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Joint Comprehensive Plan of Action (JCPOA), Vienna, 14 July 2015 – Summary and Assessments

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EXECUTIVE SUMMARY

The long awaited Joint Comprehensive Plan of Action in regard to the Iranian nuclear crisis is a detailed document outlining the actions to be taken by Iran on the one side, and the EU3+3, sometimes called the P5+1, on the other to resolve the impasse. The document including its annexes comprises over a hundred pages – 159 pages in the rough draft copy immediately available. On the side of Iran's commitments, it involves a detailed program for the dismantlement of the lion's share of Iran's nuclear capabilities to date; on the side of the EU3+3, or the E3/EU+3 as they are called in the document, it involves for the most significant part an eventual rescinding of virtually all of the sanctions imposed on Iran, as the IAEA confirms Iranian compliance – or "implementation" – with the major steps regarding dismantlement of its nuclear capabilities.

As regards the issue of "Access", with respect to the right of the IAEA to conduct surprise inspections at any facility it suspects or wishes to visit, Iran's position has been generally accepted by the P5+1: military sites may be inspected, but subject to constraints which call into question the workability of the concept, as detailed below, because it involves bureaucratic steps that could eliminate the possibility of discovery. The first is the requirement that the IAEA reveal to Iran in writing why it is asking to inspect the suspect facility, i.e. meaning exposing of the intelligence information leading to the desire to inspect the facility; this is most unlikely to be a viable proposition – sensitive intelligence cannot be used or passed to Iran to allow it to uncover the sources providing such intelligence, human or technical, and thus eliminating future discovery. The second is that bureaucratic haranguing by Iran can delay the inspection for up to 24 days, sufficient time for Iran to obfuscate evidence of violation. In his news conference of July 15th, U.S. President Obama justified this loophole by claiming that if the rest of the nuclear cycle is under careful scrutiny and transparency, it will be exceedingly difficult for Iran to launch into a covert violation and nuclear weapons program. There is some degree of validity to this claim, but it does not satisfy the prior commitments regarding "anywhere, anytime" inspections made in the wake of the Lausanne Framework, and is a capitulation to Iranian "red lines" regarding inspections at military facilities.

Another eccentric aspect in the document is a long list of Iranian individuals, companies and entities from which sanctions will be lifted, and whether by oversight or by intention some extremely questionable names come up: Ghasem Soleymani, the head of the Qods Force of the Islamic Revolutionary Guard Corps, who appears in the lists twice – once as Ghasem Soleymani and another time as Qasem Soleimani, as well as other Generals (Safavi) of the IRGC, the IRGC itself, and then the "Cruise Missile Industry Group", followed by "Shahid Bagheri Industrial Group (SBIG)" – the Iranian solid-propelled ballistic missile program, which produces a wide variety of short and long-range

solid-propelled ballistic missiles; and "Shahid Hemmat Industrial Group (SHIG)" – the Iranian liquid-propelled ballistic missile program, which produces the Shahab-3. These are apparently included in the list of sanctioned entities from which restrictions will be lifted at "Transition Day", which is to occur eight years from "Adoption Day", and subject to IAEA confirmation that Iran is complying with the terms of the agreement at that time and date.

A third side to the agreement is the IAEA. The agreement imposes on the IAEA a gargantuan verification effort, in regard to overseeing Iran's overt nuclear activities – while in effect barring IAEA involvement in any potential discovery of undeclared covert or clandestine activities, as detailed above, because intelligence information cannot serve as the basis for access to suspect sites, and because the procedures involve a 24-day delay from the moment of request to the inspection. Nonetheless, it is here assessed that the IAEA is capable of performing the enormous task thrust upon it as detailed, less of course the virtual impossibility of performing discovery of covert or clandestine activity, as detailed.

Overall, if the agreement is complied with by Iran, it will block the possibility of Iran acquiring nuclear weapons through the use of an indigenous overt nuclear program; it does not preclude acquisition of nuclear weapons produced outside Iran, though this appears at this time to be a rather remote possibility, and unprecedented. If the agreement is grossly violated to the point at which Iran attempts to develop a covert breakout effort to nuclear weapons, this most likely would be discovered in good time by the combination of the expansive and uniquely intrusive inspection regime, together with the unique and unprecedented intelligence focus on Iran, which presumably will continue. This assessment would hold true for at least ten to fifteen years, again assuming that Iran continues to by and large comply with the provisions of the agreement, and may be projected beyond that time. The imponderables of who will be in charge in Iran in a few years' time, after Khamenei, Rouhani, Zarif, Araghchi and Salehi are no longer on the scene, remain just that – imponderables, assuming, once more, that at least for the next few years Iran will be by and large complying with the provisions of the agreement, and that the agreement is adopted and ratified by the Majlis as is, without a demand to renegotiate some of its provisions.

IN DETAIL

The Schedule of implementation:

"Finalization Day": the day on which the parties "endorse" the JCPOA. This is the least important day in the sequence, as it only stipulates that the parties will in short order seek a United Nations Security Council resolution, which will be what begins the clock ticking. At time of writing this is being done, as the U.S. has submitted to the UNSC a draft resolution proposing that the Council adopt and endorse the agreement and it is expected that the resolution will indeed be adopted within days.

"Adoption Day": 90 days after the UN Security Council resolution, and the subsequent approval of the agreement by the relevant bodies of the state parties, this is the date when the agreement takes

effect and implementation begins. As a side note, in the U.S. the Senate will use the interim period for a 60-day review, with an additional 22 days set aside for voting on the agreement, and if legislation in its regard is vetoed by President Obama – to consider a vote to override his veto, if arithmetically plausible (an override would require at least 13, and preferably more, Democratic Senators to vote with the Republican opposition – currently assessed as very unlikely, but subject to circumstances). In Iran, the Majlis must adopt the agreement, without condition, i.e. without requiring a re-negotiation of some of the provisions which are disliked or opposed because they hinder Iran's options, or may be viewed as "humiliating", or perceived to be beyond declared "red lines".

Following "Adoption Day", the parties will begin to take action to realize the provisions of the agreement, so as to reach "Implementation Day", which is the day on which the IAEA confirms that Iran has taken the steps specified to dismantle the lion's share of its nuclear program (see details below), and the EU3+3 act to lift the sanctions as specified in great detail in the agreement. As of "Adoption Day", Iran will begin to implement the sweeping limitations which the agreement places on its nuclear activities, most notable of which are three to be mentioned here: a) dismantling the Arak reactor's core (the "calandria"), and making it "inoperable by filling any openings in the calandria with concrete"; b) dismantling / uninstalling more than 11 thousand centrifuges, most of them currently installed at Natanz FEP Production Hall A, mostly IR-1 type but including 1008 advanced IR-2m type as well, and moving them for storage in the adjacent empty Production Hall B for storage and IAEA monitoring; and c) reducing Iran's LEU stocks from the 7,600 kg allowed Iran in the November 2013 and January 2014 interim agreement and Joint Plan of Action, and any additional stocks, to the JCPOA ceiling of 300 kg, by either downblending them to the natural uranium level, or by shipping them out of Iran to another country – probably Russia, or to the envisaged IAEA fuel bank in Kazakhstan, when it becomes operational. These steps are expected to take several months, at least.

There is no time period specified for the interim between "Adoption Day" and "Implementation Day": i.e. there is no schedule or timetable for the Iranians to perform their commitments to the provisions of the agreement.

"Implementation Day": this is the day on which the IAEA announces that Iran has completed doing what it had to do to comply with the agreement at this stage, namely dismantling what it was supposed to dismantle, and disposing of what it was supposed to dispose, and disabling what it was supposed to disable (details below), and, "simultaneously" (see comments below – it's not exactly clear from the wording what "simultaneously" means: simultaneous with Iran's actions to implement? or simultaneous with the IAEA declaration of compliance that these actions have been taken, or are being performed?) that it is now the turn of the EU3+3 to lift the sanctions which it was agreed would be lifted at this phase; which virtually means almost all the sanctions imposed on Iran, and facilitation of almost unlimited trade, with no significant restrictions remaining. The document details along several dozen pages all the fields in which sanctions will be lifted and economic activity may take place, from banking to pistachios and everything in between, from ships to commercial airliners, metals and software, gold and insurance. It also lists all the Iranian individuals and entities

regarding which sanctions will be lifted, in three attachments relevant to different phases of the implementation, and different time points at which sanctions will be lifted – for example the missile related entities will be exempted from sanctions on "Transition Day", eight years after "Adoption Day".

"Transition Day": eight years from "Adoption Day", with the IAEA confirming that Iran is within compliance with its commitments to the agreement, another wave of sanctions rescinding will be launched by the EU3+3 (apparently this will include the sanctions imposed on Iran's ballistic missile program).

"UNSCR Termination Day": ten years from "Adoption Day", the UN Security Council will pass a resolution that it "would no longer be seized of the Iran nuclear issue." This in effect would signal the end to the international political preoccupation with the danger that Iran is attempting to make nuclear weapons, and actions in this regard. Nonetheless, even after "UNSCR Termination Day", IAEA verification continues, and Iran will continue to be restricted for years to come, for example its LEU stock ceiling will remain at 300 kg for 15 years, or 5 years beyond "Termination Day", and other items detailed in the agreement mandate IAEA verification until year 20, year 25, and beyond. Iran's commitment never to seek nuclear weapons, in accordance with its NPT commitments, is unbound in time; and needless perhaps to state any UNSC resolution is potentially reversible if Iran violates the agreement subsequently.

ANNEX 1: IRAN'S COMMITMENTS

The following explains the main elements of what Iran has committed to do, in the order in which they appear in the agreement's Annex I.

The Arak reactor: without the agreement, Iran would probably have completed the IR-40 reactor and commissioned it within a year, and begun to stockpile plutonium; since Iran does not have a suitable reprocessing facility to separate the military grade plutonium (Pu-239), it is probable that plutonium would have been, at this stage, stockpiled for future use, especially if reprocessing (separation) would have become possible once a suitable facility had been built.

The Iranians had indicated early on in the negotiations, in the spring months of 2014 that the Arak reactor issue was not a stumbling block to an agreement, because they were willing to modify it so that it would not be able to produce militarily significant quantities of military-grade plutonium (Pu-239) and would cease to be of proliferatory concern. This is now realized in the agreement. Iran will dismantle the currently installed core of the reactor (the "calandria"), will make it inoperable for the future by filling any openings with concrete, and the IAEA will verify that it will not be usable for a future nuclear application. Subsequently, Iran in concert with the EU3+3 will design and install a different core ("calandria"), according to detailed specifications provided in the attachment to the annex; the new core will be fueled with enriched uranium, not natural uranium, thus making it less suitable for the production of military grade plutonium, and in any case it will not be able to produce

militarily significant quantities of military grade plutonium (Pu-239), all subject to ongoing intrusive IAEA verification. The name IR-40 (indicating a 40-megawatt thermal capacity) will be dropped, and the new reactor will be limited to a ceiling of 20-megawatt thermal capacity.

Iran will not engage in spent fuel reprocessing or spent fuel reprocessing R&D for 15 years. Iran will not build a reprocessing facility of a magnitude suitable for weapons, but it will be building "hot cells" to use to process the materials produced by the reactor for civilian purposes, subject to strict IAEA safeguards and oversight, and limited to 6 cubic meters. Hot cells beyond the 6 cubic meter limit will require approval by the Joint Commission. Theoretically, if Iran decides to violate the agreement at some stage, it would be able to separate small quantities of Pu-239 using these hot cells. Iran did in the past (1991-1993) experimentally separate such plutonium on a very minor scale (100 milligrams) in the hot cells at the Teheran center, just to prove that it could be done.

Iran agrees that no other heavy water reactors will be constructed in Iran for the next 15 years; and agrees that all the excess spent fuel from this reactor will be shipped out of the country (probably to Russia?) for its entire lifetime, within a year from its extraction from the reactor core (this is reasonable since the spent fuel needs to be "cooled" for a period of time before it can be safely handled, this normally takes between six months to a year).

Iran will stop producing natural uranium pellets as fuel for the reactor, at the Esfahan Fuel Manufacturing Plant, and all the fuel already produced will be put under IAEA safekeeping safeguards. Iran will stop producing heavy water in excess of the requirements of the new reactor, these are estimated to be about 220 tons and that is more or less what the Iranians have produced to date. Excess heavy water produced will be sold to a customer abroad (probably Russia).

After 15 years, Iran will be free to seek separated plutonium, and highly enriched uranium, but its commitments not to make nuclear weapons will remain formally in effect.

Enrichment and centrifuges: **Natanz FEP and PFEP**: if the interim agreement JPA had lapsed in the absence of agreement, Iran would have had about 30 thousand centrifuges enriching within six months to a year, or a tripling of its current inventory. This is because it has about ten thousand centrifuges already enriching uranium, another almost ten thousand already installed but not yet enriching (including at Fordow FFEP), and has completed preparations for the installation of yet almost another ten thousand more; this would have included several thousand advanced IR-2m type centrifuges, nominally capable of enrichment at twice the rate of the otherwise ubiquitous IR-1 type (though this has never been put to the test at the production scale). All of Iran's currently installed FEP centrifuges, and the completed preparations for additional centrifuges, are in Production Hall A at the Natanz underground Fuel Enrichment Plant, FEP.

Iran will reduce the number of (IR-1) centrifuges enriching uranium to 5,060 in 30 cascades, from the currently enriching 9,156 centrifuges in 54 cascades. The disabled centrifuges will be "removed" from Production Hall A to the adjacent empty Production Hall B, where they will be subject to IAEA ongoing monitoring, to make sure that they have not been re-installed. It is not clear whether these

centrifuges need to be de-contaminated of UF6 tails before they can be handled (UF6 is an extremely hostile material, extremely toxic and corrosive, and must not come into contact with humans). Altogether, then, 3,194 IR-1 centrifuges currently enriching uranium will be uninstalled and moved.

Additionally, another 6,264 IR-1 centrifuges already installed but not yet enriching, installed in Production Hall A, will be uninstalled and moved to Production Hall B for storage and IAEA monitoring. Also, 1,008 IR-2m centrifuges currently installed in Production Hall A, but not yet enriching, will be uninstalled and moved to the adjacent empty Production Hall B for storage and IAEA monitoring. UF6 pipework, valves, pressure transducers, vacuum pumps, chemical traps, control equipment and all the other assorted whatnots used in operating centrifuge cascades, but not in use, will also be dismantled and stored under IAEA monitoring. Idle centrifuges may be cannibalized for spare parts for the spinning centrifuges.

Iran will be limited to 5,060 IR-1 centrifuges enriching uranium to LEU level (3.67%) for ten years. Iran intends to begin phasing out the IR-1 type centrifuge as of ten years hence, and to replace it with more advanced centrifuges (IR-6 or IR-8; see below). In this connection it needs to be restated, or re-emphasized, that any which way Iran is limited to a stock of 300 kg of LEU for 15 years, and any new enriched uranium will either have to be used to make fuel for the new Arak reactor, or for other reactors, or downblended back to the natural uranium level, or shipped out of Iran, and it cannot be added to the 300 kg ceiling of LEU allowed for 15 years.

PFEP: the above-ground Pilot Fuel Enrichment Plant at Natanz is where all kinds of other activities take place: this is where enrichment to the 20 percent level began in early 2010, using two IR-1 cascades now converted to enriching only to the LEU level and thus contributing insignificant quantities to LEU stocks; there are two full cascades of IR-2m and IR-4 type centrifuges respectively enriching uranium but their product is not extracted to add to the LEU stock, they are only for R&D purposes; and R&D on advanced type centrifuges in various configurations of small cascades or single machines takes place here (IR-2m; IR-4; IR-5; IR-6; IR-6s; IR-7 and IR-8 to date). The agreement goes into great detail regarding the limitations placed on Iran's R&D activity in their regard, too detailed to list here, except for perhaps some interesting highlights. Iran will be allowed, after 9 1/2 years ("a year and a half before the end of the tenth year", some observers read this to mean after 8 1/2 years, but a careful reading of the wording shows that it is 9 1/2 years), to run a 30-centrifuge cascade of IR-6 type centrifuges, and similarly as regards IR-8 type to run a 30-centrifuge cascade.

This way or that, it is clear from the agreements regarding R&D, that Iran intends after the 10 year limitation, to start replacing its antiquated and inefficient IR-1 centrifuges with the best available advanced model centrifuge; at the moment it looks like the IR-8 will be the preferred candidate, but if it does not live up to expectations, any of the other types mentioned could become preferred candidates – IR-6, IR-4 or even the already installed IR-2m, although in ten years' time it may be considered antiquated too. The agreement allows Iran to begin installing the necessary infrastructure for the IR-8 in Hall B of FEP after year 10. Any of these will allow Iran to speed up the

rate of enrichment, to the tune of doubling it, tripling it, or even quadrupling it, although Iran will remain limited to the 300 kg ceiling of LEU stocks for 15 years, as well as to the 3.67% level of enrichment; after 15 years, it will be allowed to resume stockpiling of LEU over the 300 kg limit, and to enrich beyond the 3.67% level of enrichment, though it will still be formally prohibited from pursuing nuclear weapons. The currently operating full IR-1 will remain in place, but will be disabled, the one by disconnecting of its operating equipment, and the other by both disconnection of its operating equipment and by the injection of epoxy resin. The IR-2m and IR-4 R&D cascades will continue to operate until 30 November 2015, or "Implementation Day", whichever comes later – that means that they will be dismantled after sanctions rescinding begins; this specification may stand out to indicate that in the other cases dismantlement precedes sanctions relief. "For the full IR-1 cascade (No. 6), Iran will modify associated infrastructure by removing UF6 pipework, including sub-headers, valves and pressure transducers at cascade level, and frequency inverters. The IR-1 cascade (No. 1) centrifuges will be kept but made inoperable, as verified by the IAEA, through the removal of centrifuge rotors and the injection of epoxy resin into the sub headers, feeding, product, and tails pipework, and the removal of controls and electrical systems for vacuum, power and cooling.* Excess centrifuges and infrastructure will be stored at Natanz in Hall B of FEP under IAEA continuous monitoring.

Fordow FFEP: for 15 years, Fordow will retain 1,044 of the currently installed 2,710 IR-1 centrifuges. The remainder will be uninstalled and sent to Natanz FEP Production Hall B to join the centrifuges dismantled at FEP Production Hall A and PFEP, for storage and IAEA monitoring. The centrifuges remaining at Fordow will be from the cascades currently installed but not yet enriching uranium; the centrifuges to be dismantled include both those used so far for enriching uranium – first to the 20 percent level as of 2011, and then to LEU level, as of the implementation of the interim JPA in January 2014 – and centrifuges additionally installed but not yet enriching. There will be no enriching at Fordow for 15 years at least (assuming compliance for the duration).

Out of the 1,044 IR-1 centrifuges remaining, 348 will be used to produce stable isotopes in a project to be jointly undertaken by Iran and the Russian Federation; the remaining centrifuges will remain idle, under IAEA monitoring. Idle centrifuges can be used for spare parts for the spinning centrifuges.

LEU stocks: already discussed, Iran will be allowed to retain only 300 kg of LEU stock for 15 years; this does not include nuclear fuel for reactors, such as power reactors or research reactors, whether provided from outside (Russia) or produced indigenously. All excess LEU has to be downblended to the natural uranium level, or shipped out of Iran. The initial excess, currently standing at between 7,300 kg (because Iran was allowed in the interim JPA to keep 7,600 kg) and 10 or even 12 tons mentioned by spokesmen and observers,[1] must be either downblended to the natural uranium level and then stored under IAEA oversight, or exported out of the country – either bought by a foreign state (Russia?), or, as is further suggested, sent to the envisaged IAEA uranium bank to be established in Kazakhstan. The agreement does not specify which solution Iran must choose, nor

[1] Some observers may be adding the LEU oxides being processed at the Esfahan UO2 Powder Plant (EUPP), in compliance with the interim JPA, to the 7,600 kg of LEU in UF6 form allowed by the interim JPA

does it specify a timetable for implementation – presumably this will take several months at least to accomplish, and it is not clear what IAEA confirmation of Iranian compliance, required for "Implementation Day", will be forthcoming. It is somewhat surprising that such a major central issue was not settled, as most other issues are outlined in excruciating detail.

As regards what remains in Iran of 20 percent enriched uranium in all its forms, the agreement specifies that all of it will be made into fuel plates for the Teheran reactor (this is already ongoing). When Iran has exhausted its own supply of 20 percent enriched uranium needed for the operation of the Teheran reactor, the EU3+3 will supply the reactor with the fuel that it needs without prejudice.

Centrifuge manufacturing: Iran will only produce what is needed for the operation of the elements contained in this annex. Iran will have plenty of idle centrifuges available to cannibalize for spare parts to keep the operating centrifuges going, and if the available stock of spare centrifuges falls below 500 Iran is allowed to manufacture centrifuges to replenish it to the 500 level.

At the end of year 8, i.e. as of year 9, Iran will be allowed to manufacture IR-6 and IR-8 centrifuges at the rate of 200 per year for each type, but without rotors. After year 10, complete centrifuges may be produced at the same rate, and stored at Natanz above ground (!) until they are needed for assembly.

Additional Protocol: Iran will immediately implement the Additional Protocol, but provisionally; full ratification will follow subject to the legislative and executive procedures.

"Past and Present Issues of Concern": this is what is normally referred to in IAEA jargon as "Clarification of Unresolved Issues" in regard to "Possible Military Dimensions" (PMD) of Iran's nuclear activities. Iran reiterates its commitment to clear up all the outstanding issues by 15 October 2015, and in expectation of a report by the Director General of the IAEA, Amano, to be issued on 15 December 2015, to the effect that the IAEA is satisfied with the result, **this being one of the prerequisites for "Implementation Day"**. Whether this is a realistic expectation, given Iran's long record of stonewalling the IAEA, and flagrantly ignoring the provisions of the 11 November 2013 agreement with the IAEA in this regard – can only be a matter of speculation. Does this include Parchin, and interviews with Iranian nuclear scientists, including the long-time head of the weapons group (or oft-changing weapons groups under different names, with different affiliations and different locations), Mohsen Fakhrizadeh? This is most doubtful, and it remains to be seen what report the IAEA will issue in this regard on December 15th.

Verification of uranium ore: this is not a central component of the agreement, but it should be mentioned that IAEA oversight of the transferring of uranium ore and uranium ore concentrate to the Esfahan Uranium Conversion Facility (UCF), where it is transformed into UF6 feed – is specified for 25 years (the Iranians currently have a stock of almost 400 tons of UF6 produced at UCF – 550 produced less 179 used, according to the 29 May 2015 IAEA inspection report – which should last them for many years, perhaps for the entire duration of the agreement).

Access: as mentioned above in the summary, the issue of access (item Q of Annex 1) to undeclared facilities has turned out to be a big disappointment, and a focus of critics of the agreement. The principle of "challenge inspections" (in CWC lingo), or "anywhere, anytime" propagated by Obama administration officials (including Secretary of Energy Moniz) after Lausanne in April – has been abandoned, and the P5+1, i.e. the U.S. have capitulated to Iranian "red lines" regarding inspections at military sites. This may perhaps be a *quid pro quo* for Iranian capitulation on the rescinding of sanctions only after confirmation by the IAEA of Iran's compliance with the provisions specifying dismantling of the lion's share of Iran's capabilities – if this is what has been agreed (there is some question as to the use of the word "simultaneously" – see below). Additionally, it may be speculated that these two last sticking points in the negotiations may have been resolved by accompanying letters of commitment from both sides, to the effect that some sanctions will be lifted before the IAEA confirmation of compliance on "Implementation Day", and an Iranian commitment to be forthcoming in allowing inspections at undeclared sites in spite of the provisions of the agreement, though the proof of this pudding would be in the eating….

As the wording of this item stands now, after the IAEA declares its desire to inspect a suspect site, Iran may require that the Agency explain, in detail, and in writing, why it wants to inspect this site. This is to a significant degree unworkable, because no doubt such inspections will be set in motion by highly sensitive intelligence information passed to the IAEA by a leading member state (U.S., U.K., though the source may be from yet another state), and its provision to the Iranians will compromise the source (HUMINT, technical, SIGINT, COMINT, imagery, other VISINT, or other) and foil its further use for subsequent discovery. It may even be foreshadowed by an unwillingness of states to pool their information with partner states and agencies for fear of compromising sources, if such information were to be relayed to Iran at the end of the line, and in any case may be expected to hinder the further passing along of such information to the IAEA by member states (primarily U.S. and U.K, perhaps others too) for action.

Secondly, the Iranians succeeded in affirming a cumbersome bureaucratic procedure which, in the bottom line, means that the inspectors will get to the site for a "managed access" visit only 24 days after the request is made. President Obama, in his news conference of July 15th, stated that this is defendable because, first of all, if there is an unprecedented and unique intrusive transparency regime on the entire scope of Iran's nuclear fuel cycle and activities, it will be almost impossible for the Iranians to divert materials and to launch a covert nuclear weapons program; and that, secondly, such activities cannot be completely obfuscated, even in 24 days, because even after 24 days IAEA inspectors will still be able to find traces of prohibited activity. The experience of North Korea, Iran, and Syria tends to validate this, but still, critics feel justifiably marked discomfort with this arrangement, especially as measured against prior assertions about an "anywhere, anytime" inspections regime.

Other enrichment activities: Iran will not engage for ten years in any other form of uranium enrichment, except centrifuges – laser, gaseous diffusion (Oak Ridge - Hiroshima), chemical, electromagnetic (Iraq), vortex and aerodynamic (the South African "nozzle" technique), etcetera, are all prohibited (for ten years).

ANNEX 2: THE UNITED STATES AND EU COMMITMENTS

The next 80 pages of the draft document issued in Vienna, immediately upon the announcement that agreement had been reached, detail almost *ad absurdum* the process of sanctions rescinding. First there is a detailed list of actions that the E.U. must take, as of "Implementation Day", to remove sanctions, using E.U. legislative and executive lingo, i.e. as these are worded for action in the E.U.; then there is a list of actions which the U.S. must take, executive, legislative and judicial, using the U.S. legal provisions language and jargon. Then there is a list of enabling measures, i.e. a commitment not to prejudice or hamper economic activity between Iran and E.U. or U.S. partners, first in E.U. paperwork language, and then in detail in U.S. paperwork lingo. There are details of the areas of activity where Iran will be allowed free range: financial and banking; oil, gas and petrochemical; shipping, shipbuilding and transport sectors; metals; gold, other precious metals, banknotes and coinage; software; insurance; automotive sector; and other trade measures, including "Iranian origin carpets and foodstuffs, including pistachios and caviar".

There then follow three "attachments" listing all the Iranian individuals and entities (companies and industrial groups), including the members of the high command of the Islamic Revolutionary Guard Corps and the IRGC as an organization, from whom sanctions are to be lifted in the order specified by the agreement. One lot of such specified is to be exempted from sanctions immediately as of "Implementation Day"; another group listed is to be exempted as of "Transition Day" eight years after "Adoption Day", namely as regards missile sanctions. Qods Force head Qasem Soleimani appears twice, once spelled "Ghasem Soleymani" and another time as "Qasem Soleimani". Defense industries like "7th of Tir", which is identified as having been involved in covert centrifuge production, and is so mentioned in UN Security Council resolution 1737 adopted December 2006; "Cruise Missile Industry Group"; "Shahid Bagheri Industrial Group (SBIG)", which is the Iranian solid-propelled ballistic missile industrial group, producers of a great variety of missiles and rockets, some of them provided in the thousands to Hezbollah in Lebanon; "Shahid Hemmat Industrial Group (SHIG)", which is the liquid-fueled ballistic missile industrial group, producers of the Shahab-3; and "Ya Mahdi Industrial Group" which produces various military items such as anti-tank missiles, all appear among the many mentioned. So does "Kalaye Electric Company", in the past a cover name for clandestine uranium enrichment centrifuges development and production. And a multitude of other companies and groups with similar previous or current involvement in activities subject to sanctions.

ANNEX 3: CIVIL NUCLEAR COOPERATION

This annex specifies, over approximately ten pages, in great detail, the support which the EU3+3 will grant Iran in its peaceful nuclear endeavors, including in aspects directly relating to its commitments in the JCPOA, such as the redesign and rebuilding of the Arak reactor so that it does not pose a proliferation concern. Some of the fields of cooperation are compatible with the IAEA agreements with its member states in support of peaceful nuclear uses, in accordance with the guarantee which NPT provides to compliant non-nuclear weapons states to facilitate their peaceful nuclear activities over a wide spectrum of issues. Some others are additional. The annex addresses "Reactors, Fuels and Associated Technologies, Facilities and Processes"; "Modern light water power and research reactors and associated equipment, technologies and facilities"; "Arak modernization project"; "Nuclear Safety, Safeguards and Security"; "Nuclear Medicine and Radioisotopes, Associated Technologies, Facilities and Processes"; "Waste Management and Facility Decommissioning"; and other issues. The bottom line is that Iran will be receiving a massive dose of Western / Russian / other aid and assistance for its nuclear program, which could indirectly boost its subsequent nuclear weapons effort, but only indirectly and only in a few relevant fields. This is unavoidable in such a scenario, and it can only be noted that previous nuclear weapons proliferation cases began with peaceful nuclear assistance – India, Pakistan, North Korea, Iraq, Iran, Syria, and Libya, for example. But overall, it can be assessed that the products of this wide scope of assistance will be carefully scrutinized in a manner which will ensure that any contribution to a potential future Iranian nuclear weapons effort – will be indirect and secondary, and perhaps marginal.

ANNEX 4: JOINT COMMISSION

The Joint Commission is going to be the executor and adjudicator of the agreement. It will be comprised of members of all the parties. It will establish Working Groups in particular areas, as appropriate, to deal with the different issues which need to be dealt with. The annex establishes the responsibilities of the Joint Commission, and procedures for its functioning. The Joint Commission will meet as required in New York, Vienna or Geneva. There will be a "Procurement Working Group" – to oversee procurement. There will also be a "Working Group on Implementation of Sanctions Lifting". At this stage it is difficult to assess whether the Joint Commission and its Working Groups will function smoothly as envisaged, perhaps subject to, and circumscribed by, the political environment and positions of the governments of the states participating.

ANNEX 5: IMPLEMENTATION PLAN

As noted above, the sticky part here is the wording of the terms of "Implementation Day": *"Implementation Day will occur **upon the IAEA-verified implementation by Iran of the nuclear-related measures** described in paragraph 15 below, **and, simultaneously, the E3/EU+3 taking the actions described** in paragraphs 16 and 17 below, and with the actions described in paragraph 18 below taking place at the UN level in accordance with the UN Security Council resolution"* (the latter referring to rescinding of sanctions).

Iran's part is clear: *"**Iran will implement the nuclear-related measures as specified in Annex I**:*

15.1 Paragraphs 3 and 10 from Section B on "Arak Heavy Water Research Reactor";

15.2 Paragraphs 14 and 15 from Section C on "Heavy Water Production Plant";

15.3 Paragraphs 27, 28, 29, 29.1 and 29.2 from Section F on "Enrichment Capacity";

15.4 Paragraphs 32, 33, 34, 35, 36, 37, 38, 39, 40, 41 and 42 from Section G on "Centrifuges Research and Development";

15.5 Paragraphs 45, 46, 46.1, 46.2, 47.1, 48.1 from Section H on "Fordow Fuel Enrichment Plant";

15.6 Paragraphs 52, 54 and 55 from Section I on "Other Aspects of Enrichment";

15.7 Paragraphs 57 and 58 from Section J on "Uranium Stocks and Fuels";

15.8 Paragraph 62 from Section K on "Centrifuge Manufacturing";

15.9 Complete the modalities and facilities-specific arrangements to allow the IAEA to implement all transparency measures provided for in Annex I;

15.10 Paragraphs 64 and 65 from Section L on "Additional Protocol and Modified Code 3.1";

15.11 Paragraphs 80.1 and 80.2 from Section R on "Centrifuge Component Manufacturing Transparency"; and

15.12 Within one year from Implementation Day, Iran will have completed the measures specified in paragraphs 47.2 and 48.2 of Section H on "Fordow Fuel Enrichment Plant".

On the face of it, this means that first the IAEA has to confirm that Iran **has implemented** (that would have been a more precise wording….) or **is implementing** (that too would have been more precise) – by implication has taken significant tangible steps forward in this regard – and **then** the EU3+3 will take the actions described regarding lifting of sanctions. Another, problematic, but less probable, definition of the use of the word *"simultaneously"*, means that Iran does not need to show significant steps forward before sanctions are lifted. It is here recalled that Iran's Foreign Minister Zarif, after the Lausanne Framework was announced, told Iranian television that all the sanctions would be lifted "as soon as the IAEA confirms that Iran has done what it committed to do"; but subsequently the Iranians pulled back from that definition, and wanted sanctions lifted with the signing of the agreement. Where things stand now is not completely clear, and room for flexibility may have been deliberately left in the foggy wording of this sentence.

There is no mention, as far as could be determined, of the interim JPA. It can only be assumed that it continues to be in effect until superseded by the JCPOA. This may be expected to become evident when the IAEA issues its regular full periodic inspection report in late August or early September for the 7-11 September 2015 Board of Governors Meeting, prior to the JCPOA being "adopted" and "implemented".

Nor is there any reference to the conventional arms embargo, which is said to remain in effect for five years.

OVERALL ASSESSMENT – THE BOTTOM LINE

After the UN Security Council endorses the agreement, the following 90 days will see an uphill battle in the legislatures of Washington and Teheran to secure its adoption and ratification. This altercation should not be underestimated, and in both the U.S. Senate and the Majlis there will be calls to re-negotiate some of the provisions of the agreement. The successful outcome of the legislative process in both arenas is by no means guaranteed, and a firm requirement by any party to renegotiate terms of the agreement is a "whole 'nother ball game". But, assuming that in spite of all that is going to happen in the next 90 days the advocates of the agreement secure its approval, probably, and the agreement is adopted – "Adoption Day" – a new situation will begin to unfold, and the agreement will begin to be implemented by the parties.

If Iran complies with the provisions of this agreement to the letter, perhaps with only minor technical "glitches" or deviations here and there of no substantial bearing on the core issue, for its entire duration, Iran will have moved a great distance away from acquiring nuclear weapons – probably significantly more than the one year of breakout warning time which the agreement was declared to be intended to achieve. Assuming compliance, it will not be able to produce nuclear weapons for at least the next fifteen years. This would be a revolutionary achievement in regard to the concern that Iran will acquire nuclear weapons.

Whether Iran so complies with the agreement for its entire duration is impossible to predict or assess. What can be said is that Iran will very probably – assuming "Adoption" – comply with the provisions of the agreement at least for a few years. The horizon of prediction is here set at six years, give or take a year, during which it appears moderately probable that Iran will by and large comply with the provisions. Beyond six years hence it is quite impossible to say what will happen. In six years' time none of the current faces will be in office any longer. Perhaps the first big test will be Rouhani's re-election two years from now, in 2017, after which, if re-elected, he will have another four-year term. But in six years Khamenei, Rouhani, Zarif, Araghchi and Salehi will no longer, most probably, none of them be holding the positions which they hold, and who will be calling the shots in Iran is an imponderable.

If Iran uses the windfall of sanctions relief to considerably strengthen its military capabilities, it is possible that the Western (U.S. / Israeli) military options available today will be much more difficult to use to foil an Iranian breakout to nuclear weapons – this could happen as soon as five or six years hence. Therefore the statements made by the U.S. administration that all the options which are on the table today will be available in the future too, if Iran violates the agreement, should be qualified and subject to some degree, at least, of circumspection – they might not be. In this sense the agreement is more of a gamble than its advocates are willing to admit. Much of the future revolves around what will happen in Iran in the coming years. The Obama administration wanted Rouhani in 2013 (after rooting for Khatami in 2009 and falling flat on its face), and got what it wanted out of him. If he is not re-elected in 2017, and is replaced by Ahmadinejad II, because the Supreme Leader and / or the IRGC decide to get rid of Rouhani and his team, then the smooth running of the agreement may be in trouble; at this time it looks like this scenario has a low probability, but anything is possible, especially given the Supreme Leader's poor health (although prostate cancer at the age of 80 is not an immediate threat, still his term can now be measured in a very few years). Rouhani's second term will end in six years in any case, and his successor will most probably not re-appoint Zarif.

Predictions are, then, exceedingly difficult to make, especially when it comes to the future…. Advocates of the agreement, generally of a liberal world view, have many good, and sound, reasons to be hopeful, alert and cautiously optimistic about the agreement postponing Iranian nuclear weapons for many years, at least; and to assert that there is no good viable alternative, short of escalation to potential war, with probably some inevitably unpredictable results and fallout. Critics, generally of a conservative world view, have many excellent, irrefutable and unshakable, reasons for being skeptical, and to scoff at the advocates' demonstrated and oft-repeated glazed vision and *naïveté*, in their view. History will judge between them.