Adequate Verification Under a Comprehensive Iran Nuclear Deal

Testimony Before the House Committee on Foreign Affairs

April 22, 2015

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With the negotiation of a set of parameters for an eventual Joint Comprehensive Plan of Action, the shape of a final deal between Iran and the P5+1 group of countries (the United States, Britain, France, Germany, Russia, and China) has emerged. However, many important provisions of a final deal remain to be negotiated in the coming months. A critical set of these provisions involves the adequacy of verification arrangements that would be in place to monitor Iran's compliance with a deal. Much of this verification effort will be overseen by the International Atomic Energy Agency (IAEA). The United States has recognized that the current verification arrangements in Iran, namely a comprehensive safeguards agreement (CSA), even if supplemented by the Additional Protocol, are not sufficient in the case of the Islamic Republic of Iran. Tehran's long history of violations, subterfuge, and non-cooperation require extraordinary arrangements to ensure that Iran's nuclear program is indeed peaceful. A priority of the ongoing negotiations is establishing legally binding measures guaranteeing this adequate verification.

On a separate but linked negotiating track, Iran and the IAEA have been working in a step-wise approach to address the IAEA's concerns about Iran's alleged past and possibly on-going work on nuclear weapons development and other possible military dimensions (PMD) of Iran's nuclear program. However, this IAEA/Iran track has gone poorly, and Iran has shown increasingly an unwillingness to address the IAEA's concerns, asserting disingenuously that it never had a nuclear weapons program. It continues to dissemble and stonewall the inspectors and apparently remains committed to severely weakening IAEA safeguards and verification in general, actions inconsistent with achieving adequate verification under a comprehensive plan. Recently, Iranian officials have asserted that the IAEA will never be allowed to visit military sites in Iran. Without a fundamental shift in Iran's views on safeguards and verification, the prospect of obtaining adequate verification measures fades.

Adequate verification is critical to a long-term deal in terms of verifying activities at declared nuclear sites and more importantly ensuring the absence of undeclared nuclear material and facilities. Although the interim deal under the Joint Plan of Action (JPA) strengthened the monitoring of declared sites, it did little to increase the IAEA's ability to detect and find covert

sites and activities. Inspectors have regularly reported in quarterly safeguards reports on Iran that the IAEA is not in a position to provide credible assurance about the absence of undeclared nuclear material and activities in Iran, and therefore to conclude that all nuclear material in Iran is used for peaceful activities.

Whether this situation changes will largely depend on the ability of the United States and its partners to create a comprehensive plan that establishes legally binding conditions on Iran that go beyond those in the comprehensive safeguards agreement and the Additional Protocol. A critical question will be whether the agreement establishes a verification regime adequate to promptly catch Iranian cheating. The U.S. Fact Sheet and subsequent briefings I received on the parameters of a comprehensive plan show that a considerable amount of work remains in the area of verification.

Recent Iranian statements disagreeing with verification provisions in the U.S. Fact Sheet raise the question of whether the U.S. negotiators have tried to oversell what has been agreed to. Iran's public disagreements with the text could reflect also spin for domestic consumption, but more concerning, they could be attempts to create a predicate to renegotiate certain key parameters agreed to in Lausanne. U.S. officials have stated that everything in the U.S. Fact Sheet was agreed "in the room," meaning that Iran agreed to all these parameters during the negotiations in Lausanne. If one assumes that the U.S. version is accurate, the U.S. Fact Sheet combined with briefings from officials shows that key verification arrangements remain unresolved, particularly those related to PMD issues and those that supplement the Additional Protocol. In fact, there are enough verification provisions unsettled that we at my organization cannot make a judgment about their adequacy without further progress in the negotiations.

But the need for these additional provisions remains clear and U.S negotiators should be held to a high standard in achieving these adequate verification provisions. There are many reasons why an agreement must require extraordinary verification arrangements. The most critical reasons are Iran's violations of its safeguards agreement, actions which have been inconsistent with that agreement and a peaceful nuclear program, and its long history of non-cooperation with the IAEA. Examples include:

- The IAEA found that Iran had violated its comprehensive safeguards agreement prior to 2004 on multiple occasions, including, to name a few, importing natural uranium without notifying the IAEA, enriching uranium to test centrifuges, experimenting with plutonium separation and laser enrichment, and allegedly carrying out weaponization experiments, possibly including nuclear material. (See appendix 1).
- Iran built several nuclear facilities in secret, including the Natanz centrifuge plant, the Fordow centrifuge plant, the Kalaye Electric centrifuge research and development site, the Physics Research Center at Lavisan-Shian linked to undeclared military nuclear work, the Lashkar Ab'ad laser enrichment facility, and the Arak heavy water production plant. In addition, Iran created a secret centrifuge manufacturing complex, parts of which are still secret today.
- Iran has depended extensively on illegal overseas procurement for its nuclear programs in violation of national laws and UN Security Council resolutions; at least one illegal

- procurement for the Arak reactor complex was attempted after the JPA went into effect (although not a violation of the JPA, it violated UNSC resolutions). (See Appendix 2).
- Iran unilaterally stopped implementing Code 3.1 of its CSA in 2006, an act the IAEA called inconsistent with its safeguards agreement. Code 3.1 of the subsidiary arrangement of the safeguards agreement requires a state to declare a nuclear site when it authorizes or starts to design a nuclear facility and to submit design information as work proceeds.
- Iran has not allowed the IAEA to visit a site at the Parchin military complex or other sites associated with past work on nuclear weapons research and development and other military nuclear activities.
- Iran has delayed inspectors' access to sites and extensively modified buildings or the sites themselves in apparent efforts to thwart IAEA verification methods which aim to detect undeclared activities and facilities. Iran attempted to prevent these methods from succeeding in 2003 at the Kalaye Electric centrifuge research and development site but was caught; its efforts at sanitization and concealment succeeded at the Lavisan-Shian site, which it bulldozed and rebuilt into an athletic facility after suspicion was raised that it was allegedly involved in military nuclear work; Iran's efforts may yet succeed to conceal from environmental sampling and other verification techniques any past work at the Parchin site where high explosive tests related to nuclear weaponization may have been conducted.
- Iran has stonewalled the IAEA's efforts to resolve its concerns about the possible military dimensions of its nuclear programs. (See Appendix 3).

Iran has in general been in compliance with the conditions of the JPA. However, it enriched in the IR-5 centrifuge, an act inconsistent with its JPA undertakings. When confronted by the United States, Iran quickly backed down and even took additional steps to increase confidence that enrichment in this centrifuge would not happen again. However, Iran has not shown a willingness to back down on more fundamental issues, such as resolving the IAEA's PMD concerns, halting its illicit nuclear procurements, and fully cooperating with the IAEA. On less important issues, Iran is more cooperative but on the difficult ones, its record remains problematic.

Iran has carried out unprecedented violations, both in the length and depth of these violations, and has been non-cooperative with the IAEA and UN Security Council. There is a significant confidence deficit between Iran and much of the international community. As a result, verification conditions in a comprehensive plan will likewise need to be rigorous, unprecedented, and long lasting. This time frame should be sufficient for the IAEA to achieve full confidence in the absence of undeclared Iranian nuclear materials and facilities and in the peaceful nature of Iran's nuclear programs.

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¹ After enrichment and measurement of enrichment level was achieved, the enriched material and depleted uranium was mixed together, becoming natural uranium.

Several measures are needed to ensure adequate verification in a long term deal²:

- 1) Iran addressing the IAEA's concerns about Iran's past and possibly on-going nuclear weapons work. If no concrete progress is forthcoming by July 1, a deal should not be signed. If Iran in good faith asks to delay demonstrating concrete progress until after a deal is signed, it should not receive any sanctions relief from the United States and European Union until it fulfills this commitment, along with providing a road map on resolving the rest of the IAEA's PMD concerns. IAEA visits to Parchin and related sites, inspection of related equipment, and access to key individuals should be part of the demonstration of concrete progress as one of the key conditions for suspending EU and U.S. economic and financial sanctions.
- 2) The removal of UN Security Council resolutions should be tied to the long term resolution of the PMD file, a determination by the IAEA of the exclusively peaceful nature of Iran's nuclear program, and the demonstration of adequate verification arrangements on Iran's industrial infrastructure, both military and civilian, related to the potential development of nuclear weapons.
- 3) UNSC sanctions or controls on proliferation sensitive goods need to continue indefinitely. These controls, along with a rigorously verified procurement channel, are a fundamental part of ensuring that Iran is not secretly outfitting undeclared nuclear facilities and activities.
- 4) Establishment of binding language guaranteeing the IAEA snap inspections, or anywhere, anytime inspections, and broader Iranian declarations about its activities than required in the Additional Protocol, lasting for longer than the reported term of a deal, at least until the IAEA has satisfactorily concluded its PMD investigation and several more years have passed wherein Iran is compliant with its Nuclear Non-Proliferation Treaty (NPT) obligations.

The evaluation of the adequacy of verification provisions remains a critical role of Congress. Toward that end, it makes sense for the P5+1 countries, along with the IAEA, and separately, Congress, to create a strong review process of the adequacy of the verification regime at one year, five years, and every five years afterwards for the duration of the major phasing arrangements in the deal.

Measures 1-4 are detailed further:

1) Achieve Concrete Progress in Resolving Concerns about Iran's Past and Possibly Ongoing Nuclear Weapons Efforts Prior to U.S./EU Sanctions Suspension

The U.S. Fact Sheet currently lacks much specificity regarding Iran's obligation to resolve in a significant and concrete manner the IAEA's concerns about its past and possibly ongoing work

² For a more detailed discussion, see ISIS's critique of the Framework deal: Albright et al., "P5+1/Iran Framework: Needs Strengthening," ISIS Report, April 11, 2015, http://isis-online.org/uploads/isis-reports/documents/Assessment of Iran Nuclear Framework April 11 2015-final.pdf

on nuclear weapons, or the possible military dimensions (PMD). Strict conditions must be added that the suspension of U.S. and European Union nuclear-related sanctions requires that Iran takes concrete steps to address the PMD file. Iran will need to take additional nuclear-related steps prior to the suspension of these sanctions but the PMD conditions need to be emphasized. Moreover, UNSC sanctions would only be removed once Iran the IAEA makes a determination that it has fully resolved the PMD file and come to a "broader conclusion" about the peacefulness of Iran's nuclear program (described also in Measure 2).

There is also a future dimension to the PMD issue that needs to be incorporated into a deal. Given Iran's past transgressions, a comprehensive plan has to provide assurance that those industries, both civil and military, associated with activities that can be used in the researching and development of nuclear weapons are subject to verification. On-going access to military sites will be required to meet these provisions. Moreover, Iran will need to declare its past procurements of key goods associated with nuclear weapons R&D and its future procurements of such goods, if allowed (see Measure 2 as well).

Achieving adequate verification provisions in a comprehensive plan is far from settled. Despite a great effort over the last year and half, the IAEA has learned little from Iran that has added to the inspectors' ability to resolve its concern about Iran's past and possibly on-going work on nuclear weapons research and development. For years, the inspectors have unsuccessfully asked the Islamic Republic to address the substantial body of evidence that it was developing nuclear weapons prior to 2004 and that it may have continued some of that, or related work, afterwards and even up to the present. As one condition for suspending U.S. and EU sanctions, Iran must demonstrate concrete progress on the central issue of whether Iran has worked on nuclear weapons and is maintaining a capability to revive such efforts in the future. A deal also needs to lay out a road map of how and when Iran will address the IAEA's remaining PMD concerns and receive no UNSC sanctions relief until it resolves them.

Supreme Leader Ali Khamenei often declares that nuclear weapons violate Islamic strictures. His denials are not credible. The United States, its main European allies, and most importantly the IAEA itself, assess that Iran had a sizable nuclear weapons program into 2003. The U.S. intelligence community in the 2007 National Intelligence Estimate (NIE) agreed: "We assess with high confidence that until fall 2003, Iranian military entities were working under government direction to develop nuclear weapons." European governments and the IAEA have made clear, the United States less so, that they believe Iran's nuclear weapons development may have continued after 2003, albeit in a less structured manner. In its November 2011 safeguards report, the IAEA provided evidence of Iran's pre- and post-2003 nuclear weaponization efforts. The IAEA found, "There are also indications that some activities relevant to the development of a nuclear explosive device continued after 2003, and that some may still be ongoing." To reinforce this point to Iran, the United States in late August sanctioned Iran's Organization of Defensive Innovation and Research (SPND), headed by Mohsen Fakrizadeh, the suspected military head of the nuclear weapons program in the early 2000s and perhaps today. SPND is a Tehran-based entity established in early 2011 that is "primarily responsible for research in the

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³ IAEA Director General, *Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran*, GOV/2011/65, November 8, 2011, Para. 45. http://isis-online.org/uploads/isis-reports/documents/IAEA Iran 8Nov2011.pdf

field of nuclear weapons development."⁴ Thus, there is widespread evidence and suggestion that Iran has worked on developing nuclear weapons and that some of those activities may have continued to today.

Despite the overwhelming evidence, Iran denies it has ever worked on nuclear weapons. Its intransigence on this issue makes progress in the negotiations difficult to predict.

Some argue that Iran should not have to confess its past; its face should be saved, they argue. However, making this determination should not be the role of U.S. negotiators. The power to make a determination about Iran's past or ongoing military nuclear work resides with the IAEA and the U.S. negotiators, and a final comprehensive plan, should support the fundamental role of the IAEA to make this determination in a timely manner. Lack of adequate cooperation by Iran with the IAEA's effort should be judged a material breach of any deal.

Moreover, turning a blind eye to the past emboldens Iran to further resist the IAEA and necessary verification arrangements, ultimately threatening the viability of any deal. If Iran is allowed to "save face" and not address the IAEA's PMD file, it will ultimately be given the ability to maintain the remnants or continued efforts of this military nuclear work, hidden from inspectors and the international community.

Addressing the IAEA's concerns about the military dimensions of Iran's nuclear programs is fundamental to any long-term agreement. Although much of the debate about an agreement with Iran has rightly focused on Tehran's uranium enrichment and plutonium production capabilities, an agreement that side steps the military issues would risk being unverifiable. Moreover, the world would not be so concerned if Iran had never conducted weaponization activities aimed at building a nuclear weapon. After all, Japan has enrichment activities but this program is not regarded with suspicion. The establishment of Iran's peaceful intentions, resting on solid verification procedures, is critical to a serious agreement.

A prerequisite for a comprehensive agreement is for the IAEA to know when Iran sought nuclear weapons, how far it got, what types it sought to develop, and how and where it did this work. Was this weapons capability just put on the shelf, waiting to be quickly restarted? The IAEA needs a good baseline of Iran's military nuclear activities, including the manufacturing of equipment for the program and any weaponization related studies, equipment, and locations. The IAEA needs this information to design a verification regime. Moreover, to develop

"SPND was established in February 2011 by the UN-sanctioned individual Mohsen Fakhrizadeh, who for many years has managed activities useful in the development of a nuclear explosive device. Fakhrizadeh led such efforts in the late 1990s or early 2000s, under the auspices of the AMAD Plan, the MODAFL subsidiary Section for Advanced Development Applications and Technologies (SADAT) and Malek Ashtar University of Technology (MUT). In February 2011, Fakhrizadeh left MUT to establish SPND. Fakhrizadeh was designated in UNSCR 1747 (2007) and by the United States in July 2008 for his involvement in Iran's proscribed WMD activities. SPND took over some of the activities related to Iran's undeclared nuclear program that had previously been carried out by Iran's Physics Research Center, the AMAD Plan, MUT, and SADAT."

⁴U.S. State Department, "Additional Sanctions Imposed by the Department of State Targeting Iranian Proliferators." Media Note, Office of the Spokesperson, Washington, DC, August 29, 2014. http://www.state.gov/r/pa/prs/ps/2014/231159.htm The media note states:

confidence in the absence of these activities—a central mission—the IAEA will need to periodically inspect these sites and interview key individuals for years to come. Without information about past military nuclear work, it cannot know where to go and who to speak to.

The situation today makes it impossible for the IAEA to determine with confidence that nuclear weapons activities are not on-going. The IAEA already has the legal right to pursue these questions, including accessing military sites, under the comprehensive safeguards agreement with Iran. Despite this right, Iran has refused to allow the IAEA access to military sites. Early in the JPA negotiations, according to U.S. officials involved in the negotiations, Iranian negotiators said that the Iran Revolutionary Guard Corps would not allow the IAEA access to its military sites. Of course, this demand is unacceptable. Nevertheless, because of Iran's refusal to abide by its safeguards obligations, a long term deal needs to include clear, legally enforceable conditions allowing the IAEA prompt access to military sites where suspicious activities have been detected or reported. The U.S. Fact Sheet is ambiguous on whether Iran has agreed to allow access to all suspect sites anywhere in Iran.⁵ Iranian officials state that they have not agreed to this condition. How this issue is resolved will be a strong indicator whether verification is adequate in a comprehensive plan.

One important test of this issue is when and under what conditions the IAEA gains access to a site at the Parchin military complex. This site is the alleged location of high-explosive testing linked to nuclear weapons development prior to 2004. Since the IAEA asked to visit this site in early 2012, Iran has reconstructed much of it, making IAEA verification efforts all but impossible. Tehran has undertaken at this site what looks to most observers as a blatant effort to defeat IAEA verification. Because of such extensive modifications, the IAEA, once allowed access, may not be able to resolve all its concerns. Undoubtedly, the IAEA will need to visit related sites. One should think of IAEA access to Parchin as a list of actions that would involve access to other sites and individuals. .

Iran continues to say no to IAEA requests to interview key individuals, such as Fakrizadeh and Sayyed Abbas Shahmoradi-Zavareh, former head of the Physics Research Center, alleged to be the central location in the 1990s of Iran's militarized nuclear research. The IAEA interviewed Shahmoradi years ago about a limited number of his suspicious procurement activities conducted through Sharif University of Technology, at a time when Iran's current head of the Atomic Energy Organization of Iran was head of this university and aware of Shahmoradi's activities. The IAEA was not fully satisfied with his answers and its dissatisfaction increased once he refused to discuss his activities for the Physics Research Center. Since the initial interviews, the IAEA has obtained far more information, some supplied by my institute, about Shahmoradi and the Physics Research Center's procurement efforts. The need to interview both individuals, as well as others, remains.

⁵ See ISIS's critique of the Framework deal: Albright et al., "P5+1/Iran Framework: Needs Strengthening," ISIS Report, April 11, 2015, pp. 10-11. http://isis-online.org/uploads/isisreports/documents/Assessment of Iran Nuclear Framework April 11 2015-final.pdf

⁶ See for example, Albright, Paul Brannan, and Andrea Stricker, "The Physics Research Center and Iran's Parallel Military Nuclear Program," ISIS Report, February 23, 2012. http://isis-online.org/uploads/isisreports/documents/PHRC report 23February2012.pdf

If Iran is able to successfully evade addressing the IAEA's concerns now, when biting sanctions are in place, why would it address them later when these sanctions are lifted, regardless of anything it may pledge today? Iran's lack of clarity on alleged nuclear weaponization and its noncooperation with the IAEA, if accepted as part of a nuclear agreement, would create a large vulnerability in any future verification regime. Iran would have succeeded in creating precedents to deny inspectors access to key military facilities and individuals. There would be essentially no-go zones across the country for inspectors. Tehran could declare a suspect site a military base and thus off limits. And what better place to conduct clandestine, prohibited activities, such as uranium enrichment and weaponization? After all, the Fordow centrifuge plant was originally built in secret at a military site and only declared to the IAEA after Iran learned it was exposed.

Iran would have also defeated a central tenet of IAEA inspections—the need to determine both the correctness and completeness of a state's nuclear declaration. As a recent March 11, 2015 communication from Iran to the IAEA made clear, it stands opposed to allowing the IAEA to carry out this well-established mission.

Without resolving the PMD issues, the history of Iran's previous military nuclear efforts may never come to light and the international community would lack confidence that these capabilities would not emerge in the future. Moreover, Iran's ratification of the Additional Protocol or acceptance of additional verification conditions, while making the IAEA's verification task easier in several important ways, would not solve the basic problem posed by Iran's lack of cooperation on key, legitimate IAEA concerns. Other countries contemplating the clandestine development of nuclear weapons will certainly watch Tehran closely.

Solving the PMD issue does not require a *mea culpa* from Iran. Numerous approaches have been explored that can provide a mechanism to postpone a potentially embarrassing, albeit needed, admission. A simple acknowledgement of a past military nuclear program would be a positive step, and absent that, a decision not to dispute an IAEA finding on the matter. If no concrete progress is forthcoming by July 1, a deal should not be signed. If Iran in good faith asks to delay demonstrating concrete progress until after a deal is signed, a condition for sanctions relief should be that it fulfills this commitment, along with providing a road map on resolving the rest of the IAEA's PMD concerns. In particular, the condition must be added to the final deal that the U.S. and European Union nuclear-related sanctions will be suspended only after Iran addresses in a significant and concrete manner the IAEA's concerns about its past and possibly ongoing work on nuclear weapons, or the possible military dimensions, including:

- Allowing visits to Parchin and related military sites where nuclear weapons-related
 activities are alleged to have taken place. Access to the company where the explosive
 chamber was manufactured and the provision of information about other, similar
 chambers made by this company in the past. Access to key equipment and individuals
 associated with the alleged activities at Parchin;
- Access to key individuals identified by the IAEA as related to its PMD concerns;
- The IAEA issuing a provisional determination about whether Iran had a nuclear weapons program prior to 2004, parts of which may have continued after 2004.

After the deal is implemented, including Iran's ratification of the Additional Protocol, the IAEA would be guaranteed that it could conduct a more rigorous investigation of PMD issues.

2) Lifting of UNSC Resolutions Contingent on IAEA "Broader Conclusion"

With regards to the eventual lifting of UNSC resolutions, as discussed in the U.S. Fact Sheet, a condition must be added that UNSC resolutions will be lifted upon completion by Iran of its commitments and actions addressing all key concerns (PMD but also including enrichment, Fordow, Arak, and transparency) and completion, by the IAEA, of a determination under the Additional Protocol that Iran's nuclear program is peaceful, often called a broader conclusion. Negotiators must not agree to lift UNSC resolutions before the IAEA has reached its broader conclusion about the peaceful nature of Iran's program, including determining the extent of past progress on Iran's military nuclear program and dismantling any remaining efforts. Precedents for accomplishing this process are available from the case of South Africa's nuclear dismantlement. It will be vital to the ultimate success of an agreement that Iran not retain any residual military nuclear capability after sanctions leverage is removed. It is unlikely that UNSC sanctions can be re-enacted quickly. Combined with shorter breakout times and greater enrichment capacities after year ten of the deal and particularly after year 13, leaving this capability in Iran would only create a heightened version of the current security situation. Unless this facet of Iran's nuclear program is dealt with, no agreement should be made. It is a deal component that negotiators would ignore at the peril of regional security and peace.

3) Maintain Sanctions and Controls on Proliferation Sensitive Goods⁷

An often overlooked aspect of verifying against Iran's construction of secret nuclear sites or any other undeclared activities is preventing Iran's illegal procurements of critical goods and technologies. Iran depends on the foreign acquisition of a wide range of goods for its nuclear programs and has undertaken extensive and elaborate overseas illegal procurements in order to build its nuclear facilities. However, similar to its attitudes toward the IAEA and safeguards, Iran views others' national trade control laws and UN Security Council sanctions with contempt. On August 30, 2014, Iranian President Hassan Rouhani stated on Iranian television: "Of course we bypass sanctions. We are proud that we bypass sanctions." Few, if any, presidents proclaim such pride in conducting internationally illegal activities. In fact, his statement is egregious and implies a high level public endorsement of widely recognized illegal activities.

Evidence indicates that in the last few years Iran has been conducting its illegal operations to import goods for its nuclear program with greater secrecy and sophistication, necessitating greater attention to this issue. A long term nuclear agreement should ban Iranian illicit trade in items for its nuclear programs while creating additional mechanisms to verify this ban.

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⁷ For a more detailed discussion of this issue, see David Albright and Olli Heinonen, "Provisions to Limit Future Iranian Illicit Procurements for its Nuclear Programs," ISIS Report, November 20, 2014, http://isis-online.org/isisreports/detail/provisions-to-limit-future-iranian-illicitprocurements-for-its-nuclear-pro/8

Because of Iran's extensive commitment to smuggling, a long term deal must create a basis to end, or at least detect with high probability, Iran's illicit procurement of goods for its nuclear programs. Such a verified ban is a critical part of ensuring that Iran is not establishing the wherewithal to:

- Build secret nuclear sites,
- Make secret advances in its advanced centrifuge or other nuclear programs, or
- Surge in capability if it left the agreement.

A comprehensive nuclear agreement is not expected to end Iran's illicit efforts to obtain goods for its missile and other military programs. Iran appears committed to continuing its illicit operations to obtain goods for a range of sanctioned programs. Given Iran's sanctions-busting history, a comprehensive nuclear agreement should not include any provisions that would interfere in efforts of the international community to effectively sanction Iranian military programs.

These conditions argue for continuing all the UNSC and national sanctions and well-enforced export controls on proliferation-sensitive goods. Such goods are those key goods used or needed in Iran's nuclear programs and nuclear weapon delivery systems, the latter typically interpreted as covering ballistic missiles.

Sanctions should continue on the listed goods in the UNSC resolutions, many of them dual-use in nature, and more generally on those other dual-use goods that could contribute to uranium enrichment, plutonium reprocessing, heavy water, and nuclear weapon delivery systems (see United Nations Security Council resolution 1929, par. 13). The latter is often referred to as the "catch-all" provision and mirrors many national catch-all requirements in export control laws and regulations. In the case of Iran, this provision is especially important. Without illicitly obtaining the goods covered by catch-all, Iran would be severely constrained in building or expanding nuclear sites.

Strengths and Weaknesses of Provisions in U.S. Fact Sheet

A goal of negotiators has been to create a final agreement which maintains international sanctions and controls on imports by Iran of proliferation-sensitive goods while creating a verifiable procurement channel for Iran's legitimate nuclear program. In this sense, the Fact Sheet succeeds in its provisions that seem to address both issues. On one side, the Fact Sheet contains a provision that "core provisions in the UN Security Council resolutions – those that deal with transfers of sensitive technologies and activities – will be re-established by a new UN Security Council resolution that will endorse the JCPOA and urge its full implementation." On the other, one of the strongest provisions relates to the establishment of a procurement channel that will monitor and approve the supply, sale, or transfer of certain nuclear-related and dual-use materials and technology.

As important, but not discussed in the U.S. Fact Sheet, procurements of sanctioned goods outside this channel would be banned and considered illicit nuclear trade. One key aspect that accompanies this provision in a final deal has been the creation of a comprehensive list of goods

subject to control and monitoring via the procurement channel. This list, which has not been made public although Iran may have seen it, needs to be extensive and include the major goods needed by Iran's nuclear programs. Initial indications are that this list may not be adequate.

The Framework does not mention the body that will oversee Iran's procurement channel or how import activities will be coordinated. It also does not deal with how UN sanctions compliance will be monitored. The UN Iran Sanctions Committee and its Iran Panel of Experts are already established bodies that could provide monitoring of exports via the channel. According to briefings by negotiators, Iran opposes the use of these UNSC bodies to oversee the procurement channel.

The IAEA should have a key role with an expanded authority in verifying that Iran is complying with these provisions. The Panel of Experts cannot perform this function, whereas the IAEA has performed similar verification activities in Iraq and Libya and can muster the resources to perform this verification task in Iran.

Missing in the Fact Sheet is any indication that Iran will commit not to conduct illicit trade in the goods subject to this agreement. This is a major point given the extent of Iranian illicit nuclear and nuclear-related procurements in the past and its on-going efforts to acquire nuclear-related goods illegally.

As detailed under recommended measure 2, UNSC sanctions on proliferation-sensitive goods must be made conditional on the IAEA reaching a broader conclusion about the peacefulness of Iran's nuclear program.

Enforcement Must Continue

The adequacy of verification and ensuring Iran's compliance with the deal will depend on strong enforcement of national and regional export control laws and on-going sanctions on proliferation-sensitive goods throughout the world. A risk is the undermining of national enforcement efforts against Iran's illegal purchase of proliferation sensitive goods. U.S. and other nations' prosecutors and investigators should be encouraged to aggressively pursue enforcement efforts against Iranian illicit procurements. Iran has continued to procure key goods illegally for its nuclear, missile, and military programs even throughout the time that the interim deal has been in place. Although an agreement would create a procurement channel for authorized nuclear programs, Iran would still be banned from buying a range of goods outside of this channel.

All nations should commit to detecting and enforcing any violations of this part of the agreement. President Obama, or a designated senior representative, should make a statement on the importance of enforcing sanctions on proliferation-sensitive goods now and under any agreement. The administration should send out guidance to U.S. enforcement agencies that their efforts should not cease to collect evidence and prosecute crimes by Iranian illicit procurement agents. To that end, the United States should allocate more financial and logistical resources to their on-going enforcement. The European Union countries should undertake similar actions. If a deal is signed, the P5+1 will need to conduct an aggressive international outreach effort about

the need for countries to continue enforcing export controls and sanctions against Iran and provide a mechanism for reporting violations to the assigned body overseeing sanctions compliance.

4) Include Supplementary Verification Conditions

The recent parameters framework contains many provisions related to the verification of a comprehensive plan. However, the conditions are such that their adequacy cannot be assessed comprehensively without progress on some key provisions in the negotiations. As a result, it is difficult to make specific recommendations. However, the general areas that we believe are priorities for resolution or clarification include those detailed below.

Anywhere, Anytime Inspections

A clearly stated commitment is needed in the agreement that will allow the IAEA to have access to suspicious sites anywhere in Iran, including military sites. The Fact Sheet is confusing on this point. The relevant bullet is:

"Iran will be required to grant access to the IAEA to investigate suspicious sites or allegations of a covert enrichment facility, conversion facility, centrifuge production facility, or yellowcake production facility *anywhere in the country*." (emphasis added)

The key phrase "anywhere in the country" does not appear to be applied to the suspicious sites in the first clause. These suspicious sites could include military sites where nuclear weapons research, development, or production could have taken place or would take place. Doubt about whether the P5+1 obtained Iran's commitment to allow inspections anywhere is evident in recent public statements. Supreme Leader Khamenei said on April 9 that military sites would be off limits to inspections. A day earlier, Hossein Dehqan, Iran's Minister of Defense and Armed Forces Logistics, said that Iran has not agreed to open its military facilities to inspections: "Such an agreement has not taken place, and fundamentally inspections of military sites are among the red lines, and no inspections of these sites will be allowed." Thus, there is no doubt Iran is denying that it will allow critical access to military sites. A priority in the negotiations is an explicit commitment by Iran to allow IAEA access to military sites.

This access must be prompt. Inspectors must have access to sites where evidence indicates suspicious nuclear-related activities are taking place in a manner that is close to immediate or "anytime." The United States has recognized that the Additional Protocol alone is not sufficient to obtain access quickly enough and supports more timely access conditions in an agreement. The exact nature of that proposal is not in the Fact Sheet but Iran has apparently not yet agreed to this proposal and this proposal remains a very tough issue.

In addition to anywhere, anytime inspections, the comprehensive plan must ensure that the IAEA can take environmental samples and other measurements at sites of concern and interview key personnel related to those suspect activities. These measures should be permanent.

Broader Declarations

In addition to the broader declarations needed to address the IAEA's PMD concerns, the verification arrangements will also need to include requirements that Iran declare how many centrifuges Iran has made and its inventory of raw materials and equipment for its centrifuge program. This baseline is necessary if the agreement is to provide assurances about the absence of secret centrifuge activities and facilities.

With regard to establishing a baseline on the number of centrifuges made by Iran, verification of centrifuge manufacturing is necessary, including the declaration and verification of key raw materials and components. The declaration needs to include the origin and amounts of key raw materials and the total number of major components, including the number held in stock, the number manufactured or procured, and their fate. A description of the locations used to produce these goods will also be needed.

The U.S. Fact Sheet appears to recognize the importance of this condition. However, the language in the Fact Sheet focuses on the future and not the past. Without knowledge of past centrifuge manufacturing activities, centrifuge-related equipment and raw material inventories, and centrifuge-related procurements, verification cannot be adequate. Covert stocks of centrifuges and related equipment and materials could exist and be kept outside the purview of the inspectors. Ensuring a full declaration of the past should be a priority.

Another element is the rigorous verification of uranium obtained abroad and produced domestically. The Fact Sheet and briefings have emphasized the continuous surveillance of uranium mills over a twenty five period. Less clear is whether Iran has committed to cooperate with the IAEA in making a full, verified accounting of past uranium purchases and production. Moreover, knowing Iran's historical acquisition and use of uranium stocks is the more important goal. Like the provision guaranteeing daily IAEA inspector access to Iran's centrifuge plants under the interim deal under the Joint Plan of Action, daily or continuous inspector access to uranium mills would be more political show than sensible or substantively useful. The deal needs to ensure that the IAEA can conduct remote surveillance of the mills and in fact other key nuclear sites. So far, Iran has refused to allow remote monitoring. The Fact Sheet states that the IAEA access can include the use of the "most up-to-date, modern monitoring technologies." However, based on this statement, Iran may or may not have accepted the routine use of remote monitoring.

Iran would also need to agree to provide the IAEA with details of past and future imports, exports, and uses of key items listed under INFCIRC 254 part 1 and 2 and other critical goods that are used in Iran's nuclear programs. These declarations would go beyond the ones in the Additional Protocol and Iran's commitment to make these declarations should be in the comprehensive deal.

As part of broader declarations, the comprehensive plant should also include a provision for verification of any past activities related to the separation of plutonium. These declarations should include information on any actual or attempted procurements related to acquiring capabilities to separate plutonium from irradiated material.

In sum, because of Iran's history of denying or delaying the IAEA access to sites, taking actions to hide activities at sites, and generally abusing the consultation process with the inspectors, a deal needs to include legally binding provisions that ensure the IAEA prompt access to sites and a complete inventory of information about Iran's past and future activities. The IAEA must have the ability to verify an agreement for its duration without hindrances from Iran.

As I stated, the evaluation of the adequacy of verification provisions remains a critical role of Congress. Congress should have a role in evaluating the adequacy of the verification regime throughout its duration at the most critical phasing points.

Thank you for the opportunity to testify today.

Appendix 18:

Specific Violations of the Comprehensive Safeguards Agreement, Pre-2004

From the mid-1980s to 2003 Iran violated its safeguards agreement with the IAEA by failing to declare numerous activities required by Iran's safeguards agreement with the IAEA, primarily involving experiments with nuclear material. Though several IAEA reports describe these violations, the November 2004 IAEA safeguards report on Iran provides an especially detailed summary of Iran's overall nuclear program, including specific NPT violations. According to the IAEA, Iran failed to declare the following major activities:

- **Uranium Imports:** Iran failed to report that it had purchased natural uranium (1,000 kg of UF6, 400 kg of UF4, and 400 kg of UO2) from China in 1991, and its subsequent transfer for further processing. Iran acknowledged the imports in February 2003.
- **Uranium conversion:** Iran did not inform the IAEA of its use of the imported uranium in tests of its uranium conversion processes, including "uranium dissolution, purification using pulse columns, and the production of uranium metal, and the associated production and loss of nuclear material." Iran acknowledged this failure in February 2003.
- **Uranium enrichment:** Iran failed to report that it had used 1.9 kg of the imported UF6 to test P1 centrifuges at the Kalaye Electric Company centrifuge workshop in 1999 and 2002. In its October 2003 declaration to the IAEA, Iran first admitted to introducing UF6 into a centrifuge in 1999, and into as many as 19 centrifuges in 2002. Iran also failed to declare the associated production of enriched and depleted uranium.
- **Hidden Sites:** Iran did not declare to the IAEA the existence of a pilot enrichment facility at the Kalaye Electric Company Workshop, and laser enrichment plants at the Tehran Nuclear Research center and at Lashkar Ab'ad. Because experiments at these sites involved the use of nuclear material in equipment, Iran was obligated to report them to the IAEA.
- Laser Isotope Enrichment Experiments: Iran failed to report that in 1993 it imported 50 kg of natural uranium metal, and that it used 8 kg of this for atomic vapor laser isotope separation (AVLIS) experiments at Tehran Nuclear Research Center from 1999 to 2000, and 22 kg of the metal for AVLIS experiments at Lashkar Ab'ad from 2002 to 2003. These activities were ultimately acknowledged in an October 2003 declaration.
- **Plutonium Experiments:** Iran did not report to the IAEA that it had produced uranium dioxide (UO2) targets, irradiated them in the Tehran Research Reactor, and then separated the plutonium from the irradiated targets. Iran also failed to report the production and transfer of waste associated with these activities and that it had stored unprocessed irradiated targets at the Tehran Nuclear Research Center. In later meetings with the IAEA, Iran said that it conducted the plutonium separation experiments between 1988 and 1993 using shielded glove boxes at the Tehran Nuclear Research Center.

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⁸ Excerpted from Albright and Jacqueline Shire, "Iran's NPT Violations – Numerous and Possibly Ongoing?" ISIS Report, September 29, 2006. http://isis-online.org/uploads/isis-reports/documents/irannptviolations.pdf

⁹ http://www.iaea.org/Publications/Documents/Board/2004/gov2004-83.pdf

¹⁰ International Atomic Energy Agency, *Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran*, GOV/2003/75, 10 November 2003, Annex 1, p. 2. 3

Appendix 2:

Major Illicit Iranian Procurements in Violation of UN Security Council Sanctions and National Trade Controls

Iran's wide-ranging illicit procurement efforts have centered on outfitting its gas centrifuge program and Arak nuclear reactor project in defiance of a host of supplier countries' national trade controls and of United Nations Security Council sanctions resolutions that require Iran to suspend both programs. The UN Security Council first passed a resolution demanding a suspension of Iran's nuclear programs in 2006 under resolution 1696. But Iran continued to conduct smuggling operations regularly to outfit its sanctioned nuclear programs. Intelligence agencies and the IAEA found that Iran also conducted illicit procurement to supply its secret nuclear weapons program until at least 2004; European countries have detected procurements after 2004 related to nuclear weapons development. Iran continues these operations throughout the period of the Joint Plan of Action, although the agreement did not explicitly denote that Iran would suspend illicit procurement activities.

Some prominent examples of major procurements made or attempted by Iran in recent years include:

- In 2012, a major U.S. sting operation led to the arrest of an Iranian working with a Chinese company to send or attempt to send U.S. and European-origin goods to Iran and Iranian companies or entities via transshipment through China. The sought-after goods, which included tons of maraging steel, vacuum pumps, pressure transducers, mass spectrometers, and accessories, were dual-use items intended for and critical to the operation and advancement of Iran's gas centrifuge program.¹⁵
- Qiang Hu, a Chinese citizen, was charged in the United States for violating U.S. export controls by selling thousands of pressure transducers, which measure pressure in gas centrifuge cascades, to unnamed customers through his position of sales manager at MKS Instruments Shanghai Ltd. in China. Iran was a likely recipient. Hu worked with two colleagues and two phony Chinese trading companies to fraudulently obtain U.S. export licenses for over \$6.5 million worth of pressure transducers.

http://www.justice.gov/usao/ma/news/2012/May/HUQiangchargesPR.html.

¹¹ For additional, detailed examples, see ISIS, "Illicit Trade: Case Studies." http://isis-online.org/studies/category/illicit-trade/

¹² United Nations Security Council Resolution 1696 (2006), July 31, 2006. http://www.isisnucleariran.org/assets/pdf/UNSC_res_1696.pdf

¹³ Report by the Director General, *International Atomic Energy Agency (IAEA)*, *Implementation of the NPT Safeguards Agreement and the relevant provisions of Security Council resolutions in the Islamic Republic of Iran*, November 8, 2011. http://isis-online.org/uploads/isis-reports/documents/IAEA Iran 8Nov2011.pdf

¹⁴David Albright and Christina Walrond, *The Trials of the German-Iranian Trader Mohsen Vanaki: The German Federal Intelligence Service Assesses that Iran Likely Has a Nuclear Weapons Program*, ISIS Report, December 15, 2009. http://isis-online.org/uploads/isis-reports/documents/MohsenCaseStudy_update_15Dec2009.pdf

¹⁵ David Albright and Andrea Stricker, "Major U.S. Sting Operation Arrests Iranian in Nuclear Smuggling Network," ISIS, August 12, 2012. http://isis-online.org/uploads/isis-reports/documents/US case gas centrifuge equipment.pdf

¹⁶ Department of Justice Press Release, "Chinese National Charged in Massachusetts with Illegal Exports of Sensitive Technology to China," May 23, 2012.

- A Swedish naturalized citizen, originally from Iran, was convicted in 2013 for running a small Swedish trading company that attempted to illegally export gas centrifuge relevant valves and vacuum pumps to Iran. Many previous dual-use exports to Iran were successful.¹⁷
- In 2011, an Iranian trading company, Jahan Tech Rooyan Pars Co., sought via a commercial Chinese web site 100,000 ring magnets, whose dimensions matched those of ring magnets of Iran's IR-1 centrifuge. This number of ring magnets was enough for 50,000 IR-1 centrifuges. ¹⁸
- According to a senior U.S. official interviewed by The Washington Post, Iran was detected in 2010 trying to buy carbon fiber in China, a material used in fabricating advanced gas centrifuges.¹⁹
- In 2009, a Chinese company, Roc-Master Manufacture and Supply Company, working on behalf of an Iranian client, brokered a deal for 108 European-made pressure transducers with a distributor of this equipment located in Taiwan. The Taiwanese distributor misled the European manufacturer that the end user was in China, but instead forwarded the pressure transducers to Iran.²⁰
- Starting in 2007 and continuing into 2011, Iran sought 1,767 valves from Germany for its IR-40 heavy water reactor at Arak and planned to pay \$6 million for these valves.²¹ The Iran-based Modern Industries Technique Company (MITEC) which is responsible for the design and construction of the Arak reactor, was the entity that sought the valves abroad. MITEC has been listed under United Nations Security Council sanctions since 2010. The major players in the procurement scheme, including Hossein Tanideh, an Iranian procurement agent, were arrested in Turkey and Germany.
- From 2006 to the present, the United States has tracked a Chinese company's sales of missile and nuclear related materials to Iran, including illegally accessing the U.S. financial system to receive payments from Iran. The prominent case of the sanctioned Chinese company, Limmt, and its owner, Li Fang-Wei, has showcased China's inaction on enforcing sanctions against Iran. In 2009, the United States first indicted Li and Limmt, and in 2014, the United States released a new indictment and a reward for Li's arrest.
- In 2006, a private Chinese manufacturing company under false pretenses acquired vacuum pump systems from a European company's Chinese subsidiary. These pumps were manufactured in Europe and

¹⁷ Swedish indictment of Shahab Ghasri, September 24, 2011. http://www.exponerat.info/wpcontent/uploads/2012/12/iranier_Smuggling-tekn-utrust-Iran-B-3487-11-stämning.pdf; Report of the Panel of Experts on Iran established pursuant to resolution 1929 (2010), June 5, 2013, paras 23-27 and 111.

¹⁸ David Albright, "Ring Magnets for IR-1 Centrifuges," ISIS Report, February 13, 2013. http://isis-online.org/uploads/isis-reports/documents/iran_ring_magnet_13Feb2013.pdf

¹⁹ John Pomfret, "Chinese Firms Bypass Sanctions on Iran, U.S. Says," *The Washington Post*, October 18, 2010.

²⁰ "How Nuclear Equipment Reached Iran," The Associated Press. March 1, 2010.

²¹ Cathrin Gilbert, Holger Stark, and Andreas Ulrich, "Operation Ventilator," Der Speigel, 40/2012. See also *Report of the Panel of Experts on Iran*, June 5, 2013.

²² Andrea Stricker, "A Smuggler's Use of the U.S. Financial System to Receive Illegal Payments from Iran," ISIS Report, October 23, 2009, updated February 11, 2011. http://isis-online.org/uploads/isisreports/documents/Limmt Li Fang Wei 23Oct2009 update9Feb2011.pdf

²³ David Albright, Andrea Stricker, and Donald Stewart, "Serial Proliferator Karl Li: China's Continued Refusal to Act," ISIS Report, May 8, 2014. http://isis-online.org/isis-reports/detail/serial-proliferator-karl-li-chinas-continued-refusal-to-act/20

intended for use exclusively in China. Nonetheless, the Chinese manufacturing company sent them to Iran without official approval.²⁴

• In the last few years, Iran acquired significant quantities of high quality carbon fiber, a good usable in its advanced gas centrifuges. The carbon fiber, made in Japan, was sold to a U.S. company, which in turn sold it to an EU country. It was subsequently sold to other companies within the EU, and ultimately trucked to Iran via Turkey.

²⁴ David Albright, Paul Brannan, and Andrea Scheel, "How Cooperation between a Company and Government Authorities Disrupted a Sophisticated Illicit Iranian Procurement," ISIS Report, January 12, 2009. http://isisonline.org/uploads/isis-reports/documents/Pumps China 12January2009.pdf

Appendix 3:

Update on the IAEA/Iran Framework for Cooperation and Resolution of Possible Military Dimensions (PMD): Effort Remains Stalled

Iran has pledged under a Framework for Cooperation with the IAEA to resolve all outstanding issues relating to the possible military dimensions of its nuclear program. These issues were detailed in an annex in the IAEA's November 2011 safeguards report.²⁵ The evidence underlying the outstanding issues is viewed by the IAEA as "overall, credible." Iran has told the IAEA that "'most of the issues' in the Annex to GOV/2011/65 (the November 2011 safeguards report) were 'mere allegations and do not merit consideration.",26

The IAEA reiterated in September 2014 that with regard to its investigation:

The Board of Governors has confirmed on numerous occasions, since as early as 1992, that para. 2 of INFCIRC/153 (Corr.), which corresponds to Article 2 of Iran's Safeguards Agreement, authorizes and requires the Agency to seek to verify both the non-diversion of nuclear material from declared activities (i.e. correctness) and the absence of undeclared nuclear activities in the State (i.e. completeness).

The IAEA has stated it needs to conduct a "system" assessment of the outstanding PMD issues, and that "this will involve considering and acquiring an understanding of each issue in turn, and then integrating all of the issues into a "system" and assessing that system as a whole."

Although Iran has pledged to cooperate on addressing the past and present issues related to the possible military dimensions of its nuclear program, the latest IAEA Iran safeguards report from February 19, 2015 notes no further progress on resolving them. In particular, Iran has not proposed any new practical measures to resolve its PMD file in a fourth step under the IAEA/Iran Framework for Cooperation. It has also not addressed the last two measures in the third step of the Framework for Cooperation that had been agreed upon in May 2014. These two measures concern the initiation of high explosives and neutron transport calculations possibly related to the development of nuclear weapons. In August 2014, the IAEA had also invited Iran to propose new measures for a new step in the Framework for Cooperation, but, as of early March 2015, Iran has failed to do so.

Requests to Access Parchin Site

In February 2012 the IAEA requested a visit to a site at the Parchin military site which it has not yet been granted. Instead, the IAEA (and ISIS) has tracked via satellite imagery the apparent sanitization efforts by Iran to conceal past activities at the site over the past two plus years since the IAEA first asked to visit.²⁷ The IAEA reports that the activities that have taken place at the site since its request for access have likely "undermined its ability to conduct effective verification" and that Iran must address its questions and provide access to the site.

²⁵ Report by the Director General, *Implementation of the NPT Safeguards Agreement and relevant provisions of* Security Council Resolutions in the Islamic Republic of Iran, GOV/2011/65, November 8, 2011. http://isisonline.org/uploads/isis-reports/documents/IAEA Iran 8Nov2011.pdf

²⁶ Report by the Director General, Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council Resolutions in the Islamic Republic of Iran, GOV/2014/43, September 5, 2014. http://isisonline.org/uploads/isis-reports/documents/gov-2014-43.pdf ²⁷ "Iran: ISIS Reports with Imagery," http://isis-online.org/isis-reports/imagery/category/iran/

The IAEA reported in its February 2015 safeguards report viewing in satellite imagery further activity at the Parchin military site. It has observed construction materials, vehicles, and other equipment present at a specific location at Parchin where the nuclear weapons-related high explosive activities are alleged to have taken place. Similarly, through analysis of commercial satellite imagery dated between August 12, 2014 and January 31, 2015, ISIS also detected various activities and the presence of construction materials at the site in question. In the most recent imagery, resurfacing or re-asphalting activities could be seen as well as cleanup of construction materials and debris, all of which would be consistent with the IAEA's findings.²⁸

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²⁸ David Albright, Serena Kelleher-Vergantini, and Christopher Coughlin, "Modifications at the Parchin Site: A Comprehensive Timeline; New Imagery Suggests Re-Asphalting," ISIS Report, February 11, 2015. http://isis-online.org/uploads/isis-reports/documents/Parchin February 11 2015 Final.pdf