confrontation, sanctions and diplomatic impasse, the Iranian nuclear crisis was finally over.

6. The Joint Comprehensive Plan of Action

The *Joint Comprehensive Plan of Action* is an extremely complicated 90-pages document containing several sections, technical annexes and attachments. More specifically, the JCPOA is a limited framework of political intention for future action among the P5+1, the EU High Representative and the Islamic Republic with the endorsement of the UN Security Council (Samore *et al.* 2015). The deal marks a fundamental

[21] See IAEA, Director General's Statement on the Announcement by the E3/EU + 3 and Iran on the Agreement of the Joint Comprehensive Plan of Action, *Press Release*, July 14, 2015.

shift on the Iranian nuclear issue and its implementation will ensure the exclusive peaceful nature of Iran's nuclear program, thus contributing to regional and international peace and security.[22] Though, as all agreements reached during the crisis, it is important to stress that the JCPOA is not a binding agreement pursuant existing international law; it has not been signed, nor ratified by any parties; it does not contribute to customary law that moves beyond the Nuclear Proliferation Treaty and the non-proliferation legal regime (Mardani, Hooshmand 2016). Given the fragile nature of the deal, parties may decide to withdraw themselves at any time (Khalaji 2015: 62). In the preamble, the parties to the JCPOA provide a description of the general political framework and the objectives of the agreement. While reflecting a step-by-step approach and including reciprocal commitments, the preamble further affirms:[23]

1. The full implementation of the JCPOA will ensure the exclusively peaceful nature of Iran's nuclear program (Art. II);
2. Iran reaffirms that under no circumstances it will ever seek, develop or acquire any nuclear weapons (Art. III);
3. The successful implementation of the JCPOA will enable Iran to "fully enjoy its right to nuclear energy for peaceful purposes under the relevant articles of the NPT in line with its obligations therein, and the Iranian nuclear program will be treated in the same manner as that of any other non-nuclear-weapon State party to the NPT (Art. IV);"
4. This JCPOA will produce the comprehensive lifting of all UNSC sanctions as well as multilateral and national sanctions related to Iran's nuclear program (Art. VII);
5. The P5+1 and Iran commit to implement the JCPOA "in good faith and in a constructive atmosphere, based on mutual respect, and to refrain from any action inconsistent with the letter, spirit and intent of the JCPOA that would undermine its successful implementation (Art. VIII)."
6. The P5+1 and Iran will establish a Joint Commission, consisting of the parties to the JCPOA, in order to monitor the implementation of the agreement and carry out the functions provided for. The Commission will address issues arising from the implementation of the JCPOA and will operate in accordance with the provisions as detailed in the relevant annex (Art. IX);
7. The IAEA will monitor and verify the voluntary nuclear-related measures of the JCPOA. The IAEA will be requested to provide regular updates to the IAEA Board and the UNSC (Art. X);

[22] See Preface of the "Joint Comprehensive Plan of Action", *US Department of State*, available online.

[23] See Preamble of the "Joint Comprehensive Plan of Action".

8. All provisions and measures contained in the JCPOA should not be considered as setting "precedents for any other state or for fundamental principles of international law and the rights and obligations under the NPT and other relevant instruments (Art. X)."
9. The P5+1 and Iran will meet at the ministerial level every 2 years, or earlier if needed, in order to review and assess progress and to adopt appropriate decisions by consensus (XVI).

7. The Nuclear Related Measures

Pursuant the JCPOA, Iran had agreed to limit significantly its nuclear program for a fixed period. In this regard, the nuclear deal envisages the following "voluntary measures":[24]

A. Enrichment, Enrichment R&D, Stockpiles

1. For 10 years, Iran will keep its enrichment capacity at Natanz at up to a total installed uranium enrichment capacity of 5060 IR-1 centrifuges (Art. 2).
2. It will continue to conduct enrichment R&D in a manner that does not accumulate enriched uranium (Art. 3).
3. Iran will not manufacture or assemble other centrifuges and will replace failed ones with machines of the same type. After 8 years, Iran will start manufacturing two models of advanced machines under IAEA monitoring (Art. 4).
4. For 15 years, it will carry out its uranium enrichment activities, including R&D, exclusively in the Natanz Enrichment facility and keep its level of uranium enrichment at up to 3.67% (Art. 5).
5. Iran will convert the Fordow facility into a "nuclear, physics and technology centre." For 15 years, it will maintain no more than 1,044 IR-1 centrifuges in six cascades. It will further refrain from conducting uranium enrichment and R&D and from keeping any nuclear material (Art. 6).
6. For 15 years, Iran will keep its uranium stockpile under 300 kg enriched up to 3.67% or the equivalent in other chemical forms (Art. 7).

B. Arak, Heavy Water, Reprocessing

1. Iran will redesign and rebuild a modernized heavy water research reactor in Arak, based on an agreed conceptual design, using fuel enriched up to 3.67 % (Art. 8) The redesigned and rebuilt Arak reactor will not produce weapon grade plutonium.

[24] See Nuclear section of the "Joint Comprehensive Plan of action".

2. For 15 years, there will be no additional heavy water reactors or accumulation of heavy water (beyond 130 metric tons) in Iran. All excess heavy water will be made available for export to the international market. (Art. 10)
3. For 15 years, Iran will not engage in any spent fuel reprocessing or construction of a facility capable of spent fuel (Art. 12).

C. Transparency and Confidence Building Measures

1. Iran will provisionally apply the Additional Protocol, proceed with its ratification within the timetable planned, and fully implement the modified Code 3.1 (Art. 13).
2. It will fully implement the "Roadmap for Clarification of Past and Present Outstanding Issues" agreed with the IAEA, containing arrangements to address past and present issues related to the nuclear program and mentioned in the famous IAEA report of November 2011.[25] These activities will be completed by October 15, 2015, and will be followed by the Director General's final assessment to the Board of Governors by December 15, 2015 (Art. 14).
3. It will allow the IAEA to monitor the implementation of the voluntary and transparency measures for their respective durations. These measures include: long-term IAEA presence in Iran; IAEA monitoring of uranium ore concentrate produced by Iran from all uranium ore concentrate plants for 25 years; containment and surveillance of centrifuge rotors and bellows for 20 years; use of IAEA approved and certified modern technologies including on-line enrichment measurement and electronic seals (Art. 15).
4. It will not engage in activities, including at the R&D level, that could contribute to the development of a nuclear explosive device (Art. 16);

In Annex I (*Nuclear Related Measures*), the JCPOA provides further additional measures beyond the provisions of the Safeguards Agreement and the Additional Protocol:

1. Iran will permit the IAEA regular access, including daily access as requested by the IAEA, to underground facilities at Natanz, for 15 years (Art. P-71).
2. For 15 years, Iran will only engage in import or export of any enrichment or enrichment related equipment and technology, including related research following approval by the Joint Commission (Art. P-73).

[25] See IAEA Board of Governors, Road-map for the Clarification of Past and Present Outstanding Issues regarding Iran's Nuclear Program, July 14, 2015, GOV/INF/CIRC/2015/14.

3. Requests for access to facilities and information will be made in good faith, with due observance of the sovereign rights of Iran, kept to the minimum necessary and will not be aimed at interfering with Iranian military or other national security activities (Art. Q-74).
4. If the IAEA has concerns regarding undeclared nuclear materials or activities, or activities inconsistent with the JCPOA, at locations not declared under the Safeguards Agreement or Additional Protocol, the Agency may request access to such locations (Arts. Q-75-Q.76).
5. If these concerns cannot be verified after the implementation of the alternative arrangements agreed by Iran and the IAEA or if the two sides are unable to reach satisfactory arrangements within 14 days of the IAEA's original request for access, Iran, in consultation with the members of the Joint Commission, would resolve the IAEA's concerns through necessary means agreed between Iran and the IAEA. In the absence of an agreement, the members of the Joint Commission, by consensus or by a majority vote, would advise on the necessary means to resolve the IAEA's concerns. The Joint Commission will have 7 days to take a decision, whereas Iran will have 3 days to implement it (Arts. Q-78). The total time for this procedure is 24 days.

8. Sanctions

Differently from the desires of the Iranians, the JCPOA does not lift UN, multilateral and unilateral sanctions automatically (paragraph 6.10), but sanctions relief occurs in two phases. Most of them (listed in Annex II) will be removed on *Implementation Day*, whereas the second set, which targets special individuals and entities involved in nuclear and proliferation activities, will continue to be effectuated until *Transition Day*. These two stages will ensure Iran with the necessary incentives to implement the deal in the long-term. Specifically, the text envisages:[26]

1. On *Implementation Day*, the UNSC resolution endorsing the JCPOA (resolution 2231 of 2015) will terminate all provisions of previous resolutions on the Iranian nuclear issue: 1696 (2006), 1737 (2006), 1747 (2007), 1803 (2008), 1835 (2008), 1929 (2010) (Art.18);
2. On *Implementation Day*, the European Union will terminate all nuclear-related economic, financial sanctions and related designations, including within the following areas: transfer of funds, bank activities, provision of insurance, financial assistance and concessional loans, transactions of bonds, import and export of Iranian oil, petroleum

[26] See Sanctions, Joint Comprehensive Plan of Action.

products, gas and petrochemical products and access to EU airports of Iranian cargo flights (Art 19);
3. On *Transition Day*, will terminate all provisions of the EU Regulation implementing all EU proliferation-related sanctions, including related designations (Art. 20);
4. On *Implementation Day*, the United States will cease the application of nuclear related sanctions, including within the following areas: financial and banking transactions with Iranian banks and financial institutions, including the Central Bank of Iran, sale, supply or transfer of goods and services used in connection with Iran's automotive sector; import and export of Iranian oil, petroleum products, gas and petrochemical, transactions in Iranian rial, transactions with the energy sector, trade with gold and other special metals (Art. 21);
5. On *Transition Day*, the US will seek such legislative action as may be appropriate to terminate the sanctions specified in Annex II on the acquisition of nuclear-related commodities and services for nuclear activities contemplated in the JCPOA (Art. 23).
6. The EU, US and UN will refrain from re-introducing the sanctions that they have terminated implementing under the JCPOA. Similarly, there will be no new nuclear-related sanctions. "Iran has stated that it will treat such a re-introduction or re-imposition of the sanctions specified in Annex II, or such an imposition of new nuclear-related sanctions, as grounds to cease performing its commitments under this JCPOA in whole or in part (Art.26)."

As for the UN sanctions on arms sales and ballistic missiles, the restrictions will expire respectively 5 and 8 years. Though, the JCPOA dos not require suspending unilateral sanctions on Iran's support for terrorism, its human rights abuses and on arms and WMD-related technology sales. Similarly, unilateral sanctions against the ballistic program remain in place (Katzman, Kerr 2017: 20-22).

9. The Implementation Plan

The JCPOA (Art. 34) set an ambitious timeline for implementation with the following steps:[27]
1. *Finalization Day*: the date on which negotiations of this JCPOA are concluded among the P5+1, the EU and Iran (July 14, 2015). The parties submit a resolution endorsing the agreement to the UN Security Council for adoption.

[27] See Implementation Plan, Joint Comprehensive Plan of Action.

2. *Adoption Day*: 90 days after endorsement of JCPOA by UN Security Council or earlier by mutual consent. Iran prepares to implement the Additional Protocol, whereas the members of the P5+1 make the necessary arrangements to prepare for lifting or suspension of sanctions. On July 20, 2015, the UNSC adopted resolution 2231, setting Adoption Day at October 18, 2015.
3. *Implementation Day*: Following the IAEA verification that Iran has complied with the nuclear related measures of the JCPOA, the UN, US and EU remove individual and entity related nuclear sanctions. The Resolution endorsing the JCPOA terminates all previous resolutions, becoming the sole operative UNSC text on Iran. Implementation Day occurred on January 16, 2016.
4. *Transition Day*: 8 years from Adoption Day (October 18, 2023) or after the release of the "Broader Conclusion" report from the IAEA Director General to the IAEA Board and UNSC, whichever is earlier. As of Transition Day, Iran will begin the necessary arrangements to prepare for the ratification of the Additional Protocol. The EU will remove proliferation-related sanctions, while the US will remove from designation specified additional Iranian individuals and entities subjected to sanctions.
5. *Termination Day*. 10 years from Adoption Day (October 18, 2025). The UNSC Resolution endorsing JCPOA will terminate, removing the nuclear dossier from the agenda of the UNSC. Iran will be treated in the same manner as that of any other non-nuclear-weapon State party to the NPT. Though, the JCPOA and the remaining provisions will not terminate on this day.

10. The Dispute Resolution Mechanism

The *Joint Comprehensive Plan of Action* has a special mechanism to solve disputes between parties (Arts. 36-37). Specifically, if Iran/the P5+1 believes that any or all of the P5+1/Iran is not meeting their/its commitments under the JCPOA, the issue can be referred to the Joint Commission for resolution. The Joint Commission, coordinated by the EU High Representative, will have 15 days to resolve the issue, unless the period is extended by consensus. After Joint Commission consideration, any participant can refer the issue to the Ministers of Foreign Affairs, if it believes the compliance issue has not been resolved. Meanwhile, the complaining participant or the participant whose performance is in question can request the consideration of an Advisory Board. The Board, composed by three members (one each appointed by the participants in the dispute and a third independent member) shall provide a non-binding opinion on the compliance issue within 15 days (with 5 further addi-

tional days). If the issue has not been resolved and the complaining participant deems the issue to constitute significant non-performance, the participant can cease performing its commitments under the JCPOA in whole or in part and/or notify the UN Security Council.

Upon receipt of the notification from the complaining participant, the UN Security Council, in accordance with its procedures, shall vote on a resolution to continue the sanctions lifting. If the resolution described above has not been adopted within 30 days of the notification, then the provisions of the old UN Security Council resolutions would be (automatically) re-imposed, unless it is decided otherwise. The total time envisaged for the whole procedure is 65 days.

This is the so-called "snap-back" mechanism, which enables the reintroduction of sanction without the possibility of a veto from the Permanent member of the UNSC (e.g. China and Russia). In this case, as mentioned previously, Iran will treat that as grounds to cease performing its commitments under the JCPOA in whole or in part.[28]

11. Assessment of the JCPOA

The finalization of the JCPOA triggered an international vigorous debate on the quality of the deal and its implications for the region. In this regard, the agreement had been severely decried for a wide number of reasons. In this regard, some of critical considerations were the following (Mahapatra 2016; see also Rubin 2015, McCarthy K. 2015):

1. The JCPOA is limited in time and most of its nuclear provisions will expire after 15 years (2030). Following that date, Iran will be free to do anything it wants with little obligations;
2. The JCPOA has not definitively prevented Iran from acquiring a nuclear bomb, but only delayed;
3. The IAEA may only request access to suspect undeclared nuclear facilities. This access may be delayed by the Iranian authorities as in the previous phases of the nuclear crisis; moreover, the resolution of disputes concerning undeclared material or activities is long (24 days) and requires a majority vote within the Joint Commission (5/8 members);
4. The JCPOA will lift the UN arms embargo for conventional weapons and ballistic missiles, as well as sanctions against individuals potentially involved in terrorism, after few years,
5. Sanctions relief will provide Iran with massive amounts of resources (nearly $100 billion) that might be used to support terrorism, from

[28] See Dispute Resolution Mechanism, "Joint Comprehensive Plan of Action".

backing the Assad regime in Syria to supporting Iran's proxies in the region (e.g. Hezbollah in Lebanon, Hamas in Palestine and Houthis in Yemen);

6. The JCPOA is not comprehensive and addresses only the nuclear dossier, ignoring prominent issues such as Iran's human rights violations and ballistic program.

Some of these considerations might be understandable, particularly the concern regarding the brief duration of the agreement, and only in part admissible. However, most of these claims are short-sighted and tend to neglect two basic aspects behind the conclusion of the nuclear deal. First, the JCPOA is the result of a negotiated bargain between two parties, who shared a long and difficult history of confrontation (most at all the US and Iran). As such, it is indisputably far from perfect as both sides were reluctantly forced to make concessions in the effort to harmonize their conflicting interests (Bohlen 2015: 61).

Second, these critical voices tend to forget the long history of the Iranian nuclear crisis and the conditions that made the JCPOA indispensable. Given the level of impasse and confrontation, including the recurrent threats of use of military force, there was no better and credible alternative than a compromised solution to the standoff. Having said this, the *Joint Comprehensive Plan of Action* is overall a landmark deal with positive implications for the region (and the world). As previously described (paragraph 2), the Islamic Republic agreed to give up 98% its stockpile of LEU with a limitation to 300 kg for 15 years. Moreover, it further accepted to use only 6,104 IR-1 (and the oldest) centrifuges for 10 years. These concessions were surprisingly unexpected given Iran's maximalist position on enrichment and the stunning results achieved. Specifically, in May 2015 the IAEA reported that Teheran had produced 8,714,7 kg of LEU up to 5% and installed nearly 20,000 centrifuges (about 1,000 IR-1 centrifuges at the PFEP, 15,420 IR-1 centrifuges and 1008 IR-2m centrifuges at the FEP and 2,710 IR-1 centrifuges at the FFEP).[29] Before the JPOA, the Islamic Republic was producing 150 kg of 5% LEU and installing 700 centrifuges per month; it was stockpiling nearly enough 20% uranium for a weapon and completing the heavy-water reactor, capable of producing enough weapon grade plutonium for two bombs per year. Clearly, Iran was on the brink of being a nuclear-armed State (Fitzpatrick 2015). Therefore, the most important accomplishment of the deal was to increase the breakout time from estimated 2-3 months to 1 year

[29] See IAEA Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran, May 29, 2015, GOV/2014/34.

for 10 years and to prevent Iran from manufacturing a plutonium bomb with the modified design of the Arak reactor (Lederman 2015). Additionally, the JCPOA set an intrusive monitoring system that goes beyond the Non-Proliferation Treaty, the Safeguards Agreement and the Additional Protocol (paragraph 2). With these provisions, the objective of the P5+1 was to minimize the existing loopholes in the international regime of non-proliferation (chapter 3, paragraph 1), which contributed in part to develop Iran's nuclear ambiguity. The deal further requires Teheran to implement the modified version of Code 3.1 of the Subsidiary Arrangement and the Additional Protocol, which will be eventually ratified by the *Majilis*. Unequivocally, the monitoring system is not perfect, as noted by the detractors of the JCPOA, but at least it will contribute to reduce the risk of a nuclear-armed Iran in the very near future. Moreover, by committing the Islamic Republic "not to seek, develop or acquire any nuclear weapons," the transparency measures of the JCPOA oblige Iran to solve all outstanding issues. In this regard, on December 2, 2015, Yukiya Amano released the report on the "Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme." After several rounds of talks with the Iranian authorities, pursuant the agreed Road-map, the IAEA reached the following conclusion:[30]

1. The Agency assesses that a range of activities relevant to the development of a nuclear explosive device were conducted in Iran prior to the end of 2003 as a coordinated effort, and some activities took place after 2003.
2. It also assesses that these activities did not advance beyond feasibility and scientific studies, and the acquisition of certain relevant technical competences and capabilities.
3. It has no credible indications of activities in Iran relevant to the development of a nuclear explosive device after 2009. Nor it has found any credible indications of the diversion of nuclear material in connection with the possible military dimensions to Iran's nuclear programme.

The resolution of all outstanding issues and compliance with the nuclear measures paved the way to the implementation of the agreement, which formally occurred on January 16, 2016 (Gladstone 2016). Finally, the JCPOA is a game changer in the international relations and encouraging opening for diplomacy, reaffirming the idea that complex issues should be resolved through dialogue and discussion rather than confrontation (Bohlen 2015: 65). Indeed, after 35 years of mutual antagonism, the United States and Iran could sit together on table and reach a

[30] See IAEA Director General, Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme, December 2, 2015, GOV/2015/68, p. 15.

diplomatic solution to a major standoff (Barzegar 2014). Similarly, the world powers were able to remain united and to agree on a sensitive area of collective security, despite their divisions on a wide range of issues (Syria, Ukraine etc.).

Moreover, the nuclear deal prevents a nuclear arms race in the region and opens the scenario of a more cooperative approach with Iran. It further constitutes the first steps to solve other challenging issues, which were not included in the agreement, and crisis in the Middle East (e.g. Yemen, Syria and the so-called "Islamic State"; Fabius 2016: 37-38). Although there are no certain guarantees that it will be fully implemented until its natural expiration, the JCPOA represents a significant precedent that shall be defended and reaffirmed, today more than ever, in other alarming contexts (such as North Korea).

CONCLUSION

The objective of the thesis was to address the trajectory of the Iranian nuclear crisis from the origins of the program to the JCPOA following the conceptual framework of nuclear ambiguity as defined in the introduction. The dissertation started with a brief overview of the origins of the Iranian program. As discussed (chapter 1, paragraph 1), since the late '50s, the Shah began developing the civilian nuclear infrastructure of the country with the key cooperation of the West, particularly the United States (US), France and Germany. In the aftermath of the regional developments of the '70s, particularly the nuclear test of India (1974), Mohamad Reza Shah began to consider the possible military applications of the atom, triggering the increasing concern of the Nixon, Ford and Carter Administrations (chapter 1, paragraph 2). The Islamic Revolution (1978-1979) and the "imposed war" with Iraq (1980-1988) both undermined Persia's achievements, becoming a "lost decade" for the program (paragraph 1.3). Nevertheless, after the resumption amid the Iran-Iraq conflict (1983), during the Rafsanjani (1989-1997) and Khatami (1997-2005) periods the Iranian nuclear projects made a new qualitative leap with clear military dimensions (chapter 1, paragraph 4). Besides the reason of national pride, this ambiguous shift was probably justified by several events that contributed to increase the security concerns and perceptions of threat: the Iraq-Iran conflict, the first Gulf war, the disclosure of Iraq's secret programs of mass destruction (1991) and the nuclear tests of India and Pakistan (1998).

Moreover, the Iranians exploited two existing opportunities that contributed to define their behavior as "ambiguous." The first lied in the dual use nature of nuclear energy (chapter 2, paragraph 1). Indeed, as it was widely discussed (chapter 2, paragraph 2), the underlying challenge of accomplishing a complete and self-sufficient nuclear fuel cycle consisted in the achievement of nuclear independence from foreign assistance and the theoretical capacity to develop a nuclear weapon.

The second feature lied in the several legal flaws that characterized the original regime of non-proliferation (chapter 3, paragraph 1). Besides Article IV of the Non-Proliferation Treaty, there were two other major

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constraints. First, the Safeguards Agreement to the NPT required every NNWS to declare all existing nuclear material and facilities where the International Atomic Energy Agency (IAEA or the Agency) had the right to inspect. Though, as it emerged in the case of Iran, the IAEA had no authority to visit covert nuclear sites not declared under the Safeguards Agreement. Second, according to the original Code 3.1 of the Subsidiary Arrangements, every NNWS was required to report preliminary design information on a new nuclear installation "normally no later than 180 days before the facility is scheduled to receive nuclear material for the first time." This provision became a further legal loophole exploited by several NNWS, including Iran, to justify the non-declaration of clandestine nuclear facilities under construction.

During the first nuclear crisis (2002-2005), after the public disclosure of two secret nuclear sites – the PFEP in Natanz and the heavy-water production plant of Arak – the nuclear program and its possible military dimension received special attention from the IAEA Board of Governors and the international community (chapter 4, paragraph 1). Following the preliminary disclosure of the undeclared activities (chapter 4, paragraph 2), in May 2003 the Iranian authorities proposed a comprehensive and direct negotiation with the Bush Administration. Given the unsuccessful result of the initiative, the Islamic Republic decided to accept the EU3 invitation for a diplomatic engagement and solution (chapter 4, paragraph 3). The goal of both parties was to prevent the referral of the Iranian nuclear case to the UN security Council and avoid a military escalation of the crisis, receiving in this regard the political support of Russia, China and the Non-Aligned Movement. The intervention of the EU3 produced the *Teheran Declaration* of October 2003, which envisaged the temporary suspension of enrichment in return for general economic and political guarantees. The later events (e.g. the "Libyan surrender") and the findings concerning the Iran's nuclear program (e.g. the P-2 centrifuges, Polonium 210 and the discovery of Lavisan-Shian) contributed to increase tension, requiring a major clarification that resulted in the *Brussels Agreement* of March 2004 (chapter 4, paragraph 4). However, the lack of full suspension and the persisting resistance toward the implementation of the Additional Protocol convinced the EU3/EU to withdraw from the previous commitments, particularly from the removal of the dossier from the IAEA Board's agenda. After the disclosure of new details on the nuclear program (the discovery of Parchin) and the imposition of a further ultimatum, the EU3 decided to re-engage the Islamic Republic, thus concluding the *Paris Agreement* of November 2004 (chapter 4, paragraph 5). Despite the little progress achieved, the negotiations for a long-term agreement faced immediately significant obstacles. Between January and July 2005, the Iranian delegation put forward four different packages, which were all considered unsatisfactory by the EU3/EU,

who in turn refused to withdraw preconditions and make important political concessions. Finally, after the presidential election of the conservative candidate, Mahmoud Ahmadinejad (June 2005), in August 2005 the Supreme Leader agreed to support a major change in foreign policy, paving the way to the collapse of the European diplomatic intervention (chapter 4, paragraph 6).

With the second nuclear crisis (2005-2009), the standoff experienced an escalation due to the confrontational diplomacy of President Ahmadinejad. Even if Russia made a last-ditch attempt to prevent the involvement of the UNSC, in early 2006 Iran announced the resumption of the enrichment activities. The decision contributed to unify the international community, easing the creation of the P5+1 with the resulting referral of the nuclear dossier to the UNSC (chapter 5, paragraph 1). Given the political divisions within the P5+1, the UN Security Council adopted a "wait and see" approach in the effort the reach a negotiated solution on the issue with the Iranian authorities. Though, President Ahmadinejad was unwilling to make major concessions on the program (which experienced a phase of great expansion) or to accept the offers of the P5+1. After the failure of a multilateral package of June 2006, the UNSC adopted resolution 1696 (chapter 5, paragraph 2). Similarly, following Iran's refusal to accept the new proposal of the IAEA Director General ("double suspension") and to comply with the request of the international community, the UNSC adopted resolution 1737 in December 2006 (chapter 5, paragraph 3) and 1747 in March 2007 (chapter 5, paragraph 4). The "wait and see" approach was gradually becoming a "dual track approach" (or "carrots and stick"), represented by the effort to find a diplomatic solution coordinated by the adoption of new punitive measures. Given the deadlock, in mid-2007 the initiative was taken by ElBaradei, who autonomously negotiated a workplan meant to solve all outstanding issues (chapter 5, paragraph 5). The framework was partially implemented by Iran and was facilitated by the release of the new US National Intelligence Estimate of December 2007. The NIE contributed to fade away the clouds of wars and the scenario of new imminent sanctions within the UNSC (chapter 5, paragraph 6). Still, given Teheran's unwillingness to resolve all outstanding issue with PMD, (e.g. the "alleged studies"), the P5+1 decided to increase pressure and approved resolution 1835 in March 2008 (chapter 5, paragraph 7). During the summer, the multilateral negotiations resumed with the unprecedented participation of the US (chapter 5, paragraph 8). The P5+1 offered a revised version of the June 2006 proposal, giving Iran two weeks to formally accept it. Following the lack of any reply, the six world powers adopted UNSC resolution 1835 in September 2008 and suspended any diplomatic initiative (chapter 5, paragraph 9).

During the second term of the President Ahmadinejad (2009-2013), the negotiations reached a new diplomatic impasse. In the aftermath of

the election (November 2008), Barack Obama made several openings to the Iranian leadership, expressing the readiness to engage in a direct dialogue with Teheran. Though, the controversial elections of June 2009 undermined these efforts, resulting eventually in the reaffirmation of the dual track policy (chapter 6, paragraph 1). Meanwhile, the US Administration had engaged the Islamic Republic and proposed to re-fuel the Teheran Research Reactor with an ingenious scheme. Although President Ahmadinejad was willing to accept the plan, the domestic check and balances prevented him from finalizing the agreement (chapter 6, paragraph 2). In the following months, the fuel swap proposal was rescued by Turkey and Brazil, who jointly succeeded in reaching a compromise with Iran (chapter 6, paragraph 3). Still, given the unsatisfactory quality of the *Joint Teheran Declaration*, the P5+1 decided to pass new sanctions with the adoption of resolution 1929 of June 2010, the harshest since the beginning of the crisis (chapter 6, paragraph 4). Resolution 1929 was followed by similar multilateral (EU) and unilateral (US, UK and France) initiatives that overall had a great economic impact, but failed to reverse the trajectory of the program, which experienced a new phase of expansion. In the meantime, between 2009 and 2012, several States, allegedly the US and Israel, tried to delay or undermine the Iranian program with the launch of a cyber worm, later known as Stuxnet, which had a limited impact on the nuclear facilities targeted. Similarly, there were few attempts to undercut the nuclear projects through the assassination of several Iranian scientists (chapter 6, paragraph 5). This phase was further marked by new shocking revelations concerning the PMD (e.g. the famous IAEA report of November 2011) and by a total diplomatic impasse. Indeed, in mid-2011, the lead was taken by Russia, who presented a step-by-step plan (chapter 6, paragraph 6). Even if the package was quite realistic and seemed to be acceptable by Iran, the other members of the P5+1 were unjustifiably inflexible and not willing to compromise on this basis. Similarly, in 2012 and 2013, there were other exchanges of offers that failed to produce tangible results (chapter 6, paragraph 8). Though, at the eve of the Iranian elections of June 2013, the key conditions that justified a serious engagement between Iran and the P5+1 were in the air. On one side, the Islamic Republic was facing a huge pressure due to the economic effect of UN, multilateral and unilateral sanctions and to the prolonged international political isolation. On the other, the P5+1 were forced to acknowledge the constraints of punitive measures on the political front since they were unable to reverse the Iranian nuclear trajectory. Most of all, given Teheran's stunning developments, the P5+1, particularly the US, believed that it had already reached the nuclear threshold with a breakout time of about 2 or 3 months.

After the election of the moderate candidate, Hassan Rouhani (chapter 7, paragraph 1), in September 2013 Iran and the six world powers,

coordinated by the European Union, decided to seriously engage and to solve the crisis, including the clarification of all remaining issues with the IAEA. The negotiations started in Geneva and Vienna in October 2013. After several sessions, in November 2013 the parties concluded the *Joint Plan of Action* and a *Joint Declaration on the Framework for Cooperation* (chapter 7, paragraph 2). Following the implementation of both frameworks, the talks for a long-term agreement resumed in February 2014 and faced immediately huge challenges. Given the remarkable differences and the external pressure, Iran and the P5+1 could not reach a solution within the deadline agreed and decided to extend the JPA. Similarly, the clarification of the outstanding issues with PMD proved to be more difficult than expected (program 7.3). The multilateral talks resumed in September 2014 and proceeded smoothly. Still, the persisting differences on a wide range of issues prevented both parties from concluding a final deal, paving the road to a second extension in November (chapter 7, paragraph 4). Finally, after several crucial meetings, in mid-July 2015 the Islamic Republic and the P5+1 announced the finalization of the *Joint Comprehensive Plan of Action* (chapter 7, paragraph 5).

The nuclear deal is not a classic agreement according to international law (chapter 7, paragraph 6), but a political framework that attempts to go beyond the mentioned history of ambiguity. More specifically, the JCPOA envisages:

1. Significant temporary limitations of the nuclear program, committed perpetually to peaceful purposes (chapter 7, paragraph 7), and huge incentives for its implementation (chapter 7, paragraph 8) within a fixed implementation plan (chapter 7, paragraph 9);
2. An unprecedent and intrusive inspection mechanism that goes beyond the provisions of the NPT, the Safeguards Agreement and the Additional Protocol, becoming the most robust nuclear verification regime in the world.
3. The compulsory clarification of all past and present outstanding issues of the nuclear program with PMD.

For these reasons and despite wide criticisms, the nuclear deal is a landmark framework that must be defended and promoted as a positive precedent in other regions of the world (chapter 7, paragraph 11). However, as of today (late-September 2017), the future of the JCPOA remains uncertain and it is difficult to predict if it will be entirely executed until its natural expiration.

According to the implementation plan, the agreement was formally endorsed by the UNSC resolution 2231 on July 20 and adopted on October 18, 2015. In the case of the United States, in September 2015 the Republican Party failed to pass a resolution of disapproval within the terms indicated by the law, enabling the Obama Administration to issue

the waivers of sanctions on *Adoption Day* (Davenport 2015a). Similarly, Iran was the other only country that was confronted with congressional review. Although it was not a formal procedure of ratification, in October 2015 the *Majilis* approved the deal (Davenport 2015b). Following the "Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme" and the IAEA confirmation of Iran's compliance with the nuclear related measures, the JCPOA was officially implemented on January 16, 2016.[1] On that day, all previous UN resolutions were terminated with the relief of most of the nuclear related UN, multilateral and unilateral sanctions, opening new economic opportunities (Ghauri 2015). Moreover, since January 2016, the IAEA Director General had verified and monitored Iran's compliance with the measures under the JCPOA in five quarterly reports (the last available was in June 2017).[2] The IAEA had raised concerns only in two occasions, in February 2016 and November 2016, when the Iranian authorities had slightly exceeded the threshold on heavy-water, even if they had promptly returned to compliance by shipping the material abroad (Murphy 2016). Despite Iran's full observance of the provisions of the agreement, there are currently several interconnected challenges that might undermine the future implementation. The first one is the continuation of the ballistic program. In this regard, since *Implementation Day* Iran has conducted seven missiles tests, the last on September 23, 2017. As it was previously discussed, given Teheran's strong opposition, the issue was excluded from the long-term final agreement. Similarly, resolution 2231 (2015) did not mention the ballistic program, neither in the preambular paragraphs nor in the operative ones. The only reference was contained in the third paragraph of a *Statement* made by Iran and the P5+1 that was annexed to the resolution, which "called upon Iran not to undertake any activity related to ballistic missiles designed to be capable of delivering nuclear weapons, including launches using such ballistic missile technology … ." From a legal perspective, this provision cannot be regarded as a prohibition. Moreover, as declared by the Iranian leadership in occasion of the last test, the development of a ballistic capacity was considered part of a multifaced defensive strategy. "We will promote our defensive and military power as much as we deem necessary," President Rouhani declared. "We seek no one's permission to defend our land." He further added, "Whether you

[1] See IAEA Director General, Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015), January 16, 2016, GOV/INF/2016/1.

[2] See IAEA Director General, Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015), June 2, 2017, GOV/2017/24.

like it or not we are going to help Syria, Yemen and Palestine, and we will strengthen our missiles" (Clarke, Bozogomehr 2017).

The second challenge regards the constraints of sanctions relief. After *Implementation Day*, the JCPOA has created significant opportunities for Iran's economic growth and normalization. However, the Iranian financial system is confronted with huge economic difficulties, from corruption to weak Central Bank liquidity and to the lack of modern banking practices (Schwartz, Reddy, Ghorashi 2017). Most of all, Iran is facing the consequences of the US decision to maintain in place key non-nuclear related sanctions that prevent the Islamic Republic from using the US commercial markets and banking system.[3] Similarly, given the fear of fines from the US Department of Justice, the major European and American banks are not investing in the country, causing increasing dissatisfaction within the Iranian authorities (Clemente 2017). Additionally, despite the large public support for the JCPOA, the economic benefits to the Iranian people still remain limited (Schwartz, Reddy, Ghorashi 2017). This may contribute to increase future discontent, threatening the bottom-up support for the nuclear deal.

The third great challenge is the drastic review of policy and approach of the new US Administration. During the electoral campaign, the Republican Candidate, Donald J. Trump, delivered several contradicting statements on the future of the JCPOA, from the support to the agreement to its renegotiation or unilateral abrogation (Torbati 2016). Following the inauguration of the new Presidency (January 2017), the Trump Administration has officially "put Iran on notice" for recent actions that threatened US friends and allies in the region, including test of ballistic missiles, weapons transfers, support for terrorism and other violations of international norms (Borger, Smith, Ackerman, Dehghan 2017). Similarly, in April 2017, Secretary of State Rex Tillerson announced that the US would "review completely the JCPOA," claiming that Iran's nuclear ambitions pose a great risk to international peace and security (Gardinier 2017). Despite the review of the agreement, the US Administration has certified in three occasions, in April, July and September 2017, Iran's technical respect of the JCPOA and continued to waive nuclear related sanctions in line with the provision of the deal. Nevertheless, in late July 2017, the Administration has also imposed non-nuclear related sanctions against additional individuals and entities related to the ballistic program, the *Pasdaran* Navy operations in the Persian Gulf, *Pasdaran* and Quds Force activities in the region (The Guardian 2017). Thus, the new President is not interested in exploiting the political gains of the JCPOA and in continuing to improve the US-Iranian relations in the long-term.

[3] See CANP, Iran Nuclear Agreement: Implementation, July 14, 2017.

This was further confirmed by his first speech to UN General Assembly, where he stated "the Iran deal was one of the worst and most one-sided transactions the United States has ever entered into. Frankly, that deal is an embarrassment to the United States, and I don't think you've heard the last of it, believe me" (Politico 2017). Finally, according to the implementation plan, the President is required to certify every 90 days to Congress whether Iran is complying or not with its obligations under the deal. The final decision of the Administration is expected to be made in mid-October 2017 (Tabatabai 2017). As a result, given the significant existing challenges, the future of the *Joint Comprehensive Plan of Action* still remains uncertain.

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